As an income contingent loans bill is considered by the US Congress, income contingent loans (ICL) have risen to the forefront of economic discourse. ICLs are collected through the income taxation system and are repaid only when future incomes exceed a specified level. ICLs were first introduced in Australia in 1989 to help college students finance their tuition costs, and since then many countries have followed this policy approach. Bruce Chapman, Timothy Higgins and Joseph E. Stiglitz along with a host of internationally recognised experts who have been instrumental in impacting national policy in this field, explore the theory of ICLs, and the prospect of applying the basic principles to many other potential areas of social and economic policy such as paid parental leave; recompensing poor countries for skilled migrant emigration; legal aid for civil disputes; business innovation for small and medium enterprises; out-of-pocket health care expenditure needs, and for periods of unemployment.

The text describes an alternative approach to ICLs, which takes the form of human capital contracts or graduate taxes, as well as examining hybrid schemes that combine the attractive aspects of both arrangements. Case studies are used to examine the prospects for ICLs for higher education in Malaysia, Germany, Thailand, Chile and Colombia, and there is discussion of the barriers for adoption of ICLs in countries that lack efficient institutions for debt collection.

A key message from the contributions is that in countries with appropriate institutions for taxation administration, there are considerable transactional efficiencies associated with ICLs. These efficiencies, combined with the improvements in risk and incentives that well-designed ICL programs can provide, suggest that such programs can play an important role in a modern welfare state.

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In 1989 the Australian government introduced the first university tuition-loan program in which debts would be collected through the income tax system depending on the participant’s income. The policy, known as the Higher Education Contribution Scheme (HECS) is an arrangement known as an income contingent loan (ICL), a debt that differs critically from ‘normal’ loans in that repayments occur if and only when debtors’ incomes reach a given level. Eight other countries have since adopted similar student loan schemes and, at the time of writing, there is a Bill (the Earnings Contingent Education Loans (ExCEL) Act) under bi-partisan consideration in the US Congress which, if passed, would have the effect of introducing a broadly-based ICL. It is generally agreed that ICL policies for higher education financing have worked effectively from the perspective of equity and efficiency, and from a transactional perspective.

While HECS was considered to be a creative innovation, applauded in the main for its political sophistication, no-one at the time foresaw the potential of ICL to transform the debate concerning the economic and social policy landscape. There was no appreciation of the possibility that contingent loan financing could provide a model for far-reaching renovations to the nature and form of public policy; yet in the eyes of some contemporary social scientists such a possibility is close to being realised. The ICL potential, and the intellectual, conceptual and empirical bases of contingent financing, are the subjects of our book.

Over about the last 25 years economists and other social scientists have taken the basic template of Australia’s education ICL and applied it to a plethora of different social and economic arenas. It is this policy and research experience that provided the idea of holding an International Economics Association workshop on the broad topic of ICL, and this came to fruition at
Dhurakij Pundit University (DPU) in Bangkok in April 2013. The convenors were Professors Joseph E. Stiglitz and Bruce Chapman, with critical funding support provided by DPU, the Australian Research Council and Ausaid, the Australian government aid agency at the time.

The two-day workshop covered: the conceptual and theoretical underpinnings of ICL; the costs and benefits of different types of higher education student loans; and potential contingent loan policy applications beyond higher education. A number of participants presented commentary during and after the workshop, summarising their thoughts on the discussion, and examining, among other things, advantages and disadvantages of particular features of different ICL programs, lessons learned, unresolved questions, and future prospects and challenges.

This volume contains revised versions of the presentations and commentaries presented at the workshop.

In the first chapter following this introduction, Chapman sets the scene by traversing the major theoretical and policy issues in historical, conceptual and empirical contexts. The chapter is intended to introduce ICL to readers unfamiliar both with loans of this form and with the literature analysing these programs.

The remainder of the book consists of four sections. Section 1 examines the theoretical underpinnings of ICL. Section 2 describes and considers critically the application of ICL in higher education, and includes an overview of the motivation, design, and lessons learned from the implementation of ICL schemes for higher education. Various case studies (Chile, Colombia, Malaysia, Thailand and Germany) illustrate a variety of issues that higher education financing programs face, and the possibility for solutions through ICL.

Section 3 provides an examination of several disparate potential applications of ICL in financing areas well beyond student loans, including: paid parental leave; legal aid; business innovation; health care; sustaining consumption during a period of unemployment; and providing for aged care. It also contains a discussion of the internationalisation of ICL debt payments for human capital trade imbalances. Section 4 concludes with commentaries on aspects of ICL theory, design and application, ranging from a reassessment of the costs and benefits of ICL in higher education, to reflections on contingent loans as a new paradigm for the welfare state and as a lower cost alternative to private financial markets in certain critical realms.

Following are brief summaries of the chapters, and what we consider to be the key findings from the workshop.

In Chapter 1, Chapman highlights the critical advantages of ICL over conventional loans: it provides for better consumption smoothing, since with ICL repayment obligations are a fixed proportion of income; the administrative and compliance costs with ICL have been low; government has
the legal power to collect from income; and, in countries with universal and
transparent internal revenue services (or taxation offices), the transactional
efficiency of these systems can lead to significant cost advantages of ICL over
other financing instruments. This last point is raised by Stiglitz in Chapter 2,
and by Denniss in the volume’s final chapter. While focusing on the
Australian experience, Chapman goes on to briefly summarize the
international experience with ICL. Chapman stresses that the viability of ICL
requires a strong legal framework, a universal and transparent regime of
income taxation and/or social security collection, and an efficient repayment
mechanism. This point is also emphasized by Salmi (Chapter 6) in discussions
of student loans in Chile and Colombia, and by Hock-Eam, Ismail and
Ibrahim (Chapter 7) with respect to Malaysia.

In the second part of Chapter 1, Chapman examines some major conceptual
issues related to the application of ICL to disparate policy areas beyond higher
education. The policy benefits essentially take the form of insurance against
consumption hardship (and concomitantly, loan default), but there is a major
and pervasive issue inherent in the design of all ICL, which concerns the
possibilities of non-repayment of the loan. Related problems are adverse
selection – the risk that only individuals who anticipate having a low income
will sign up for the program – and moral hazard – the risk that income
contingent loans will attenuate incentives. These concepts and their relevance
to the use of ICL as a government risk-management instrument are examined
in detail.

In the first chapter in Section 1, the broad theoretical consideration of ICL,
Stiglitz compares and contrasts the economic consequences of debt and equity.
In financing human capital, ICL has distinct advantages in risk sharing,
alogous to that of equity in financing conventional investments. He also
highlights the issue of ‘transactional efficiencies’ and makes a strong case that
governments are particularly well-placed to be engaged in financial
intervention in many areas of economic behavior because the use of the
internal revenue service as a loan collection agency is an extremely efficient,
as well as equitable, way to collect debt. The point is taken up enthusiastically
and expanded in the final volume chapter by Denniss.

In Chapter 3, Quiggin presents a simple model of income contingent loans.
His model illustrates how ICLs allow for insurance against wage (and more
generally, income) uncertainty and shows that under reasonable conditions, an
ICL is superior to market loans or tax-financed public subsidies in terms of
both labor market efficiency and equity. Quiggin argues that if individuals
expect to repay the full ICL with certainty, then there will not be distortions to
labor supply. Rather, he points out that distortions will only occur in the wage
interval where optimal effort leads to partial loan repayment. This raises the
important question as to the size of the wage interval for which adverse
effects on labor supply arise, a question Racionero poses in Chapter 19.
Long adds to the debate in Chapter 4, providing a conceptual model for measuring social welfare gains for an ICL utilizing a flexible piecewise linear repayment scheme. Under the proposed model, ICL scheme parameters could, in theory, be selected by optimizing the social welfare function subject to known distributions of labor productivities and elasticities of labor supply, and appropriate equity constraints. Starting with the modeling of simple systems and interactions is a practical and sensible approach, and a marked improvement over a simple linear repayment scheme. Long, like Stiglitz and Yun (Chapter 16), suggest that a general theory for ICLs has to be embedded in the broader context of taxation, welfare and social security, and his paper can be viewed as a necessary step along the path to developing such a theory. Long shows that an ICL contributes toward consumption smoothing across states of nature (or individual types) within any period, as well as across periods. He argues in favour of a scheme of piecewise linear income-dependent repayment rates, which is a dynamic generalization of the scheme of piecewise linear income taxation that Apps, Long and Rees (2012) investigated in a static setting.

Section 2 focuses on ICL developments in higher education, where they have had their widest application. Chapter 5 begins with Barr’s comprehensive coverage of the debate on higher education funding, and is an important complement to Chapman’s background paper. Barr first provides the context, namely that higher education has changed and that the expansion of the sector requires new approaches to financing. He summarises the arguments for cost-sharing based on fiscal constraints, equity, and efficiency, and concludes that the only ‘large-scale equitable source of private finance’ is through graduate future earnings (p.65), that is, through a contingent system of loans.

Barr highlights the issue of interest rates, arguing strongly against blanket interest subsidies in ICL programs, on the grounds that they are expensive and poorly targeted, particularly if debt forgiveness already protects graduates with low lifetime earnings. A consequence of high real interest rates is the possibility of spiralling nominal debt, and Barr presents some solutions, such as applying zero real rates when repayments fall short of accrued interest. Barr then shares lessons about loan design and implementation in the UK, New Zealand, and Hungary. Of particular interest is the case of Hungary, where loans are financed by the private sector with repayments based on past earnings, and an interest rate is charged that is the sum of the cost of finance, a cohort risk premium (to cover the risk of non-repayment), and administrative charges. The essential point is that with careful design, ICL loans can be privately financed. The Hungarian approach essentially moves the risk from the taxpayer to the cohort of graduates (see Racionero, Chapter 19, for further discussion of this point).
Barr’s point that there is no single income contingent scheme – ‘income contingency is a mechanism for collecting repayments’ (p.69) – highlights what sets income contingent loans and graduate taxes apart from other policies. In this context two features of ICL are special: the built-in insurance of the mechanism, and its transactional efficiency when collection is through the tax authorities. The transactional efficiency of ICL was a recurring theme in the Workshop, and one that is argued in depth by both Stiglitz (Chapter 2) and Denniss (see Chapter 22).

In Chapter 6 Salmi recounts lessons from the recent student loan policy experience in Chile and Colombia. His key lesson is that in times of economic hardship, if loans are not income contingent graduates will face considerable repayment burdens and very high loan default rates. This led to the collapse of the Chilean loan system following recent student protests. Despite government announcements to move to an ICL arrangement for all students, the new administration has since promised to abolish fees and introduce free higher education. Salmi stresses that if implemented, so-called ‘free’ higher education could be a backward step and potentially jeopardize the quality and equity of higher education in Chile: budget constraints limit the availability of funds to higher education, and a disproportionate share of the beneficiaries come from higher income families and/or end up as higher income individuals. His chapter explains that Colombia, the first country to introduce student loans, has also faced pressure from student protests for the abolition of fees and increased public funding, and has resisted moves to adopt an ICL approach, partly due to difficulties in repayment collections through the tax system in the presence of a large informal sector and fiscal fraud. Reiterating a key lesson raised by Chapman in Chapter 1, Salmi stresses that the challenge is having a reasonably fool-proof collection mechanism.

While Malaysia has considered implementation of an ICL in the past, higher education is currently financed through highly subsidised mortgage-type loans. In Chapter 7, Hock-Eam, Ismail, and Ibrahim critically examine the existing financing arrangements. They focus on empirical evidence related to repayment burdens of mortgage-type loans, which is the proportion of a debtor’s income that is required to repay typical student debts. It is clear that for a significant minority of Malaysian graduates there are worryingly high repayment burdens, even though the current scheme does not cover the full costs of the course and has subsidies of over 50 per cent for some higher education qualifications (such as for sciences and medicine). The chapter demonstrates that an ICL could yield subsidies that are considerably lower than under existing arrangements, and be associated with manageable repayment burdens. Despite the equity and affordability of ICLs (both for students and government), the authors are careful to stress the unresolved challenge of collection in the Malaysian institutional and political context.
In Chapter 8, Lounkaew contributes to the student loan literature by providing empirical evidence of the trade-off between interest rate subsidies and expected aggregate loan recovery. In particular, the paper explores the potential impact of eliminating the interest rate subsidies of Thailand’s Student Loans Fund (SLF). Three important policy conclusions can be drawn. First, in the absence of interest rate subsidies, which are currently of the order of around 60 per cent, the repayment burdens for a large number of debtors would be extremely high. Second, it is shown that attempting to solve the high interest rate costs problem by setting the real rate of interest to 3 per cent would result in default rates of close to 50 per cent, implying very large subsidies of this kind for taxpayers. Third, the current design of the SLF – which is a mortgage-based loan system – does not allow for consumption smoothing, an important issue given the significant variations in graduate incomes over the life-cycle.

The final paper (Chapter 9) in this section, by Grave and Sinning, describes the loan scheme used in Germany for financing student living expenses, known as the BAföG scheme. Subsidies in the scheme can be as high as 80 per cent. Consequently they suggest that the scheme could arguably be replaced by grants, which could be more cost-effective for the government when administrative savings are taken into consideration. Grave and Sinning go on to show that under the current loan arrangements, high subsidies are required to offset the high repayment burdens or long repayment durations that students would otherwise face in the absence of subsidization. There is an alternative, however, to grants or high subsidies; they show how a properly designed ICL can provide an attractive and much less expensive alternative.

Part 3 of the volume explores the prospects for ICL beyond financing higher education. Many examples are motivated by capital market failures – individuals typically can’t get loans, let alone income contingent loans, to finance the items in question. The applications that have received most focus are those in which it is considered that there are clear externalities; there are broader social concerns surrounding the individuals being able to obtain the good or service in question. In all possible extensions of ICL it is acknowledged that poorly designed arrangements can be associated with substantial costs as a result of adverse selection and moral hazard, a prospect writ large when there is not universal compulsion to participate in the scheme (which is true of all the schemes discussed in this section).

In the first contribution (Chapter 10) Higgins discusses the application of an ICL to help finance parental leave. He argues that paid parental leave is an investment in human capital as it fosters workforce retention, and a lack of collateral for young parents leads to liquidity constraints. As with higher education there is a market failure due to asymmetric information concerning future work intentions and prospects. Adverse incentive and selection effects can be mitigated through scheme design, which could include limiting the
duration of the leave, making the debt an obligation of both parents, and restricting eligibility to the paid labor force.

Clarke and Chapman, in Chapter 11, examine the issue of the international emigration of skilled workers from less developed countries to economically advanced nations, a process that can be described as highly regressive. The chapter examines the viability of a proposal to make operational Bhagwati’s ‘brain drain tax’. The basic idea is that emigrating graduates would be required to repay to their original country debts for higher education and these would be collected in the same way as ICL debts are for domestic students.

Chapter 12, by Denniss, considers the development of an ICL scheme for legal aid for civil disputes in Australia. Denniss presents evidence that cost is the main reason for the unmet demand for legal services, and he outlines a Legal Expenses Contribution Scheme as a financing instrument. Importantly, to mitigate the risk of adverse selection, cases would be subject to a merit test prior to consideration for funding. Denniss argues that an appropriately designed scheme could help to meet the demand for legal services, while encouraging equity by striking a balance between the retention of personal risk in order to limit unnecessary legal action, and protection against poverty through imposition of a minimum income threshold.

Gupta and Withers follow in Chapter 13 with an ICL arrangement for the financing of business innovation. Small and medium-sized enterprises are often precluded from funding sources available to larger enterprises due to lack of expertise, size constraints, and generally limited capacity for risk. The lack of access to finance represents a market failure, and the authors suggest a scheme that would include a default-protected contingent loan mechanism with repayments from net earnings. Because repayments would be required only when the firms’ circumstances are financially propitious, this would ensure that the scheme provides revenue or profit smoothing. As with other examples in Section 3, the authors note the importance of limiting adverse selection and moral hazard, and propose a training requirement and commercial assessment in partnership with government and financial institutions. A (partial) risk-pooling arrangement is proposed, such that successful firms repay, in present value terms, more than they borrow (which is, of course, always a feature of non-subsidized income contingent loan programs), thus adding an ‘important mutual responsibility dimension’ (p.162), but also partial taxpayer subsidization is argued for on the grounds of social pay-off from the opportunities generated from innovation activities.

In Chapter 14, Vaithianathan considers how ICLs could be used in health care, in particular for the funding of out-of-pocket health care expenditure in specific areas where there seem to be substantial needs and benefits from the increased access to health care that such a scheme would provide. She notes the potential for significant efficiency gains from such a program. Her analysis begins by pointing out that in high income countries, despite
widespread health insurance, some services such as psychological therapies for depression are not funded despite depression being a major cause of disability and exit from work. It is suggested that ICLs may offer an opportunity for those who face potentially high returns from investing in health but are cash-constrained form doing so, and where conventional health insurance systems cannot fully overcome the adverse and moral hazard problems.

In Chapter 15, Chomik and Piggott expand on the concept of ‘contingency’ beyond income to resources more broadly in the context of support policies for the elderly. They demonstrate the similarities between ICLs and existing public age pensions and reverse mortgage products, which one might broadly classify as resource contingent instruments, and they stress the importance of such policies in light of the fiscal pressures on the state associated with an ageing population.

The final paper in Section 3 (Chapter 16), by Stiglitz and Yun, explores the potential use of ICLs in the context of unemployment insurance. Episodes of unemployment can cause serious hardship, even if the loss of lifetime income is limited, because of imperfections of capital markets. Loans enable individuals to smooth consumption over time, without some of the adverse incentive effects (on search) associated with unemployment insurance. But unemployment loans run into difficulties when individuals face successive bouts of unemployment. Conventional loans can leave individuals in hardship later in life. ICLs are a solution to this quandary, providing better incentives than ordinary unemployment insurance, but better risk sharing than a conventional loan. They show that there are complex externalities, across periods and instruments, with the unemployment program in one period affecting search behavior in other periods. These externalities have to be taken into account in designing the optimal unemployment program. They show that in general, the mix of loans and insurance and the terms of the ICLs should vary over the individual’s life and depend on his or her work experience.

The final section of the book includes commentaries from several participants on a number of different ICL areas. While the workshop focus was on ICL, in Chapter 17 Palacios describes the benefits and costs of income contingent financing more broadly, to include human capital contracts and graduate taxes. Palacios describes the involvement of the private sector as providers of human capital contracts, which are privately underwritten income contingent contracts that are a form of equity rather than debt finance. His major contribution is beyond the comparison of these different contingent arrangements and lies in the argument that the costs imposed by adverse selection and moral hazard may not be as critical as generally perceived, and that such products might provide important price signals to students, government, and higher education providers as to the value of human capital.
Chapter 18 from Yun outlines welfare effects of ICL as compared to other types of government aid program such as mortgage-type loans and grants. Yun describes the Korean student loan program, and discusses the potential efficiency and equity aspects of two-tier loan systems that consist of an ICL for low-income families and mortgage-type loans for other income groups.

In Chapter 19, Racionero provides a considered summary of many points of debate covered during the workshop. Among other matters, she summarizes the options for ICL design (risk-sharing, where the cost of non-repayment is borne by taxpayers, versus risk-pooling, where successful graduates are responsible for covering the repayment shortfall of low earning graduates); and the theoretical work on scheme design selection for optimal participation in the presence of risk aversion. Racionero also discusses issues relating to the application of ICLs beyond higher education, reiterating the significance of moral hazard and adverse selection as critical in scheme design. Her chapter also expresses concern over the accumulation of ICL debt if multiple ICLs are simultaneously offered, and refers to contributions in the ‘new dynamic public finance’ literature that may provide lessons and guidance for further development of ICL theory. Of note, Stiglitz and Yun (Chapter 16) explicitly address the problem of multiple loans in the context of an individual facing the possibility of multiple bouts of unemployment.

In Chapter 20, Quiggin poses the interesting question of why ICLs have yet to be adopted in policy areas outside of higher education financing. His basic proposition is that while the conceptual case for ICL is strong, special interest groups will generally have the political muscle to resist policy changes which in many cases would reduce financial privileges of citizens currently in receipt of grant assistance. In the United States and many other advanced countries, the financial sector has been an impediment to the design of better financial products. As a number of papers in this volume have emphasized, one of the significant advantages of ICL is collection of payment/enforcement through the tax services. However, greater adoption of ICL is likely to cut out the financial sector from the large rents that they currently receive (the issue is taken up further by Denniss in the final chapter of the volume).

Withers pursues the issues of ICL in rational individual choice theory in Chapter 21. He suggests that there are also complementary possibilities for additional new directions for ICL theory and research. An especially promising way to identify such sectors is through a positive political economy analysis of the role of voters, politicians, bureaucrats and interest groups.

Throughout the workshop there was robust discussion on the benefits and values associated with the features of ICL. It was argued that the lower transaction and collection costs of government through the income taxation system offer considerable untapped opportunities that go beyond the ability of such loans to smooth consumption across time and over different income contingencies. A persuasive argument on these lines is presented in Chapter
22 by Denniss. As the lower costs can be passed on to borrowers (whether through scheme benefits such as insurance, or because charges are lower than they are for private sector loans), an ICL is welfare enhancing, and on this basis an argument can be put forward for government intervention in all areas where there is a case for intertemporal and interstate smoothing (across contingencies that affect individuals’ lifetime well-being), essentially implying an alternative welfare state to the contemporary system. The argument is strongly consistent with the benefits highlighted by Stiglitz in Chapter 2 on the issue of ICL transactional efficiencies. This represents a major departure from the direction being taken in many countries, entailing greater reliance on private sector lending.\(^2\)

A key message from the contributions in this volume is that there appears to be a critical potential for the use of ICL instruments not only in higher education, but in many other areas. And the opportunity for welfare gain from lower cost government administration and collection (in countries with appropriate institutions) suggests that consideration be extended for contingent loans even when capital markets are functioning (albeit with higher transactions costs).

The papers in this volume have noted that there are critical matters of design, most obviously motivated by the need to maximize ICL debt recovery, addressing adverse selection and moral hazard concerns, which often loom large. Many of the examples in this volume have shown how these issues of design can be, and have been, addressed. The considerable transactional efficiencies associated with government intervention of these forms, combined with the improvements in risk and incentives that well-designed ICL programs can provide, suggests that such programs can play an important role in a modern welfare state.

Of course it should be acknowledged that policy change is difficult even when there is a clear case for reform on economic grounds. In the event of vested interests and generous benefit payments, barriers to reform can be great. A more widespread embrace of ICL requires careful framing of the benefits to the public, politicians and to policy makers. The strong potential for welfare gains suggests that this is a challenge well worth pursuing, and especially so at times such as these when so many countries are facing severe fiscal issues.

Notes

Chapman and Higgins gratefully acknowledge the support of the Australian Research Council (ARC, LP1102200496).

1. Yale University had introduced an income contingent loan program some years earlier but there were two critical distinctions (highlighted in the paper by Nerlove (1975)): in the Australian program the debts were collected by the tax authorities, enhancing enforcement and lowering transactions costs; and because all students participated in
the program, the adverse selection problem which plagued the Yale program did not arise.

2. Note that the U.S. finally recognized the extra burden associated with private financial markets, moving in 2010 to a public higher education program that relied exclusively on direct loans from the government rather than subsidies to private banks. This measure will save approximately $68 billion from 2010 to 2020. However, the U.S. has not yet moved to an income contingent loan program.

References


1

Income Contingent Loans: Background

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Income contingent loans (ICL) are generally collected through the income taxation system and are repaid only when future incomes exceed a specified level. ICL were first introduced in Australia in 1989 to help college students finance their tuition costs; since then many countries have followed this policy approach. This background chapter analyses the conceptual and empirical basis of ICL, and explains that compared to ‘normal’ bank loans – which are paid on the basis of time – ICL provide the insurance benefits of consumption smoothing and default protection, and are associated with significant collection transactional efficiencies. We examine the prospect of the application of the basic principles of ICL into many other potential areas of social and economic policy, and highlight the significant ICL design difficulties related to both moral hazard and adverse selection.

1.1 Introduction and motivation

In 1988 an options paper was produced for the Australian government motivated to provide the basis for the reintroduction of university tuition fees (Chapman, 1988). The paper recommended an income contingent loan (ICL) for the payment of Australian university fees, to be operated through the income tax system and collected in periods in which the debtors’ income exceeds the average income of employed Australians. The proposal was legislated in 1989, remains in operation and is known as the Higher Education Contribution Scheme (HECS).

As background, an ICL is a debt in which repayments depend on the income of the borrower. Because the collection institution needs to be able to assess
with some accuracy the income of the debtor, the most obvious agency is the internal revenue service (IRS) (or tax office); it has both the legal jurisdiction to know citizen’s incomes, and the administrative apparatus to collect efficiently.\(^1\)

Since the Australian policy change ICLs for higher education financing have been adopted in several other countries\(^2\), and there is active policy debate concerning their possible implementation in many additional countries in reforms of student loan schemes.\(^3\) Currently (in 2014) a bipartisan bill is under consideration in the US House of Representatives with the aim of replacing the US College loan system with an ICL.\(^4\)

Over the last several years there has been burgeoning interest in the potential for policy reform for the adoption of ICL beyond higher education financing. Research on this possibility has traversed areas as diverse as the collection of criminal fines, drought relief policy, paid parental leave and R & D investments. Perhaps as many as 30 to 40 papers have been published on these types of ICL applications\(^5\) and several examples of the types of policy possibilities are examined briefly below.

This chapter has two distinct goals: to examine the conceptual basis and policy experience of ICL in higher education to lay the groundwork for a broader analysis of this type of instrument; and to clarify the circumstances in which ICL applied to social and economic policy reform beyond student loans would be welfare improving. Both are examined in turn.

Section 1.2 explains the case for government intervention in higher education financing and compares and contrasts the two main approaches used internationally to address the market failure involved in human capital investment funding: government-guaranteed bank loans and ICL. The key characteristic of ICL, and their contrast with normal ‘mortgage-type’ bank loans, is that the collection of the debt is based on capacity to pay. The critical implication of this is that when and if debtors experience adverse economic circumstances they have no repayment obligations in that period. In contradistinction, typical loan schemes debt obligations are constant over time and are thus insensitive to a debtor’s financial circumstances. These distinctions mean that ICL provide:

(i) Consumption smoothing, since debtors pay nothing when incomes are low, and proportionately more when incomes are relatively high.

(ii) Insurance against default which would otherwise result from low income.

The chapter examines these issues and reports in summary some of the empirical evidence associated with the actual and potential effects of different types of student loan schemes in a range of countries.
Section 1.3 broadens the discussion of ICL to consider the conceptual basis of the instrument with respect to social and economic policy domains beyond higher education financing. In an important sense a major motivation is to begin the search for the answer to the question ‘while ICL seems to work in practice, would it work in theory?’ A simple way to begin the journey is to explore the conceptual and policy basis behind a small subset of ICL research applications, the original goal motivating the International Economics Association workshop that is the foundation for this book.

1.2 Student loans in international higher education financing

1.2.1 Introduction

It would be reasonable to describe the spread of ICL, essentially as a substitute for mortgage-type loans, as representative of a quiet international revolution in higher education financing over the last 25 years. What now follows explains the conceptual basis for an understanding of why this has been happening. Empirical evidence is summarised with respect to the major issue associated with non-ICL loan systems, the proportion of a debtor’s income required to repay the loan, with respect to around six countries. Australia’s experience with HECS is also documented.

1.2.2 Theoretical issues

A significant financing issue for higher education is that there is generally seen to be a case for both a contribution from students and a taxpayer subsidy (Barr, 2001; Chapman, 2006). An important question is: is there a role for government beyond the provision of the subsidy?

An understanding of the issue is facilitated through consideration of what would happen if there were no higher education financing assistance involving the public sector. That is, a government, convinced that there should be a subsidy, could simply provide the appropriate level of taxpayer support to higher education institutions, and then leave market mechanisms to take their course. Presumably this would result in institutions charging students up-front on enrolment.

However, there are major problems with this arrangement, traceable in most instances to the potent presence of risk and uncertainty. The essential point is that educational investments are risky, because:

(i) Enrolling students do not know fully their capacities for (and perhaps even true interest in) the higher education discipline of their choice. This means in an extreme they cannot be sure that they will graduate with, in Australia for example, around 25 per cent of students ending up without a qualification.
(ii) Even given that university completion is expected, students will not be aware of their likely relative success in the area of study. This will depend not just on their own abilities, but also on the skills of others competing for jobs in the area.

(iii) There is uncertainty concerning the future value of the investment. For example, the labor market – including the labor market for graduates in specific skill areas – is undergoing constant change. What looked like a good investment at the time it began might turn out to be a poor choice when the process is finished.

(iv) Many prospective students, particularly those from disadvantaged backgrounds, may not have much information concerning graduate incomes, due in part to a lack of contact with graduates.

These uncertainties are associated with important risks for both borrowers and lenders. The important point is that if the future incomes of students turn out to be lower than expected, the individual is unable to sell part of the investment to re-finance a different educational path. For a prospective lender, a bank, the risk is compounded by the reality that in the event of a student borrower defaulting on the loan obligation, there is no available collateral to be sold, a fact traceable in part to the illegality of slavery. And even if it was possible for a third party to own and sell human capital, its future value might turn out to be quite low taking into account the above-noted uncertainties associated with higher education investments.

It follows that, left to itself – and even with subsidies from the government to cover the presumed value of externalities – the market will not deliver propitious higher education outcomes. Prospective students judged to be relatively risky, and/or those without loan repayment guarantors, will not be able to access the financial resources required for both the payment of tuition and to cover income support.

These capital market failures were first recognised by Friedman (1955) who suggested as a possible solution the use of a graduate tax or, more generally, the adoption of approaches to the financing of higher education involving graduates using their human capital as equity. The notion of human capital contracts developed from there and is best explained and analysed in Palacios (2004). A critical point for policy is that without some form of intervention higher education financing will not deliver the most propitious outcomes in aggregate, nor can such markets left alone deliver equality of educational opportunity because those without collateral (the poor) will be unable to participate.

Consequently, in almost all countries, governments intervene in the financing of higher education. As noted, there are currently two major forms that this intervention takes: government-guaranteed loans provided by banks,
Bruce Chapman

What now follows examines some critical empirical findings with respect to both forms of assistance.

### 1.2.3 Country studies: repayment burdens with mortgage-type loans

The first type of higher education financing system involves government-backed loans provided by banks and is known as a mortgage-type arrangement in which loan repayments are made on the basis of predetermined amounts over a given time period. Currently this collection basis is used to help finance higher education in many countries, including the US, Canada, the Philippines and Thailand.

Since our main focus is a comparison of mortgage-type loan and ICL, the proportions of graduate incomes per period that need to be allocated to repay mortgage-type student loans. Education economists and others have examined the concept and implications of student loan repayment burdens for more than a quarter of a century. Defined simply in a comparative static context, an RB is, formally:

\[
\text{Repayment burden in period } t = \frac{\text{Loan repayment in period } t}{\text{Income in period } t} \tag{1}
\]

The attention given to RBs with respect to mortgage-type loans is apposite because the essential difference between bank loans and ICL is that the latter have RBs set at a maximum by law; by contrast, RBs for mortgage-type loans are unique for each individual borrower and can in theory and practice be close to zero for high income debtors and even well over 100 per cent for very low income debtors.

RBs are very important to an understanding of the effects of mortgage-type student loan systems because the higher is the proportion of a graduate’s income that needs to be allocated to the repayment of a loan the lower will be disposable income. And lower student debtor disposable incomes have two adverse and related consequences: consumption hardship and higher default probabilities for student loans. There is arguably no more important aspect of the feasibility of a student loans system than the associated RBs.

There is by now considerable empirical analysis of RBs associated with mortgage-type student loans in many different countries, including with respect to Vietnam, Thailand, Indonesia, Germany and the US. An important and innovative aspect of this empirical work is that in all cases the calculation or simulation of RBs for graduates is done at different parts of the graduate earnings distribution using an unconditional quantile regression approach; this allows the impact of student loan repayment obligations to be revealed for all aspects of the graduate income distribution by age and sex, a major
improvement over previous analyses which generally focussed on RBs at the means of graduate income distributions.

The main results in summary for graduates in the bottom 25 per cent of the graduate income distribution by age and sex are:

(i) Between 40 and 85 per cent in Vietnam would have annual RBs around 15 to 20 per cent in the first ten years after graduation.

(ii) In Thailand annual RBs are up to 30 per cent of the group (which is lower than many comparable countries – with respect to GDP per capita – only because the Thai student loan scheme has a very large public subsidy).

(iii) In Indonesia RBs are very high for the group, of around 30 per cent in a relatively high income area (Java), to about 85 per cent in a relatively low income area (Sumatra).

(iv) Even graduates in developed countries can face very high annual RBs, ranging from 50 per cent for public sector lawyers in the United States to around 70 per cent for East German women.

These estimates reveal that mortgage-type student loan schemes have the potential to be associated with significant problems of consumption hardship, with an associated significant minority of prospective students facing defaults. This promotes for discussion the alternative higher education financing option ICL, in which, by design, RBs cannot be an issue because the maximum repayment proportion of income is set by law (and is no more than 10 per cent in Australia, New Zealand and the UK).

1.2.4 International adoption of ICL in higher education financing

After HECS was introduced there were similar debates in other countries concerning the introduction of university fees, and how best to do this. The following examples are of interest:

(i) In 1992 New Zealand introduced a tuition system which was in essence a variant of HECS in that the charge was to be income contingent and collected through the income tax system. There were significant differences however, among them being the inclusion of means-tested income support and the debt having a real rate of interest of around 5 per cent a year. In 2008 the New Zealand government reduced the rate of interest to zero in nominal terms, implying very high effective rates of subsidies.

(ii) In England in 1997, the mortgage-type student loan system was converted into loans collected through the IRS contingent on income, and in 2005 universal tuition for universities was introduced using the same mechanism. In 2011 the newly elected government increased
tuition fees by over 300 per cent, apparently ending all higher education teaching subsidies.

(iii) In 2006 the Thai government replaced its mortgage-style loan system with an ICL known as the Thailand Income Contingent and Allowance Loan system (TICAL). However, this was replaced a year later with the old arrangement, seemingly because TICAL was seen to be associated with former Prime Minister Taksin, who himself had been replaced. It now seems to be back on the agenda (Krongkaew, 2013).

(iv) In 2003 Hungary introduced an ICL for both tuition and income support, with repayments collected through the income tax system (Berlinger, 2009).

(v) President Bill Clinton changed US student loans in 1994 to allow a version of an ICL, but design issues have meant that it hasn’t had take-up of any significance.

(vi) In 2014, the Earnings Contingent Education Loans (ExCEL) Act, which is essentially an ICL replacement for other US college loans, is under consideration by the Congress.

(vii) Both South Korea and the Netherlands introduced variants of ICL, collected through the income tax system, in 2012.

1.2.5 The HECS experience

As noted, in 1989 Australia instituted a broadly based risk-sharing ICL charging system for higher education, known as the Higher Education Contribution Scheme. HECS seeks to recover a part of tuition costs, and the system does not involve student income support, which happens with the ICL in operation in New Zealand, Hungary, and England. With HECS, repayments are progressive and there is a real rate of interest of zero.

The main area of investigation into the effects of HECS has been with respect to the consequences of the scheme for the access of relatively disadvantaged prospective students. The conclusions from the Australian research with respect to socio-economic mix and access are that: the introduction of HECS was associated with aggregate increases in higher education enrolments; and HECS has been associated with increases in the participation of prospective students from relatively poor families (although the percentage point increases were higher for less disadvantaged students, especially in the middle of the wealth distribution).

However, it is apparent than that there have been few consequences from HECS for the accessibility to higher education for students from relatively disadvantaged backgrounds, at least as represented by enrolments. Broadly speaking, the socio-economic make-up of the higher education student body was about the same in the late 1990s and early 2000s as it was before HECS was introduced.
Two further HECS-related points are apposite. One is that, as noted, the collection of the debt has been administratively straightforward and inexpensive, promoting for debate the significance of the issue of transactional efficiencies from the use of the IRS or equivalent as a government risk management instrument. However, and on the other hand, as a result of a design fault, uncollected HECS repayments from graduates moving overseas are not trivial, with Chapman and Higgins (2013) suggesting that these foregone revenues are likely to have been around $(A)400–800 million for the total length of operation of the system.

1.2.6 Is government necessary for ICL?
It is likely that ICLs will remain the domain of government because the collection mechanism needs to be the IRS or equivalent, for two reasons: First, the IRS is the only institution with the unambiguous legal power to know the incomes of citizens and business enterprises. Second, in the circumstances in which the IRS is a comprehensive and administratively efficient institution, the additional costs of collecting an ICL through the normal operation of the system have turned out to be very low. Specifically it is reported in Chapman (2006) that Australian Tax Office estimates put the collection costs for the government at around $40 million (2013 dollars) annually, or less than 3 per cent of yearly receipts. To this figure Chapman (2006) adds an estimate of the compliance costs for universities and comes up with a total administration cost of less than 5 per cent of yearly receipts.

Thus in collection terms the system seems to have worked well and purely from a public policy administrative perspective could provide one of the strongest reasons for policy reforms involving ICL. Indeed, Stiglitz (Chapter 2, this volume) and Denniss (Chapter 22, this volume) point to this as a major advantage of ICL policy. Both authors argue that this aspect of ICLs (the transactional efficiencies) is one of their most important advantages.

1.2.7 ICL as higher education policy: a significant caveat
In Australia and other countries in which an ICL has been introduced, this has turned out to be a relatively simple matter from an administrative point of view. The reasons for this are that the public administration systems of these countries feature a strong legal framework, a universal and transparent regime of income taxation and/or social security collection, and an efficient repayment mechanism.

Under these circumstances it is not complicated to identify and track individual citizens and their incomes over time and space. It is not expensive, moreover, to tack onto an existing tax collection mechanism an additional function: the collection of payments from ex-students, on the basis of a fixed proportion of income. In the developing world, however, the preconditions to allow ICL are often lacking.
Chapman and Nicholls (2004) argue that the minimum conditions for a successful ICL seem to be:

(i) Accurate record-keeping of the accruing liabilities of students.
(ii) A collection mechanism with a sound, and if possible, a computerised record-keeping system.
(iii) An efficient way of determining with accuracy, over time, the actual incomes of former students.

Some would argue that a further basic requirement for the introduction of an ICL is a strong legal framework and functional judicial system. Indeed, it is hard, from a developed-world perspective, to imagine implementing a workable scheme outside this context.

It is worth emphasizing that of the three conditions noted above for the implementation of an income contingent loan, two apply also to the collection of any kind of loan. The exception involves determining with accuracy, over time, the actual incomes of former students. This seems to require an effective income tax system including a reliable, preferably universal, system of unique identifiers; accordingly this particular criterion is likely to be the most difficult institutional barrier to reform in developing countries.

1.3 Applications of ICL beyond higher education financing

1.3.1 Introduction
The apparent success of ICL in higher education financing has been associated with a plethora of studies examining the prospects for ICL in many other areas of social and economic policy. Below several only of these studies are considered briefly, to illustrate the disparate nature of possibilities and to help set the scene for the development of a broad ICL theoretical framework.

1.3.2 Government as risk manager
A major role recognised for government involves the management and distribution of risks. The concept of risk plays a central and unifying role in current analyses of a wide range of social and political issues, similar to that performed by the concept of globalisation in the 1990s (Quiggin, 2004).

The role of government, and particularly of the welfare state, has been reinterpreted with an increasing emphasis on risk and uncertainty, and across the social sciences there are different analytical approaches. Neoclassical economists have stressed the extent to which risk can be rationally managed using the tools of expected utility theory. Psychologists, sociologists and
various groups of other economists have stressed the limitations of expected utility theory.

When government is considered in its role as a risk manager, new aspects of both existing policies and future policy options are revealed. In *When All Else Fails*, for example, David Moss (2003) provides a fine historical analysis of the role of the state as the ultimate risk manager. Through analysis of US government legislative reforms over the last two hundred years, Moss promotes an understanding of the risk management role of the state, which can take many diverse forms, such as laws associated with limited liability, the application of speed limits for automobiles, national health insurance, occupational health and safety legislation, disaster relief and social security.

Barr (2001) has written a similar treatment of the welfare state as that promoted by Moss, in which the potential role of government is analysed in the context of insurance failure, which is conventionally seen in the economics literature to be a consequence of asymmetric information. In the absence of markets providing accessible and affordable insurance Barr argues that government has a unique role to play as a ‘piggy bank’, an efficient institution to manage and decrease the costs to citizens of the unavoidable uncertainties associated with human events. As stressed by many, there are disparate ways in which government intervention can help manage the risk of citizens, an obvious instrument outside the US being universal health care insurance.

In the current context it is critical to realise that ICL for higher education are simply a subset of the many risk management instruments available to government, a point made most explicitly in Shiller (2003). What ICL offer, after all, is insurance against consumption hardship and protection against the costs of default that arise with mortgage-type loans when the incomes of debtors are low. To begin to tease this out in the journey towards a general theoretical framework, what now follows are brief notes on several applications of ICL beyond student loans. Through this process we are seeking to address the question for policy: under what circumstances are ICL appropriate and inappropriate instruments for governments to use for social welfare improvement?

1.3.3 ICL case studies beyond higher education tuition

1.3.3.1 Income support for all tertiary education financing

It is critical to understand that while HECS concerns the collection of tuition charges only, the basic idea can and does apply to the financing of all costs associated with studying, including income support. Indeed, in just about all countries with student loans of either variety the finances distributed are designed to cover living expenses as well as the payment of up-front fees. In two of the countries with ICL (England and New Zealand) the loans have a
means-tested component incorporating financial support for student living expenses; and in the Australian context there have been various attempts to both model and promote for policy consideration the use of HECS for living costs as well (Chapman, Higgins and Taylor, 2009).

1.3.3.2 ICLs for paid parental leave
The majority of OECD governments have grants-based paid parental leave systems (PPL), in which recent parents are provided with income support for short periods to allow time off paid work for the purposes of child-rearing. However, the time involved to cover the expenses is typically quite short because of the costs to government.

Higgins (2010) and Chapman and Higgins (2009) illustrate that there might be a solution to the lack of preparedness of government and business to finance PPL beyond very short periods. Similar to the situation associated with higher education financing it is recognised that there is a fairly clear market failure, in that in the absence of collateral the private commercial bank sector would not be interested in providing loans for this activity; asymmetric information and the associated adverse selection and moral hazard loom large for this issue.

The main contribution of the research in the area of the application of ICL to PPL is to explain and present simulations of revenue streams of PPL in different household and expected lifetime income streams. It is found that there are critical design issues in order to minimise the potential for both adverse selection and moral hazard to undermine the financial basis of the potential policy. Clarification is offered as to what such an approach might mean for government subsidies for particular groups and what the financial implications for PPL borrowers might be.

The analysis suggests that an ICL approach has the potential to satisfy key policy objectives (perhaps as an optional supplement to a grants system): it can introduce flexibility and choice without requiring major further contributions from the government; it provides a solution to a financing impasse that would not be solved by commercial banks; and, because repayments of the loan are only required when households are in a position to do so, it provides significant consumption smoothing and income distribution advantages over alternatives. Higgins (2010) and Higgins and Sinning (2013) show the sensitivity of collection of the ICLs on the basis of different approaches to the modeling of fluctuations in estimates of future incomes.

1.3.3.3 Low-level criminal fine repayments
A quite different application of the basic principles of ICL came from a suggestion by John Quiggin in the context of the collection of low level criminal fines. The basic idea that ICL could apply to this area was motivated by the facts that current collection processes for low level criminal activity are
inefficient and expensive for the public purse – a large proportion of fines remain uncollected – and with the current fine collection arrangements there can be significant social costs. The latter might even involve the imprisonment of offenders for low level criminal activity to meet their fine repayment obligations.

Chapman, Freiberg, Quiggin and Tait (2004) proposes the Fine Enforcement Collection Scheme (FECS) which would use the tax and/or social security systems to collect fines for low level criminal activity that were not recovered within a grace period (of, say, a month); most of these would be in the order of $1000. The repayments would depend on the offender’s future income, and would thus be paid back at a rate that would fluctuate with capacity to pay. There would need to be relatively low income thresholds for repayment to make the scheme viable, implying that the HECS parameters would not be suitable.

FECS can be seen as balancing risks for the individual and the community. For the individual it almost eliminates the risk of a fine turning into something more costly such as the seizure of a car or even imprisonment. On the other hand it reduces offenders’ chances of avoiding paying some or all of the debt. For the community it ensures that the loss of revenue through non-payment of fines is minimised, and the unnecessary costs associated with penalty escalation are avoided. For magistrates FECS would likely produce a greater certainty that fines imposed would be collected, and this would enhance the credibility of the sanction.

1.3.3.4 The ‘Brain Drain Tax’

One of the most transparent examples of regressivity in international labor markets is the fact that very significant numbers of skilled immigrants trained in poor countries emigrate to more developed countries is search of higher incomes. For example, many engineering graduates from Haiti move to the US and other rich countries after completion of their degrees, and the situation is very similar with respect to young Indian doctors and nurses trained in the Philippines. A policy approach using the basic concepts of an ICL could be used to redress some of this injustice (see Clarke and Chapman, Chapter 11, this volume).

In this ICL application skilled immigrants trained in poor countries might be able to contribute to the costs of their education to compensate the government of their country of origin for part of the investments. An associated and essentially the original idea comes from Bhagwati (1972), who suggested an ICL collection mechanism using the income tax system of the developed countries to which the graduates of poor countries typically migrate. Chapman and Clarke, as reported in Garnaut and Namalui (2010) explain the issue and the possible solution with respect to PNG emigrants to Australia as follows.
They argue that the emigration of skilled labor is associated with two problems. First, it creates workforce shortages which make it difficult for PNG to achieve its long-term development goals. Second, for the most part PNG is bearing the educational costs of training many of these professionals while other countries are benefiting from this investment in human capital. Policies aimed at recouping the educational costs of PNG graduates, indeed the graduates of all relatively poor countries, are arguably both fair and apposite.

One approach to dealing with skill workforce emigration would be internationalisation of the collection of student loans from the graduates of poor countries who emigrate to more wealthy destinations. In Australia, New Zealand and England, for example, the use of the existing ICL collection systems would seem to be ideally suited to such a task.

### 1.3.3.5 Other potential applications of ICL

Over about the last 20 years there has been very considerable research output related to the application of the basic principles of ICL to a large number of other areas of social and economic policy beyond the several examples noted above. As examples, for the financing or payment of:

(i) R & D investments (Denniss, Yuan and Withers, 2009).
(ii) White collar crime and insider trading offences (Chapman and Denniss, 2005).
(iii) Income smoothing for the agricultural sector (Botterill and Chapman, 2009).
(iv) Housing costs relief for low income households (Gans and King, 2006).
(v) Social investment community projects (Chapman and Simes, 2006).
(vi) Elite athletes training (Denniss, 2003).
(vii) Legal aid services (Denniss et al., 2012).
(viii) Climate change adaptation policies (Dobes and Chapman, 2013).

Several of these possibilities are examined in more detail in Part III of the book.

### 1.4 Summary

ICL, collected through the income tax system, began as a policy innovation to facilitate the reintroduction of university tuition fees in Australia in 1989. Once the system appeared to be administratively feasible, and politically acceptable, the Australian template encouraged the governments of other countries to adopt similar approaches. It would be fair to suggest that there has been a quiet revolution internationally in the way that student loans have
been designed, and recent events in countries such as the US imply strongly that the trend towards ICL is continuing.

While the original motivation for contingent approaches to higher education financing was documented over 50 years ago by Milton Friedman, some of the more sophisticated aspects of ICL have been understood properly only over recent decades. These include the fact that ICL essentially offer insurance to borrowers against both consumption hardship and default, advantages which are unavailable through the use of traditional mortgage-type systems of student loans.

A critical insight into the potential of ICL to be applied to a host of other social and economic reforms is that the instrument fits comfortably into the intellectual and policy space of government as a manager of risk. Thus while some of the research applications of ICL well beyond student loans are apparently novel and arguably unprecedented, they are not a long way from some increasingly commonplace perceptions of the role of the public sector in many other areas.

It is clear that the disparate areas of potential ICL mentioned in this chapter are very diverse, but there are some striking similarities in terms of their conceptual and potential policy basis, including:

(i) They are all associated with a recognised area of either market or government failure.

(ii) They all involve the use of the income tax system, often in different ways, to collect debt, a point which can be traced in general to the transactional efficiencies associated with the use of the government’s income tax monopoly powers.

(iii) Given that repayments of debt in all these areas are based on capacity to pay they have the two clear insurance advantages of consumption smoothing and default protection.

(iv) There is a significant potential for improvements being made in the areas of both efficiency and equity given well-designed ICL interventions.

(v) Very importantly, in all policy areas there is the possibility of both adverse selection and moral hazard to undermine the value of the ICL intervention. Indeed, much of the modeling energy associated with the analyses has been related to design issues of ICL motivated by the need to minimise revenue loss from non-collection which can be traced to adverse selection and moral hazard.

This last point is the key policy issue, since the effectiveness of ICL instruments depends critically on design features that deal with both moral hazard and adverse selection. In an ICL context the moral hazard relates to the behavioral consequences of having the repayment of obligations depend on
work (or business) effort and choices. Adverse selection concerns the real possibility that if the take-up of an ICL is voluntary (for example, as it would be with respect to paid parental leave) then it is clear that those most interested in the scheme would be those with the poorest prospects of repayment.

With this as background it should be clear that much remains to be done in both conceptual and theoretical contexts before the true potential and difficulties of ICL are properly understood. The case for continuing the journey does however seem to be very clear.

Notes

3. There is currently keen academic debate on the policy issue for Germany, Colombia, Chile and Malaysia.
4. This bill, sponsored originally by Congressman Tom Petri (Republican, Wisconsin) is known as the Earnings Contingent Education Loans (ExCEL) Act.
5. Much of this research is available in Chapman (2006) and the special issue of the Australian Journal of Labour Economics devoted to the topic (2009).
8. In the Australian, New Zealand and English ICL systems the maximum allowed RBs are 8, 10 and 9 per cent.
10. It should be emphasized that the default is very expensive for debtors because of the associated effects on individuals' credit reputations.
12. This is typically between 2 and 4 months.
13. The current Australian government grant of 18–20 weeks is fairly typical in an international context.
14. On-going research of this type is currently being pursued by Higgins and Sinning (2013).

References


Part I
Towards a Theory of Income
Contingent Loans
Remarks on Income Contingent Loans: How Effective can they be at Mitigating Risk?

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2.1 ICL and risk

A well-known principle holds that equity provides better risk sharing opportunities than debt, but that there are greater enforcement problems associated with equity. Income contingent loans (ICL) represent an efficient (low transactions cost) way of implementing equity contracts for human capital. The amount the individual repays is dependent on his or her income. While it seems natural to link ICL with investments that increase the value of human capital – most notably education – there is no necessary reason to limit it to such investments.

The limits on market provision of ICL are related to: (a) enforcement costs; (b) adverse selection; and (c) moral hazard. Government provision lowers transactions costs because of the joint product of income reporting for purposes of the income tax. But reporting is imperfect, and the higher the effective tax rate (including the fraction of income committed in ICL repayments), the greater the incentive for underreporting. In some areas and in some countries, this is greater than others. This likely imposes an upper bound to the extent to which there can be reliance on ICL. For a country like the US where a large fraction of transactions are electronic and where top income tax rates are low, the scope for vastly expanded use of ICL would seem large.

Adverse selection effects can be serious, which is why ICL needs to be focused on areas where forced pooling (so those that rationally anticipate having high incomes don’t drop out of the program) seems plausible, such as
higher education. But can the old way of financing education through public funding also be thought of as a form of ICL? Individuals can be thought of as paying for their education retroactively, by giving the government a (large) share of their incremental income. There is a distinction: those who did not go to college pay as well as those that do. This, then, is the critical distinction – in effect, a higher tax rate for those who avail themselves of a college education than those that do not. But, of course, efficient investment requires that individuals pay for the costs of education. The risk sharing associated with ICL should lead to more investment in education than would be the case under current arrangements, even if individuals are not capital constrained. Given the large benefits – non-pecuniary as well as monetary – to a college education, the underinvestment (if any) in education for those who have sufficient wealth is likely to be small.

But for those who do not have funds of their own, risk sharing is important. They have to borrow, and with conventional loans, were they to pay the full costs of a college education, their level of indebtedness would be very high. If their income turned out to be low, the consequences for their living standards would be very adverse. The realization of this would inhibit undertaking a college education, even if the expected returns exceeded the costs by a substantial amount. There would be significant underinvestment in education. In a world in which everyone went to colleges costing the same amount, a comprehensive ICL in which everyone had to participate would be little different (apart from the intergenerational issues to be noted below) from public funding. ICL typically entails a linear relationship between repayment and income, and most countries have adopted slightly progressive tax systems, but in principle, there is nothing to restrict ICL to linear schedules. (In fact, various provisions in most ICL programs – for example, forgiveness of the residual debt after a certain number of years – do make the repayment function non-linear.) If almost everyone went to colleges costing the same amount, would there be any point of having a separate ICL program? Would it be simpler to provide a tax rebate to the few people who did not go to college? (The optics of rewarding people for not going to college might not be so positive, but functionally, it does not appear to be different from taxing those who do.)

Adverse incentive effects are likely to be small, so long as income tax rates and ICL repayment rates combined are not too large. But in countries with already high income tax rates, the marginal disincentive effect will have to be considered. There are a large number of decisions that may be affected by the implicit tax associated with ICL: labor supply, retirement, job choice (including risk taking), compensation packages (with repayments limited to twenty years, there is an incentive for hard-to-value deferred compensation schemes). So long as the ICL repayment percentage is relatively low, the magnitude of these effects will be limited.
A standard objection to government loan programs is that, if the returns are so high, why doesn’t the private market provide the funds? There are two retorts: first, there are significant economies of scope in collection, arising through the income tax system. What is easy and feasible for the government may not be possible or be expensive for the private sector; second, the government is pursuing a social welfare maximization objective markedly different from that of the private sector. With a utilitarian social welfare function, for instance, pooling is socially efficient and desirable. But there cannot be pooling in a private market economy.

Most importantly, government is concerned with equality of opportunity and (if there is an inequality-averse social welfare function) of income. Even if government were to make funds available to anyone who wanted to borrow, with conventional loans, many of those from poor families would not be willing to borrow. As a result, society would be afflicted with a low level of equality of opportunity. ICL loans change all of this, because now, the risk borne by the individual is reduced to a more manageable level.

However, there are further market failures associated with private sector insurance and loan programs, especially associated with cross-market externalities. For instance, greater student indebtedness may affect the ability to repay other loans. Government programs can be designed to be sensitive to these externalities. Furthermore, there are externalities to numerous government programs. Because the consequences of not having a job are more severe with a conventional loan, an individual who has lost his job may search harder (reducing unemployment insurance payments, with benefits both to the unemployment insurance fund and to the government’s Treasury), but may have a lower reservation wage in accepting a job – introducing an inefficiency into the economic system. Some of the benefits of a more educated labor force accrue to the government, in the form of higher tax revenues. Obviously, a private lender would not include these benefits in the calculus of whether he should lend to an individual and the terms at which he would make loans available.

There are, of course, other ways that social objectives of enhancing equality of opportunity and access to education can be achieved, in particular through public provision of education. This is a route that has traditionally been taken by many countries. It has two disadvantages. The first is that ICL facilitates self-selection: those who do not expect to get sufficient returns out of education will not choose to get a college or advanced education. Especially if education has consumption value, then with free education there will be excessive consumption. Efficiency will require a greater burden being borne by screening.

Probably more important, however, are the fiscal realities, in political economies driven by myopic governments (and the citizens who elect them): there is a concern about budget deficits even if the spending is used to
increase assets, enhancing the economy’s productivity and future tax revenues. Few governments have capital accounts which would help citizens assess the extent to which greater indebtedness is incurred to finance consumption or investment. Pressures to keep taxes and debts low mean that public financing of higher education cannot be relied upon. The overall national level of indebtedness is, of course, the same whether the government borrows to finance education, or if individuals borrow. Indeed, there can be distinct advantages to the latter, for borrowing costs are likely to be far lower (partly because of the lower transactions costs alluded to earlier in this note). Nonetheless, the desire to move the indebtedness off of the government’s balance sheet onto private individual’s balance sheets has had probably more to do with the reliance on student debt for financing higher education than anything else.

2.2 Seeing ICL within a broader set of capital instruments

Stiglitz and Yun (2013; Chapter 16, this volume) consider a set of instruments that provide societal risk sharing for individuals who have large adverse shocks, but not for small shocks (loans that are, effectively, forgiven in the event of extended unemployment). Let $R$ be the repayment as a function of lifetime income $Y$. The simplest ICL has $R = aY$. But a more general scheme is $R = F(Y)$. For example,

$$R = \begin{cases} 
R^* & \text{if } Y > Y^* \\
 aY & \text{if } Y < Y^* 
\end{cases} \tag{1}$$

where $R^* = aY^*$, or,

$$R = \begin{cases} 
 a(Y - d) & \text{if } Y > d \\
 0 & \text{if } Y < d 
\end{cases} \tag{2}$$

Different payments schemes will have different incentive and implementation (compliance) costs and, if there is not universal compulsion to join the scheme, different adverse selection effects. An important research question is to assess the relative merits of alternative repayment functions, under alternative assumptions.

If we have a situation where there is a well-defined income tax system, given by $T = T(Y, G)$ for every level of $G$, then if there is a group of individuals who are provided with additional benefits costing $\Delta G$ (in the simplest case, the entire population), and it is determined that they should be self-financed, then the repayment function for the program should presumably be:
The full analysis of the shape of the optimal repayment function is quite complicated. Here, I suggest three considerations:

(i) Those at the top receive disproportionately large amounts from rents and/or good luck, so that the adverse incentive effects of marginally increased recoupment rates will be small. There should be at least some progressivity in the repayments schedule.

(ii) If there is some complementarity across skills – those in certain areas generating higher productivity for lower wage workers, and thus improving the before-tax distribution of income – tax rates in such occupations may be lower than they otherwise would be (see Stiglitz, 1998).

(iii) Fixed obligations at the bottom can have strong incentive effects, especially if there is a stigma associated with bankruptcy. But because the revenue raised is small (unless there are large numbers of such individuals) and the suffering of these individuals is significant – and the anticipation of such suffering may be a large deterrent to lower income individuals undertaking education, and so has strong adverse incentive effects on education – it seems preferable to have programs which entail total debt forgiveness when income falls below a critical threshold.

It will be important to assess whether there is a need for better screening – that is, should there be full reliance on self-selection into the ICL loan/tertiary education program, or whether there should be admissions officers. The fact that income is low even with a college education does not mean that the individual should not have gone to school; we have to assess the counterfactual of what his income (and broader life satisfaction) would have been in the absence of the school. It may be, however, that individuals are not good at assessing these private and social returns.

2.3 ICL as an instrument for investment in the young and social protection

The reason that ICL is a natural fit for education is that young people obviously cannot finance their own investments in education. But there is a broader need for intertemporal smoothing, borrowing younger in life in order to make investments that yield a return later in life or to smooth out a temporary loss in income (as a result of a bout of unemployment) or a
temporary increase in income needs (such as might arise in the event of an illness, in the presence of imperfect disability insurance.)

As Stiglitz and Yun (2013; Chapter 16, this volume) point out, the need for smoothing through loans depends on the extent to which there is insurance (which smooths income across states of nature). Moral hazard and adverse selection arise in both loans and insurance, and there are important cross-market externalities. Even in the limited case of a market characterized by a single set of risks (unemployment in different periods) solving for the optimal mix of insurance and loans turns out to be inordinately complicated.

Given the importance of human capital (for most individuals early in their life, it represents the predominant form of wealth), the benefits of better ways of sharing the risks associated with human capital should be obvious. This is especially so in the context of individuals undertaking fixed large obligations today for payments in the future. Thus, if an individual faces a short bout of unemployment early on in life, the impact on his or her lifetime income will be negligible, and a conventional loan (perhaps collateralized by future retirement benefits) has the advantage of having no adverse incentive effects. In such a situation, the benefits of risk mitigation from an ICL are negligible, and (at least in standard models) would be outweighed by the adverse incentive effects (though these could be small). But the problem is that the future is uncertain: there is uncertainty about whether an individual who faces a short bout of unemployment today will face further bouts in the future, to such an extent that the repayment of a loan today would impose hardship later in life. Income contingent loans are a good way of handling such uncertainty.

The liabilities that are encountered in paying for tertiary education are not small; nor are those that might be encountered as part of extended periods of unemployment or disability, or other temporary but large needs associated with child rearing. One could imagine extending ICL to any of these arenas. Questions, however, arise:

(i) As the obligations increase, so too do the adverse incentive effects (both adverse effects on generating income and on reporting income). Is there a threshold above which we should become worried?

(ii) In the case of tertiary education, it is relatively easy to force a pooling equilibrium. In the case of other areas, this may be more difficult. (If ICL were part of an unemployment scheme, high income individuals might claim to not be unemployed, so as not to be forced to participate; they can easily create low income generating consultancy firms.) Without pooling, ICL can still work, but it would serve a limited group of high risk/highly risk averse individuals.

(iii) As the domain of activities covered increases and the size of the ICL program(s) increase, there can be important interactions (externalities) with other activities. Stiglitz and Yun (2013; Chapter 16, this
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volume), for instance, focus on the effect on job search of unemployment compensation; but they note that individuals may undertake excessive precautionary savings, because they do not take into account the adverse effect of such savings on search and employment, with implications in turn for the costs of the unemployment insurance system.

This raises the further question: are there institutional designs (including alternative variants of the repayment function) which mitigate the adverse incentive and selection effects? Which lead to less adverse externalities? For example, Singapore’s Provident Fund (allowing spreading of risks across different kinds of shocks) may allow better risk mitigation without adverse incentive effects than the separate funds (unemployment, disability, retirement) that characterize the dominant forms of social protection. Such a system forces pooling across these risks.

2.4 Transition

Consider a standard overlapping generations life cycle model, where each generation pays for the education of its children. In effect, generation $t$ makes a large transfer of wealth to generation $t + 1$. In a steady state, they feel this is just, because when they were young, they received a transfer from generation $t - 1$. But now, consider what happens if we change the system to one where each generation pays for its own education. Now, generation $t$ received a gift from its parents, but does not bequeath the same gift onto its descendants. Any notion of intergenerational equity would say such a redistribution is ‘unfair’, unless, that is, generation $t$ made an offsetting larger transfer to generation $t + 1$ in a different form. But something like that may be happening: as many countries switch from pay-as-you go social insurance programs to fully funded programs (or at least more fully funded programs), the current generation is being asked both to pay for their parent’s retirement and to pay for their own retirement.

How particular members of each generation are affected by these complex shifts of burdens and responsibilities across generations is an important issue that should be addressed in future research – as is the question of whether the benefits of these large intertemporal shifts in burdens and responsibilities are worth the costs.

Notes

1. For a review of the basic economics of ICL see Chapman (2010; and Chapter 1, this volume), Chapman and Hunter (2009), and Quiggin (Chapter 3, this volume).
2. Pooling refers to individuals of different characteristics (different future income profiles) being within the same program. As we note below, ICL can be thought of a loan program plus an insurance program for those whose income turns out to be low, financed by those whose income turns out to be high. But in markets, those who know that their income is likely to be high will attempt to ‘separate’ themselves out, so that the premium they would have to pay for this income insurance is reduced. That is why there may have to be forced pooling.

3. In most countries, bankruptcy laws provide for some risk sharing: those whose incomes are very low can get a fresh start. But so-called bankruptcy reform in the US has made it almost impossible to discharge student debt, increasing the consequences of adverse outcomes and further discouraging investments in education.

4. Moreover, from a social point of view, the risks are the same, except with public finance there is de facto better risk pooling. Securitization of student loans has increased the extent of risk pooling; but the US mortgage crisis has highlighted fundamental problems with securitization, including the role of ratings agencies in assessing the risks associated with various financial products and the limitations of the abilities of the rating agencies and distortions in their incentives.

5. The similarity between this and the standard optimal tax problem should be obvious. Here, we are maximizing a social welfare function aggregating expected utilities of different individuals, where individuals may differ in both their abilities and idiosyncratic risks, and where they are making decisions not just about labor supply, but about education and jobs.

References


3

Income Contingent Loans as a Risk Management Device

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This chapter presents a simple model of income contingent loans. It is shown that, under plausible conditions, income contingent loans are superior to (i) market loans under asymmetric information, and to (ii) tax-funded provision. In particular, if individuals expect to repay the loan in full, then reducing labor participation does not remove the obligation to repay, and each additional unit of income earned allows an additional dollar of consumption in the period in which the loan is repaid. Hence, even though an income contingent loan is implemented as an increase in the marginal tax rate during the repayment period, it will, in these circumstances, have no distorting effects on labor supply. Adverse effects on labor market efficiency only arise for wages in the interval where the optimal effort given the repayment schedule would lead to partial, but not complete, repayment.

3.1 Introduction

Beginning in Australia in 1989, income contingent loans (ICLs) have been used in a number of countries to address the problem of higher education financing. The Australian scheme, originally known as the Higher Education Contribution Scheme (HECS), was used for the payment of tuition fees for all undergraduate university courses. Over the ensuing decades ICLs have been adopted in several other countries, and there is active policy debate concerning their possible implementation in many other countries as replacements for traditional student loan schemes. The World Bank (Salmi, 2003) has recommended the use of ICL in countries with the administrative capacity to efficiently collect the debt.
Compared to student loan systems such as that prevailing in the United States, ICLs offer significant advantages. The key characteristic of ICL is that the collection of the debt is based on capacity to pay, which means that when those assisted experience adverse economic circumstances they have no repayment obligations in that period. This critical feature of ICL has two major advantages relative to ‘normal’ (mortgage-type) loans in which repayments are constant over time and are thus insensitive to a debtor’s financial circumstances:

(i) Consumption-smoothing, since debtors pay nothing when incomes are low, and proportionately more when incomes are relatively high.
(ii) Insurance against default resulting from low incomes.

The success of ICLs in higher education has raised the suggestion that the risk management advantages of ICLs could be applied in other contexts, including the financing of parental leave (Chapman and Higgins, 2009), drought relief (Chapman, 2006) and the payment of criminal fines (Chapman, Freiberg, Quiggin and Tait, 2004).

To assess this suggestion, it is important to consider the theoretical basis for ICLs. In particular, it is important to consider why standard loan systems have not been adapted to incorporate the consumption-smoothing and income insurance features of ICLs and whether the market failures that prevent such adaptation may also pose problems for a system of ICLs.

3.2 Model

We consider a model in which agents live for $T + 1$ periods. Implicitly, this is an overlapping generations model, but since we abstract from intergenerational transfers and assume zero interest rates, it is sufficient to focus on a single generation.

Agents have identical preferences, but differ in ability.

In period $0$ agent $i$ is endowed with an ability level $\alpha_i$ and may observe a signal $\theta_i$ on their own ability.

In periods $1..T$, agents work and consume.

The objective function for agent $i$ is given by

$$W_i = \sum_{t=1}^{T} u(c_{it}) - \sum_{t=1}^{T} g(e_{it}),$$

where $c_{it}$ is consumption in period $t$, $e_{it}$ is effort in period $t$, $u$ is a von Neumann Morgenstern utility function and $g$ is a disutility of effort function.
In period 1, agent $i$ incurs a reduction $\Delta_{i1} \in \mathbb{R}_+$ in disposable income, either voluntarily (for example, by participating in education, or by taking parental leave) or involuntarily (for example, by incurring a parental support obligation).

The wage for agent $i$ in period $t$ is $w_{it}(a_i, \Delta_{i1}, \varepsilon_{it}, t)$ where:

- $a_i$ is ability,
- $\Delta_{i1}$ is the period 1 reduction in disposable income, if this contributes to future earning capacity,
- $\varepsilon_{it}$ is a random idiosyncratic shock,
- $t$ is the individual's age.

Agents may finance consumption out of earned income, transfer payments net of taxes or borrowing. We assume, for simplicity that the interest rate is zero and that there is no discounting. Hence, cumulative consumption over periods $t = 1...T$ must satisfy the constraint

$$\sum_{t=1}^{T} c_{it} \leq \sum_{t=1}^{T} y_{it} + \sum_{t=1}^{T} n_{it} + \sum_{t=1}^{T} b_{it}, \quad (2)$$

where:

- $n_{it}$ denotes net transfers received in period $t$,
- $b_{it}$ denotes net borrowing in period $t$,

and, for agent $i$ with wage $w_{io}$

$$y_{it} = \begin{cases} w_{it} e_{it} - \Delta_{i1} & t = 1 \\ w_{it} e_{it} & t = 2...T \end{cases} \quad (3)$$

Assuming a constant population, the government budget constraint is

$$\sum_{i} \sum_{t=1}^{T} n_{it} = 0. \quad (4)$$

while the loan market constraint is

$$\sum_{t=1}^{T} b_{it} = 0. \quad (5)$$

### 3.2.1 Outcome without loans and transfers

We first consider the case where there are no transfers and where agents cannot borrow or lend. Agent $i$ will choose $c_{it}$ and $e_{it}$ to satisfy
subject to the constraint
\[ c_{it} = y_{it}. \] (7)

### 3.2.2 Market outcome with loans and insurance

We now consider the case of a loan market operating under conditions where ability is observable, shocks \( \varepsilon_{it} \) are fully anticipated, and loan contracts are fully enforceable. Loans are supplied competitively at a zero rate of interest and there is no default or bankruptcy. There are no transfers.

The period \( t \) budget constraint for individual \( i \) becomes
\[ c_{it} = y_{it} + b_{it}, \] (8)

and incorporating the loan market constraint, the lifetime budget constraint becomes
\[
\sum_{t=1}^{T} e_{it} = \sum_{t=1}^{T} w_{it} e_{it} - \Delta_{i1} \\
= \sum_{t=1}^{T} \left( w_{it} e_{it} - \frac{\Delta_{i1}}{T} \right). \] (9)

Because the function \( u(\cdot) \) is the same for all periods, and because the rate of time preference is zero by assumption, the optimal solution has time-independent \( c_t \) and constant \( g'(e_{it}) / w_{it} \)
\[ w_{it} u'(c_t) = g'(e_{it}) \forall t, \] (10)

subject to the lifetime budget constraint.

So, labor supply satisfies the optimality condition that the wage is equal to the ratio between the marginal disutility of effort and the marginal utility of consumption. The optimal repayment net schedule sets net borrowing as follows:
\[
b_{it} = \begin{cases} 
\Delta_{i1} + (c_i - w_{it} e_{i1}) & t = 1 \\
\frac{c_i - w_{it} e_{it}}{T} & t = 2 \ldots T
\end{cases} \] (11)

For the case when the wage is constant, this yields a standard loan contract with
Income Contingent Loans as a Risk Management Device

Proposition 1 Given the known distribution of ability, the outcome described in this section is Pareto-optimal

Now consider the case when ability is observable, and individual shocks $\varepsilon_{it}$ are not anticipated but are observable ex post. It follows that the wage $w_{it} (a_i, \Delta_{it}, \varepsilon_{it}, t)$ is a stochastic variable. Given the existence of a competitive insurance market, with insurers earning zero expected profits, it is possible to design a policy such that the optimal consumption plan for agents remains unchanged.

3.2.3 Asymmetric information and default

Loans and insurance produce less satisfactory outcomes in the presence of asymmetric information and the possibility of default. There is a large literature on problems of adverse selection and moral hazard, which will not be redeveloped here. In general, moral hazard problems are severe enough that market-based insurance against wage uncertainty is unavailable, except for special kinds of risk such as incapacity through injury.

In the presence of wage uncertainty, and in the absence of wage insurance, a loan contract is vulnerable to default. The simplest way to model this is to suppose that default is a discrete event, resulting in the loss to the lender of the outstanding value of the loan, and in an additional cost of bankruptcy, borne by the defaulting borrower. In this case, provided $w_{it}$ follows a well-behaved stochastic process, there will exist for each $i, t$ and outstanding loan balance $B_t = \sum_{r=1}^{t} b_r$, a critical wage value $w^i (i, t, B_t)$, decreasing in $B_t$, such that the borrower will choose default if and only if $w_{it} \leq w^i (i, t, B_t)$. It follows that, for any given proportionate repayment structure, the probability of default is higher, the higher is the initial loan $b_1 = B_1$. Disregarding the details of the repayment structure, we will write the expected loss to the lender from default as $L (b_1)$ and observe that in the presence of default risk, the loan contract must specify

$$\sum_{i=1}^{T} b_t + L (b_1) = 0. \quad (13)$$

The introduction of default risk implies a number of changes in the structure of loans, and in the equilibrium outcome.
First, for sufficiently large values of $h$, the probability of eventual default may be high enough that rational agents will default immediately. In this case, no loan contract is feasible.

Second, assuming that $l(\Delta_1) > 0$, consumption smoothing is costly and hence individuals will not seek full smoothing.

Third, unless the cost of default is very large, the optimal loan will include a positive default risk. Hence, relative to the first-best case, agent's welfare will be reduced both because of incomplete consumption smoothing and because they bear the cost of default.

Finally, in the absence of default, labor supply will satisfy the condition $w_{it}u'(c_{it}) = g'(e_{it})$ for all $t$, but not the intertemporal optimality condition. In periods where $w_{it} \leq w(i, t, B_i)$, agents will be in default for a wide range of effort choices. Typically, therefore the marginal benefit of effort will be less than the wage in default periods.

### 3.2.4 Tax-funded provision

Under tax funding, governments finance transfers with a tax defined according to a schedule $t(y)$. For simplicity, we will focus on the case of a threshold $y$ (set below the minimum income level) and single rate $\tau$, so that $t(y) = \tau(y - y)$.

Further we will assume that positive transfers are made only in period 1. Consider first, a policy in which transfers exactly offset the initial shock $\Delta_{i1}$ for all $i$, $y$ is fixed exogenously, and the tax rate $\tau$ is set to satisfy the budget balance constraint. In the education context, such a policy arises if education is provided without charge (perhaps with a living allowance to offset the wage income foregone during study) with the expenditure being financed out of general revenue.

The net transfer received by individual $i$ is

$$N_i = \Delta_{i1} - \sum_{t=1}^{T} \tau (w_{it}e_{it} - y).$$  \hspace{1cm} (14)

This policy fully offsets the initial shock $\Delta_{i1}$ and provides some consumption smoothing across time, and between individuals, since $N_i$ is decreasing in $w_{it}$ for all $t$.

The private optimality condition for labor supply is

$$(1 - \tau) w_{it}u'(c_{it}) = g'(e_{it}).$$  \hspace{1cm} (15)

That is, as usual with an income tax, labor supply is distorted. It follows that the second-best social optimum will involve an initial transfer $n_{i1}$ less than
such that the marginal welfare cost of consumption variability is equal to the marginal welfare cost associated with the labor supply distortion.

Assessment of the equity effects of tax-funded provision depend crucially on the nature of the initial transfer. A number of possibilities might be considered.

First, there are universally provided public services, such as school education. Policies of this kind yield the strongest case for tax-funding. From an ex ante viewpoint, these policies are Pareto-improving, provided that the labor supply distortion is modest.

Among transfers that are not universally provided, several distinctions may be drawn. First, there is the question of whether wage income $w_{it}$ is positively or negatively correlated with the combined impact of the income shock $\Delta_{i1}$ and the initial transfer. Examples of positive correlation including funding for post-school education, and, arguably, drought assistance to farmers (since weather conditions are cyclical, a policy of providing grants during drought period will raise average farm incomes). Examples of negative correlation include payments to unemployed workers. In equity terms, if grants are positively (negatively) correlated with wage income, they will normally be regressive (progressive).

Finally, there are cases where the initial shock $\Delta_{i1}$ may be regarded as an equitable outcome. One example is that of costs incurred as a result of parenthood. While some assistance to parents is generally supported, it is widely agreed that parents should bear much of the cost of raising children and that, in cases of separation, both parents should contribute to that cost. An even clearer case is that of criminal fines.

### 3.2.5 Income contingent loan

Finally, we consider the case of an income contingent loan. The key assumptions here are:

(i) The loan repayment can be made contingent on income $y_{it} = w_{it}e_{it}$ but not on the wage.

(ii) The repayment is independent of the outstanding balance, though it may depend on the initial loan.

(iii) There is no default. The repayment schedule is given by a function $b_{it}(y_{it}, \Delta_{1})$ such that $y_{it} + b_{it} \geq 0$.

(iv) The expected return to the lender across all loans must equal zero.

To maximize comparability with the case of tax financing, we will consider the case where the repayment schedule, for $t > 1$, sets the repayment $-b_{it}$ as follows:
That is, the agent repays the entire outstanding balance, if any, when it falls below $\tau (y_{it} - y)$ and otherwise reduces the balance by $\tau (y_{it} - y)$.

The equity properties of the income contingent loan are preferable to those of tax financing when the initial transfer is positively correlated with wages, as in the case of higher education.

Under appropriate circumstances, the income contingent loan will also have superior efficiency. In particular, if individual $i$ expects, with probability 1 to repay the loan in full, then each additional unit of income earned allows an additional dollar of consumption in the period in which the loan is repaid (and larger increments to income during the repayment period bring forward the date at which the loan is repaid). Conversely, reductions in income would delay repayment, but would not reduce the amount owing. This is in contrast to tax financing, where a reduction in income would lead to a reduction in the tax payable. Hence, if the ICL is paid off in period $t^*$, private labor supply in periods $t < t^*$ is optimized under the first-order condition

$$w_{it}u'(e_{it}) = g'(e_{it}),$$

in which the tax rate does not appear.

As compared to market loans under conditions of asymmetric information, the income contingent loan allows for insurance against wage uncertainty. Consider in particular, agents whose wage $w_i$ (assumed constant for simplicity) is such that the first-order condition

$$w_i u'(w_i e_i) = g'(e_i),$$

is satisfied for $y_i = w_i e_i \leq y$. Such agents do not anticipate repaying any of the loan and thus benefit from the full insurance effect of the loan without any adverse effect on labor market efficiency. Adverse effects on labor market efficiency only arise for wages in the interval where the optimal effort given the repayment schedule, would lead to partial, but not complete, repayment.

### 3.3 Implications for human capital investment

Thus far, we have taken the period 1 income reduction as given, and considered the implications of various financing options, including income contingent loans. The most prominent application of income contingent loans has been to the financing of higher education. More generally, we might
consider a range of investments in human, or individual-specific capital, such as assistance in setting up a small business.

These applications have some distinctive characteristics. First, the investment is normally voluntary, with different individuals facing different choice sets. This means that, even with identical preferences, individuals will make different choices depending on the signal they have received regarding their abilities, and possibly also on access to parental support or inherited wealth (not explicitly modeled here, but may be treated as an offset to $\Delta_{i1}$.)

Second, a central aim of investment in human capital is to increase future earning capacity, but such investments are not always successful. This is represented in the model presented above by the inclusion of $\Delta_{i1}$ as an argument of the wage function $w_{it}(\theta_{it}, \Delta_{i1}, x_{it}, t)$.

As noted above, in the presence of asymmetric information, the probability of eventual default may be high enough that rational agents will default immediately. In this case, no loan contract is feasible. Agents may therefore choose not to undertake investment in human capital even in cases where the investment would yield a positive expected present value. Hence, a potential Pareto-improvement could arise from subsidies to human capital investment.

On the other hand, the positive correlation between human capital investment and future earnings means that, in general, a subsidy for human capital investment is likely to be regressive in the absence of offsetting measures for income redistribution.

3.4 Concluding comments

Income contingent loans combine elements of the older alternatives of market loans and tax-financed public subsidies. We have shown that, under plausible conditions, income contingent loans will be superior to either of these alternatives.

In particular, we have identified a crucial advantage of income contingent loans over tax financing. If individuals expect to repay the loan in full, then each additional unit of income earned allows an additional dollar of consumption in the period in which the loan is repaid. Hence, even though an income contingent loan is implemented as an increase in the marginal tax rate during the repayment period, it will, in general, have no distorting effects on labor supply.

Notes

1. Note that this conclusion does not imply that participation would be superior under an ICL than under tax financing. As noted by Racionero in the context of higher education (Chapter 19, this volume), while those who do not study would prefer an ICL, for those
who intend to study the attractiveness of an ICL compared to tax financing will depend on their expected probability of success and their level of risk aversion.

References

4

Income Contingent Loans: Toward a Piecewise Linear Scheme

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This chapter sets up a simple framework for the analysis of income contingent loans, under adverse selection and moral hazard. Economic agents face credit constraints, and consumption smoothing is not perfect when the interest rate on borrowing is higher than that on lending. An income contingent loan scheme contributes toward consumption smoothing across states of nature (or individual types) within any period, as well as across periods. We argue in favour of a scheme of piecewise linear income-dependent repayment rates. This is a dynamic generalization of the scheme of piecewise linear income taxation that Apps, Long and Rees (2011) investigated in a static setting.

4.1 Introduction

Income contingent loans, whereby repayment rates are made dependent on the income level of the debtors, have been increasingly accepted as a great idea for improving efficiency and equity in situations where the operations of the private credit and insurance markets are severely affected by asymmetric information giving rise to moral hazard and adverse selection problems (Chapman 2006, 2010; Barr and Johnston, 2010; Jacob and van der Ploeg, 2006; Gary-Bobo and Trannoy, 2013). The success of Australia’s income contingent loan scheme for financing university education has been acclaimed as a case where a combination of judicious economic analysis, practical ideas, and a good administrative system for collecting repayments, can mitigate the failure of the market (see, for example, various columns penned by J. E. Stiglitz for the New York Times).
Income contingent loans, originally designed for higher education financing, may also find natural applications in various other areas of public policy. Examples include financing parental leave and low level criminal fines. The moral hazard and adverse selection problems for these cases are not quite the same as for the student loan case, but the principle of insurance and income smoothing apply in all cases.

The present chapter outlines an approach that provides a theoretical basis for providing income contingent loans with piecewise linear repayment rates. The approach combines efficiency and equity considerations, while keeping in mind that policy rules should be simple.

The efficient allocation of resources is a major objective of economic policy designs. The dominant criterion for efficiency is Pareto-efficiency. In general there exist many Pareto-efficient allocations. Equity considerations can be imposed as constraints that narrow down the range of acceptable efficient allocations. The optimization of a social welfare function without equity constraints may fail to deal with the equity issues in a satisfactory way. Diamond and Saez (2011) argue that practical policy prescriptions based on models that maximize a social welfare function should be fairly simple, and should not go against commonly held normative views. This line of thought has led to the development of simpler models of taxation, for example, optimal piecewise linear income taxation (Apps, Long, and Rees, 2011).

The present chapter follows this approach. While the model can be applied to a variety of situations where individuals face severe credit constraints, for ease of exposition we refer to the situation where students need financing for university education. We sketch a simple model of education financing which may be useful for the analysis of student loans under various policy scenarios. It seems that, under appropriate conditions (such as the absence of a competitive insurance market against income shocks and employment shocks), an income contingent loan scheme is superior to the standard market-based student loan scheme. This is because income contingent loans contribute toward smoothing consumption across states of nature (or individual types) within any period, as well as across periods. Of course, in the absence of asymmetric information problems, income contingent loans remain useful in their welfare-enhancing role by allowing consumption smoothing when agents face unexpected income shocks.

It is important to stress that we are not considering an optimal income tax system. That is beyond the scope of this paper. We assume for simplicity that there is no income tax in place. We simply ask how a properly designed income contingent loan scheme may improve social welfare.

4.2 The basic setting

In this section we introduce the basic setting.
Individuals live for $T$ periods, where $T > 2$. In period $t = 1$, they use their endowment (for example, bequest from parents) to finance their consumption and investment in education as well as investment in a safe asset if they are sufficiently wealthy. If they are poor, they must borrow to pay for their education.

In period 2, having completed their education, they enter the workforce and earn an income. Each person’s earned income in period $t$ (where $t = 2, 3, \ldots, T$) is a random variable $y_{it}$ with a cumulative probability function $G(y_{it} | \theta_{it}, L_{it})$ where $\theta_{it}$ represents their income-earning ability (which reflects the fruits of their education, as well as their health conditions, et cetera.) and is their private information, and $L_{it}$ is their effort level (unobserved). Their earned income is observable and verifiable by the government.

Debtors must repay the principal and interest on the loan if their income is sufficiently high. If their income is low, they declare bankruptcy, which is allowed by the law.

For simplicity, assume that all students incur the same education cost, $K$. We assume they all obtain their degrees, but their post-education ability level, denoted by $\theta_{it} > 0$, is private information.

One may want to assume that in period 1, there are two types of young individual: the rich and the poor. A rich individual has initial wealth $W_R$ and the poor individual has initial wealth $W_P$. Their group sizes are $N_R$ and $N_P$ respectively. However, this consideration is not essential for our argument in favor of an income contingent loan scheme. Thus the whole paper can be read on the assumption that $N_R = 0$.

### 4.3 Educational loans and repayments: a benchmark case

Consider first the case of a social planner that borrows $KN_P$ dollars from a bank at a constant interest rate $r > 0$. The planner in turn lends $K$ dollars to each poor young individual. The government operates the scheme under the break-even constraint (budget balance). We follow Galor and Zeira (1993) by assuming that agents can evade debt payments with a cost. Financial intermediaries could avoid such defaults by monitoring borrowers, but these activities are also costly. Given that some of the borrowers will go bankrupt and default in period 2, or in later periods, the break-even constraint of the loan scheme implies that those who are able to pay back must pay an interest rate $r^*$ that is greater than $r$. In other words, the terms of the loan are: we lend you $K$ dollars for education fees; in period 2, you owe us $(1 + r^*)K$ dollars, unless you are bankrupt. You can repay the loans in instalments, at the rate of interest $r^*$, over a number of years, as long as the present value of your flows of repayments is expected to be equal to $(1 + r^*)K$. 


Wealthy young people do not find it optimal to borrow at such a high rate of interest. We assume they have enough wealth to pay for their education. If the government can optimize social welfare by using a non-linear income tax scheme à la Mirrlees (1971), the proportion of rich to poor young individuals \( N_R/N_P \) will play an important role. However, to keep the analysis simple, we will restrict attention to the loan issues, assuming that there is no income tax.

The individual utility function is \( U(C_{it}, L_{it}) \) where \( C_{it} \) is their consumption level, and \( L_{it} \) is their work effort. Assume that \( U \) take the additive separable form

\[
U(C_{it}, L_{it}) = u(C_{it}) - \Phi(L_{it}).
\] 

(1)

where \( u(\cdot) \) represents the utility of consumption, and \( \Phi(L_{it}) \) is the disutility of effort. Assume \( u(\cdot) \) is concave and increasing, and \( \Phi(\cdot) \) is convex and increasing.

An important feature of our model is that the interest rate on the educational loan, \( r^* \), is greater than the safe rate of return \( r \). If the individual saves, their stock of (safe) financial assets \( A_i > 0 \) earns the rate of interest \( r \), while the interest rate on their debts is higher: \( r^* > r \). It follows that they do not want to hold a strictly positive \( A_i \) before the debt has been fully paid back. We assume that the consumer cannot borrow against their future income.

Thus there are two phases in their working life. In phase 1, any excess of income over consumption is used to pay back the debt. In phase 2, which begins when the debt balance becomes zero, the consumer begins to accumulate financial assets to provide for retirement and/or future income shocks. In phase 3 of their life, there is no wage income, and the stock of financial assets is gradually decumulated.

Assume that the individual's earning is \( Y_{it} = \theta_{it} L_{it} + \varepsilon_{it} \) where \( \varepsilon_{it} \) is a random variable with cumulative distribution \( G(\varepsilon_{it}|L_{it}) \), and some parameters of its distribution might depend on \( L_{it} \). The parameters \( \theta_{it} \) and the distribution \( G(\varepsilon_{it}|L_{it}) \) are sources of adverse selection and moral hazard respectively. Note also that in the case of income contingent loans, the labor supply decision may be distorted as individuals have incentives to reduce or avoid repayments. In principle, the individual can hold debts \( B_{it} \), as well as financial assets, \( A_{it} \), which earn a lower rate of interest than the interest rate on debts, \( r^* \).

The dynamics of their stock of debts is described by the following transition equation

\[
B_{it+1} - B_{it} = r^* B_{it} - R_{it}, \text{ where } B_{it} \geq 0.
\]

(2)

where \( R_{it} > 0 \) is repayment of debts.
The dynamics of their financial assets $A_{it}$ is described by the following transition equation

$$A_{i,t+1} - A_{it} = rA_{it} + I_{it}, \quad (3)$$

where $I_{it} \leq 0$ is their savings. If $I_{it} < 0$, they are withdrawing from their bank account. The difference between their wage income and debt repayments or investments is their consumption,

$$C_{it} = \theta_{it}L_{it} + \varepsilon_{it} - R_{it} - I_{it}. \quad (4)$$

Now, assume that the time path of repayment amounts $R_{it}$ is not constrained. As long as the debt balance falls to zero by the end of the individual's working life, any repayment time profile is acceptable. What would be the individual's optimally chosen time path of repayments?

Let $\beta < 1$ be the utility discount factor $\beta = \frac{1}{1 + \rho}$ where $\rho$ is the utility discount rate. The individual then chooses the sequences $\{L_{it}, C_{it}, R_{it}, I_{it}\}$ to maximize their expected lifetime utility

$$\max E \left[ \sum_{t=2}^{T} \beta^t [u(C_{it}) - \Phi(L_{it})] \right], \quad (5)$$

subject to the two transition equations, the cash flow constraint, and the following conditions on the stocks of debt and financial assets: $E[B_{T+1}] = 0$, $E[A_{T+1}] \geq 0$.

Note that the above constraints mean that the expected terminal stock of debt is zero, and the expected terminal stock of assets is non-negative. Implicit in these requirements is the assumption that the individual has no intention of default, though this result can occur as a result of a sequence of bad luck.

Consider for simplicity the case where the individual is not subject to uncertainty. Assume $\rho = r < r^*$, and that $\theta_{it} = constant$ with respect to $t$, except for periods $T$ and $T - 1$, when the individual is retired $(\theta_{iT} = \theta_{i,T-1} = 0)$. Then the solution consists of three phases:

In PHASE 1, the individual works very hard, and consumes very little in order to repay their debt. Consumption starts at a low level, but rises gradually. The debt is paid off at the end of this phase. Debt repayment is highest at the beginning of their career.

In PHASE 2, the individual works, and saves for retirement. Consumption and work effort are constant over this phase.
In PHASE 3, the individual lives as a pensioner, and their asset is decumulated gradually. Consumption level in retirement is at the same level as during phase 2 (See Appendix).

The solution can be contrasted with the standard loan scheme, in which all individuals who do not become bankrupt must pay back the same amount per period until the debt balance goes to zero. Obviously, the inflexibility in the payback schedule is a welfare loss for the consumers.

4.4 Income contingent loans: piecewise linear repayment rates

Now consider the case where individuals are heterogeneous with respect to their ability parameters $\theta_{it}$. Suppose for simplicity that $\varepsilon_{it} = 0$, so that we now consider only the adverse selection problem in the sense of Mirrlees (1971) and Laffont and Tirole (1988). In other words, when ability levels are private information, high ability individuals may claim to be low ability people, by earning low income through reduced work efforts (which are not observable). This reduces their tax bill, or their required loan repayments. Adverse selection means that individuals of one type have incentives to pretend to be of another type. Moral hazard, on the other hand, often refers to the situation where individuals change the probability of an outcome through unobserved action (for example, by not brushing your teeth carefully, you increase your chance of tooth decay, which you do not care about if you are fully insured).

The social planner would want to affect transfers from high-ability individuals to low-ability ones. If $\theta_{it}$ were observable, and $\varepsilon_{it} = 0$ identically, then there would be neither adverse selection nor moral hazard. The redistribution problem would then be relatively easy to solve, though, of course, there are still disagreements on what would be an appropriate social welfare function: one could choose the Rawlsian maximin, or one of the various versions of utilitarianism, or some other criteria, such as the Rights and Welfare Index proposed by Martinet and Long (2012).

Consider the more realistic case where the ability levels $\theta_{it}$ are not observable. It might seem natural to adapt the static Mirrlees approach (1971) to our dynamic environment, along the lines of Golosov et al. (2003), and Kocherlakota (2005). There are however some difficulties, because if for each $i$, the random variables $\theta_{it}$ are serially correlated, then we cannot use the revelation principle, in view of the ratchet effect that Laffont and Tirole have emphasized.

It seems that a simpler approach might be preferable. Here, we take the hint from Apps et al. (2011) and outline the design for an optimal piecewise linear scheme of income contingent repayment schedules. Consumers have identical quasilinear utility functions

$$U_{it} = u(C_{it}) - \Phi(L_{it}) \quad \Phi' > 0, \: \Phi'' > 0$$

(6)
where $C_{it}$ is consumption and $L_{it}$ is labor supply. Earned income is $Y_{it} = \theta_{it}L_{it}$, with $\theta_{it} \in [\theta_L, \theta_H] \subset \mathbb{R}^{++}$. We assume that the consumer has perfect information about their $\theta_{it}$, but the government does not.

We assume a differentiable distribution function, $F(\theta_{it})$, with continuous density $f(\theta_{it})$, strictly positive for all $\theta_{it} \in [\theta_L, \theta_H]$.

Given a two-bracket repayment system with parameters $(b, \tau_1, \tau_2, \hat{Y})$, where $b$ is a fixed repayment component, $\tau_1$ and $\tau_2$ are the marginal payback rates in the first and second brackets respectively, and $\hat{Y}$ is the income level determining the upper limit of the first bracket, the consumer faces the budget constraint that the sum of consumption and net savings is equal to the difference between income and repayments:

\begin{align}
C_{it} + I_{it} &= -b + (1 - \tau_1)Y_{it} \text{ for } Y_{it} \leq \hat{Y} \quad (7) \\
C_{it} + I_{it} &= -b + (\tau_2 - \tau_1)\hat{Y} + (1 - \tau_2)Y_{it} \text{ for } Y_{it} > \hat{Y} \quad (8)
\end{align}

That is, given income $Y_{it}$, he or she must pay back the amount $\tau_1Y_{it} + b$ if $Y_{it} \leq \hat{Y}$, and pay back the amount $\tau_2Y_{it} + b - (\tau_2 - \tau_1)\hat{Y}$ if $Y_{it} > \hat{Y}$ as long as these amounts are lower than his or her current debt obligations.

The consumer's choice problem then becomes a standard optimal control problem in discrete time. In principle, the choice problem gives rise to an indirect lifetime utility function, $V_i = V_i(b, \tau_1, \tau_2, \hat{Y}, \theta_{it}(\cdot))$, where $\theta_{it}(\cdot)$ is the stochastic process of his or her earning ability. The associated expected lifetime utility is denoted by $\hat{V}(b, \tau_1, \tau_2, \hat{Y}, \theta_{it})$.

Notice that this indirect utility function arises from individual maximization of lifetime expected utility subject to the constraints that the expected terminal stock of debt is zero, as stated in Section 4.3 above. This implies that there is an assumption that the individual does not have the intention to default, though default may occur as a result of a sequence of bad luck. There are two cases:

- **The convex case**: $\tau_2 \geq \tau_1$. In this case, the marginal repayment rate is higher for individuals belonging to the higher income brackets.
- **The concave case**: $\tau_2 < \tau_1$. This is probably an unlikely case, because it means the marginal repayment rate is lower for individuals belonging to the higher income brackets. This does not imply that this case is necessarily suboptimal. Recall that in the optimal income tax literature à la Mirrlees (1971), the top marginal income tax rate is zero to encourage the highest ability type to work.

The government then seeks the parameters $b, \tau_1, \tau_2, \hat{Y}$ to optimize the social welfare function.
subject to the constraint that the present value of the stream of total repayments be equal to the initial loan. Here $S(\cdot)$ is a continuously differentiable, strictly concave and increasing function which expresses the planner's preferences over utility distributions. Inequality aversion parameters may be embodied in such a social welfare function.

The necessary conditions can be derived and interpreted, as in Apps et al. (2011). Practical recommendations (for example, is the convex case better than the concave case?) can only be made (also as in Apps et al.) if more precise properties of the distributions are known, and if elasticities of labor supplies are available.

### 4.5 Concluding remarks

We have followed Apps, Long and Rees (2011) in arguing for the case of an optimal piecewise linear income contingent loan scheme. We have considered only the two bracket case, but it is easy to see how this can be extended to an arbitrary number of brackets. In general, we expect that the optimal solution would require higher income individuals to pay back their debt faster than lower income individuals. This seems to be an appealing property.

The question of the optimal number of brackets is left open. Note, however, that we are not trying to find the best piecewise linear approximation to a known nonlinear function that is optimal in the sense of Mirrlees (1971), in that it separates all ability types and offers each a marginal repayment rate optimal for its type. Rather, we start from the position that it is practical only to pool most types. Given the complexity of the situation which faces the planner, in which the multi-dimensionality of the type-space rules out the practical derivation of a Mirrlees-type optimal function, this may be the only feasible approach to designing real-world income contingent loan systems. Finally, we should note that when adverse selection and/or moral hazard are very strong, the optimal solution would be not to provide income contingent loans, that is, the optimal loan is zero.

### Notes

1. Please refer to Chapman (2006, 2010) for insightful analysis of these cases.
2. Unless the objective function itself embodies a mixture of welfare and rights, as proposed by Martinet and Long (2012).
This is not the case in Australia's HECS; the real interest rate is zero for these loans. However, those who pay fees upfront get a 10 per cent discount. See Chapman (2006, 2010).

I am using the terms adverse selection and moral hazard in the sense as discussed by Laffont and Martimort (2001).

Note that Kocherlakota (2005, p. 1601) also pointed out the importance of this ratchet effect.

In Apps et al. (2011), we found it useful first to separate the two types of system and examine the conditions that characterise a convex or nonconvex system when it is optimal. We provided a simple and transparent model which allowed the characteristics of each type of tax system, and particularly the optimal bracket thresholds, to be easily seen and compared, and characterised the optimal tax parameters in the nonconvex case. We then went on to consider, in a numerical analysis, the determinants of whether one or the other system is in fact optimal.

This therefore excludes the utilitarian case, which can however be arbitarily closely approximated. As is well known, the strict utilitarian case, with \( S' = 1 \), presents technical problems when a quasilinear utility function with consumption as numeraire is also assumed.

For the relationship between compensated labor supply elasticities and the elasticity of substitution, see Saez (2001).

References


Appendix

The three phases of life after graduation
We form the discrete time Lagrangian (dropping the subscript \( \hat{t} \))

\[
\mathcal{L} = \sum_{t=2}^{T} \beta^t \left\{ u(\theta_t L_t - R_t - I_t) - \Phi(L_t) \right\} \\
+ \beta^t \lambda_t (A_t(1+r) + I_t - A_{t+1}) \\
- \beta^t \mu_t (B_t(1+r^*) - R_t - B_{t+1})
\]

The first order condition with respect to \( L_t \) is

\[
\theta_t u'(C_t) = \Phi'(L_t).
\]

In other words, the marginal product of labor, measured in marginal utility of consumption, is equated to the marginal disutility of work. If \( \theta_t \) is time-independent, this relationship indicates that in periods of low consumption (i.e., high \( u' \)), the individual supplies more labor (high \( \Phi' \)).

The first order conditions with respect to \( R_t \) and \( I_t \) are

\[
\mu_t - u'(C_t) \leq 0 \quad (= 0 \text{ if } R_t > 0)
\]
\[
\lambda_t - u'(C_t) \leq 0 \quad (= 0 \text{ if } I_t > 0);
\]

The first order condition with respect to \( A_t \), for periods with \( A_t > 0 \) is

\[
\lambda_t (1+r) - \lambda_{t-1} \beta^{-1} = 0 \implies \frac{u'(C_t)}{u'(C_{t-1})} = \frac{1 + \rho}{1 + r} \text{ if } I_t > 0 \text{ and } I_{t-1} > 0.
\]

If \( \rho = r \), then \( C_t = C_{t-1} \) whenever \( I_t > 0 \) and \( I_{t-1} > 0 \).
The first order condition with respect to $B_t$, for periods with $B_t > 0$,

$$\mu_t(1 + r^*) - \mu_{t-1} \beta^{-1} = 0 \implies \frac{u'(C_t)}{u'(C_{t-1})} = \frac{1 + \rho}{1 + r^*} \text{ if } R_t > 0 \text{ and } R_{t-1} > 0.$$

Thus, if $\rho = r < r^*$, then in the phase where the loan is being gradually repaid, consumption will be rising over time (and effort, and hence employment income, will be falling over time) until the loan is fully paid. Afterwards, consumption will be constant.

Since $r^* > r$, the consumer will never choose to invest in financial assets and repay the student loan at the same time, except possibly in the period when the loan is fully repaid.

**A numerical example:** Assume $T = 7, r^* = 0.10 > r = 0 = \rho$ and $\theta_t = 1$ for $t = 2, 3, 4, 5, \theta_6 = 0 = \theta_7$. Assume the debt after graduation is $(1 + r^*)D = B_2 = 1.3507$.

The individual expects a wage income of zero in periods 6 and 7 (due to old age). Assume $\Phi'(L) = \frac{1}{2} L^2$ and $u(C) = C - (1/4)C^2$ for $C < 2$. Then $u'(C) = 1 - (1/2)C > 0$ for $C < 2$.

We will construct an example such that along the optimal path $C_t = \bar{C} = \frac{2}{5}$ for $t = 4, 5, 6, 7$, labor supplies are $L_7 = L_6 = 0, L_4 = L_5 = \frac{4}{5}$, and $A_8 = 0, A_7 = \bar{C} = \frac{2}{5}, A_6 = 2\bar{C} = \frac{4}{5}, A_5 = \frac{2}{5}, A_4 = 0$.

It is easy to show that in periods 4 and 5, the condition $\theta u'(C) = \Phi'(L)$ is satisfied. In periods 2 and 3, consumption is rising, with marginal utility falling. Suppose $C_3$ is such that

$$\frac{1 - (1/2)C_4}{1 - (1/2)C_3} = \frac{1}{1 + r^*}$$

Say $r^* = 0.10$. Then the above equation implies $C_3 = 0.24$. And, since

$$\frac{1 - (1/2)C_3}{1 - (1/2)C_2} = \frac{1}{1 + r^*}$$

$C_2 = 0.064$.

This implies that

$$\Phi'(L_2) = L_2 = 1 - \frac{C_2}{2} = 0.968.$$
and

\[ \Phi'(L_3) = L_3 = 1 - \frac{C_3}{q} = 1 - 0.12 = 0.88. \]

Since labor income minus consumption is used for repayment of debts (savings being optimally set at zero, as we have noted in the paragraph just before the numerical example), we infer that

\[ R_3 = L_3 - C_3 = 0.88 - 0.24 = 0.64 \]

and

\[ R_2 = L_2 - C_2 = 0.968 - 0.064 = 0.904. \]

Thus the individual repays more in period 2 (the period when their labor income is highest).

The present value (seen at the beginning of period 2) is

\[ \frac{R_2}{1 + r^*} + \frac{R_3}{(1 + r^*)^2} \]

\[ = \frac{0.904}{1.1} + \frac{0.64}{(1.1)^2} = 1.3507. \]

If \( B_2 \) is slightly lower than 1.3507, then the individual can afford higher consumption for periods 2 and 3, without raising \( \bar{C} \).
Part II

Practice in Higher Education
The expansion of higher education is both necessary and desirable. But, as the opening section of this chapter explains, higher education is costly and faces competing imperatives for public spending. The second part of the chapter explains the market failures faced by lending to finance investment in human capital and compares two approaches to addressing them: a graduate tax, where graduates repay a fraction of their earnings for life, or till retirement (i.e., equity finance), and income contingent loans, where repayments stop once the graduate has repaid his or her loan; and concludes by discussing designs which combine the two approaches. The third section discusses the ill-effects of blanket interest subsidies and provides brief assessments of reforms of higher education finance in the UK, New Zealand and Hungary, all of which have income contingent systems. A concluding section briefly outlines unanswered theoretical questions about the design of student loans.

5.1 Background

5.1.1 Objectives of higher education policy
The world has changed. One could argue that 50 or 60 years ago higher education was not really important in economic terms. It was part of the cultural life of the nation, rather like the opera house or national gallery. Higher education today matters for the same reasons it has always mattered: to transmit knowledge, to promote core values, and to develop knowledge for its own sake.
But today it also matters to promote economic growth in a competitive economy, as skill-biased technological change drives up the demand for skills. In other words, we need more training. Separately, skills have a shorter half life, requiring repeated training. So it is no accident that participation rates in higher education have risen in virtually all countries, with no sign that the trend is slowing.

Against this backdrop, there are three specific objectives that higher education finance should facilitate:

(i) Improving the quality of teaching and research.
(ii) Widening access, that is, improving participation for students from disadvantaged backgrounds.
(iii) Increasing the size of the sector. Because of skill-biased technological change, the myth of a return to a small elite-based system won’t fly. Yesterday’s solutions are no longer on offer.

5.1.2 The drive to cost sharing

5.1.2.1 Cost sharing: why?

There are three arguments for cost sharing between the taxpayer and graduate beneficiaries of higher education:

(i) The microeconomic argument is that higher education creates benefits to society in excess of those to the individual, providing a strong case for taxpayer support. However, higher education also creates substantial private benefits on average for individual graduates, not only in monetary terms, but also in non-pecuniary forms such as job satisfaction. Cost sharing is thus an element in efficient pricing.

(ii) Macroeconomic realities are such that there is increasing pressure for expanding education, but competing fiscal pressure from ageing populations, from rising medical expenditure, and from increasing international competition which constrains the ability of individual countries to impose taxes too much in excess of those in other countries. Cost sharing is thus an element in containing public spending.

(iii) Equity arguments. Free is just another word for ‘someone else pays’. The ‘someone else’ are people who typically don’t go to university and who come from poorer backgrounds. Thus excessive reliance on taxpayer finance is regressive. Cost sharing, it can therefore be argued, contributes to social justice.
5.1.2.2 Cost sharing: how?
Fiscal constraints and the externality argument both point to a system in which public finance is supplemented by private finance. Why, however, should private finance be through loans? There are at least six potential sources of private finance:

(i) Family resources, though not bad in themselves, do nothing to promote access.
(ii) A student’s earnings, while a student, are generally small in most countries apart from the USA. In addition, time spent earning money competes with study time and leisure activities.
(iii) A student’s future earnings, that is, loans.
(iv) Employers: it is in the interests of employers that people are trained, but in the interests of each employer to free-ride on training financed by competitors. This type of externality did not arise when workers generally stayed with a single employer for many years, but today’s labor markets require mobility, creating incentives against substantial employer contributions.
(v) Entrepreneurial activities by universities: net revenues are generally small – few universities make much money out of patents, for example – and there is a risk of diverting scarce institutional capacity to lower-priority activities.
(vi) Philanthropy – for example, charitable foundations or bequests in wills – are useful but marginal, except for a small number of US universities.

Having ruled out (i), (ii), (iv), (v), and (vi) as major sources of private finance, the only large-scale equitable source of private finance is through the future earnings of graduates, that is, loans.

5.1.2.3 Overarching issues
While one can argue that students should share in the costs of their higher education, there are two overarching issues. First, students are credit constrained, so an instrument is needed to provide consumption smoothing. Second, investments in human capital are risky, so an instrument is needed that also includes insurance.

5.2 Theory
An important first step is to clear up a common ambiguity about what is meant by ‘income contingent’. For a given size of loan, ‘income contingent’ is used in two different ways:
(i) Definition 1: repayments are contingent on lifetime income. That is, in present-value terms people who earn more over their lifetime repay more.

(ii) Definition 2: the present value of repayments is independent of lifetime income. Repayments stop when the borrower has repaid the loan in full in present-value terms. Except for the lifetime poor, under this definition income contingency affects the time path of repayments but not the total repayment.

5.2.1 Loans for human capital: the central problem

Leaving aside the global financial crisis, markets for home loans over the decades have tended to work reasonably well for two reasons: the house acts as physical collateral for the loan; and houses do not have behavioral responses – a house cannot choose to collapse. In contrast, loans to finance human capital are subject to two constraints:

(i) There is no physical collateral.
(ii) There are behavioral responses; and because of asymmetric information those responses are inefficient.

5.2.1.1 Constraint (i): no physical collateral

Borrowing to buy a house is generally not high risk. People who buy a house have a good idea of what to expect as they have lived in houses all their life, the value of the house is likely to go up over time, the house is unlikely to fall down, and if the borrower’s income falls unexpectedly, he/she has the ability to sell the house to repay the loan.

In contrast, borrowing for human capital is risky for the borrower because he has imperfect information, both about his aptitudes for achievement in higher education and about future labor market outcomes. Secondly, there is a lack of physical collateral. If someone does not earn as much as expected, he/she has no option to sell the degree to repay the loan. Borrowing for human capital is also risky for the lender, both because of the absence of physical collateral and because of behavioral responses.

5.2.1.2 Constraint (ii): asymmetric information

Behavioral responses include the potential for adverse selection: if I take out a loan, I may know that I want to become an accountant or an actor, but I can conceal that fact from the lender. In addition, there are sources of moral hazard, including working less hard, analogous to the sharecropper problem.

Strategically, there are two approaches to addressing those constraints: the graduate tax approach and the income contingent loan approach.
5.2.2 The graduate tax approach

In this approach, someone with a higher lifetime income repays more in present value terms. This is definition one, above.

5.2.2.1 Friedman and the benefit principle

Milton Friedman, in work with Kuznets, showed that the return on human capital was higher than on physical capital. Having ruled out other explanations, he argued that this was the result of capital market imperfections, particularly the riskiness to lender and borrower of an unsecured loan:

[I]n a non-slave state, the individual embodying the investment cannot be bought and sold. But even if he could, the security would not be comparable. The productivity of…physical capital does not...depend on the cooperativeness of the original borrower. The productivity of the human capital quite obviously does…A loan to finance the training of an individual who has no security to offer other than his future earnings is therefore a much less attractive proposition than a loan to finance, say, the erection of a building (Friedman, 1955, p. 137).

Having diagnosed the problem, Friedman went on to offer a prescription:

The device adopted to meet the corresponding problem for other risky investments is equity investment plus limited liability on the part of shareholders. The counterpart for education would be to ‘buy’ a share in an individual’s earning prospects: to advance him the funds needed to finance his training on condition that he agree to pay the lender a specified fraction of his future earnings (Friedman, 1955, p. 138).

This could most easily be collected via income tax. The resulting policy is a graduate tax which involves a flow of dividends to facilitate individual investment in human capital. This is a device for risk sharing between the lender and the borrower, not for redistribution.

5.2.2.2 Glennerster and the ability-to-pay principle

A different approach can be found in the UK literature. Glennerster et al. (1968) started from the idea of freely available public services available to all, but abandoned that model in the case of higher education because of its regressivity. He argued that:

…in the United Kingdom, higher education is now financed as a social service. Nearly all the costs are borne out of general taxation...But it differs radically from other social services. It is reserved for a small and highly selected group…It is exceptionally expensive…[And] education
confers benefits which reveal themselves in the form of higher earnings. A graduate tax would enable the community to recover the value of the resources devoted to higher education from those who have themselves derived such substantial benefit from it (Glennerster et al., 1968, p. 26).

Thus, coming from the political left, the resulting policy, again, is a graduate tax, whereby recipients of higher education pay a tax in addition to income tax. The amount a graduate repays is related to his or her subsequent earnings, and the government is able to redistribute the funds received, for example to widen access.

Thus a graduate tax is compatible with the ability-to-pay principle, but also identical to the Friedman policy based on the benefit principle. In sum, one approach is equity finance, which can be approached either by the benefit principle, or the ability-to-pay principle.

5.2.3 The income contingent loan approach
A second mechanism is through income contingent loans: except for those with low lifetime income, the present value of repayments is independent of a person’s lifetime income. This is definition two, above, and is loan finance, not equity finance.

A well designed income contingent loan has three central characteristics:

(i) An interest rate based on the cost of finance, or somewhat higher (discussed further below).

(ii) For the purpose of consumption smoothing, the loan should be large enough to cover tuition charges and realistic living costs, and repayments should be structured so that the only graduates who do not repay in full in present value terms are those with low lifetime incomes.

(iii) An essential component is insurance against low current income through the income contingent formula. An additional option is insurance against low lifetime income, for example, by forgiving debt that has not been repaid after 25 or 30 years. While highly desirable, this component is not essential.

5.2.4 Combining the two approaches
In a simple graduate tax, a percentage of income is repaid for life (or up to (say) retirement age), hence high earners repay multiples of their initial investment. This is the pure case of equity finance. At the other end of the spectrum is a simple income contingent loan, where nobody repays more than he or she borrowed in present value terms, and losses are picked up by the taxpayer. This is the pure case of loan finance.
The two approaches can be combined under hybrid arrangements. Suppose, for example, that the loss in a loan system is 20 per cent. It would be possible to design a graduate tax with a ceiling on repayment by any individual where, ex-ante, the ceiling is chosen so that the cohort as a whole repays what it has borrowed. (This is the sort of scheme that Yale University tried to implement in the 1970s.) Or, there could be a loan scheme with an interest rate equal to the cost of finance plus a cohort risk premium such that, ex-ante, the cohort repays 100 per cent.

One can see how the two approaches of the graduate tax and income contingent loan converge (for fuller discussion, see Barr, 2010). What do they converge to? In essence, they converge to an arrangement with the characteristics of social insurance: nobody is excluded; everyone is in the same risk pool; and losses from low earners are made up by high earners, so that the scheme is self-financing. The ‘insurance’ part is that those who are lucky (that is, those who stay in work and have high earnings) subsidise those who are unlucky (that is, those who remain unemployed or who die young). The ‘social’ part is that the system can cover everyone, including bad risks and can redistribute from higher to lower earners.

Thus the benefit principle and ability-to-pay principle are compatible with each other and with the idea of social insurance.

The bottom-line is that there is no single income contingent scheme. Income contingency is a mechanism for collecting repayments. Very different designs are possible, which share risks in different ways.

5.3 Practice

5.3.1 Different ways of implementing income contingent repayments

As well as the possibility of different designs, income contingency can also be implemented in different ways:

(i) Based on current income, as in Australia, New Zealand and the UK. This is the best method where a country has the institutional capacity to implement it effectively.

(ii) Based on past income, as in Hungary and Sweden.

(iii) Through a hybrid arrangement, as in the Netherlands. The Netherlands has a traditional mortgage-like system, but if a person’s earnings are low, he/she can contact the student loans administration and request a lower repayment rate.

5.3.2 Interest subsidies: a key mistake to avoid

Interest subsidies are a major potential pitfall for a system with income contingent repayments. The central point is that an interest subsidy for everybody is enormously expensive; it therefore interferes with the quantity of
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places and/or the quality of higher education; it impedes access (since if loans are expensive, they will be rationed for fiscal reasons); and worst of all, interest rate subsidies are targeted with considerable precision at exactly the wrong group of people. They are regressive in the extreme.

The last point requires explanation. With conventional loans (that is, with fixed monthly repayments), an interest subsidy reduces monthly repayments and thus helps people with low earnings; thus it might be good policy to subsidise the interest rate paid by young couples buying their first home. But a system of income contingent repayments with forgiveness after 25 or 30 years turns the conventional argument upside down. Consider who benefits from interest subsidies:

(i) Is it students? No, because students do not make loan repayments.
(ii) Is it low earning graduates? Low earning graduates are protected by the income contingent formula in the short-run and by debt forgiveness in the long-run.
(iii) Is it high earning graduates early in their careers (e.g., junior hospital doctors)? They are protected by the income contingent formula.
(iv) The only effect of the interest subsidy is to shorten the duration of the loan so that with the subsidy, repayments would end after, say, 10 years, whereas without the interest subsidy they would have continued for 12 years. The people who benefit are successful professionals in mid-career.

As Johnson and Barr (2013) show, the subsidy from loan forgiveness after 25 years exclusively benefits those with low lifetime earnings and is thus well targeted, but the interest subsidy benefits all persons, irrespective of their lifetime earnings, including the top income quintiles. One result of a blanket interest subsidy is that nobody repays in full in present-value terms.

5.3.3 International experience

5.3.3.1 Lessons about loans: design

Income contingent loans do not harm access. The Australian system, introduced in 1989, offers the longest historical record. The evidence (see, for example, Chapman and Ryan, 2005) shows an increase in overall participation since 1989 and finds, superimposed on that trend, that women’s participation grew more strongly than men’s, and that the system did not discourage participation by people in the lowest socioeconomic groups.

Interest subsidies are expensive. Shen and Ziderman (2009) show that the high costs in the UK are a common problem internationally. New Zealand offers additional evidence. Reform in 2000 introduced a zero nominal interest
rate while a student was still at university (previously a real interest rate was charged from the time the student took out the loan). In addition, the real interest rate charged after graduation was frozen at somewhat below its previous rate. The impact of these changes was startling. Previously, according to official estimates, of every 100 that was lent, 90 would be repaid. As a result of the changes, it was estimated that only 77 out of every 100 would be repaid (New Zealand Ministry of Education, 2002, p. 7). The change was so expensive precisely because the subsidy to students while still at university applies to all students. A key message is that seemingly small adjustments can be very expensive.

**Upfront Discounts Create Distortions.** The system in Australia introduced in 1989 allowed students to pay the tuition charge (I use an illustrative figure of $6,000) either upfront at a 25 per cent discount or deferred. The mechanism can be thought of either as a discount on upfront payment of fees or as a surcharge on loans. In the former case, the student arrives at the university and hands over a cheque for $4,500 (i.e. $6,000 minus 25 per cent discount). With deferred payments, the student arrives at the university and signs a piece of paper. The loans administration pays the university $4,500. Thus the university is indifferent between upfront and deferred payments. The student makes income contingent repayments after graduation until he/she has repaid $6,000 in real terms.

Under this arrangement, a borrower repays $1,500 more in real terms than the fee of $4,500 which the government has paid on his/her behalf. Thus there is a positive real interest charge in the form of a lump sum of $1,500. That arrangement is problematical in two ways. First, it is inefficient since it has none of the incentive effects at the margin of a positive real interest rate. The implicit interest rate is arbitrary across individuals and over time. An additional inefficiency arises if the lump-sum charge creates adverse selection – people who expect to be high earners pay upfront, leaving the government scheme with the bad risks. A second strategic problem concerns loans to cover living costs. With fees, it is possible to present the arrangement as a discount because it mimics an arrangement which is common in other areas. But a charge of $6,000 for a loan of $4,500 to cover living costs will be seen not as a discount but as a surcharge. Thus in practice the $1,500 is likely to be eroded, and over time eliminated because of its high visibility, leading to a system with a low or zero real interest rate.

To some extent such erosion has already happened for loans to cover fees. By 2013 the discount had been reduced to 10 per cent, with discussion of eliminating it entirely. The resulting system, with a zero real interest rate, would have all the ill-effects already discussed.
THE POLITICS OF INTEREST RATES MATTER. A discount for upfront payments may be defensible for small tuition charges (for which the resulting distortion is small), given the advantages of the arrangement in terms of political presentation. A positive real interest rate, if that were the only policy, would lead to spiralling nominal debt for low earners, creating obvious political problems. There are solutions:

(i) It is possible to design loans with a targeted interest subsidy such that a person’s real debt never increases. The simplest method is that where a person’s loan repayment does not even cover that year’s interest, a zero real rate should be applied (freezing the real outstanding loan balance).

(ii) Presentation should not focus on nominal debt (which obviously can be frightening) but on better-understood variables, such as how long until the person has paid off his/her loan at his/her current level of earnings.

(iii) Positive real interest rates are feasible. Systems in various countries, including the Netherlands, Sweden and Hungary charge a real interest rate, a matter which is not politically contentious. As discussed, with income contingent loans a higher interest rate does not increase a graduate’s monthly repayments, only the duration of the loan.

CONSTRACTIONS IS IMPORTANT. International labor mobility is high and likely to increase, raising questions about potential default if a person emigrates. The problems with the design of the loan contract in Australia and New Zealand, illustrate the point. In those countries, loan repayments are part of a person’s tax liability, and hence are zero for someone with no Australian/New Zealand income. In the UK, in contrast, the loan contract specifies that someone outside the UK tax net is still liable to make repayments.

5.3.3.2 Lessons about loans: implementation

Any fool can give away money. The difficult part is getting it back. A country generally cannot implement income contingent repayments effectively unless it can collect income tax. But, it is a mistake to think that collecting conventional loan repayments is much easier. If institutional capacity is insufficient, the only solution is to improve institutional capacity; the world is littered with failed loan systems based on optimistic assumptions about institutional capacity.

5.3.3.3 The UK

There is good news and bad news, but sadly more of the latter (for an up-to-date assessment, see Barr 2012b). Though the loan system is UK-wide, tuition
fees are charged only in England. Income contingent loans, introduced in 1998, were first advocated by Peacock and Wiseman in the Robbins Report (1963), and later picked up by Barr and Crawford (see, for example, Barr 1989).

The loan covers living costs, and since 2006, also tuition fees. The current formula is that repayments are nine per cent of income above GBP 21,000 per year. Repayments are collected as a payroll deduction on the basis of current earnings, alongside income tax.

The mistake to avoid, as discussed above, is blanket interest subsidies. Until the UK got rid of them in 2012, of every GBP 100 lent, about one third was not repaid just because of the cost of the interest subsidy.

5.3.3.4 New Zealand

New Zealand is a sad story. The country had the world’s best system between 1993 and 2000. Loans covered fees and living costs. Income contingent repayments were collected as a payroll deduction. The interest rate was one per cent above the government’s cost of borrowing. The NZ authorities calculated that a risk premium of two per cent would cover the entire loss on the portfolio, so the effect of charging one per cent above the cost of finance was that half of the estimated loss was paid by the cohort of borrowers and half by taxpayers.

A mistake was political failure to explain the system properly, leading to the introduction of very expensive interest subsidies.

5.3.3.5 Hungary

The system was introduced in 2001. Income contingent loans cover part of living costs and repayments are based on past earnings because Hungarian policy makers judged (rightly) that their tax administration was not up to collecting on the basis of current income.

The interest rate is cost of finance, plus a cohort risk premium, plus an administrative charge.

The question facing the team (Nicholas Barr, Iain Crawford and the UK Student Loans Company) was: ‘How can we design an income contingent loan system that is privately financed?’

The problem is the following: a loan in which students borrow from the private sector but with a government guarantee is not private. IMF and Eurostat rules for public-sector accounting state that unless there is substantial risk transfer to the private sector, the loan is not privately financed, but should be classified as government borrowing. But if, to avoid the loan being classified as public, there is no substantial government guarantee, private lenders will be reluctant to provide finance for a scheme that is available to everybody.
This was the technical problem which the design team faced. The cohort risk premium was the key to the solution. The risk premium means that there is a guarantee to private lenders, but because the guarantee comes from the cohort of borrowers through the cohort risk premium, it is a private guarantee.

The system in Hungary has worked well and proved robust in the face of economic crisis. In 2010, the European Investment Bank agreed to provide a new credit line of about 140 million Euros (a market test of the scheme’s credit worthiness). In 2011, cumulative repayments by past borrowers were enough to cover outgoings to the 2011 cohort of new borrowers. The system is fairly large, at 0.82% of GDP. For a more detailed description and evaluation, see Berlinger (2009).

5.4 Towards a welfare-economics framework

5.4.1 Unanswered theoretical questions

Conventional debt adds to risk. Income contingent debt adds to marginal tax rates. It does so wholly with a pure graduate tax, though arguably less so with a loan where repayments eventually stop (though no modeling has been done on this aspect). The question is which aspects of second-best are key? What is the optimal mix? What choice leads to more or less moral hazard?

5.4.2 Risk sharing

Risk sharing lies at the heart of income contingent loans. In a well-designed system, most graduates repay in full in present value terms. But there will be a loss from borrowers with low lifetime earnings. That loss is an inherent and deliberate design feature of the loan; it is the essence of the insurance mechanism.

As with pension design, a central issue is how risks should be shared, and in particular, where the costs of the loss should fall: they could fall on the taxpayer, as in the UK, Australia and New Zealand; they could fall on the cohort of graduates through a cohort risk premium, as in Hungary; there could be a university-specific insurance premium on the loss of loans to their graduates; or, there could be a mix of all three (Barr, 2010).

The second-best optimisation problem concerns (a) the extent of risk to which borrowers are exposed and (b) where the risks fall of the loss on the portfolio.

Notes

This chapter draws on Barr (2012a, Ch. 12). I am grateful for helpful comments from participants at the International Economic Association Roundtable on Income Contingent Loans, Bangkok, 16-17 March 2013.
References


The Challenge of Sustaining Student Loans Systems: Lessons from Chile and Colombia

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After a period of relative calm on university campuses all over the world during the first decade of the new century, 2011 and 2012 saw waves of strong student protests against the high cost of university education in places as diverse as Berkeley, Bogota, Khartoum, London, Madrid, Montreal, Santiago and Seoul. The Chilean government almost fell in 2012 because of student protests against the student loan system and demands for the abolition of fees in all higher education institutions. Partly as a result of the Chilean student loan crisis, students in Colombia also started to question the desirability of having a student loan system instead of providing free higher education for all. Is the end of student loans in Latin America in sight, echoing the growing concern in the United States, where the US$1 trillion student loan debt figure has been used to denounce student loans as a failed system and approach? In a recent New York Times column, Charles Blow described US debt levels as ‘staggering,’ and ‘having long-term implications for our society and our economy, as that debt begins to affect when and if young people start families or enter the housing market’ (Blow, 2013). In this context of crisis and apocalyptic statements about student loans in the Americas, the purpose of this chapter is to review lessons from recent developments linked to higher education financing in Chile and Colombia.

6.1 The case of Chile

What started as a demand by secondary school students that their free transport pass be extended from 10 months to the entire calendar year evolved into a full-blown confrontation opposing secondary and university student
organizations and the entire government. Ironically, the government rejected that initial demand citing its high budgetary cost but later agreed to a reform package costing 20 times as much as the initial request of the students. The leading factions of university students went as far as demanding a constitutional amendment that would guarantee free public, high-quality education for everyone at all levels, including higher education.

To be fair to the students, they had legitimate grievances. For several decades, Chile has had a segregated higher education system, with two groups of universities offering different benefits to students. First, 16 public and nine private universities receive government subsidies, whose students are eligible for generous scholarships and have access to a highly subsidized income-contingent loan system (*Fondo Solidario*). Second, 36 private universities do not receive public funding but enroll 53 per cent of all university-level students in the country. These students have limited access to government scholarships but are eligible for a loan scheme, run by commercial banks with a government guarantee, which was established in 2005.

The inequitable nature and consequences of this segmentation was analyzed and criticized in a 2009 comprehensive review of tertiary education undertaken jointly by the OECD and the World Bank (OECD and World Bank, 2009). Household survey data show, in particular, that even though the overall enrollment rate more than doubled between 1990 and 2009 in Chile from 15 per cent to 40 per cent, the gap in enrollment rates between the lowest and the richest income quintiles also increased, from 35 per cent in 1990 to 62 per cent in 2009.

The new student loan scheme established in 2005 (*Crédito con Aval del Estado – CAE*), which was designed as a key instrument to reduce access inequalities, was very successful in terms of uptake and targeting. By 2011, 75 per cent of all eligible students from the first and second poorest income quintiles received a loan. But the commercial banks were not all keen to participate in the scheme, and the scheme itself started to run into severe difficulties when the first repayments were due, as some graduates found themselves with high debt levels and a limited repayment capacity because the scheme was not income contingent and required fixed mortgage-style repayments. The average debt-service ratio or repayment burden (see Chapman in Chapter 1 of this volume for a discussion of repayment burdens in the context of higher education), calculated as monthly payment over monthly income, was 18 per cent, compared to four per cent in Australia, 6.4 per cent in New Zealand, 2.9 per cent in the United Kingdom, and 2.6 per cent in the Netherlands. As a result, the default rate quickly rose to 36 per cent, which is extremely high for a young student loan program. Not surprisingly, one of the key demands of the protesting students was to abolish the CAE student loan program.
After two years of student strikes, protests and even riots, in 2012 the government announced its intention to align the two existing student-loan schemes, applying the terms and conditions of the first one to the second one. This means, among other things, that repayments would become income contingent, allowing students to choose their preferred careers and paying for their degree with a fixed share of future income, thereby ensuring a reasonable repayment burden. Monthly payments would range from five to 10 per cent of monthly income, depending on the income level of graduates. Repayments would be collected through the tax system, even though the Ministry of Finance was initially reluctant to get involved in the administration of student loan repayments.

However, with the arrival of a new administration in March 2014, it is unlikely that the two student loan schemes will continue to operate in this form. The incoming president, Michelle Bachelet, has promised to respond positively to the students’ call for free higher education for all and to move to a system fully funded by general taxation revenue.

The Chilean experience provides two important political economy lessons. First, governments are likely to pay a high price if they delay or do not implement needed reforms, especially after serious issues have been put on the public scene and discussed at length by large segments of society. In the case of Chile, the technical analysis carried out by the OECD and the World Bank created the hope of change and dashed expectations have certainly been a factor in igniting protests.

Second, Chile faces a serious risk of back-tracking if the next government actually implements the promise of eliminating student fees and student loans, which are among the most innovative financing features of any tertiary education system in Latin America. This could help resolve the crisis in the short term, but would likely have adverse long-term consequences, as illustrated by the Irish example of fee abolition in the 1990s. Ireland was the first Western European country that introduced tuition fees in the beginning of the 1990s, which helped improve the financial sustainability of the higher education system. In 1996, however, the new Labor government abolished the fees to fulfill electoral promises. As a result, not only did equity not improve because in the absence of fees the poorer part of the population ended up subsidizing free studies for the middle class, but in addition quality has suffered overall for lack of sufficient public funding, as observed by the 2006 OECD review of tertiary education in Ireland (OECD, 2006).

6.2 The case of Colombia

Few people in the world are aware that the first ever student loan agency was established in 1950 in Colombia. The Colombian Student Loan Agency (Instituto Colombiano de Crédito Educativo - ICETEX) was the dream of a
young and idealistic Colombian, Gabriel Bettencourt. After persuading his employer to give him a loan to finance his master’s degree in the United States, Gabriel Bettencourt returned to Colombia, started paying his loan back to his former company, and convinced the President of the Republic to set up an agency that would provide the same kind of services to all needy Colombians.

After several decades of uneven developments, ICETEX has grown to be one of the strongest and most successful mortgage-type student loan agencies in the world. Since the mid-2000s, ICETEX has benefited from a strong and innovative leadership team, who has been able to mobilize additional resources from government and multilateral donors. As a result, it has extended coverage to 19 per cent of the total student population, focusing on students from the lowest socioeconomic groups. This is the highest student loan coverage rate in Latin America. ICETEX has also improved its collection record – reducing overdue loans from 22 per cent in 2007 to 13 per cent in 2009 – and modernized its management practices, bringing operating costs from 12 per cent in 2002 to three per cent today. It has also entered into partnerships with participating universities to provide not only financial but also academic and psychological support to loan beneficiaries, which has greatly reduced dropout rates among loan beneficiaries, compared to students without a loan. To help students from the lowest income groups, ICETEX also supplements its student loans with scholarships to cover living expenses.

However, ICETEX has faced two types of troubles in recent years. First, with the economic crisis, a growing number of graduates have found it difficult to meet their repayment obligations. The proportion of graduates who are not current with their loan payments has reached 17 per cent in recent months. Even if the economic situation improves, the proportion of graduates facing a high repayment burden is likely to grow in the future because of the loan and repayment characteristics of the ICETEX scheme. Calculations of the repayment burdens suggest that a significant minority of Colombian student loan debtors at the bottom end of the graduate income distribution will face very high repayment burdens (up to 80 per cent for those in the bottom quartile of graduate incomes), implying that in the future either consumption hardship or default will become very important aspects of the Colombian system. This should be recognised as a high risk factor for ICETEX.

Second, just as the Government of Colombia was processing a new higher education law through Congress that would have introduced performance-based funding, increased resources for student loans, and established a clear legal distinction between for-profit and non-profit private universities, the Chilean student crisis spilled over to Colombia. Students from both public and private universities renewed their long-standing demand for the abolition of fees across the board, increased funding for public tertiary education, and the transformation of student loans into grants. One afternoon, they protested in
front of ICETEX and ended up smashing a few of the building’s windows. Robust pressure from the streets against various aspects of the draft law, mostly through peaceful demonstrations bringing students and teachers together, forced the Government of Colombia to withdraw the draft higher education reform law from Congress.

For many years, external observers have suggested to ICETEX that it could look at the feasibility of transforming its traditional mortgage-type student loan system into an income contingent scheme. The hesitation of ICETEX management to move in that direction, partly due to their fear that the tax system would not be able to capture most graduates in a country where fiscal fraud is high and many people still work in the informal sector, illustrates an important paradox of public policy in the student loan area. Even though the evidence in favor of the income contingent loan approach is very strong, and even though studies have shown that university graduates tend to work in organized employment (Chapman, 2006; Barr, 2009), the ICETEX leaders – just like many leaders of mortgage-type student loan agencies – have been reluctant to abandon the well-trodden path and explore ways of improving the probability of better repayment rates. As the Australian experience with the Higher Education Contribution Scheme (HECS) demonstrates, income contingent loans have clear advantages over conventional fixed-schedule loans in terms of reduced repayment risks for graduates and efficient collection through the national tax system.

6.3 Conclusion

By their very nature, student loan institutions are faced with a perpetual dilemma. As instruments of equity promotion, they have an important social responsibility and need to be designed in such a way as to serve the funding needs of students from low-income groups. As financial institutions, they are required to respect basic principles of financial viability to be able to continue to operate in a sustainable fashion and serve generation after generation of students. These two inherently antagonistic objectives are difficult to reconcile and represent the fundamental challenge faced by any student loan scheme.

Many factors explain the relative success or failure of any student loan scheme, including design considerations relative to the interest rate and administrative costs, the strength of its leadership, the quality of management practices and systems, and the ability to react rapidly and flexibly whenever problems arise. But loan collection is perhaps the most important element. At the end of the day, no matter what type of student-loan system operates in a country, it is doomed unless its collection mechanism is designed and operates in an effective manner.
Traditional, mortgage-type student-loan schemes are vulnerable by design, as illustrated by the Chilean and Colombian cases. Without an income contingent provision, times of economic crisis are bound to cause repayment difficulties, as unemployment rises and incomes stagnate.

Obviously, income contingent loan systems have a higher probability of success. But the necessity of having a fool-proof collection system makes it challenging for most developing countries. In this respect, Chile appears to be better placed than Colombia to work through its income tax administration to collect student-loan repayments in an efficient way. This is one of the positive consequences of the recent crisis, which has forced the Chileans to come up with a more rational and effective approach to student-loan origination and collection; however, it of course remains to be seen if Chile will retain student fees or return to free higher education.

Hopefully, Colombia will not need a crisis of such gravity to find ways of transitioning to an income contingent student loan model that would allow ICETEX to further consolidate its recent progress. In fact, ICETEX has already opened the possibility for graduates to move to an income contingent repayment schedule. Two hundred graduates took advantage of this new option in 2012. However, by offering the income contingent option as a choice to its debtors, ICETEX may not obtain the intended results because of potential adverse selection. Most likely, those opting for the income contingent repayment schedule will be those graduates expecting relatively low incomes. While this would help the participating individuals, it would not constitute a good outcome for repayment overall. For the long-term financial strength of ICETEX, it would be much more effective to convert all student loans into income contingent loans.

Notes

An earlier and shorter version of this article was published as Salmi, J. (2013) ‘The Challenge of Sustaining Student Loan Systems: In Colombia and Chile’, *International Higher Education*, No. 72, pp. 21–23.

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The Implications of Graduate Labor Market Performance in Designing a Student Loan Scheme for Malaysia

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This chapter examines graduate labor market performance and its implications in the design of a student loan scheme for higher education in Malaysia. The current mortgage-type loan scheme under the National Higher Education Fund Corporation (NHEFC) creates a major problem in terms of loan defaults which contribute to high implicit subsidies and concerns related to the sustainability of this scheme. With high unemployment among fresh graduates and where over-education is found to be prominent among employed graduates, it is likely that the current mortgage-type loan scheme creates a heavy burden on many graduates with relatively low incomes. The important concept relates to what is known as the ‘repayment burden’, the proportion of a debtor’s income that is required to meet repayment obligations. To understand the extent of repayment burdens, age-earnings profiles are estimated for Malaysia and it is found that the earning ability of graduates varies by level and field of study. The current mortgage-type student loans are shown to impose quite high repayment burdens, particularly for graduates in arts and social sciences, with the results helping us to understand the extent of loan defaults. Adjusting the data to include unemployed graduates, which results in a more informed repayment burden calculation, adds very considerably to our assessment of the average repayment difficulties. In assessing the efficacy of the current loan scheme, we compare the implicit subsidies under the current mortgage-type student loans with a proposed (hypothetical) income contingent loan (ICL). The results demonstrate that our illustrative ICL fares better than the current mortgage-type loans in which the...
implicit subsidy could be higher than 50 per cent of the loan amount. Thus, the introduction of an ICL in Malaysia can be argued to be preferred on the two grounds of lower repayment burdens for poorer graduates and overall lower government subsidies. A critical question to be resolved relates to the administrative issue concerning the costs of ICL collection.

7.1 Introduction

Consistent with the Malaysian government’s desire to be an international education hub, the higher education sector in Malaysia has grown significantly since the late 1990s. The total enrolment of students in higher education has increased more than two-fold from 576,006 in 2002 to 1,187,395 in 2011 (Ministry of Finance, Malaysia, 2005, 2012). This number is expected to increase further due to the government policy of increasing the percentage of enrolments in higher education institutions among high school leavers from 40 per cent in 2010 to 50 per cent in 2020. This increase in student enrolments has important implications for the demand for student higher education financing.

In order to provide financial support for students the Malaysian government established the National Higher Education Fund Corporation (NHEFC) in 1997. One of the main functions of the NHEFC is to provide and manage the implementation of a student loan scheme for local students enrolling in Malaysian higher education institutions. The loan is a mortgage-type loan and, beginning from June 2008, a one percent service charge per annum has been imposed on the amount borrowed.\(^1\)

The number of borrowers of NHEFC student loans increased substantially, from 11,956 students in 1997 with loans amounting to RM219 million, to 238,722 students in 2010 with the total loan amount increasing to around RM6 billion. Despite the huge amount of loans allocated to students, NHEFC is facing problems with regards to loan collection; it has been reported that the NHEFC loan collection rate is only 49 percent, which is far below the targeted rate of 70 percent (Loo, 2012). Various efforts have been taken by the NHEFC to overcome the problem of low collection, but these measures seem to have not improved the collection rate substantially. For instance, only around 20 per cent of defaulters, whose names have been submitted by NHEFC for immigration blacklisting, have started their loan repayments to NHEFC (Loo, 2012).\(^2\) The low collection rate hampers NHEFC’s capability to support a new cohort of borrowers.

The issues surrounding student loans in Malaysia have gained much political attention. In the 13\(^{th}\) general election in 2013 the opposition party called for the abolishment of NHEFC and proposed that higher education should be provided free to students. However, some segments of society opposed the proposal on the basis that higher education provides significant
private returns, and as far as higher education in Malaysia is concerned, it is highly subsidised. This argument, essentially, is that some cost recovery through student loans is justified on equity grounds. It is a fact that due to low repayment the financial sustainability of NHEFC is at stake, and a critical issue for this chapter is that if the right mechanism and loan system is put in place, both default problems and implicit subsidies might be able to be reduced.

Realising that the issue of default is strongly related to the ability of graduates to make repayments, Section 7.2 highlights empirically the Malaysian labor market performance of graduates based on the available data. Section 7.3 evaluates the repayment burden among graduates at different levels and fields of study, with the current mortgage-type loan based on graduate age earning profiles. In addition, we illustrate that calculations such as these understate very significantly the problem because the sample does not include unemployed graduates. Once this group is taken into account it becomes clear that the repayment burdens can be very high indeed.

As a potential solution to this problem of high repayment burdens, in Section 7.4 this analysis is followed by a suggested design of an income contingent loan, a loan system which cannot result in high repayment burdens, since ICL sets the maximum proportion of income that a student is required to repay. Further, the implicit subsidies related to these alternatives are estimated in order to assess the costs to the government of the two alternate loan schemes. Section 7.5 concludes the chapter, raising a cautionary note concerning the need for an effective ICL collection mechanism.

### 7.2 Graduate labor market performance

Labor market performance is examined from the perspectives of incidence and duration of unemployment, and earnings. In Malaysia there are two major sources of data available to determine graduate labor market performance: the Graduates Tracer Study (TS) (an online survey for fresh graduates (Ministry of Higher Education, Malaysia, 2010)) and the Labor Force Survey (LFS) (a household survey including graduates and non-graduates of working age (Department of Statistics Malaysia, 2011a)). By the nature of the survey, TS can be said to represent the short run labor market outcome of graduates while LFS reflects the overall or long run labor market outcome of graduates. In addition, the Salaries and Wage Survey (SW), which is incorporated in LFS, provides wage information at various levels of age and education (Department of Statistics, Malaysia, 2011b).

#### 7.2.1 Incidence and duration of unemployment

According to the TS 2010 around 24 per cent of new graduates are not employed initially. The percentage of first degree and diploma new graduates
(who consist of more than 90 per cent of total new graduates in 2010) is 23.2 per cent and 26.4 per cent respectively. However, the LFS 2011 illustrates that the unemployment rate for all graduates is only 2.7 per cent (2.6 and 2.8 per cent for degree and diploma graduates respectively). In terms of duration, TS 2010 reports that the vast majority of new graduates (around 95 per cent), either first degree or diploma, obtain their first job within six months after graduation. This result suggests that although new graduates suffer a high unemployment rate, their unemployment duration is short.

From the TS 2010 it is also clear that the rate of unemployment among new graduates varies across field of study. The field of education records the highest rate of unemployment of 34.2 per cent, however it is suspected that this is due to the delay in their job placement by the Ministry of Education. Next, in order of decreasing unemployment rate are sciences (30.7 per cent), technical (25.8 per cent), information technology and communication (24.3 per cent), arts and social sciences (20.4 per cent).

7.2.2  Earnings of graduates

Table 7.1 presents the percentage distribution of monthly income earned by new graduates. It is found that most new graduates (first degree and below) are earning a monthly income of between RM501 and RM2500.

Table 7.1  Income of graduates (RM per month) (per cent distribution)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; RM500</td>
<td>0.0</td>
<td>0.4</td>
<td>0.4</td>
<td>3.1</td>
<td>2.3</td>
<td>6.7</td>
<td>17.6</td>
<td>4.8</td>
</tr>
<tr>
<td>RM501-RM1000</td>
<td>0.2</td>
<td>1.1</td>
<td>1.1</td>
<td>10.8</td>
<td>11.1</td>
<td>33.4</td>
<td>58.4</td>
<td>18.9</td>
</tr>
<tr>
<td>RM1001-RM1500</td>
<td>1.0</td>
<td>2.1</td>
<td>3.3</td>
<td>14.8</td>
<td>18.0</td>
<td>34.8</td>
<td>18.9</td>
<td>18.5</td>
</tr>
<tr>
<td>RM1501-RM2000</td>
<td>1.2</td>
<td>5.2</td>
<td>25.2</td>
<td>22.7</td>
<td>39.0</td>
<td>17.5</td>
<td>3.5</td>
<td>18.5</td>
</tr>
<tr>
<td>RM2001-RM2500</td>
<td>1.0</td>
<td>11.3</td>
<td>55.9</td>
<td>19.1</td>
<td>22.4</td>
<td>4.8</td>
<td>0.7</td>
<td>14.6</td>
</tr>
<tr>
<td>RM2501-RM3000</td>
<td>4.7</td>
<td>19.8</td>
<td>9.2</td>
<td>13.0</td>
<td>4.8</td>
<td>1.5</td>
<td>0.4</td>
<td>9.5</td>
</tr>
<tr>
<td>RM3001-RM5000</td>
<td>29.0</td>
<td>40.4</td>
<td>3.2</td>
<td>15.3</td>
<td>2.1</td>
<td>0.9</td>
<td>0.2</td>
<td>12.3</td>
</tr>
<tr>
<td>&gt; RM5000</td>
<td>62.9</td>
<td>19.6</td>
<td>1.7</td>
<td>1.2</td>
<td>0.2</td>
<td>0.3</td>
<td>0.2</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Source: Higher Learning Institution Tracer Study (2010)

7.2.3  Implications in designing a student loan scheme

The above graduate labor market performance data has several important implications. First, unemployment rates for new graduates in the period following graduation are high. Second, there is a substantial number of new graduates who are earning a monthly income of below RM1000 (around the
minimum wage of RM900 per month). The current mortgage-type student loan imposes a high repayment burden to borrowers (as will be shown below) and, arguably as a consequence, the collection rate is low. As reported by NHEFC, the collection rate is around 49 per cent with only 22.5 per cent of borrowers paying consistently as scheduled. Third, labor market performance varies according to the level and the field of study and, as such, the repayment ability also varies; it is thus of interest to disaggregate the analyses of age-earning profiles of graduates with respect to the level and field of study. Fourth, there are a number of graduates who are economically inactive which implies that there will be no repayment from this group if an income contingent loan scheme is introduced.

7.3 Evaluating repayment burdens for the mortgage-type loan scheme

7.3.1 Age-earning profiles

To evaluate the repayment ability of graduates, age-earnings profiles are estimated using the Salaries and Wage Survey for 2011 (SW2011)\(^6\), with the following assumptions:

(i) The productivity growth of employed graduates is assumed at 3.01 per cent (the average of Malaysian productivity growth for 2004-2010) over their life-cycle.

(ii) The after-tax earnings are calculated using the monthly tax deduction of a single person of 2010 and it is assumed that the tax structure remains unchanged in the future.

(iii) Students graduate and start work at the age of 24 years.

Following Chapman and Liu (2013), Chapman and Lounkaew (2011), and Chapman et al. (2010), we use unconditional quantile regression\(^7\) to estimate the age earnings profiles of graduates at the 20\(^{\text{th}}\), 50\(^{\text{th}}\), 75\(^{\text{th}}\), and 90\(^{\text{th}}\) percentile. These quantile regressions are estimated in the range of age from 24 to 45 years and in the following six categories (of different levels and fields of study) of graduates: diploma in arts and social sciences, sciences, and medical related sciences, and degree in art and social sciences, sciences, and medical related sciences. Age and age squared are the independent variables to allow the construction of the profiles.

As an example, Figure 7.1 depicts three categories of age-earning profiles for first degree graduates and shows clearly that earnings over the life cycle of arts and social science degree graduates are lower than that of science and medical related sciences (the analysis for the diploma graduates also shows similar results). In addition, degree graduates earn more than diploma graduates. Overall, the age-earning profiles reveal that graduates at different
levels and fields of study have different higher education loan repayment abilities.

It is of some interest that the age-earning profiles calculated from these data are convex, that is, earnings increase with age at an increasing rate, a finding which is not found in other empirical exercises of this type. This could be because the age of the sample has been limited to 45 years. As shown in the Salaries and Wage Report of Malaysia (Department of Statistics, Malaysia, 2012), in general, earnings increase from age 25 (RM1536) to 54 (RM2476), peak at age of 55 to 59 (RM2566) and start to reduce from about the age of 60 (RM1577). Since our focus is on the youngest age groups this is not considered to be a major source of concern.

Figure 7.1 Age-earning profiles of Malaysian first degree graduates by type of degree
7.3.2 Repayment burdens of the current mortgage-type loan scheme: wage and salary employed graduates

Based on the estimated age-earning profiles we are able to calculate the repayment burden of the current mortgage-type loan scheme, where the repayment burden is the proportion of income received that is required to service the debt in that period (see Chapman (Chapter 1, this volume) for a discussion of repayment burdens with mortgage-type loans). In the literature, as pointed out by Chapman and Liu (2013), there is no objective rule for constituting a level of percentage of loan repayment as being ‘excessive’ and thus implying consumption hardship for borrowers. However, Salmi (2003) suggests a maximum of 18 per cent based on the experiences of the Venezuelan government loan agency, while Baum and Schwartz (2006) suggest a ceiling of eight per cent of income based on an extensive review of the literature. It is important to note that the so-called ‘eight percent rule’ should ideally vary across different levels of income; that is, eight per cent could imply difficulties for a low income borrower but not for a high income borrower (Chapman and Liu, 2013).

For this chapter, since graduates are earning low incomes (refer to Table 7.1 and Figure 7.1), and to be conservative, we somewhat arbitrarily use a repayment burden of eight per cent as a cut-off point in identifying a graduate as a potential defaulter and/or someone experiencing repayment hardship.

To allow calculations of repayment burdens it is necessary to be clear about the structure and levels of student loans, and this is now considered. For public universities in Malaysia, the following student loan is offered for various levels and fields of study.8

(i) Diploma (arts and social sciences/sciences/medical related): Loan amount RM15,000; repayment duration 10 years; total payable RM16,500; monthly repayment RM137.50.
(ii) Degree (arts and social sciences): Loan amount of RM19,500; repayment duration 10 years; total payable RM21,450; monthly repayment RM178.75.
(iii) Degree (sciences): Loan amount, RM28,000; repayment duration 15 years; total payable RM32,200; monthly repayment RM178.89.
(iv) Degree (medical related sciences): Loan amount of RM35,000; repayment duration 15 years; total payable RM40,250; monthly repayment RM223.61.

In all of the above loans the total payable is in nominal terms. For illustrative purposes, the real values of the expected annual loan repayments (diploma in arts and social sciences) is depicted in Figure 7.2 for a hypothetical borrower who begins to repay at age 24 over a 10 year period.
Tables 7.2 and 7.3 present the percentage of repayment in terms of graduates’ monthly earnings for a sample of employed graduates only, depending on which part of the earnings distribution they are in, by age. That is, we show repayment burdens for those: in the bottom 20 per cent of earnings (p20); at median earnings (p50); in the top 75 per cent of earnings (p75); and those in the top 90 per cent of earnings (p90).

The main results are as follows. Except for medical related science graduates, it is clear that during the first five years of repayment the bottom 20 per cent of Diploma graduates (in terms of earnings) are facing high repayment burdens of 9-34 per cent. During the first three years of repayments, even those at the median of Diploma graduates are facing high repayment burdens of 9 to 21 percent.

7.3.3 Adjusting repayment burdens to include the unemployed

It is important to note that the above estimated incomes are based on the SW survey that consists of only employed graduates. Due to data limitations, we are not able to include unemployed graduates in the income estimation which must lead to upward bias in the estimated income as a reflection of all graduates’ income. This has the critical implication that the use of employed graduates only to estimate repayment burdens for all graduates imparts a downward bias. Given the very high unemployment rates experienced by graduates immediately after they finish their degrees this bias could be very high.

To illustrate this downward bias and adjust the repayment burdens to allow for the experience of unemployed graduates, we obtained the following aggregate statistics from TS2011 for graduates (diploma in arts and social sciences)
sciences) who are 24 years old (new graduates) in the bottom 20 per cent of income (Table 7.4). Repayment burdens exceeding eight per cent are in bold.

Table 7.2  Repayment burdens under current mortgage-type loan: diploma

<table>
<thead>
<tr>
<th>Age</th>
<th>Arts and Social Sciences</th>
<th>Sciences</th>
<th>Medical related sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p20</td>
<td>p50</td>
<td>p75</td>
</tr>
<tr>
<td>24</td>
<td>0.34</td>
<td>0.21</td>
<td>0.06</td>
</tr>
<tr>
<td>25</td>
<td>0.23</td>
<td>0.15</td>
<td>0.05</td>
</tr>
<tr>
<td>26</td>
<td>0.18</td>
<td>0.12</td>
<td>0.05</td>
</tr>
<tr>
<td>27</td>
<td>0.14</td>
<td>0.09</td>
<td>0.05</td>
</tr>
<tr>
<td>28</td>
<td>0.12</td>
<td>0.08</td>
<td>0.04</td>
</tr>
<tr>
<td>29</td>
<td>0.10</td>
<td>0.07</td>
<td>0.04</td>
</tr>
<tr>
<td>30</td>
<td>0.09</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>31</td>
<td>0.08</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>32</td>
<td>0.07</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>33</td>
<td>0.06</td>
<td>0.04</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Table 7.3  Repayment burdens under current mortgage-type loan: first degree

<table>
<thead>
<tr>
<th>Age</th>
<th>Arts and Social Sciences</th>
<th>Sciences</th>
<th>Medical related sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p20</td>
<td>p50</td>
<td>p75</td>
</tr>
<tr>
<td>24</td>
<td>0.15</td>
<td>0.13</td>
<td>0.07</td>
</tr>
<tr>
<td>25</td>
<td>0.13</td>
<td>0.11</td>
<td>0.06</td>
</tr>
<tr>
<td>26</td>
<td>0.11</td>
<td>0.09</td>
<td>0.06</td>
</tr>
<tr>
<td>27</td>
<td>0.10</td>
<td>0.08</td>
<td>0.05</td>
</tr>
<tr>
<td>28</td>
<td>0.09</td>
<td>0.07</td>
<td>0.05</td>
</tr>
<tr>
<td>29</td>
<td>0.08</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>30</td>
<td>0.07</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>31</td>
<td>0.06</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>32</td>
<td>0.06</td>
<td>0.04</td>
<td>0.04</td>
</tr>
</tbody>
</table>

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Based on the aggregate statistics of items 1-5 in Table 7.4, we calculated the average incomes of employed and unemployed graduates (in the bottom 20 per cent of the graduate income distribution) using weighted percentages of the employed and unemployed. It is found that the average income, under the assumption that the unemployed receive no income in that period of joblessness, is RM245 per month. Consequently, and very importantly, the new estimate of the repayment burden is 0.56, which is in stark contrast to the 0.34 repayment burden calculated for employed graduates. Thus the calculations reveal that, for very young graduates, including the unemployed increases repayment burdens by around 65 per cent. This could partially explain the low collection rate faced by the NHEFC and, importantly, it suggests strongly that the current loan scheme is associated with important difficulties of repayment by borrowers.

**Table 7.4** Employment status, income and repayment burdens for data including the unemployed: diploma

<table>
<thead>
<tr>
<th>Diploma graduates, 24 years old, bottom 20 per cent of income</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Unemployment rate for graduates</td>
<td>0.7489</td>
</tr>
<tr>
<td>2. Average unemployment duration (month)</td>
<td>2.75</td>
</tr>
<tr>
<td>3. Average income (unemployed graduates)(RM per month)</td>
<td>250</td>
</tr>
<tr>
<td>4. Average income (unemployed graduates)(RM per month)</td>
<td>193</td>
</tr>
<tr>
<td>5. Average income (employed graduates)(RM per month)</td>
<td>401</td>
</tr>
<tr>
<td>6. Average income (employed and unemployed graduates)</td>
<td>245</td>
</tr>
<tr>
<td>7. Monthly loan repayment</td>
<td>137.5</td>
</tr>
<tr>
<td>8. Repayment burden without adjustment</td>
<td>0.34</td>
</tr>
<tr>
<td>9. Repayment burden after adjustment</td>
<td>0.56</td>
</tr>
</tbody>
</table>

**Notes:**
1. Average income (unemployed graduate)(RM per month) = \[(12-2.75)*250\]+\[(2.75)*0\]/12=193
2. Average income (employed and unemployed graduates) = \[(0.7489)*193 + (1-0.7489)*401\]/245 = 245
3. Repayment burden without adjustment\(=\) 137.50/401 = 0.34
4. Repayment burden with adjustment \(=\) 137.50/245 = 0.56

7.4 **An alternative: income contingent loans**

In this section we develop a hypothetical income contingent loan with realistic parameters and illustrate how, under such an ICL scheme, the repayment burden is manageable for all borrowers. Further, subsidies can be considerably lower than under existing loan arrangements.
7.4.1 Choosing parameters for an income contingent loan scheme

Designing an income contingent loan scheme involves the determination of many factors, including loan indexation, loan amounts, income thresholds and corresponding repayment rates. For the hypothetical scheme that we develop here for illustration of the benefits of an ICL, we set the lowest income threshold (below which borrowers do not have to repay their loan) at RM1400 which is approximately double the income corresponding with the Malaysian poverty line. For the highest income threshold in the repayment schedule we choose RM4000, which is the income corresponding with the upper quartile (top 75 per cent of income) for all graduates. A repayment rate of eight per cent is chosen to correspond with this maximum income level, as it is the lowest repayment percentage that we believe would not cause financial hardship. A hypothetical repayment schedule based on these parameter choices is given in Table 7.5.

<table>
<thead>
<tr>
<th>Income (RM per month)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1400</td>
<td>0</td>
</tr>
<tr>
<td>1401 to 2000</td>
<td>2</td>
</tr>
<tr>
<td>2001 to 2600</td>
<td>4</td>
</tr>
<tr>
<td>2601 to 4000</td>
<td>6</td>
</tr>
<tr>
<td>Above 4000</td>
<td>8</td>
</tr>
</tbody>
</table>

It is important to emphasize that under this arrangement no graduate would face a repayment burden exceeding eight per cent. Indeed, any borrowers with incomes below RM1400 would benefit from default insurance (and face a repayment burden of zero).

For ease of implementation by the authority, it is recommended that a single repayment schedule, such as that described above, could be applied for all types of degrees and diplomas and, further, consideration be given to having fewer income categories than those of Table 7.5. For the sake of illustration, however, we proceed with calculations based on the above repayment schedule.

7.4.2 Calculating the implicit subsidy

To illustrate some of the key potential benefits of an income contingent loan scheme, we compare the implicit subsidy of a hypothetical ICL with the
current mortgage-type loan scheme. As suggested by the Labor Force Survey, 10.6 per cent of degree graduates and 17.6 per cent of diploma graduates are economically inactive. These inactive percentages are treated as the default in the income contingent loan scheme. To calculate the present value of disbursement, loan collection and cost of collection, we use a discount rate of 4.36 per cent (the average cost of borrowing for NHEFC)\textsuperscript{10}, a collection cost of 3.6 per cent on the loan collected\textsuperscript{11}, and an inflation rate of 3 per cent. For loan indexation, we assume a zero real rate of interest. For the ICL, the repayment period is endogenous and determined by the amount of repayment, which is calculated using the expected value of repayment.

Tables 7.6 and 7.7 present the implicit subsidy corresponding to the current mortgage-type loan scheme and the ICL scheme. It is obvious that the current mortgage-type loan scheme suffers from high implicit subsidies, ranging from 31.6 per cent (medical related sciences) to 57.3 per cent (sciences) for diploma graduates, and from 33.6 per cent (arts and social sciences) to 52.2 per cent (sciences) for first degree graduates. On the other hand, the income contingent loan scheme results in lower implicit subsidies, ranging from 19.9 per cent (medical related sciences) to 24 per cent (arts and social sciences) for diploma graduates, and from 22 per cent (medical related sciences) to 26.9 per cent (arts and social sciences) for first degree graduates.

It should be recognised that our hypothetical ICL exercises are illustrative only, and government loan reforms in this direction might well involve quite different parameters. For example, if the indexation rate imposed on the ICL exceeds zero in real terms, the extent of the reduction in the implicit subsidy could be even greater than presented here.

\begin{table}[h]
\centering
\caption{Implicit subsidy (diploma) (per cent)}
\begin{tabular}{lllllll}
\hline
 & \multicolumn{3}{c}{Arts and social sciences} & \multicolumn{3}{c}{Sciences} & \multicolumn{3}{c}{Medical related sciences} \\
 & Current & ICL & Current & ICL & Current & ICL \\
\hline
1. Implicit subsidy (no default; no collection cost) & 17.3 & 18.7 & 17.3 & 19.4 & 17.3 & 15.0 \\
2. Implicit subsidy (with default; no collection cost) & 50.3 & 20.4 & 54.3 & 20.7 & 28.6 & 16.1 \\
3. Implicit subsidy (with default and collection cost) & 53.3 & 24.0 & 57.3 & 24.3 & 31.6 & 19.9 \\
\hline
\end{tabular}
\end{table}

Notes: the figures show the percentage of the total loan.
Table 7.7: Implicit subsidy (first degree) (per cent)

<table>
<thead>
<tr>
<th></th>
<th>Arts and social sciences</th>
<th>Sciences</th>
<th>Medical related sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current</td>
<td>ICL</td>
<td>Current</td>
</tr>
<tr>
<td>1. Implicit subsidy</td>
<td>17.3</td>
<td>15.4</td>
<td>43.6</td>
</tr>
<tr>
<td>(no default; no collection cost)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Implicit subsidy</td>
<td>30.6</td>
<td>23.8</td>
<td>50.2</td>
</tr>
<tr>
<td>(with default; no collection cost)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Implicit subsidy</td>
<td>33.6</td>
<td>26.9</td>
<td>52.2</td>
</tr>
<tr>
<td>(with default and collection cost)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The figures show the percentage of the total loan.

7.5 Conclusion

The idea of having an income contingent loan may not be new to Malaysia but several factors have hampered its implementation (Ministry of Higher Education, Malaysia, 2009). It may be difficult to gauge the impending shortcomings and challenges of an ICL, however, as expected, the obvious challenge for an ICL scheme is the collection mechanism. The Inland Revenue Department (IRD) would be a collection agent as IRD is the only department that has the necessary information with respect to people’s incomes. It is worth stressing that for an ICL to be effectively implemented, the law has to be amended to enable the IRD to collect repayments of the higher education loan, which, as in countries using similar schemes (in Australia, New Zealand and the UK), would be an obligation of the employer (such as is the process used to collect income taxes).

Our exercises have illustrated that the current Malaysian student loan arrangement is associated with high repayment burdens for many students and high implicit interest rate subsidies for the government. Moreover, it is well documented that collection rates are low (Loo, 2012) and this might well be the result of the high repayment burdens associated with the current loan scheme. These concerns suggest strongly that there is a case for serious consideration for the introduction of an ICL, which can be designed to minimize repayment burdens and reduce interest rate subsidies. While there remain issues to be resolved with respect to the nature and viability of ICL collection, the case for further serious policy reform debate in the area of student loans for Malaysia is apparently very clear.
Notes

We would like to thank Professor Bruce Chapman for his valuable comments which have improved this chapter substantially. Thanks are also due to Dr. Timothy Higgins for his constructive comments.

1. Since its establishment in 1997, there have been few changes made in terms of the interest rate or service charge. Before June 2008, the interest charged was based on a reducing balance. The rate was four per cent before 1st January 2004, and three per cent from 1st January 2004 up to the end of May 2008. In June 2008, PTPTN had introduced ‘Ujrah’ (a flat rate service charge of one percent yearly) based on the ‘Shariah’ principle.

2. As one of the strategies to recover the loan, NHEFC will submit the list of names of the defaulters to the Department of Immigration Malaysia and their names will be blacklisted. These defaulters are banned from travelling abroad unless they make the specified amount of repayment to NHEFC.

3. The Graduates Tracer study seeks to determine the status of graduates within four to six months following their graduation, and is considered important as a way of gauging graduates’ capability of securing employment. In addition it provides the information on graduates’ satisfaction level, encompassing various experiences throughout their studies in higher education institutions in Malaysia.

4. This is based on the fact that most of the graduate's unemployment duration is six months. Descriptive statistics such as median of unemployment duration is not available.

5. This justifies the current grace period of loan repayment (6 months).

6. The Salaries and Wages Survey for 2011 (SW2011) is used to estimate age-earning profiles. SW2011 collects the wages and salaries information from respondents aged 15 and over who are employed either in the private or government sector. This data collection was conducted by the Department of Statistics of Malaysia (DOS) from January to June 2011 via the Labour Force Survey. For further information, please see http://www.statistics.gov.my. The SW2011 consists of 16,315 respondents with information such as age, education level, field of study, salary and wages. Most of the respondents are in the age range of 24 to 55 which suits the age-earning profile estimation. In terms of field of study, diploma and degree graduates are almost equal; most graduates are in the fields of arts and social sciences.

7. The distributional approach used to estimate the age-earnings profile answers the question ‘what is the impact of age on the xth percentile of earning?’ which enables the construction of age-earning profiles. We estimate the unconditional quantiles of earnings following the specification of Sergio, Fortin and Lemieux (2007).

8. In terms of loan repayment, starting from 1st January 2004 the repayment period is determined by the size of the loan, with the repayment periods ranging from five to 20 years. The loans should begin to be repaid six months after the completion of studies or upon termination. On average, the grace period is 3.5 years. The formula to calculate the interest payment (the total Ujrah) is:

\[ \text{Total Ujrah} = \text{Total principal funding} \times \text{Ujrah rate (1\%)} \times \text{repayment period (years)} \]

9. 8 per cent also corresponds with the repayment rate for the highest income threshold in the Australian ICL scheme (HECS).

10. NHEFC obtains loans from various institutions including commercial banks (government as guarantor) with the interest rate ranging 3.72 per cent to 5.55 per cent, where the mean value is 4.36 per cent.
11. The collection cost is calculated as the percentage of the average ratio of total operating cost to the total collection due of NHEFC.

References


Department of Statistics, Malaysia (2011a) ‘Labour Force Survey 2011’ (Putrajaya: Pencetakan Nasional Malaysia Berhad (PNMB)).


8
Modeling Aggregate Loans Recovery of the Student Loans Fund in Thailand

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Dhurakij Pundit University, Thailand
The Australian National University, Australia

This chapter contributes to the student loan literature by providing empirical evidence of the trade-off between interest rate subsidies and expected aggregate loan recovery. In particular, the paper explores the potential impact of eliminating, or radically reducing, interest rate subsidies of the Thai Student Loans Fund (SLF), which takes a mortgage-type form. Three important policy implications can be drawn from the exercise. First, the consumption premium exercise stipulates that obligation to repay the loan should not involve more than 8 to 10 per cent of borrower’s income. Second, it has been found that an attempt to solve the high interest rate subsidies problem by setting the real rate of interest to 3 per cent is not a viable option because it is very expensive for taxpayers given the association with loan repayment obligations and default probabilities. The model predicts that, at this level of real interest rate, the expected loan recovery rate will be around 40 to 50 per cent. Third, the current design of the SLF does not facilitate consumption smoothing because it does not adequately take into account the variations in the labor market outcomes of Thai university graduates. It is argued herein that these deficiencies can be addressed by moving from a mortgage-type loan to an income contingent loan.

8.1 Introduction

Previous research has consistently identified strong associations between borrowers’ debt burdens relative to incomes and the decision to default on student loans (Dynarski, 1994; Volkwein and Cabrera, 1998; Choy and Li, 2006; Gross, Cekic, Hossler and Hillman, 2009). These analyses imply that
there is a very likely trade-off between interest rate subsidies and the ability to recover loans. For example, by raising the interest rate, the loan administering agency is able to recover a higher proportion of the loan disbursed to borrowers who repay the loans at the new level of interest; however, the higher interest rate will also increase the repayment burdens experienced by all borrowers. As a result some debtors may find it hard to devote more income than they already have to repay the loan, and hence will default. Thus there is a trade-off involved in the determination of the total amount of loans that can be recovered for a loan scheme. It is of great research and policy interest that, apart from Lounkaew (2011), this trade-off has not been explored in a rigorous manner either conceptually or empirically.

The net gain in terms of aggregate loan recovery from a given cohort of borrowers depends on the magnitude of the gain from the higher interest rate compared to the loss through higher default. Such a trade-off possibility has long been acknowledged in the student loan literature and early discussion on this issue can be traced to Woodhall (1987). Recent empirical investigation addressing repayment burden issues are to be found in Chapman et al. (2010) and Chapman and Lounkaew (2010b).

This chapter contributes to the student loan literature by providing empirical evidence of the trade-off between interest rate subsidies and expected aggregate loan recovery. These contributions are the continuation of Chapman et al. (2010), which explores the potential impact of eliminating the interest rate subsidies of the Thailand Student Loans Fund (SLF). It has been found that complete elimination of interest rate subsidies will result in borrowers at the bottom 10th percentile of graduate income distributions being required to pay up to 70 per cent of their incomes in order to avoid default. Chapman et al. (2010), however, do not investigate what this means in terms of default and expected aggregate loan recovery.

The remaining sections are organized as followed. Section 8.2 explains the repayment arrangement of the SLF and examines default rates. Since, from the literature, the major cause of default is excessive indebtedness, Section 8.3 develops an empirical benchmark for excessive indebtedness for Thai borrowers. Data and empirical exercises to illustrate these trade-offs are considered in Section 8.4. Section 8.5 offers policy implications drawn from the empirical exercises conducted herein. The last section provides suggestions for future research.

8.2 The SLF described

The SLF is a mortgage-type loan with a maximum repayment period of 15 years. Annual repayment obligations in proportionate terms increase over time, ranging from 1.5 per cent in the first year of repayment to 13 per cent in the last repayment year. The nominal interest rate charged on the loan is one per
cent. There are two types of grace period built into the SLF. The first interest rate grace period is before the interest rate begins to accrue two years after graduation or termination from program enrolment, meaning that for a four-year program the interest rate grace period is six years. Second, there is a two-year repayment grace period after graduation or termination from the program enrolled.

The loans cover tuition fees as well as living expenses. The loan ceilings for tuition fees differ depending on the fields of study varying from 60,000 Baht per year for the social sciences and humanities to 150,000 Baht per year for selected science and medical programs, and loans for living allowances are limited to 26,400 Baht per year. Figure 8.1 illustrates the repayment pattern for a loan size of 200,000 Baht.

![Figure 8.1 SLF repayments for debt of 200,000 Baht](image)

*Source: Lounkaew (2011)*

The above description of the SLF repayment arrangements points to two sources of potentially high interest rates subsidies. The first is a low nominal interest rate of one per cent. Since the average inflation rate in Thailand is about 4 per cent per annum, this means that the SLF has a real rate of interest of -3 per cent. The second source of high interest rate subsidies is the grace periods: six years for interest and two years for repayment and, as a result, the SLF has interest rate subsidies of around 50–55 per cent. Adding the default
rate of 15 per cent\(^1\) and administrative costs of 3 per cent, the total implicit subsidies can be as high as 72 per cent (Ziderman, 2003; Chapman et al., 2010).

The design features of the SLF and default data provide the point of departure to a deeper analysis of issues surrounding the SLF interest rate subsidies and default rates. In order to understand what these arrangements mean conceptually, the next section develops formal analyses of the default decision and uses them to characterise the trade-off between the interest rate charged on the loans – hence, interest rate subsidies – and the expected aggregate loan recovery.

### 8.3 Establishing an indicator for excessive indebtedness of student loans

This section attempts to establish an indicator for excessive indebtedness of student loans. For the purpose of this exercise, excessive indebtedness is defined as the level of a repayment burden beyond which a borrower will default on a student loan. Ideally this indicator should be derived from a panel study of borrowers, but in Thailand such data are not available. The approach discussed below offers a way to circumvent this short-coming.

Student loans permit students to borrow their future incomes to finance current consumption and investment in higher education. Had they been unable to borrow, their incomes would have remained at the level of high school graduates. In the life-cycle framework, investment in higher education increases income and consumption; higher income and consumption enjoyed by university graduates can be thought of as ‘premiums’ (Hartman, 1971; Baum and Schwartz, 2006). Baum and Schwartz (2006) extend Hartman’s argument to a consumption premium defined as additional welfare enjoyed by university graduates.

Using monthly expenditure data taken from the Socio-Economic Survey 2009 (SES), Table 8.1 shows this consumption premium for a typical Thai university graduate. Income premiums are obtained by calculating rates of returns for university graduates age 25–40 and income data used in the calculation are taken from the OLS age-earning profiles reported in Lounkaew (2011); the income premium for male and female graduates are about 10 and 13 per cent. Since the proportion of males and females are 35 per cent and 65 per cent, the weighted average income premium is in the order of 12 per cent.

This exercise, using both part-time and full-time graduates, indicates that a range of repayment burdens used as an indicator for over-indebtedness in Thailand is in the order of 8–12 per cent. This range can be narrowed further with an aid of information related to income distribution and the actual default data. These issues are taken up in the next section.
Table 8.1 Indicators of excessive indebtedness of student loans (age 25–39)

<table>
<thead>
<tr>
<th>Data</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of all graduates</td>
<td>0.35</td>
<td>0.65</td>
</tr>
<tr>
<td>Income premium</td>
<td>9.79%</td>
<td>13.21%</td>
</tr>
<tr>
<td>Weighted average income premium</td>
<td>12.01%</td>
<td></td>
</tr>
<tr>
<td>Consumption premium</td>
<td>8.4%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Lounkaew (2011)

8.4 Illustrating the trade-off between interest subsidies and aggregate loan recovery

As discussed, repayment burdens of around 8 to 12 per cent will be used as indicators of over-indebtedness and default probabilities. This section provides further refinement of the indicators, achieved by calculating the proportions of graduates at a given age who are experiencing a repayment burden of at least 8 to 12 per cent, and comparing this to actual default rates. The calculation is facilitated by Singh-Maddala estimates of income distribution by age and gender (Singh and Maddala, 1976).

The calculation can be demonstrated by means of an example. For a debt level of 200,000 Baht, the repayment required in the first year is 3,000 Baht. If the repayment burden of 8 per cent is used, then annual income below which borrowers will default is 3,000/0.08=37,500 Baht. Similarly, annual income consistent with a 10 per cent repayment burden is 3,000/0.1=30,000 Baht.

The estimates show that when a repayment burden of 8 per cent is used as a cut-off, the default rate is predicted to be around 36 per cent, and with a repayment burden of 15 per cent default rates are estimated to fall to around 10 to 13 per cent. Given the fact that actual default rates are around 30 per cent, these results suggest that an appropriate range of repayment burden used to approximate existing default rates should be in the order of 8 to 10 per cent. The next sub-section utilises this knowledge to illustrate the trade-off between interest rate and expected aggregate loan recovery.

The remainder of this section establishes empirical evidence of the trade-off between the interest rate charged on the loan, $r$, and expected aggregate loan recovery, $R_e(r)$. Let $s(r)$ denote the implicit interest rate subsidy which is a function of the interest rate charged; the higher the interest rate, the lower the level of interest rate subsidy. $q(r)$ is the proportion of graduates who default on student loans. The expected aggregate loan recovery (expressed as a proportion of the total loan) can be formalized as shown in equation (1):
\[ R^c(r) = [1 - s(r)][1 - q(r)] \]  

The \( R^c(r) \) curve can be constructed by calculating the proportion of the loan recovered at a given level of real interest rate due to the interest rate subsidy multiplied by the proportion of graduates who will repay their student loans—these are graduates whose incomes are at or below the income threshold corresponding to a given level of repayment burden that is assumed to be associated with excessive indebtedness. Figure 8.2 reports results from these numerical exercises for female graduates.

![Figure 8.2 Expected loan recovery for female graduates](source)

The three main results from the exercises are as follows:

(i) The \( R^c(r) \) curves exhibit an inverted u-shape pattern as predicted by the formal model.

(ii) \( R^c(r) \) curves for male graduates are higher than \( R^c(r) \) curves of female graduates at the same level of repayment burdens. These can be traced to the fact that male graduates earn more than female graduates at any given age.
(iii) Under the current SLF arrangement, interest rate subsidies are around 50 per cent, and a default rate of 30 per cent means that about 70 per cent of loans are repaid. Therefore the expected aggregate recovery rate of the SLF is 0.5 x 0.7 = 0.35 or 35 per cent. The model that assumes repayment burdens of 8 to 10 per cent predicts that the expected aggregate loan recovery rate should be around 35 to 45 per cent, meaning that these results seem to be consistent with the actual operations of the SLF. The results should provide some comfort in using this technique to approximate potential default, especially in developing countries where panel data suitable for the analysis of this nature is lacking.

An inverted $u$-shape relationship between $r$ and $R^e(r)$ implies that there exists a level of interest rate, $r^*$, that will maximise $R^e(r)$. Table 8.2 reports these levels of interest rate and their corresponding levels of expected aggregate loan recovery. If we accept the repayment burden of 8 to 10 per cent as a benchmark, the results indicate that the real rate of interest charged on the loan should be around 1 to 2 per cent; at these levels of interest the expected aggregate loan recovery is in order of 40 to 50 per cent.

<table>
<thead>
<tr>
<th>Repayment burden</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Real rate of interest</td>
<td>Expected loan recovery</td>
</tr>
<tr>
<td>8</td>
<td>1.25</td>
<td>42.4</td>
</tr>
<tr>
<td>10</td>
<td>3.13</td>
<td>50.4</td>
</tr>
</tbody>
</table>

Source: Adapted from Lounkaew (2011)

It should be noted that the results obtained above are derived from a single cross-section of data and so can only provide a snapshot of what would happen if income levels and distributions remain as they are today. If productivity growth due to technological advancement is taken into account, graduates’ incomes may increase faster than the rate of inflation and tuition fees. As a result the expected aggregate loans recovery may increase over time, raising the possibility that current SLF arrangements will eventually be feasible and sustainable. However, this will take considerable time, even with rapid increases in labor productivity.
8.5 Policy implications

Three important policy implications can be drawn from the above exercise. First, the consumption premium exercise stipulates that obligation to repay the loan should not involve more than 8 to 10 per cent of a borrower’s income. It will be hard for a mortgage-type loan to ensure that these rules are applied universally to all borrowers due to post-university earning differentials. If a policy maker decides to move from a mortgage-type loan to an income contingent loan (ICL), the same principle must be adhered to – a legal maximum repayment requirement of the alternative ICL should not exceed 8 to 10 per cent of borrower’s income. It should be noted that this calculation is performed at the mean of the data and to develop a more comprehensive set of ICL repayment parameters the premium calculation must be carried out at different points of the income distribution.

Second, it has been found that an attempt to solve the high interest rate subsidies problem by setting a real rate of interest to 3 per cent per annum as suggested by Chapman et al. (2010) is not a viable option because it is very expensive for taxpayers. This is because with repayment burdens of around 8 to 10 per cent and at 3 per cent real interest rate, while the model predicts that interest subsidies would fall, default rates would increase, resulting in only a minor change in the expected loan recovery rate to between 37 and 48 per cent. The solution is even less feasible if potential legal costs and the utility losses of borrowers due to higher repayment burdens are taken into account.

Third, as is well known, the current design of the SLF and all mortgage-type student loans do not facilitate consumption smoothing. This is because the SLF does not adequately take into account the differences in labor market outcomes of Thai university graduates. For example, a considerable proportion of graduates have prolonged periods of non-employment, a reality that can be inferred from Figure 8.3 which reports the proportion of non-wage earners defined as the sum of unemployed graduates and graduates who do not participate in the labor market. About 25 per cent of new graduates do not find employment in the first four years.

The current SLF design does offer some protection from incidences of low income in that as long as monthly income does not exceed 4,700 Baht, graduates are required to pay only 300 Baht per month. However, the maximum cumulative protection period offered is two years, after which any non-payment will be considered as default. Figure 8.3 shows the proportion of graduates who do not have any income and shows that about 15 to 20 per cent have no income in the first three years following graduation. In the third year following graduation, they will have to begin repaying their student loans; without any income to do so, many of them will be forced to default on the loan.
The discussion thus far is strongly in favour of moving from a mortgage-type loan to an ICL, over a very short period of time. As shown in Chapman and Lounkaew (2010a), an appropriately designed ICL scheme can reduce interest rate subsidies to nil and it would seem to be relatively easy to design an ICL with lower interest rate subsidies than the current SLF.

The implementation of ICL is, however, not without problems. For the scheme to work successfully, the government must be ready to commit itself to providing proper administrative and collection infrastructure; the latter is usually carried out though a tax or social security agency. In addition to this, the issue of maximum loan size and collection parameter indexation must also be considered.

![Figure 8.3 Proportion of graduate non-wage earners (unemployed + not in labor force)](source)

*Source: Author’s calculations based on data from National Statistical Office (2009)*

### 8.6 Where do we go from here?

Illustrating the trade-off is only one side of the coin. It shows how much a loan agency can reasonably expect to recover, with the result of such an
exercise only providing a maximum boundary of the subsidy. The next step is to develop a benchmark to support why a particular level of subsidy is chosen and this is where the optimal income tax literature can be a great resource. Repaying a loan, be it a mortgage-type loan or an ICL, is essentially a deduction of one’s income in the same fashion as paying taxes.

There is an empirical challenge of using optimal income tax methods to reveal the appropriate data. Traditionally, the conceptual development of this strand of literature has been done with the use of calculus, but to do so accurately in the real world perhaps the most promising avenue involves optimal linear piecewise income tax development. The marriage between the two strands of research will help to improve the design of both mortgage-type loans and ICL considerably. To this end Chapter 4 of this volume by Long seems to be the right place to begin the journey.

Notes
The empirical results of this paper are based on Lounkaew (2011).

1. See Merton (1974) and Eaton and Gersovitz (1981) for early discussions about potential trade-off between interest rates and defaults in the context of commercial loans.
2. See Ziderman (2003) on institutional arrangements and administration of the SLF. Chapman et al. (2010) provides detailed discussions on the history and coverage of the SLF.
4. This is the average default rate of the 2001 and 2002 cohorts.
5. Full results are available in Lounkaew (2011).
6. This is in fact the situation in countries with ICLs currently in place such as Australia, New Zealand and the UK.

References
9

Why Don't We Just Give Them the Money? Financing Living Expenses of Students in Germany

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Mathias Sinning  
University of Queensland, Australia  
RWI, IZA, Germany

This chapter assesses the subsidies of the German student loan scheme for financing living expenses, establishes hypothetical repayment burdens in the absence of subsidies, and discusses the costs and benefits of conventional and alternative income contingent loans (ICLs). We find that the underlying subsidies of the German student loan scheme range from 57 to 80 per cent, indicating that the current scheme could be replaced by student grants if the administrative costs of collecting the debt are sufficiently high. We further demonstrate that the current scheme would either entail very high repayment burdens or very long repayment durations in the absence of loan subsidies and explain why an ICL may be viewed as a reasonable alternative to the current student loan scheme.

9.1 Introduction

The German student loan scheme for financing living expenses of students from low-income families was introduced in 1971 to create equal opportunities in the education system. The student loans are regulated by the Bundesausbildungsförderungsgesetz (Federal Training Assistance Act) and are typically referred to as ‘BAföG’ loans. BAföG loans are means-tested and eligibility depends on the income of the parents. In 2011, the German government provided about €2.27 billion in the form of BAföG loans to finance living expenses of about 644,000 students, about one-third of the student population at German universities (Federal Statistical Office, 2012a,b).
In this chapter, we study the implicit subsidies of the German BAföG scheme and describe the effects of removing these subsidies on repayment duration and repayment burden (that is, the proportion of an individual's income needed to service the debt). We further discuss the costs and benefits of conventional (mortgage-type) and income contingent loans (ICLs) and outline a simple ICL without subsidy and low repayment burden that could be made available to all students without means-testing.

Our findings reveal that the implicit subsidies of the BAföG scheme range from 57 to 80 per cent, indicating that the government could contemplate replacing the current scheme by student grants (with an implicit subsidy of 100 per cent) if the administrative costs of collecting the debt are sufficiently high. We further demonstrate that the BAföG scheme could not exist without loan subsidies because their absence would either entail very high repayment burdens (up to about 28 per cent of an individual's income for a repayment period of 15 years) or increase the hypothetical repayment duration under the current minimum repayment rate well beyond the maximum retirement age.

The chapter is organized as follows. Section 9.2 provides a brief description of the BAföG scheme, focusing on loan disbursement and repayment. Our loan subsidy calculations are presented in Section 9.3. Section 9.4 illustrates the design problems of the BAföG by comparing mortgage-type loans to an ICL. Section 9.5 concludes.

9.2 BAföG loans

The current maximum disbursement of the BAföG is €670 per month, that is, students may receive up to €8,040 per year to finance their living expenses. Since university education in Germany often takes up to five years, the total disbursement may easily reach €40,200 or even more. However, not all students who are eligible for BAföG also receive the maximum amount because the loans are means-tested and their disbursement depends on student and parent income as well as student assets. BAföG loans may be as low as €1 because students who are eligible for BAföG also have other benefits, such as reduced phone services and exemption from general fees for public television. Students have to achieve certain educational objectives and only receive BAföG beyond the fourth semester (second year) if they have reached the proficiency level that is typically expected in their field of study.

Instead of being repaid by former students, BAföG loans are mainly financed by German taxpayers. BAföG loans have a grant component of 50 per cent, while the remaining 50 per cent are disbursed as zero interest loans. Repayment of the loan component starts at the end of a five year grace period. BAföG loans also possess an income contingent element because former students only have to repay a minimum repayment rate of €105 per month if their monthly income is above €1,070. Debtors are exempted temporarily and
their repayment is deferred if their income is not high enough. Moreover, a repayment cap is in place to limit the total debt to €10,000. Finally, debtors receive a 50 per cent discount on the loan component if they repay the loan upfront at the end of the five year grace period.  

In the following, we will study the implicit subsidies of the BAföG scheme, paying particular attention to differences between deferred and upfront repayment. We begin by comparing the present value of disbursement to the present value of actual repayment to calculate the total subsidy for different disbursement levels. We focus on monthly disbursements of €333 and €670, which constitute the disbursement level at which the €10,000 repayment cap starts to matter (€333 × 12 × 5/2 = €9,990) and the maximum disbursement level, respectively. We assume a disbursement period of five years, a grace period of five years, and a repayment rate of €105 per month in the case of deferred repayment. We further take into account that BAföG loans are interest free and assume a discount rate of two per cent. 

It is important to note that the BAföG scheme contains an implicit loan subsidy, which we cannot make explicit in our analysis. Since debtors with a persistent low income cannot fully repay their debt, the scheme requires a subsidy, which depends on the proportion of debtors who are unable to repay. Loan defaults resulting from persistent low incomes are the main reason why student loans require a subsidy. Subsidies may also be justified if they encourage participation in higher education from risk averse students who might fear defaulting on their loans. The following section analyzes the redundant subsidies of the BAföG.

9.3 Loan subsidies

9.3.1 Subsidy calculation

Table 9.1 includes the subsidy calculations for monthly disbursements of €333 and €670 respectively. The numbers in Column (1a) reveal that the present value of total disbursement \( (PV_D) \) is €18,835 if students receive €333 per month over a period of five years. The total amount to be repaid \( (R) \) equals the total disbursement \( (D) \) but differs from the actual repayment \( (A) \) because half of the loan is disbursed as a grant. As a result, the present value of actual repayment \( (PV_A) \) is only €7,509. The total subsidy of the loan – the difference in the present values between total disbursement and actual repayment – is €11,326, which accounts for 60.1 per cent of the present value of total disbursement.

The numbers in Column (1b) reveal that the subsidy is even higher if the monthly disbursement increases to €670 because the repayment cap reduces the actual repayment to €10,000. The present value of this amount is €7,515,
which makes up only 19.8 per cent of the present value of disbursement. The remaining 80.2 per cent are subsidized by German taxpayers.

Columns (2a) and (2b) include the subsidy calculations for the case in which the loan is repaid upfront at the end of the 5-year grace period. In addition to the 50 per cent grant of the loan, the 50 per cent discount for upfront repayment reduces the actual repayment to 25 per cent of the amount initially disbursed. The present value of the actual repayment in Column (2a) is only €4,017, which implies a total subsidy of 78.7 per cent. Although the present value of actual repayment in Column (2b) is about twice as high as the corresponding value in Column (2a), the loan subsidy is about the same (78.8 per cent). The subsidies in Columns (2a) and (2b) only differ because the repayment cap reduces the actual repayment in Column (2b) by €50.

**Table 9.1** Examples of subsidy calculations by monthly disbursement and repayment mode (in €)

<table>
<thead>
<tr>
<th></th>
<th>Deferred repayment</th>
<th>Upfront repayment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1a)</td>
<td>(1b)</td>
</tr>
<tr>
<td><strong>Disbursement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly disbursement ($D_M$)</td>
<td>333</td>
<td>670</td>
</tr>
<tr>
<td>Total disbursement ($D$)</td>
<td>19,980</td>
<td>40,200</td>
</tr>
<tr>
<td>PV of total disbursement ($PV_D$)</td>
<td>18,835</td>
<td>37,896</td>
</tr>
<tr>
<td><strong>Repayment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total amount to be repaid ($R$)</td>
<td>19,980</td>
<td>40,200</td>
</tr>
<tr>
<td>- 50 per cent grant ($G$)</td>
<td>9,990</td>
<td>20,100</td>
</tr>
<tr>
<td>- 50 per cent discount for upfront repayment ($U$)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>- Discount resulting from €10,000 repayment cap ($C$)</td>
<td>10,100</td>
<td>50</td>
</tr>
<tr>
<td>Actual repayment ($A$)</td>
<td>9,990</td>
<td>10,000</td>
</tr>
<tr>
<td>PV of actual repayment $PV_A$</td>
<td>7,509</td>
<td>7,515</td>
</tr>
<tr>
<td>Total subsidy ($S = PV_D - PV_A$)</td>
<td>11,326</td>
<td>30,381</td>
</tr>
<tr>
<td>Percentage of PV of total disbursement ($S/PV_D$)</td>
<td>60.1%</td>
<td>80.2%</td>
</tr>
</tbody>
</table>

**Notes:** We assume a disbursement period of five years, a grace period of five years, and a discount rate of two per cent. Deferred repayment denotes that the debt is repaid over time with a repayment rate of €105 per month, starting at the end of the grace period. Upfront repayment refers to a repayment of the debt at the end of the grace period.
9.3.2 Decomposition analysis

To gain a better understanding of the relevance of the factors that contribute to the total loan subsidy, we perform a decomposition analysis similar to Ziderman and Albrecht (1995). The decomposition results are summarized in Table 9.2. A detailed description of the approach is provided in the Appendix.

The total loan subsidy based on a monthly disbursement of €333 presented in Column (1a) of Table 9.2 can be decomposed into a grant subsidy, which accounts for 52 per cent of the total subsidy, and an interest rate subsidy, which accounts for 48 per cent. The relatively high interest rate subsidy may be attributed to three factors. First, the implicit interest rate subsidy of the five year grace period makes up 24.4 per cent of the total subsidy. Second, the deferred repayment of the zero interest loan implies a subsidy of 18.9 per cent. Third, the implicit interest rate subsidy of the 50 per cent grant accounts for 4.6 per cent of the total subsidy.

The decomposition of the subsidy based on a monthly disbursement of €670 presented in Column (1b) also includes a repayment cap subsidy and an interest rate subsidy associated with the repayment cap. Since the total disbursement in Column (1b) is higher than in Column (1a), the interest rate subsidy attributable to deferred repayment is relatively high (26.7 per cent). Interestingly, the contribution of the 50 per cent grant to the total subsidy is only 26.5 per cent. At the same time, more than half of the total subsidy may be attributed to interest rate subsidies.

This picture changes notably when we consider the components of the total subsidy in the case of upfront repayment (Columns (2a) and (2b)). Now the subsidy resulting from the discount on upfront repayment makes up 27.1–28.0 per cent of the total subsidy and the contribution of the interest rate subsidy is reduced to a subsidy of less than 20 per cent attributable to the grace period. As a result, the grant subsidy accounts for more than half of the total subsidy. Taken together, these numbers reveal that the underlying subsidies of deferred and upfront repayment are very different.

Figure 9.1 depicts the total loan subsidies for deferred and upfront repayment as a function of monthly disbursement. The two lines in Figure 9.1 reveal that the total subsidy in the case of upfront repayment is constant at about 79 per cent, while an increase in monthly disbursement increases the total subsidy in the case of deferred repayment. The total subsidy increases linearly if repayment is deferred up to a monthly disbursement of €333. Beyond that point, the subsidy increases even faster but at a declining rate. The subsidies of the two repayment modes are equal at a monthly disbursement of €623. Deferred repayment turns out to be more beneficial than upfront repayment if a debtor receives a monthly disbursement above €623.

The decomposition results of the total subsidy in the case of deferred repayment are presented in Figure 9.2. The implicit interest rate subsidy of the
Table 9.2 Decomposition of total subsidy by monthly disbursement and repayment mode

<table>
<thead>
<tr>
<th></th>
<th>Deferred repayment</th>
<th>Upfront repayment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1a)</td>
<td>(1b)</td>
</tr>
<tr>
<td>Interest rate subsidy due to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grace period ($S_{GR}$)</td>
<td>2,766</td>
<td>2,765</td>
</tr>
<tr>
<td>Deferred repayment ($S_{DR}$)</td>
<td>2,142</td>
<td>8,126</td>
</tr>
<tr>
<td>50% grant ($S_{50}$)</td>
<td>526</td>
<td>2,167</td>
</tr>
<tr>
<td>Repayment cap ($S_{RC}$)</td>
<td>527</td>
<td>527</td>
</tr>
<tr>
<td>Total interest rate subsidy ($S_{I}$)</td>
<td>5,434</td>
<td>16,385</td>
</tr>
<tr>
<td>Grant subsidy ($S_{G}$)</td>
<td>5,892</td>
<td>8,035</td>
</tr>
<tr>
<td>Upfront repayment subsidy ($S_{U}$)</td>
<td>4,017</td>
<td>8,083</td>
</tr>
<tr>
<td>Repayment cap subsidy ($S_{RC}$)</td>
<td>5,956</td>
<td>40</td>
</tr>
<tr>
<td>Total subsidy ($S$)</td>
<td>11,326</td>
<td>30,381</td>
</tr>
</tbody>
</table>

Notes: See Notes to Table 9.1.

loan is around 25 per cent at the lowest disbursement level and increases (although not linearly) to about 55 per cent at the highest disbursement level. The grant subsidy is responsible for about 75 per cent of the total subsidy at the bottom of the disbursement distribution and declines (almost linearly) to about 25 per cent at the top of that distribution. Figure 9.2 further reflects that the repayment cap subsidy only matters for monthly disbursement levels above €333, which explains the strong increase in the deferred repayment subsidy presented in Figure 9.1.

To investigate the relationship between interest rate subsidy and monthly disbursement, we further decompose the interest rate subsidy into its underlying components. The decomposition results presented in Figure 9.3 indicate that the grace period explains the entire interest rate subsidy at the lowest disbursement level but contributes less than 35 per cent at the highest disbursement level. The decline in the contribution of the grace period is mainly attributable to the increasing contribution of deferred repayment to the interest rate subsidy. The implicit interest rate subsidy of the 50 per cent grant is an increasing function of monthly disbursement but explains less than 15 per cent of the total interest rate subsidy. The interest rate subsidy attributable to the repayment cap is only relevant for monthly disbursement levels above
**Figure 9.1** Loan subsidies by repayment mode

*Notes:* We assume a disbursement period of five years, a grace period of five years, a discount rate of two per cent, and a redemption rate of €105 per month.

**Figure 9.2** Decomposition of loan subsidies (deferred repayment)

*Notes:* See Notes to Figure 9.1.
€333 and its contribution is a declining function of monthly disbursement. We observe the largest contribution of the repayment cap (about 10 per cent of the total interest rate subsidy) immediately after a monthly disbursement of €333, which causes a jump in the overall interest rate subsidy (Figure 9.2) and a slight drop in the relative contribution of the remaining components of the interest rate subsidy.

**Figure 9.3** Decomposition of interest rate subsidies (deferred repayment)

*Notes:* See Notes to Figure 9.1.

### 9.4 Comparing alternative student loan schemes

To illustrate the design problems of the BAföG, we study the properties of modified BAföG-type loans in the absence of subsidies. The results presented in this section reveal that BAföG loans could not exist without subsidies because they would either entail very high repayment burdens or very long repayment durations. We further explain why an ICL can be designed to avoid the problems associated with mortgage-type loans, which either focus on loan repayments on the basis of time or on fixed repayment rates.

#### 9.4.1 Mortgage-type and income contingent loans

Mortgage-type loans are characterized by fixed repayment rates with a set time period and are typically associated with two fundamental problems in the context of higher education financing. First, students face default risks, which
cause ex-ante and ex-post default problems. The ex-ante default problem is attributable to a reluctance of prospective students to borrow for fear of not being able to meet future repayment obligations. It appears likely that default concerns reduce borrowing and consequently lead to an underinvestment in human capital (Friedman, 1962). The ex-post problem is created by students who took the credit risk and end up not being able to repay because of low incomes. Empirical evidence suggests that borrowers from low-income households, minorities, and those who did not complete their studies exhibit particularly high default probabilities (Dynarski, 1994).

Second, mortgage-type loans are insensitive to the financial circumstances of borrowers because fixed repayment rates may cause consumption difficulties if future incomes vary over time. In particular, repayment obligations reduce disposable incomes in a situation in which borrowers experience unexpectedly low incomes. Recent evidence shows that graduates with very low incomes may face repayment burdens arising from mortgage-type loans of up to 75 per cent in Thailand (Chapman et al., 2010) and 60 per cent in the US (Chapman and Lounkaew, 2010). It seems likely that the requirement of a large proportion of a debtor's income to service the debt is associated with considerable consumption hardships and very high default risks.

ICLs address the problems associated with mortgage-type loans by considering the borrower's future capacity to repay. There is no default issue if a borrower experiences a low income because repayment burdens of an ICL take this into account. At the same time, there is no concern with repayment hardships if the collection parameters are sensibly designed because repayments are contingent on income. Therefore, in contrast to mortgage-type loans, ICLs are able to provide both default insurance and consumption smoothing.

The BAföG scheme addresses problems related to default risk and consumption hardship by the use of subsidies. Similar to an ICL, the BAföG ensures that former students only have to repay the loan if their income is sufficiently high. At the same time, the BAföG is characterized by fixed repayment rates, similar to a mortgage-type loan. For that reason, the scheme has to rely on subsidies to ensure low repayment burdens. While the implicit subsidies of the BAföG are able to address the problems related to default risk and consumption hardship, they put a considerable burden on German taxpayers. In the following, we illustrate the design problems of the BAföG by comparing the properties of a BAföG-type loan in the absence of the subsidies discussed in Section 9.3 to those of an ICL.

9.4.2 Comparison of alternative loan schemes

This section studies how removing subsidies from the BAföG affects repayment burdens and repayment durations. Specifically, we consider a
BAföG-type loan without an interest rate subsidy and repayment cap. We further distinguish between a loan with a grant component of 50 per cent and a loan without a grant component. This setup allows us to compare mortgage-type loans with a minimum income threshold to an ICL. For illustration purposes, we assume the following parameters:

(i) A minimum repayment rate of €1,260 per annum (consistent with BAföG).
(ii) A minimum income threshold of €12,840 per annum (consistent with BAföG).
(iii) A total debt of €20,100 for a loan with a grant component of 50 per cent; a total debt of €40,200 for a loan without a grant component (see Table 9.1).
(iv) An average income of €25,000 at the beginning of the repayment period and a real income growth of two per cent per annum.\(^3\)
(v) A real rate of interest of two per cent (consistent with a real discount rate of two per cent assumed in Section 9.3).

We further consider an ICL with a collection rate of eight per cent. Since the ideal proportion of a debtor's income repayment burden is unknown, we follow Baum and Schwartz (2006) who recognize considerable variation in suggested boundaries in the literature but refer to an 'eight per cent rule', which is viewed as a reasonable collection rate.

Table 9.3 includes repayment burden and repayment duration calculations for alternative student loan schemes. When we consider a mortgage-type student loan with a minimum income threshold and a fixed repayment rate consistent with the BAföG scheme, we find that the repayment burden is limited to 9.8 per cent, reflecting that debtors have to repay at least €105 per month if their monthly income is €1,070 or above (105/1,070 \(\approx\) 0.098 = 9.8 per cent). According to this scheme, a hypothetical debtor who earns the minimum income of €1,070 requires 23 years to repay a total debt of €20,100 in the absence of subsidies discussed in Section 9.3. Since the scheme is insensitive to income levels beyond the minimum income threshold, a hypothetical debtor with an average income also requires 23 years to repay the debt and faces a repayment burden of less than five per cent, indicating that the scheme does not make full use of an individual's capacity to repay. Due to the low fixed repayment rate of the hypothetical scheme, a total debt of €40,200 can never fully be repaid.

To avoid indefinite repayment periods, we consider an alternative mortgage-type loan, which involves the specification of a fixed repayment duration. To illustrate the implications of such an arrangement, Panel B of Table 9.3 presents the repayment burdens of a scheme with a fixed repayment duration of 15 years. In this case, minimum income earners face a repayment...
Financing Student Living Expenses in Germany

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Table 9.3 Alternative loan schemes

<table>
<thead>
<tr>
<th></th>
<th>Total debt: €20,100</th>
<th>Total debt: €40,200</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum income (BAföG)</td>
<td>Average income</td>
</tr>
<tr>
<td>Mortgage-type loan with minimum income threshold</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A) Fixed repayment rate (BAföG)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repayment burden (per cent)</td>
<td>9.8</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Repayment duration (years)</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>B) Fixed repayment duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repayment burden (per cent)</td>
<td>14</td>
<td>&lt;7</td>
</tr>
<tr>
<td>Repayment duration (years)</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>ICL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repayment burden (per cent)</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Repayment duration (years)</td>
<td>30</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 9.3 further illustrates the properties of an ICL based on a fixed collection rate of eight per cent. A critical advantage of this scheme is that higher incomes are associated with lower repayment durations. While a debtor with a minimum income requires 30 years to repay a total debt of €20,100, a debtor with average income requires only 11 years. Although a total debt of €40,200 cannot be fully repaid by a debtor with a minimum income, an average income earner can repay the full amount within 21 years. Since the maximum repayment burden of an ICL is set by legislation, repayments of an ICL are defined by capacity to repay and therefore offer insurance against

burden of 14 per cent for a given total debt of €20,100, clearly exceeding the repayment burden of eight per cent advocated by Baum and Schwartz (2006). At the same time, the repayment burden of average income earners is below seven per cent, indicating that debtors with an average income (or above) have the financial capacity to repay their debt in less than 15 years. A total debt of €40,200 requires repayment burdens of up to 28 per cent, which is likely to be associated with substantial consumption hardships and very high default probabilities. Overall, these numbers demonstrate that BAföG loans could not exist without extensive loan subsidies because their absence would either imply very high repayment burdens or increase the repayment duration well beyond the maximum retirement age.
repayment hardships and loan default. As noted earlier, student loan schemes require a subsidy to stand in for debtors with a persistent low income who cannot fully repay their debt, and ICLs are no exception. However, the underlying subsidy of an ICL can be relatively low if the parameters are sensibly designed. \footnote{9}

\section*{9.5 Conclusions}

The German government provides more than €2 billion per year in the form of BAföG loans to finance living expenses of about one-third of the student population at German universities. The costs of the BAföG scheme are mainly financed by German taxpayers. This chapter studies the implicit subsidies of the scheme and illustrates the consequences of removing these subsidies for repayment burden and repayment duration.

Our findings reveal that the implicit subsidies of the BAföG scheme range from 57 to 80 per cent, indicating that the current scheme could be replaced by student grants if the administrative costs of collecting the debt are sufficiently high. We further demonstrate that the BAföG scheme could not exist without loan subsidies because their absence would either entail very high repayment burdens or increase the hypothetical repayment duration under the current minimum repayment rate well beyond the maximum retirement age.

We further discuss the costs and benefits of conventional (mortgage-type) and income contingent loans (ICLs) and outline the properties of an ICL that could be made available to all students without means-testing. In contrast to conventional student loan schemes, ICLs provide default insurance and consumption smoothing because loan repayments are contingent on income. It appears likely that a sensible choice of the underlying parameters of such a scheme could reduce student loan subsidies considerably.

\section*{Notes}

We thank the participants of the IEA Roundtable for valuable comments and suggestions and gratefully acknowledge the support of the Australian Research Council (ARC, LP1102200496), the Australian Group of Eight (Go8), and the German Academic Exchange Service (DAAD).

1. Since parents have a legal obligation to fund their children's education, children can sue their parents to obtain funding, which rarely happens for obvious reasons. BAföG loans are provided if the parents are unable to meet their obligations.

2. The German student loans system subsidies are startling when considered in an internationally comparative context. Specifically, Shen and Ziderman (2009) describe and analyse 44 different student loans schemes in 39 countries and find that loan subsidies (in present value terms) are less than 60 per cent for 60 per cent of the schemes, with the median value of subsidies being around 35 per cent. Not taking
account the costs to governments of defaults it seems to be the case that in only one
country, Russia, are the subsidies significantly higher than what we have found for
Germany. Shen and Ziderman’s (2009) overall estimate of the implicit subsidy of the
German scheme is about 62 per cent, which may be attributed to the relatively short
period that most borrowers require to repay the debt.
3. BAföG loans are linked to the typical duration that is required to complete a certain
field of study and may exceed 5 years.
4. Repayment rates of more than €105 per month are voluntary.
5. Students also used to receive a discount if they belonged to the best 30 per cent of the
students in their cohort and/or if they finished their studies earlier than prescribed.
This discount, which disburdened university graduates who were most likely to have a
relatively high income upon graduation, was abolished at the end of 2012.
6. We divide the total amount by two because we only focus on the repayable loan and not
the grant component.
7. Given an inflation rate of about two per cent (Federal Statistical Office, 2013) and a
nominal long-term interest rate between one to four per cent during the period after the
Global Financial Crisis, our discount rate may be viewed as an upper bound (see
8. An income of €25,000 is broadly consistent with an average income of 30 year old
individuals with tertiary education observed in the 2009 wave of the German Socio-
Economic Panel (SOEP).
9. For example, the total subsidy of the Australian Higher Education Contribution Scheme
(HECS) is about 20 per cent (Norton, 2013).

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Appendix

Subsidy calculation

To formalize the measurement of the fiscal burden of the BAföG scheme, we consider the amount of monthly disbursement, \( D_M \), over a period of \( T = 5 \) years. We define the present value of total disbursement as

\[
PV_D = \sum_{t=1}^{T} \frac{12D_M}{(1 + \delta)^t}
\] (1)

where the discount rate \( \delta \) is assumed to be two per cent. We further define actual repayment, \( A \), as the total amount to be repaid, \( R \), minus the debt relief resulting from a 50 per cent grant, \( G \), a 50 per cent discount in the case of upfront payment, \( U \), and a €10,000 repayment cap, \( C \):

\[
A = R - G - U - C.
\] (2)

In the case of deferred repayment, we consider a monthly repayment rate, \( A_M \), of €105. Since repayment starts after the end of a grace period of \( P = 5 \) years, the present value of actual repayment in the case of deferred repayment is given by

\[
PV^d_A = \sum_{t=T+P+1}^{T+P+\tau} \frac{12A_M}{(1 + \delta)^t} + \frac{r_A}{(1 + \delta)^{T+P+\tau+1}}
\] (3)

where \( \tau \) denotes the total number of years required to repay the loan and \( r_A \) is the residual repayment rate in year \( T + P + \tau + 1 \). The present value of actual repayment in the case of upfront repayment is

\[
PV^u_A = \frac{A}{(1 + \delta)^{T+P+1}}.
\] (4)

The resulting subsidies in the case of deferred and upfront repayment are given, respectively, by

\[
S^d = PV_D - PV^d_A
\] (5)

and
Decomposition of subsidies

Our decomposition of loan subsidies requires the consideration of a set of present values based on the amounts specified in equation (2). We further distinguish between present values in the case of deferred ($d$) and upfront ($u$) repayment. Given the present values of the components of equation (2), we may perform the following subsidy decomposition in the case of deferred repayment:

$$S^d = PV_D - PV_A$$

(6)

with

$$PV_D = PV_{R} + PV_{G}$$

$$PV_A = PV_{D} + PV_{G}$$

(7)

with $PV_D = PV_{D} + PV_{G}$. The differences between present values on the right-hand side of equation (7) may be attributed to a number of subsidies. The first term is the difference between the present value of total disbursement ($PV_D$) and the present value of the total amount to be repaid if the loan is repaid upfront ($PV_A$). This difference may be ascribed to the interest rate subsidy of the grace period ($S^G_D$). The second term is the difference in present values of the total amount to be repaid between upfront ($PV_A$) and deferred ($PV_D$) repayment, which constitutes the interest rate subsidy due to deferred repayment ($S^D_R$). The third term is the difference between the present value of the total amount to be repaid in the case of deferred repayment ($PV_D$) and the present value of upfront repayment excluding the 50 per cent grant ($PV_{R-G}$), which captures the grant subsidy ($S_G$) but does not include its implicit interest rate subsidy. The implicit interest rate subsidy of the 50 per cent grant ($S^G_G$) is given by the fourth term. The remaining terms ($S_C, S^G_C$) are the corresponding subsidies resulting from the repayment cap.

The total subsidy in the case of upfront repayment may be decomposed as follows:

$$S^u = PV_D - PV_A$$

(6)
where the first term on the right-hand side of equation (8) is the interest rate subsidy attributable to the grace period. Since the debt is repaid upfront at the end of the grace period, equation (8) includes no further interest rate subsidies. However, in addition to the subsidies emanating from the 50 per cent grant ($S_G$) and the repayment cap ($S_C$), equation (8) includes a subsidy arising from a discount for upfront repayment ($S_U$).

\[
\begin{align*}
&= (PV_D - PV_R^u) + (PV_R^u - PV_{R-G}^u) \\
&+ (PV_{R-G}^d - PV_{R-G-C}^d) + (PV_{R-G-C}^d - PV_{R-G-C}^d),
\end{align*}
\]

\( (8) \)
Part III
Prospects Beyond Higher Education
It is argued in this chapter that income contingent loans (ICL) may provide an efficient and equitable option for extending taxpayer funded paid parental leave (PPL) schemes, which may be otherwise limited in duration and payment amounts due to fiscal pressures. As is the case for higher education, a lack of liquidity and market failure can prevent families from financing an extension of leave beyond that typically offered in most OECD countries through taxpayer funded PPL. It is argued that an ICL could provide consumption smoothing and encourage participation, yet taxpayer costs could be kept low (if not zero) provided scheme design mitigates against adverse selection and moral hazard. It is further argued that an appropriately designed scheme could be welfare enhancing to parents even in the absence of taxpayer subsidies.

10.1 Background and motivation

10.1.1 The benefits of paid parental leave

Paid parental leave (PPL), like higher education, is an investment in human capital. It can improve maternal health and parental workforce attachment, as well as child health and development.

New parents without paid parental leave, or with insufficient leave, have to make a choice between resigning from work (which many cannot afford to do), or returning to work sooner than they would otherwise desire. For some parents both are poor options. The former clearly impacts negatively on personal lifetime income and retirement savings, and leads to higher welfare
benefit outlays and loss of taxation revenue. The latter can result in poorer parental and child health and developmental outcomes.

A strong argument for paid parental leave derives from observed labor force disparities between genders, which lead to lower skill development and lower financial independence of women. A barrier to greater participation is that women, due to the generally more flexible and casual nature of their employment, are likely to be particularly responsive to work disincentives that can arise from generous welfare systems. In the absence of welfare reform, policy such as PPL may help counter these distortions by encouraging workforce attachment. Further, a well-designed PPL scheme can promote employment prior to childbirth (if prior employment is a condition of scheme eligibility), intentionally decrease employment following childbirth (thus improving health and developmental outcomes), and improve attachment to the workforce and workplace. A further benefit can come from greater family equality and role sharing if PPL leads to a more equitable distribution of formal and informal labor between parents.

In addition, there are important physical and mental benefits to the mother for not resuming paid employment too soon after the birth of their child (see, for example, HREOC, 2002; O’Neill, 2004). There is also a wealth of research that clearly shows the benefits to a child’s physical and cognitive development from breastfeeding and parental care in early life, with longer periods of PPL associated with increased rates of breastfeeding (Productivity Commission, 2009).

10.1.2 Who should pay?
In terms of efficiency, whether the government should commit funds to support PPL depends on whether the public benefits outweigh the costs. The identification of positive externalities would suggest a case for government intervention; if the benefits of PPL are returned to society then the costs should be borne by society. Equally, if a proportion of the benefits are returned to the individual, then the individual should finance a proportion of the leave. The combination of both public and private benefits of PPL is an argument for the sharing of costs between all taxpayers and recipients rather than broad taxes.

Identifying the extent of the externalities in social policy such as PPL, however, is not trivial, particularly when these can manifest through increased productivity, taxation revenue, or lower health costs over the lifetime of both parent and child. A paucity of empirical studies, and inconclusive theory on the relationship between PPL and earnings or health care costs, makes determination of the relative magnitude of community versus private benefits impractical.
The question of whether paid parental leave should be funded partially or exclusively by government is also a question of equity. Subsidisation may result in income redistribution, as well as improved scheme participation.

Given uncertainty in the size of public benefits from PPL, and in the present climate of fiscal pressures on the back of the GFC and the ageing population, it would seem that a cautious approach to funding would be well considered by government. A base level of PPL provision provided by the taxpayer can be argued for given there are some clear externalities, however, if a parent desires more leave beyond the base, then it is not unreasonable that they fund the extra leave themselves.¹

There are, however, problems with asking parents to pay that are not dissimilar to those facing a student in higher education:

(i) New parents and students both have financial obligations. Students face fees for higher education and living expenses, while new parents face household costs, often including mortgage payments, when taking time away from work to care for their child.
(ii) They both face liquidity constraints due to lack of income from employment while studying or child-rearing.
(iii) They both face a market failure in that commercial banks will not provide funds in the absence of collateral due to repayment uncertainty. As with students, new parents generally haven’t accumulated sufficient home equity or savings as collateral. That is, many parents and students can’t access the necessary funds for their leave or education.

But, does this matter? If a parent can’t afford additional leave, and if the private sector won’t help, then why should government facilitate the additional leave?

There are two reasons.
First, while there is uncertainty in the magnitude of public benefits from PPL, there is evidence that periods of leave for up to nine to 12 months (or even longer), have greater potential for positive effects on a child’s development (Productivity Commission, 2009). That is, public benefits may still be generated for very long periods of leave, but such long periods are generally not financially feasible through tax-payer funding as argued above. Without government intervention, liquidity constrained parents wishing to take leave beyond that offered through a taxpayer-funded PPL face returning to work at a time that may be sooner than optimal from the perspective of parental and child health and developmental benefits.

Second, and importantly, even if no further public benefits are derived from additional leave beyond the base amount of taxpayer-funded PPL, it is argued
below that an appropriately designed ICL could increase welfare while remaining cost-neutral.

10.2 An income contingent loan as solution

An ICL provides an efficient and equitable alternative to funding additional leave through general tax revenue. It provides a source of funds to parents thus addressing liquidity constraints; it can be flexibly designed to allow sharing of costs between the recipients of the leave and taxpayers if further public benefits are identified, or between the cohort of borrowers themselves (via a risk-pooling rather than risk-sharing arrangement); and unlike a conventional loan, where a parent may be discouraged from participating because of a requirement to make fixed repayments, contingent repayments provide assurance that the loan won’t result in financial hardship by offering both interstate and intertemporal consumption smoothing.

10.2.1 The risks of a voluntary ICL

As discussed throughout this volume, adverse selection and moral hazard are two risks that can jeopardise the intentions and cost efficiency of ICL policy.

Adverse selection refers to the situation when individuals who participate in the scheme are those who are most likely to not repay, and is a risk in voluntary schemes such as that described in this chapter. In the current context, adverse selection could most clearly manifest if repayment obligations were the responsibility only of the person taking out the loan and undertaking the leave. For example, a parent who was able to maintain a comfortable life via dependency on their employed partner, could take out an ICL with the intention of not achieving sufficient lifetime income to repay the loan.

Moral hazard refers to the situation when a debtor intentionally changes their behavior in order to either avoid repayment, or prolong repayment in the event that the loan is subject to concessional indexation. As with adverse selection, this could occur if a parent intentionally did not re-enter the workforce following leave, who worked at low incomes part-time or casually in the future so as to avoid repayment, or who intended to emigrate overseas.

Further risks can arise from poor scheme design. For example, if the duration of the extra leave provided through the ICL scheme was overly long, it could hinder rather than improve workforce attachment by leading to erosion of skills and confidence.

10.2.2 Addressing the risks through design

Scheme design should, as far as possible, mitigate the risks of non-recovery of debt and should focus on targeting the population in need.
Parental leave is leave from employment, so eligibility to participate should be restricted to parents with employment prior to PPL. A benefit of restricting eligibility to this group is that previous employment indicates labor force attachment and increased chance of repayment. In addition to reducing adverse selection, placing a prior employment condition on scheme eligibility may incentivise women intending to have children to engage in the labor force.

To counter the scenario of adverse selection outlined in Section 10.2.1, the repayments of the loan should be made the obligation of both parents, provided they are partners at the time of issue of the loan contract. Repayments would then be the sum of the parents’ individual repayments, which would be assessed based on their separate incomes. In the event of separation, liability would be retained by both. To discourage moral hazard in the form of fraudulent non-declaration of partnership when the loan contract is signed, incentives could be offered such as loan discounts or concessional indexation. The incentives could be extended to single parents by expanding the loan rules to allow other individuals (for example, a family member) to share liability by acting as a cosignatory on the contract (see Stiglitz and Yun, Chapter 16, and Yun, Chapter 18, this volume, for discussion more generally of the benefits of cosigning under ICL contracts).

The loan amount and duration of payments made under an ICL would clearly need to depend on the amount and duration already provided through a taxpayer-funded scheme. Providing tax-payer funded amounts for PPL that are equivalent to the parent’s income prior to taking leave could be criticised on the ground of inequity, however, offering this type of variability in loan amount is more palatable through an ICL where the borrower is expected to repay. A trade-off would need to be struck between providing sufficient duration of leave so as to provide for the needs of parents, while avoiding overly generous leave provisions that could dampen re-entry to employment.

10.2.3 Default insurance and loan indexation

By definition, ICL loan repayments are contingent on income, and affordability for borrowers is therefore dependent on the scheme income thresholds and corresponding repayment rates. In addition to administrative costs, costs to government can arise because of interest subsidisation if concessional indexation is applied to the loan, and non-repayment if the borrower dies prior to repaying the total amount owing.

Like students, new parents are typically young and have long remaining life expectancies. Non-repayment, however, can occur if default insurance is incorporated into the scheme through a minimum income threshold below which repayments are not required. Arguments for including a minimum threshold can be made on the grounds that it protects against financial hardship and encourages participation in the activity by risk averse persons. While encouraging participation is important for higher education where
public benefits are clear, and where incentive effects can be significant (see Stiglitz, Chapter 2, this volume), when the purpose of the ICL is as an optional extension to existing PPL which may already capture the bulk of public benefits, it is more difficult to argue for inclusion of default insurance.

Furthermore, financial hardship is already mitigated against through the income contingency of repayments. For example, rather than having a minimum repayment rate of four per cent (as is the case for repayments under the Australian ICL system for higher education fees), a repayment rate of two or even one per cent could be proposed for very low incomes (for example, those below the lower quartile of income). While those facing low incomes would still be required to make a repayment, the repayment rate could be selected to ensure affordability for borrowers.

Another cost can arise from interest rate subsidies. In the context of ICL for higher education, Barr argues strongly against interest subsidies (see Chapter 5, this volume). Although the majority of his arguments are specific to higher education, it is the case that interest subsidies would clearly benefit all PPL ICL borrowers at the expense of the taxpayer. A real interest rate at the government’s cost of borrowing (or higher; see below), can be argued for on the grounds that it ensures complete loan repayment in present value terms for those who repay their total debt, which may be desired if public benefits are uncertain.

A criticism of this arrangement is that those on low incomes might face a situation where the repayment in a particular period doesn’t cover the indexation on the outstanding loan. This could lead to spiralling debt. In addition, since real interest rates can imply increasing real debt over time, lower income earners can face greater repayments than higher income earners. ⁵

There are a number of responses to these concerns. First, provided repayments are income contingent a larger loan doesn’t affect the repayment burden, and provided loan forgiveness is a feature of the scheme (on death or after a sufficiently long period), then the loan would not burden the next of kin. Second, as suggested by Barr (Chapter 5, this volume), an option would be to freeze the loan amount for low income earners, or limit loan indexation to be no larger than the repayment made. Third, a real interest rate could be replaced by a loan surcharge that, if designed correctly, would also effectively eliminate the interest rate subsidy, but would instead impose greater relative cost to borrowers with higher future incomes; that is, a real interest rate or loan surcharge changes the way that the costs are spread within the pool of borrowers. ⁶ (But see Chapter 5 for Barr’s criticisms of loan surcharges).

If the ICL was designed with these features – contingent repayments, no interest rate subsidies (be it through application of a real interest rate or loan surcharge), and either a low or no minimum income threshold – then costs (excluding expenses associated with scheme administration) would only arise
for those whose lifetime income was so low that their debt was not repaid by the time of death or forgiveness.

10.2.4 Welfare gains and the value of ICL

Even in the event that some borrowers do not fully repay, an ICL scheme for PPL could be designed to remain cost-neutral. This might be attractive to government if it was believed that no additional subsidisation should be provided beyond the existing taxpayer-funded PPL scheme.

Rather than adopting a ‘risk-sharing’ approach, where the cost of unpaid debt is borne by the taxpayer, a ‘risk-pooling’ design could be adopted such that all costs are pooled among the scheme participants (see for example, Racionero, Chapter 19, this volume). In practice, this could involve charging a loan indexation rate (or loan surcharge) that is determined by factoring in the cost of non-repayment (the ‘cohort risk premium’) on top of the government’s cost of borrowing (see Barr, Chapter 5, this volume).

A possible concern is that this might lead to adverse selection by acting as a disincentive for participation in the scheme by good risks. This can be countered for the following reasons:

(i) Provided features such as those described in Section 10.2.2 and 10.2.3 are incorporated into the ICL scheme, including making the debt the obligation of both parents, it is likely that the proportion of potential borrowers for whom debt would remain unpaid at death would be very low, and therefore the cohort risk premium would be commensurately low.7

(ii) Even in the presence of zero taxpayer subsidisation, the value that the majority of parents place on the ICL is likely to be higher than the cost to the government of providing the ICL.

This second point requires further discussion. The government’s ability to provide an ICL is a consequence of having an income tax system that allows it to collect income based repayments, and administer the loan system at low cost.

The total cost to government of ICL provision will equal the government cost of borrowing, plus administrative costs, plus the cohort risk premium. A parent who wishes to participate in the ICL faces these costs (manifesting as a loan surcharge or real rate of indexation), but receives the following welfare gains that are not present through market-based sources of funding: finance that would otherwise be unavailable; and affordable repayments even in the event of income shocks.

The attractiveness of the ICL to a parent is then a question of whether the gains exceed the costs, given their individual risk preference and personal discount rate. It is reasonable to assume that the government cost of
borrowing plus associated administrative costs is lower than most parents’ discount rates (which are likely to be related to the cost of market-based finance, in the event that it was available). It is also clear that many parents will place a high value on the utility derived from having access to additional leave, and the consumption smoothing that arises from income contingency. Provided the cohort risk premium is modest, it is then reasonable to conclude that there could be considerable welfare gains from government provision of an ICL, even in the absence of positive externalities.

As a final point, it is worth noting that even in the absence of a market failure – that is, even if finance was otherwise available – government has a clear advantage in providing the funds due to its ability to offer contingent repayments with low administrative costs. Importantly, the choice between government provision and market-based provision of funds is independent of the level of the cohort risk premium, because in both cases this cost would be passed on to the pool of borrowers.

10.3 Discussion

Important questions remain. As discussed above, with a voluntary ICL the choice of repayment function and other scheme parameters can alter the composition of the pool of borrowers. If we assume that externalities are addressed through existing policy, then the purpose of providing further funds is to improve parental welfare. Welfare can be improved because the government can collect repayments based on income efficiently through the income tax system. However, the wrong scheme design can result in sub-optimal welfare outcomes. Long (Chapter 4, this volume) offers a way forward for ICL scheme design via social welfare function maximization. A challenge is to collect appropriate data to allow measurement of the incentive effects, the value of consumption smoothing and default insurance for persons with different risk profiles and personal discount rates, and realistic functional forms and elasticities for input into appropriate social welfare functions. Advancement of theory in this direction could provide important insights for the development and further application of ICL both for and beyond higher education.

Notes

This chapter draws on Chapman and Higgins (2009) and Higgins (2010).

1. Another argument against taxpayer funding for long durations of leave is that different parents have different means of supplementary support. For example, some will have savings that they can draw upon to supplement taxpayer funded PPL. Providing taxpayer funds to cover all new parents for longer durations when many do not require
the support is inefficient. In addition, too much leave can exacerbate, rather than improve, workforce retention.

2. For a discussion of the difference in these arrangements see Racionero, Chapter 19, this volume

3. While parents out of the workforce also have financial needs, the welfare systems of developed countries often cater to these families.

4. Re-entry to the labor force could be further ensured (and therefore, scheme costs lowered) through shared loan arrangements between employee and employer. See Gans (2008) for a discussion of the advantages of shared loan arrangements in this context.

5. This depends on the difference between the rate of indexation and the discount rate that the borrower would use to value the repayments.

6. Chapman and Higgins (2009) and Higgins (2010) investigate the effect of applying a 20 per cent loan surcharge to an ICL scheme. They demonstrate that higher income earners when faced with a loan surcharge repay quickly, resulting in a negative subsidy (equivalent to a high effective rate of loan indexation). A consequence is that a surcharge can discourage participation in the ICL from those with high incomes, while conversely encouraging greater participation from those who are most likely to have no means of self-financing extended periods of leave. While this progressivity may be desired, this changes the composition of the participating population, with a consequent implication to cost and therefore choice of repayment function and other scheme parameters.

7. A key risk is that a large proportion of single parents with low prospective incomes take out the ICL. Chapman and Higgins (2009) show that, in Australia, lone parents make up fewer than 15 per cent of families with young dependants, and moreover, many of these would have been partnered when their children were at the age at which an ICL contract would have been entered into. Further, they show through simulation, that even in the presence of substantial adverse selection (such that 50 per cent of ICL take-up is by single parents), the aggregate subsidy (assuming a risk-sharing ICL and 20 per cent loan surcharge) would be very low.

References


Internationalisation of ICLs to deal with Human Capital Trade Imbalances

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The international emigration of skilled workers can lead to a flight of human capital from developing countries or from developed countries going through economic difficulties, and this is highly regressive. These source countries suffer both loss of this workforce and also usually bear the cost of public subsidies of higher education and other government investments, such as for pre-higher education subsidies, for such workers, only to have them emigrate after graduation. Even in countries with student loan schemes a limitation of current arrangements is that repayment of the debt continues only while the graduate is resident in the country in which they undertook their higher education. This paper considers a way of addressing the imbalances and regressively in the trade of human capital involving internationalisation of the collection of student loans through the taxation system contingent on income, a feature now of loan collection in many countries. Our purpose is to outline the design issues required and we focus on countries with well-established income contingent loan (ICL) schemes such as Australia, the UK and New Zealand. Such a scheme could be designed to require the emigrating graduate to take out an ICL repayment obligation in line with their remaining student debt at the time they are issued with an employment visa to the destination country. The ICL could then be repaid on the same terms as domestic students and the collected funds transmitted back to the country of origin, potentially to support higher education. We examine the degree to which this proposal could provide a practical method of implementing Bhagwati’s proposal for a ‘brain drain tax’ and ways it could be used to fund increased links between higher educational institutions as a way of diminishing the regressivity of
international graduate emigration with the potential for improving the quality of higher education internationally.

11.1 Background

A key feature of globalisation has been increases in rates of skilled migration over the past few decades. For example Mullan (2005) estimates that around one quarter of all physicians in developed countries such as the United States, United Kingdom, Canada and Australia were trained overseas with most coming from developing countries. These flows exacerbate skilled workforce shortages within some of the least developed countries. As Negin (2008) notes, Papua New Guinea has one of the lowest doctor to population ratios in the pacific region at around 0.1 doctors per 1000 persons compared with 2.7 for Australia, but estimates that there are around 160 Medical doctors from PNG who have migrated to Australia and New Zealand, compared with around 275 in the domestic PNG workforce.

The imbalances also play out between developing countries, particularly when countries experience economic setbacks such as in the recent Global Financial Crisis (GFC). For example, Spain produces an above-average number of graduates compared with other European Union countries, but the limited employment opportunities are leading to large scale graduate emigration, recently estimated to be as high as 300,000 since the beginning of the GFC (Alvarez, 2012). High graduate mobility has not been accompanied by development of multi-lateral institutions to assist in repayment of student loans between developing counties.

Such flows deplete human capital and also create significant imbalances as the countries that provide public subsidies for higher education do not gain the benefits of the investment in human capital of their citizens’ subsidies while bearing all the costs. The mobility of graduate students also poses a problem for student loans schemes as it adds to default costs, especially when graduates do not expect to return to the country where they undertook their higher education (Palacios, 2004).

Barr (2008) notes that design of a successful student loans scheme depends on the systems in place for collection, including a capacity to continue to collect repayments from graduates if they take up employment overseas. Barr (2001) proposes several ways to deal with this issue through the development of information sharing and repayment agreements between countries. The purpose of this paper is to consider taking this proposal further by considering ways of internationalising the collection of student loans through the taxation system.
11.2 Proposal for internationalising current income contingent loans

The internationalisation of the collection of student loans might likely require bilateral or multilateral agreements between countries regarding the repayment of income contingent student loans. The purpose of these agreements would be to enable debts to continue to be collected after graduate emigration. We suggest that it would be administratively efficient if the terms of collection of immigrant match that for domestic graduates. For example, if a graduate with a student loan immigrated to Australia, then the debt at the time of immigration would be converted into a debt under Australia’s Higher Education Contribution (HECS) scheme. They would then make repayments through the tax system based on the same income thresholds and schedule of repayments as if they accrued the debt at an Australian domestic higher education institution. In many ways such an arrangement could be seen as an extension of existing international taxation treaties or reciprocal pension entitlements that already exist between countries. In administrative terms we suggest that this would be straightforward.

Clearly the advantage of these arrangements for immigrants is that loan repayments are based on capacity to pay and therefore graduates would benefit from the default protection and consumption smoothing elements of ICLs (Chapman, 2006). In this regard, a graduate with a debt from a conventional student loan may also benefit from converting it to an ICL in countries where this system of financing is in operation. Once collected, the country collecting the ICL from the immigrant graduate could then transfer an amount equivalent to the repayments – perhaps net of collection costs – back to the country where the loan was incurred.

Why should countries collect foreign student debts? Most countries with ICLs could increase the level of repayment, and therefore reduce doubtful debt and subsidies, by entering into such arrangements. For example, Chapman and Higgins (2013) estimate that since the introduction of HECS in 1989, the uncollected debt from emigrating Australian graduates is between $400 and $800 million. A first step could be to develop repayment agreements between countries where ICLs are already in place (for example, Australia, New Zealand, England, South Africa and Hungary) as sizable migration flows exist between these countries. Sinning (2012) estimates that there were more than 3,000 applications from South Africans for skilled migration to Australia in 2011. Even if imbalances in levels of migration between countries are significant, it would still be in their mutual interest to reciprocally collect student debts if countries agreed to pay for the cost of collection by the foreign taxation office. For example, in the case of Australia and South Africa, the Australian taxation office could deduct a proportion (for example, 10 per cent) of the HECS repayments of South African immigrants in order to cover
its administrative costs. The Australian Government would also benefit from the flow of repayments of its graduates who emigrate to South Africa.

11.3 More radical proposals

Barr (2001) suggested that it may also be:

…possible for the EU or World Bank to establish an International Learning Bank from which students from poor countries would borrow to finance their tertiary education – both those who subsequently stay at home and those who emigrate. (p. 234).

While there is clearly a need for multilateral institutions to assist in the financing of higher education in developing countries, the prospect of its creation at this point seems distant. The development of bilateral agreements for the repayment of student loan debts between developed and developing countries would be a concrete first step to developing such arrangements.

As an example of how this might work, such arrangements have been proposed in the context of developing an ICL scheme for Papua New Guinea in that PNG graduates emigrating to Australia or New Zealand would continue to repay their loans (as proposed in Garnaut and Namaliu, 2010). In the case of emigration to Australia, PNG loans could be collected by the Australian Taxation Office (ATO) through the existing HECS arrangements. This would require a PNG graduate to take out a HECS debt equivalent to their remaining student debt accumulated while in PNG at the time they are issued with an Australian employment visa. On a technical level some information sharing between the PNG taxation office and the ATO on the amount of the remaining student debt at the time of immigration to Australia would be required.

Under such a system the Australian Government could then transfer an amount equivalent to the repayments made net of collection costs back to the PNG Government. Alternatively it could be used for activities to promote linkages between the higher education sector in PNG and Australia, which could include funding academic and student exchanges between the two countries, or alternatively it could be used to fund joint research projects that are relevant to PNG’s development goals. Targeting the funds in this manner would be a way of directly benefiting the higher education sector in PNG. Similar bilateral arrangements could be expanded over time and may assist the creation of ICLs in developing countries and would remove the incentive for graduates to emigrate so as to avoid repaying back their student loans.

In many ways this could be seen as a practical method of implementing Bhagwati’s proposal for a ‘brain drain tax’, that is, a tax on the incomes of those immigrating from developing countries into developed countries.
As Wilson (2008) has recently noted, the greatest obstacle to the implementation of the brain drain tax first proposed by Bhagwati is ‘the administrative problems associated with collecting it’ (p. 9). The establishment of systems for collecting income contingent loan repayments in many developed countries provides a mechanism for collecting such a tax from immigrants that did not exist at the time it was first proposed nearly forty years ago. However, the key element still required to operationalise it is the development of information sharing agreements between governments to allow student loans to be tracked and collected, and for repayments to be repatriated across national boundaries.

### 11.4 Some concluding observations

In conclusion it is important to stress four policy related issues:

(i) While our proposal has been motivated by the inequities and regressivity associated with international higher education financing responsibilities, the suggested policy reform is not only about university funding. Every young graduate from a poor country has had extensive public sector funding of various forms that has led to them experiencing higher education (such as the expenditures involved in primary and secondary education, or with respect to the provision of infrastructure).

(ii) Income contingent loan-type mechanisms are often the subject of criticism with respect to the potentially high administrative burdens related to collection, a concern that resonates particularly with respect to less developed countries. However, the type of collection mechanism suggested is aimed to apply in countries with the administrative capacity to collect repayments through sophisticated income tax systems, and will likely be extremely efficient in those countries which already have ICLs, such as Australia, the UK and New Zealand. Less developed countries that do not have the capacity to currently collect ICLs from domestic graduates could still enter into loans that would apply if the graduate migrated.

(iii) While there will always be matters of important detail, such as how much should be collected, it is important to keep the policy straightforward. For example, imposing a fixed loan amount of around USD $5,000–$10,000 per graduate will have little or no consequences for the emigration decision, but it is likely to cover a significant proportion of the higher education costs incurred by many developing countries.

(iv) Some commentators have raised the potential of such a scheme to diminish remittances from emigrating graduates, which are a major
source of the private benefits associated with international skilled migration from poor to rich countries. Two points are that: remittances are typically made to the families, and not the governments, of the emigrants’ country; and, remittances are unlikely to be affected by the additional impost of the scheme on the emigrating graduate because the loan sums involved are very small relative to the much higher incomes received by those involved.

Notes

1. Data from the 2006 Australian census indicate that 320 people from PNG with a University Education have migrated to Australia since 2001.
2. For example, the Australian and UK ICL systems collection cost only around five per cent per year of revenue (Chapman, 2006).

References

The Role of Contingent Loans in Providing Equitable Access to Legal Aid

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Legal advice is expensive and the while it is highly likely that the pursuit of a claim for compensation or redress through the courts will take a considerable amount of time there is no such certainty around the likely outcome of such a case. Access to capital and appetite for risk, therefore, play a central role in understanding the willingness of individuals to use the courts to resolve disputes. Having outlined the very limited scope of government funded ‘Legal Aid’ in Australia this paper presents survey data on the nature and extent of ‘unmet demand’ for legal services which shows that the cost of legal services is the main reason that a large number of Australians choose not to pursue legal redress for damages they believe they have incurred. The paper then outlines the design of a Legal Expenses Contribution Scheme (LECS), a suggested contingent loan which could be used to fund cases for damages that have been deemed by a panel of lawyers to pass a ‘merit test’ which includes the likelihood of success. The inclusion of an external evaluation panel is likely to reduce the risk of adverse selection and moral hazard in the operation of the scheme. At the conclusion of a case the recipient of the LECS loan satisfies their obligation by either paying to the Commonwealth a percentage of their income over the length of the loan, with payments set at a higher rate for recipients on higher incomes. Recipients would also have the option of repaying the loan immediately in a civil action with an advantageous and sufficient award of damages. Where a matter ends badly for a LECS recipient they would be shielded from extreme poverty or bankruptcy and have the opportunity to rebuild and continue to contribute to the community while repaying their loan.
12.1 Introduction

The Government’s aim is that eventually no person anywhere in Australia should suffer injustice because of the unavailability of legal advice or inability to afford the cost of representation in court proceedings (Attorney-General, Senator Lionel Murphy) (Commonwealth Parliamentary Debates, 1973).

In the absence of free or subsidised representation, it is prohibitively expensive for most Australians to adequately defend their legal rights. The costs of seeking legal advice, engaging legal representation and pursuing a legal claim within the court system mean that many people cannot afford access to justice. According to the Law Institute of Victoria, the average cost to private clients who engage a law firm can range between AUD $2,370 and AUD $11,290, depending on the type of matter (Law Institute of Victoria, 2009, p. 4). Actual costs to some clients can of course be a great deal higher.

In order to overcome, albeit partially, the problems associated with the expense of obtaining legal representation Australia has developed a system of ‘legal aid’. While this paper focuses on Australia the problems associated with the expense of seeking justice have been recognised around the world. In the US, for example, despite the existence of the publicly funded Legal Services Corporation (LSC) it is estimated that for every person who receives support from the LSC another is turned away (Legal Services Corporation, 2009). Similarly, in the UK where legal aid is provided by the publicly funded Legal Aid Agency, recent funding cuts are expected to further reduce the number of cases receiving public support by 600,000 cases per year (Byron, 2013)

Legal aid is provided in Australia by both state and federal governments as well as by law firms and charities. The purpose of legal aid is to ensure access to legal representation for those who cannot afford it, however eligibility for legal aid does not extend to all those in need of funding support due to the existence of tight eligibility criteria, including financial means tests, merit testing, and restrictions on the types of cases which qualify for financial support. Survey evidence below suggests that access to funding is a major reason why individuals choose not to pursue their legal rights.

12.2 A brief history of legal aid in Australia

Legal aid began in Australia with the Commonwealth Judiciary Act 1903, which provided funds for representation of people without adequate means committed for trial against the Commonwealth. Via the Legal Services Bureaux, established in 1942, the Commonwealth provided aid to members of the armed services and their families; there were also various other ad hoc schemes at the state level providing legal aid up to the 1970s. In 1973
Attorney-General Lionel Murphy established the Australian Legal Aid Office in an attempt to ensure that access to the justice system was not prevented by a lack of funds or advice. Following a review of legal aid in 1976, the Commonwealth Legal Aid Act 1977 introduced a scheme of arrangements between the Commonwealth and the States.

Under this scheme, state Legal Aid Commissions (LACs) were allocated a quota of legal aid matters that could be referred to the private profession, with the Commonwealth agreeing to meet the full cost of those matters irrespective of cost (Senate Standing Committee on Legal and Constitutional Affairs, 1992, p. 9). Funding of LACs was determined by the Commonwealth Legal Aid Commission Act 1977, in which the Commonwealth provided 55 per cent of funding, the remainder being the responsibility of states and territories. Determination of priorities and allocation of revenue by LACs became the responsibility of the LACs themselves (PricewaterhouseCoopers, 2009, p. 15).

Until 1997 the Commonwealth provided funding to state and territory LACs without caveat and they were free to manage their budgets independently. In 1997, Commonwealth funding for legal aid was reduced and applied to a smaller range of matters. For example, matters which were considered ‘Commonwealth law matters’ (for which someone can receive Commonwealth-funded legal aid) were confined to subjects arising under Commonwealth legislation. Matters which qualified for Commonwealth funding lacked any organising principal beyond this narrow legal definition. This in effect meant that the Commonwealth only provided legal aid funding for a restricted range of matters, including Commonwealth criminal offences, family law disputes and immigration law matters. Assistance provided for other matters by state and territory LACs, including the great majority of criminal matters, were from this time funded through state and territory budgets.

In 2007 the Australian Council of Social Services estimated that up to 72 per cent of people seeking assistance from Community Legal Centres (CLCs) are turned away because ‘services are operating at maximum capacity and CLCs have to ration access in some way’ (Senate Legal and Constitutional Affairs References Committee, 2009, p. 151). Like LACs, CLCs need to find ways of rationing their legal assistance in order to target the most deserving clients. This rationing process is discussed in more detail below.

Legal professionals, public servants and bipartisan committees in Federal Parliament have voiced concerns that the current legal aid funding model is inadequate and unjust. For example, the Senate Legal and Constitutional Affairs Committee observed in 2009:

At present, reforming the legal system might appear difficult, onerous and expensive; but…ultimately, the investment of effort, time and money will
result in significant benefits to all concerned. Otherwise, the committee predicts that within a decade it will again be inquiring into a failing, or failed, legal system and asking, ‘why wasn’t something done about this ten years ago?’ (Law Council of Australia, 2010).

These comments reflect similar observations made by the same Committee in 1997, 1998 and 2004 (Senate Legal and Constitutional Affairs References Committee, 1997a, 1997b, 1998, 2004).

12.3 Rationing legal aid

Because potential demand for legal aid is greater than the present level of funding allows for, there is a range of mechanisms in place to ensure that legal aid is delivered to the ‘most deserving’ recipients. This non-price rationing process takes two forms: means tests, which examine someone’s capacity to pay for the legal expenses they incur, and merit tests, which assess the legal aspects of a claim for assistance. Rationing of legal aid applies to situations where applicants require substantial legal representation. There are a range of services, including legal information, duty lawyers and the provision of limited amounts of legal advice, which are not rationed in these ways.

Means tests compare applicants’ circumstances to specific income and assets thresholds. Applicants who qualify for legal aid are generally both income and asset poor. The thresholds vary from one state to another; for example, the lower income threshold (that is, the level below which a recipient would receive their legal assistance without needing to make any financial contribution) is AUD $255 per week in Victoria and AUD $318 per week in NSW. Although LACs have some discretion, funding is usually available only to those on very low incomes. National Legal Aid has observed that only people in highly disadvantaged circumstances may qualify to receive legal aid, while people who would otherwise benefit from legal assistance but who still cannot afford it miss out:

The legal aid means test…is set at a level that allows only the most poor to be eligible for legal aid. There are significant numbers of people who will not meet the test (National Legal Aid, 2009).

The use of means tests to determine eligibility for legal aid effectively makes legal assistance financially inaccessible to all those who inhabit the great middle ground between very rich and very poor.

In addition to the means test, a merit test assesses whether the applicant’s case has a ‘reasonable prospect of success’ based on its legal and factual circumstances. The merit test also considers whether, in the absence of legal
aid, a prudent person with means would risk their own money on the case. Further, the merit test asks whether the expenditure of legal aid in that case is worthwhile, both to the applicant and the community. This process takes into account a range of criteria, such as the seriousness of the penalties which apply in a criminal matter. In reality, people who meet the income and assets test often do not qualify for legal aid because they fail the merit test.

LACs have responsibility for how the various tests for legal aid eligibility are applied in their jurisdiction, both among their own clientele and those who receive legal aid through CLCs or private practitioners. Because of the need for direct funding only to those who qualify for legal aid, each LAC must have extensive auditing and monitoring capabilities. These compliance functions can in reality absorb a substantial proportion of the funding that would otherwise be delivered to clients in the form of subsidised legal services.

Under the present arrangements between the Commonwealth and state governments there is a large shortfall in funding for legal aid, which means that LACs have an incentive to restrictively interpret merit tests and to retain means tests to limit spending. To give some indication of the level of extra funds needed, National Legal Aid has called for a doubling of the funding currently provided to LACs (AUD $164.8 million) simply to ensure appropriate delivery of the legal aid services it is currently expected to provide (National Legal Aid, 2007). Substantial additional funding would be required for legal aid to adequately cover civil and other matters which fall outside the Commonwealth jurisdiction.

In 2009, the Rudd Government appeared to acknowledge the funding pressures in the legal aid system, conceding that ‘the direct legal assistance sector … is operating in an environment of rising demand and increases in the cost of service provision.’ It also made the following observation:

Viewing access to justice solely as a legal assistance issue is incomplete because it is only part of the solution. Even massive increases in legal aid budgets will not provide any assistance to the vast majority of people who experience legal issues in their day to day lives…98 per cent of legal aid recipients [receive] an income that could be considered below the poverty line. This leaves much of Australia unable to afford legal representation but nevertheless ineligible for legal aid (Commonwealth Government, 2009, p. 52).

Given that not just the amount of funding for legal aid is limited, but the kind of cases for which funding can be sought, the development of an additional source of funding for access to justice, such as the income contingent scheme outlined below, has the potential to expand the number of
people accessing existing services but broaden the range of services for which support can be provided.

12.4 The nature and extent of unmet legal need

The level of directly measurable unmet demand for legal aid (that is, applications refused under the relevant means and merit tests) ranges from six to 16 per cent of applicants, depending on the type of matter and the state/territory in question. In 2007-08 there were 22,015 case applications refused across all LACs; this figure includes applications refused under both means and merit tests (Legal Aid Commission of Tasmania, 2008). Depending on the jurisdiction, between 20 and 70 per cent of refusals are made because the applicant does not fall within means test thresholds. Crucially, however, these figures do not include cases for which no application for legal aid was made. This might be because potential applicants knew or suspected they would not qualify, because they regarded the legal system as too hard to negotiate, because they just wanted the problem to go away, or because they did not even know they had a legal problem.

It is this complex issue – the comparatively unknown or poorly understood component of unmet legal need – that has led various organisations to acknowledge that further research is required to determine the level of funding required to properly subsidise legal assistance on behalf of those who would not otherwise be able to afford it. The Senate Legal and Constitutional Affairs committee has remarked that ‘relevant statistical data is in short supply’ and that there needs to be ‘a better understanding of the level of demand and unmet need for legal assistance throughout Australia’ (Senate Legal and Constitutional Affairs References Committee, 2009, p. 8).

In 2006, the Law and Justice Foundation of NSW published research which aimed to quantify legal needs in certain disadvantaged areas of the state. Its report, Justice Made to Measure, adopted a wider definition of legal needs, observing that: ‘in some instances, failing to seek a legal resolution does not necessarily imply the absence of legal need, but may merely indicate the individual’s lack of awareness that their issue is a legal one or that the issue has a potential legal resolution’ (Coumarelos, Wei and Zhou, 2006, p. 11). This research uncovered a relatively high incidence of ‘legal events’ over a one-year period (with more than two in three of those surveyed experiencing such an event), a ‘substantial rate of inaction’ on the part of those involved, and large numbers of people who encountered some kind of barrier in seeking help (Coumarelos, Wei and Zhou, 2006, p. xviii–xix).

In 2007 the Foundation, in conjunction with NLA, commissioned the National Legal Needs Survey, which is designed to quantify legal needs in much the same way as in the Justice Made to Measure research but on a
national scale and for each state and territory. The findings of this research were not available at the time of publication.

This comprehensive picture of legal needs will fill many of the gaps in the present understanding of how many Australians miss out on legal assistance and why. Nevertheless, the Foundation has itself acknowledged that ‘reported incidence and resolution rates are likely to be affected by the number, definition, type and range of legal needs examined’ (Coumarelos, Wei and Zhou, 2006, p. 12). For this reason, it is important to examine the issue of unmet legal need from multiple perspectives, including those based on narrower definitions derived from the present legal aid system as well as those stemming from broader conceptions of how people might have greater access to the justice system and people who can help them negotiate it.

In order to better understand the broad scope of unmet legal demand a survey of 1001 Australians was conducted in September 2009. The survey asked respondents about various kinds of legal problems they may have faced over the previous five years. As explained below, the survey gave greater focus to legal matters of a civil nature, because such issues are more likely to constitute ‘unknown’ legal problems (that is, issues that people are unaware can be solved through legal intervention) than criminal matters – which can be more easily discerned as having a legal dimension.

Those who had experienced a legal problem were asked whether and how they had sought legal advice or legal aid, and about the barriers to doing so if they had not received legal assistance. Respondents were also asked about their perceptions and experience of the justice system. A full description of the survey method can be found in Denniss et al. (2012).

The survey found that 33 per cent of respondents reported experiencing some kind of legal problem in the previous five years and that 24 per cent of respondents said that they had sought legal advice for a legal problem. If 33 per cent of respondents experienced at least one kind of legal problem in the previous five years, this would suggest that around one-fifth of this figure (approximately 7 per cent) could be expected to experience a legal problem in any given year. However, some respondents reported more than one kind of legal problem over a five-year period, meaning that the annual incidence of legal problems is likely to be considerably higher. Adjusting for those respondents who had multiple legal problems the survey suggests that around ten per cent of Australians experience a legal problem every year.

As Table 12.1 shows, the most common type of legal problem reported by respondents was being treated unfairly by a business (for example, bank, phone company, tradesman, retail outlet); one in eight people (12 per cent) said they had a legal problem of this kind. The next most common kind of problem was dispute with a landlord or tenant, real estate agent or neighbour (8 per cent), followed by a dispute with an employer over pay, conditions, workplace safety or overtime (7 per cent) and a divorce, a dispute over child
custody or support payments, or arguing with family members over inheritance (5 per cent).

Table 12.1  Proportion of respondents with a legal problem in the past five years

<table>
<thead>
<tr>
<th>Type of legal problem</th>
<th>Number experiencing legal problem</th>
<th>Proportion of survey sample (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Been unfairly treated by a business</td>
<td>117</td>
<td>12</td>
</tr>
<tr>
<td>Dispute with a landlord/tenant/real estate agent/ neighbour</td>
<td>75</td>
<td>8</td>
</tr>
<tr>
<td>Dispute with an employer</td>
<td>68</td>
<td>7</td>
</tr>
<tr>
<td>Divorce/family matter</td>
<td>49</td>
<td>5</td>
</tr>
<tr>
<td>Criminal matter</td>
<td>41</td>
<td>4</td>
</tr>
<tr>
<td>Parking or speeding fine</td>
<td>36</td>
<td>4</td>
</tr>
<tr>
<td>Dispute with a government agency</td>
<td>32</td>
<td>3</td>
</tr>
<tr>
<td>Healthcare dispute</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Insurance dispute</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Other type of legal dispute</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>Any kind of legal problem</td>
<td>327</td>
<td>33</td>
</tr>
</tbody>
</table>

Notes: Base = 1,001. Because some respondents reported having more than one type of legal problem in the past five years, the sum of the percentages for particular types of legal problem exceeds the percentage of people who experienced any type of problem.

12.4.1  How many people have an unmet need for legal assistance?
As Table 12.2 shows, nine per cent of respondents had experienced a legal problem but did not seek legal advice for financial reasons. In addition, three per cent had a legal problem but did not seek legal advice due to a lack of knowledge. This means that approximately one in eight respondents (12 per cent) had legal needs in the previous five years which were not met.

12.5  Using contingent loans to augment legal aid in Australia
In the absence of a significant and continued investment of new funds into legal aid budgets at the state or Commonwealth level, one possible reform might be a complementary funding model. This would be based on an income
contingent interest-free loan scheme akin to Australia’s Higher Education Contribution Scheme (HECS). A Legal Expenses Contribution Scheme (LECS) is not a final solution, nor is it a comprehensive legal aid scheme. It is, however, a practical initial step, capable of being put in place during the development of detailed policy and legislative change.

Table 12.2 Incidence of unmet need in previous five years

<table>
<thead>
<tr>
<th>Category</th>
<th>Incidence in survey sample (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Had a legal problem in the past five years</td>
<td>33</td>
</tr>
<tr>
<td>Sought legal advice</td>
<td>24</td>
</tr>
<tr>
<td>Unmet need for legal advice</td>
<td>12</td>
</tr>
<tr>
<td>Did not seek legal advice for financial reasons</td>
<td>9</td>
</tr>
<tr>
<td>Did not seek legal advice due to a lack of knowledge</td>
<td>3</td>
</tr>
<tr>
<td>Did not seek legal advice for some other reason</td>
<td>2</td>
</tr>
<tr>
<td>Did not have a legal problem in the past five years</td>
<td>67</td>
</tr>
<tr>
<td>All respondents</td>
<td>100</td>
</tr>
</tbody>
</table>

Notes: Base = 1,001. This figure refers to the total number of people in the survey sample, not the number of legal problems experienced (as with Table 12.1). Some respondents reported more than one legal problem, meaning that column percentages do not sum to 100 per cent.

The Australian HECS scheme funds undergraduate university degrees with interest-free loans and the government gradually claims back the money through the tax system when a graduate’s income goes above a sufficient level. The scheme is effectively a co-contribution arrangement, since the Commonwealth generally still funds the majority of higher education course and infrastructure costs.

Income contingent loans have a number of unique attributes which make them attractive to both citizens and consumers alike. These benefits include the potential to better smooth consumption over the life cycle (see for example, Chapman, Chapter 1, this volume), to benefit from risk-pooling and to achieve access to low transaction costs (Stiglitz, Chapter 2, this volume; Denniss, Chapter 22, this volume).

While the specific parameters for an income contingent LECS scheme would need to be carefully modeled to ensure that acceptable repayment rates were achieved from the targeted population, the following list outlines some of the access and repayment issues that need to be resolved:
(i) In order to ensure that LECS augments rather than replaces existing grant based aid if someone did not qualify for means tested legal aid, they could have the option of applying for LECS support. If they do qualify for legal aid, they would be able to receive legal aid as under the present system (assuming their matter meets the relevant merit test).

(ii) Consistent with existing applications for legal aid, LECS applications would continue to be subject to a merit test conducted by qualified lawyers to determine eligibility. Only legal matters with a declared ‘reasonable prospect of success’ would attract LECS funding.

(iii) The merit test for LECS funding would be expansive enough to incorporate a range of situations in which people encounter problems which can only be solved through pursuing civil legal action (for example against governments or corporations).

(iv) Following the conclusion of a matter the recipient satisfies their obligation by paying to the Commonwealth a percentage of their income over the length of the loan, with payments potentially set at a higher rate for recipients on higher incomes. Recipients would also have the option of repaying the loan immediately in a civil action with an advantageous and sufficient award of damages. (Prior to 2014 the Australian HECS scheme also offered an incentive discount for early payment, which could also be applied here.)

(v) Where a matter ends badly for a LECS recipient who then finds themselves in jail or facing a substantial damages bill, they would be shielded from extreme poverty or bankruptcy and have the opportunity to rebuild and continue to contribute to the community while paying back their loan.

(vi) An important design parameter is the choice of real interest rate to charge on outstanding debt. Any interest rate below the Government’s marginal cost of funds will act as a subsidy to recipients while any interest rate above that rate would help defray administrative costs or, if set high enough, either offset the cost of non-repayment or generate a surplus for the government. The low transaction costs (Stiglitz, Chapter 2, this volume; Denniss, Chapter 22, this volume) and high recovery rates of ICLs create the potential for governments to generate a surplus in markets which the private sector do not find profitable (Denniss, Chapter 22, this volume).

(vii) Another important design parameter is the choice of whether or not to limit access to the scheme to those with incomes below a threshold. Alternatively, differential interest rates could be charged to those with higher incomes and/or better access to private sector debt.
It should be noted that client co-contribution schemes already exist in some Australian jurisdictions, including for Commonwealth legal aid grants (Victoria Legal Aid, 2011). At present, applicants for legal aid who do not meet the relevant income and assets tests may be required to make upfront and/or ongoing payments to contribute to the costs of legal representation, unless their assets and income exceed the estimated costs of representation – in which case they are deemed to not require legal aid.

The fact that such schemes are already in place suggests that a LECS-style initiative is not a radical departure from current arrangements, but rather an extension of a proven concept, albeit an extension which allows access to a scheme with lower transaction costs. However, community awareness that legal aid is available on a partially self-funded basis is very low (a fact reinforced by the survey research presented in this paper). If unmet legal need is to be addressed properly, policy-makers need to promote the existence of both the present and any future co-contribution schemes.

There are two key differences between the present system, under which applicants can receive a partial grant of legal aid, and the proposed LECS:

(i) A LECS scheme would apply to a larger range of civil matters than are typically covered by merit tests at the state/territory or Commonwealth level, which concentrate largely on criminal and family law matters.

(ii) Because of the short period in which client contributions are currently required (over a maximum of one year), the current co-contribution arrangements can in effect compel applicants to liquidate at least some of their assets (or have a caveat placed on those assets) to fund their case. The proposed LECS scheme, on the other hand, would assume that applicants would make contribution payments over a lengthier period of time, making the costs of legal assistance less of an immediate financial burden.

The provision of income contingent loans for legal advice and litigation would have the distinct advantage of encouraging equity while also ensuring that sufficient personal risk is retained to act as a disincentive for unnecessary legal action. Further, unlike some other proposed applications of income contingent loans, ‘adverse selection’ would not be a significant issue in a LECS as some form of merit test would still apply. Adverse selection is a generic problem with some economic redistribution schemes where those most likely to benefit will use the scheme while those least likely to benefit will not. Insurance is an obvious example, and screening tests and higher premiums are applied to address the potential inequities. A strong merits test conducted by Legal Aid Commissions for a LECS loan would achieve the
same outcome and would ensure that only meritorious applicants receive a loan.

A scheme of this nature would provide much greater access to justice for middle-income Australians who are currently excluded by the present inadequately funded and restrictive legal aid system. It would also expand the current scheme to cover civil litigation for plaintiffs and defendants. While there is a strong case for providing more comprehensive non-loan based legal aid, the introduction of a LECS might be an effective and achievable compromise. In support of such a proposition, around three-quarters of survey respondents (74 per cent) said that they would support the government provision of loans for legal advice and representation with only 11 per cent expressing opposition. The survey respondents were not specifically presented with the option of an ICL for legal aid but, given the widespread familiarity with HECS in Australia it is possible that an ICL scheme would attract even higher support.

Table 12.3  Do you support the government providing loans to Australians who face unexpected legal problems but can’t afford a lawyer? (per cent)

<table>
<thead>
<tr>
<th></th>
<th>Unmet need for legal assistance</th>
<th>No unmet need</th>
<th>All respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support</td>
<td>71</td>
<td>75</td>
<td>74</td>
</tr>
<tr>
<td>Do not support</td>
<td>15</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Not sure</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Notes: Base = 1,001

12.6 Conclusion

The legal aid system in Australia confines its application to the very poor and socially disadvantaged. Legal aid, however, should be available to all citizens who genuinely need access to the justice system and cannot otherwise afford legal assistance. The provision of a LECS type scheme provides one way to redress the existing shortcomings of government support for access to justice.

While the issues of moral hazard and adverse selection are often raised as barriers to the provision of contingent loans, the design of LECS, in particular its reliance on a merits review by qualified external assessors, significantly limits the risk to taxpayers. The survey evidence presented above suggests both that there is significant need for a scheme such as LECS and that there is
in-principle community support for governments providing loans to citizens in need of legal assistance.

Notes

This chapter is based on an Australia Institute Discussion Paper by Richard Denniss, Josh Fear and Emily Millane titled ‘Justice For All: Giving Australians Greater Access to the Legal System’.

1. In certain circumstances people on low incomes can receive legal aid even if their assets are sizeable (for example, if they own the family home). In these situations a caveat can be placed on the property title, which means that legal aid funding is repayable if and when the asset is sold.

2. These figures refer to net disposable income, which takes into account a range of factors such as taxation, housing and financial dependants (Legal Aid New South Wales, 2010; Victoria Legal Aid, 2005).

3. The criteria described here relate to the merit test for Commonwealth-funded legal aid. State-funded legal aid (which applies to most criminal matters) have different merit tests which can vary by jurisdiction. See for example (Victoria Legal Aid, 2011).

4. The survey was conducted with a sample of 1,001 adult Australians, representative of the broader population by age and gender. Respondents were sourced through a reputable online panel, and were given a small incentive to encourage participation ($2 each). Respondents who reported experiencing more than four legal problems in the past five years were removed from the sample to improve data quality.

5. Of the 1,001 respondents in the survey sample, 327 experienced some kind of legal problem in the previous five years. The survey identified a total of 493 legal problems encountered by these 327 people in the previous five years, or around 99 problems per year on average. This means that approximately 10 per cent of people could expect to experience a legal problem in a given year.

References


Income contingent loans for business innovation

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Glenn Withers
The Australian National University, Australia

Income contingent loans have principally been considered in the field of higher education, both in matters of analysis and in practical application. However the underlying issues can also be seen to apply to the wider world of ideas and especially for the case of business innovation. It is argued in this chapter that income contingent loans, subject to important complementary policy conditions, potentially offer a highly cost-effective option for government support for business innovation. Such an approach would focus public dollars on the core financing problem for much innovation and provide a financial as well as wider return on those dollars for the community, including for ploughing back into the scheme itself. It is affirmed that such an approach would also likely have substantial public support.

13.1 Introduction

The issue of business innovation is a crucial one. This chapter uses the case of Australia to suggest a new policy approach that may enhance business innovation. That approach is based on an income contingent loan mechanism, but with side conditions.

The underlying problem being addressed here is that while Australia has been performing well amongst OECD countries in recent years by a range of macro-economic criteria, this is felt principally to be due to its natural resource export base. That base may deliver less if Asian growth diminishes. Alternative sources of growth may therefore be needed.

In particular Australia currently ranks less well on innovation than it should as a mature advanced economy (Table 13.1). Moreover its standing has been
steadily slipping (Green, 2009). Yet there is a clear and present need to boost productivity to sustain national progress (Gruen, 2012).

<table>
<thead>
<tr>
<th>Score (0–100)</th>
<th>Rank</th>
<th>Country</th>
<th>Score (0–100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Innovation Index</td>
<td>51.9</td>
<td>23</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Innovation Input Sub Index</td>
<td>63.4</td>
<td>13</td>
<td>Singapore</td>
</tr>
<tr>
<td>Innovations Output Sub Index</td>
<td>40.4</td>
<td>31</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Innovation Efficiency Index</td>
<td>0.64</td>
<td>107</td>
<td>China</td>
</tr>
</tbody>
</table>

Source: INSEAD Global Innovation Index (2012)

Microeconomic reforms undertaken in the 1980s and the 1990s and the resources boom of the last decade have delivered over two decades of uninterrupted economic growth, the longest in Australia’s modern history (Ville and Withers, 2014). However, the period of resources-led growth in particular has belied a worrying decline in national productivity. There is now widespread agreement that Australia must proactively seek to arrest this productivity decline to ensure sustainable growth post the minerals boom, and that innovation has a key role to play here.

The OECD defines innovation appropriately as follows:

Innovation is the implementation of a new or significantly improved product (good or service), process, new marketing method or a new organisational method in business practices, workplace organisation or external relations (OECD, 2005).

Innovation can therefore include any activity that improves the competitiveness and/or profitability of a firm in a sustainable manner.

The key issue that arises therefore is how to best design policies that incentivise or drive increased innovation across firms, either through increased research or through other non-research activities?

13.2 Australian business innovation experience and policy

The 2010-11 Business Characteristics Survey (BCS) conducted by the Australian Bureau of Statistics (ABS) shows that funding constraints were the biggest single barrier to innovation (Australian Bureau of Statistics, 2012). The ABS data showed that funding constraints were acute for innovating
smaller business. Funding and cost constraints were a barrier for almost 66 per cent of such small firms, while technological or knowledge constraints were an impediment for barely 14 per cent of the small firms. By contrast, lack of access to additional funds (14.7 per cent) and cost of development or implementation (16 per cent) had a far smaller comparable impact on larger firms.

Overall, these statistics clearly do show that smaller firms are far more constrained in their ability to innovate than are larger ones, but that funding and cost constraints are nevertheless significant impediments for all categories and sizes of businesses.

Australian Government industry assistance to Small and Medium Enterprises (SMEs) is primarily available through either competitive grants and tax concessions on the one hand, or through non-financial advisory and support services on the other.

Competitive grants are always application and merit-based and capped rather than demand-driven, while tax concessions are demand-driven but may require certain pre-requisites relating to type of industry, activity, or products. In most cases, eligibility requirements for grants treat innovation and research and development (R&D) as synonymous, even though the former is often defined elsewhere as being much broader in scope, as for the OECD definition as cited above.

The industry assistance most easily accessible to SMEs is of a non-financial nature. However, it can be asked how useful the non-financial forms of support alone are in fostering innovation across these SMEs if the latter face seemingly insurmountable financial constraints.

Thus these policies collectively evidence significant remaining coverage gaps. Non-financial assistance would still have to confront limits to the ability of firms to implement many of the recommendations gained through advice and support, while grants would help only a small fraction of SMEs given the caps in place. They, and the various offsets and concessions, also effectively preclude most firms in most broad industrial divisions because of administrative restrictions on eligible areas and activities.

This means there are likely to be major gaps especially for firms which need funding for non-R&D innovations, or for firms which do not have the capacity or skills to implement changes in order to become eligible for competitive grants.

13.3 Policy challenges

Given Australia’s modest standing in the innovation rankings and given the need for better productivity through innovation, the question is how policy settings might best be improved. Denniss et al. (2009) concluded that:
The current approach to increasing investment and international competitiveness in Australia through innovation is intellectually ad hoc, subject to the vagaries of program change…and either provides assistance to only a relatively small number of firms and industries because of caps and quotas or does not discriminate between firms which would innovate without assistance and those that would not (p. 152).

One key step towards better focus and prioritisation that is flagged by the above-mentioned ABS Survey evidence is to improve access to financing, particularly in the case of smaller firms, as their size effectively precludes them from the funding sources more reliably available to their larger, more well-established counterparts. For example, capital (equity or debt) markets are ruled out to a significant extent due to the firm size. Nor do such firms have the organisational, financial, and legal expertise to negotiate or execute these deals. The non-research-intensive activities of (most) smaller firms also further severely curtail their eligibility for competitive government grants, which are closely capped anyway.

Two other sources of finance are venture capitalists and commercial banks. Venture capital is a useful but insufficient alternative still for many because it typically has a higher investment threshold than most of the smaller businesses can afford or support. An anecdotal ‘rule of thumb’ current in Australia is that venture capital is rarely available for projects under AUD 5 million. This can lead to ‘financing gaps’. Furthermore, in almost all cases, equity and/or management positions by investing firms is a precondition of venture capital financing; the resultant loss of entrepreneurial autonomy might be unacceptable to some owners, especially those of new start-ups who want comparatively more leeway in directing/guiding their pet projects.

Financing by commercial banks by contrast imposes up-front repayment obligations on borrowing firms. This may place substantial pressure on firms if the innovation projects have long gestations and if the expected cash flows do not materialise until much later. Commercial banks often also require collateral in order to sanction business loans, which for many small business owners is the family home. The possibility of losing the family home in case of delayed cash flows or failure of the innovation project may create an unacceptable level of risk for the owners and make them all the more risk-averse.

Finally, firms may not have the managerial or marketing capacity to take on the extra risk associated with new innovation projects. They may be limited in their skill set, especially in the case of family-run firms, and may have limited understanding of or access to larger, global product markets. All these factors, that is, unfocussed government policy, shallow financial markets, and limited capacity for risk, collectively create a significant ‘failure of the innovation-
financing market’, and therefore serve to stifle the level of innovation in the economy.

13.4 Income contingent loans – a finance innovation for industry policy

The access to finance problem described above represents a significant market failure, and creates an imperative for effective and determined intervention by the government. Obviously, existing policies have not been sufficient to redress this market failure problem, and may even have aggravated it. The further question then is ‘if current policy arrangements are inadequate, what alternative policies could offer viable solutions?’

A reconsideration of government policies must therefore involve, as above, an evaluation of the extent and effectiveness of policy instruments intended to aid the innovation performance of all firms generally, but smaller firms in particular given their widespread significance and proliferation in the economy and the particular problems they face in supporting innovation efforts. But it can also involve additional thinking about new policies, i.e. policy innovation for business innovation.

The Green Report (2009) and various government reports have stated explicitly the importance of and need for increased across-the-board innovation in the wider economy. The Australian Chief Scientist, Professor Ian Chubb, has championed the call for a culture of innovation and continuous self-improvement in Australian industry (Chubb, 2013). This is all the more important in the context of industry assistance generally, and innovation policy in particular, which must seek to overcome the disadvantage of distance that Australia’s relatively remote location creates even in what is being termed ‘the Asian Century’ (Australian Government, 2012). Value-adding innovation is the solution to the tyranny of distance in accessing global markets and in serving domestic markets better too. Innovation is the engine of growth in the modern knowledge economy.

Yet market processes in relation to innovation finance do have some severe limitations. Governments can respond to this by doing two things: improving the pre-finance capabilities of firms, and assisting with finance to better foster allocative efficiency, including provision of the external benefits otherwise lost to the economy.

However, along with recognising this role for government, it is financial institutions that have the actual infrastructure, know-how, and networks for the selection, screening and monitoring needed for any comprehensive processing and provision of finance to businesses. At the same time the innovating firms themselves must wear part of the cost of support as well, since further problems of moral hazard and asymmetric information will otherwise arise (Withers, Chapter 21, this volume).
This logic suggests the need for an integrated program to support skill enhancement and financing for small business innovation based on a partnership between enterprises, government and financial institutions. Other schemes to assist small business innovation do exist, as indicated. However they typically do not draw on the full complementary range of expertise and motivation and so often embed poorly aligned incentives for firms, are inflexible and distort loan priorities and do not address human resource development in getting firms’ finance ready.

Therefore it seems apposite to propose a scheme that would require firms to have had or to undergo business training and to accept assistance in developing proposals to a finance-ready stage as a condition of entry into assessing and approving financing arrangements; and which would provide part of the finance through a revenue-related loan to be repaid through taxation on future positive net earnings to complement a further proportion of the finance that would be provided on normal commercial terms.

This financing proposal, which is the novel element, would involve government providing a default-protected loan mechanism where commercial entities are reluctant to take on all risk. We can justify government assuming a share of risk by the pooled probability that such an approach would yield a high social pay-off through the opportunities generated from small business innovation activity that would not otherwise be undertaken.

In this approach taxpayer financing can be recovered, but only where the investment supported has paid off. The scheme therefore provides a form of revenue or profit smoothing so as to diminish financial pressures precisely at the time this is most needed.

Such a scheme has been suggested in principle by Chapman and Simes (2004) for regional development financing and by a Macquarie Graduate School of Management team (MGSM, 2007) for Malaysian business finance.

In moving to implementation, several basic challenges can be identified that would impact upon effective design of the policy for any area of application. The first of these relates to the initial threshold decision of which projects/industries should be covered. If there are subsidy elements and/or loan forgiveness elements, careful choice of project is essential to avoid moral hazard and associated unintended losses for taxpayers. It is here that a training requirement and commercial assessment under the partnership principle would help minimise risks, as argued above. The phases in this process could be at arms-length so that financing decisions are made separately from project development. The drive and responsibility for the success of the projects after pre-finance assistance and suitable finance provision would then rest directly with the firms themselves.

For projects chosen, the terms and conditions of support involve key decisions on the balance of forms of finance, since a package approach can be envisaged encompassing options with a mix of complementary strengths and
weaknesses. The basic options thus envisaged are private debt (for example, banks), private equity (for example, venture capital), and public debt. The discipline of time-based private loan elements would be complemented by the shared-benefit supervisory role of equity holders and the patient-capital role of government, and backed by efficient corporate financial and tax data access.

Further particulars then follow such as whether or not government should have recourse to recover any outstanding loan on sale or closure of the companies so supported. The incorporation of any subsidy elements is a natural extension, though it complicates the calculations of terms and conditions still further.

One option would be to charge an interest rate that at the least covers the cost of finance for government, and possibly also administration costs. That way, any subsidy just covers the default insurance. An alternative, if taxpayer subsidisation were not desired, would be to consider a risk-pooling arrangement whereby the costs of finance, default insurance and administration costs are all reflected in the interest rate charged on the loan. Further, if taxpayer subsidisation is desirable, an option would be to have a risk-pooling loan and provide the subsidisation for innovation investment in an explicit form.

With the right vetting and repayment processes and parameters, a scheme can be put in place which is budget neutral for government and yet expands the extent of business innovation. The reason for the scheme’s success would be that it overcomes a market failure in the provision of initial capital which otherwise imposes strong credit constraints. Successful firms repay in present value terms more than they borrow in order to cover any non-subsidised costs of repayment of those loans for the firms in which the innovation fails.

Such a scheme would have the following advantages:

(i) It could act to improve the functioning of loan markets where innovation activities are below what a government might consider to be optimal.

(ii) Because some part of taxpayers’ subsidies would be recovered when the enterprise is succeeding commercially, there is an important ‘mutual responsibility’ dimension.

(iii) Not only is it fair that average taxpayers don’t eventually foot the bill for all subsidies to successful enterprises, the fact that there are returns to the public sector should also be seen to be desirable because of the associated potential to reduce national budgetary pressures.

(iv) The repayments thus allow the financing of more innovation projects than could be forthcoming if the scheme was solely grant financed (or through lower taxes, or higher provision of alternative government services).
It essentially provides a form of revenue (or profit) smoothing, and thus diminishes financial pressures on small innovative enterprises at the time when this is most needed.

There is a well-developed version of this approach in the existing literature where further detail on context and design features and implementation is available (Dennis et al., 2009, Withers and Gupta, 2013). And interestingly there is clear evidence that it would receive strong public approval, with over 60 per cent of respondents in a recent Australian survey supporting the use of an income contingent loan scheme for research and development funding (Higgins and Withers, 2009).  

13.5 Conclusion

A new way forward to fill a major gap in access to finance for SMEs can be proposed, which would help enhance innovation and productivity. The pioneering model developed for income contingent loans by Australia for universities can be used as a basis for the proposed policy framework for business innovation too.

The approach also offers a highly cost-effective option for support for innovation in times of fiscal restraint: it focuses public dollars on the core problem for innovation and it provides a return on those dollars for the community, including for ploughing back into the scheme itself. The promise of this proposal suggests that policy work on development and implementation is needed by researchers and by government in this area.

Notes

1. And notably, only 20 per cent of respondents were against the introduction of such a scheme (Higgins and Withers, 2009).

References

Health care expenditure has traditionally been seen as an ‘investment’ in one’s own human capital. A life course approach to development shows that lack of access to health care in the young can lead to a reduction in schooling and consequently lower wage rates. In high income countries, despite widespread health insurance, some services such as talking therapy for depression are not funded despite depression being a major cause of disability and exit from work. Income contingent loans (ICL) offer an opportunity for those who face potentially high returns to investing in health but are cash constrained from doing so, and where health insurance systems cannot fully overcome the adverse and moral hazard problems. This note suggests areas where ICL could be used to fund health care in both high and low income contexts.

14.1 Background

The idea behind income contingent loans (ICL) is that in countries which have the capacity to accurately assess income and collect taxes, they provide an ‘off–balance sheet’ ability of governments to fund services such as education and health. They also have some pro-efficiency features that can overcome some well-known market failures in the financing of education.

The objective of this chapter is to consider whether these pro-efficiency features can be brought to bear on the plethora of market failures that exist in the health care market place. The objective of this note is to outline an initial analysis on whether and in what circumstances an ICL might work for health
care. The principal pro-efficiency features of such loans that have been identified by Chapman (Chapter 1, this volume) are:

(i) *Consumption smoothing over one’s working life*. If we assume that an individual’s lifetime income is sufficiently high that the loan will be paid over their lifetime, then the income contingent nature of the repayment provides ‘consumption smoothing’ since debtors pay nothing in the periods in which they fall below the income threshold and more in periods when their income is high. To the extent that they have no access to other income smoothing instruments such as credit cards or insurance, ICL provides such a mechanism.

(ii) *Ability to invest in non-collateralizable assets*. This feature of ICL enables borrowing when the asset created (human capital in the case of health care) is unable to be collateralized. Therefore, cash constrained individuals (who tend to be from asset poor families) will make optimal investment decisions. This results in more efficient (and equitable) allocation since investment will not depend on the assets of the household but on the capacity to benefit from the education or health service.

(iii) *Insurance against lifetime income shocks*. In some cases the individual’s income might never exceed the threshold, and the individual might die or permanently exit the labor market before the loan is repaid. If in such cases the ICL does not have to be paid and the borrower is not required to declare bankruptcy, unlike other sorts of repayments, an ICL provides insurance against lifetime income shocks since repayments will not be paid in full, allowing a reallocation of wealth from high income to low income states.

ICL also have some ‘anti-efficiency’ features which include:

(i) *Ex-ante moral hazard*. Excessive consumption by people who expect to be able to avoid the repayment (namely, those whose lifetime income is lower than the income threshold for repayment, those who are able to arrange their business affairs to avoid the debt, or who expect to emigrate from the tax jurisdiction).

(ii) *Ex-post moral hazard*. ICL schemes impose higher effective marginal tax rates for recipients who, therefore, have an incentive to not work or emigrate to escape the liability. There might also be an incentive to delay repayment but this depends on the interest rate charged on the ICL.
14.2 Using ICL to fund health care

An income contingent loan used to fund health care services can be seen as a tax that is conditional upon both the level of health care services consumed and the lifetime income earned after the consumption of the service.

Most countries (with the notable exception of the US) offer their citizens some form of taxpayer-funded health insurance. I am going to take the existence of such a scheme as given since I don’t believe ICLs have a role in replacing such schemes.

Health care expenditure has traditionally been seen as an ‘investment’ in one’s human capital. In developing country settings this tends to be very much the case. A life course approach to development shows that lack of access to health care in the young can lead to a reduction in schooling and consequently lower wage rates. For example, Alderman and Behrman (2006) estimate that the returns to taking an infant from low birth weight (weighing less than 2,500 grams) to normal birth weight in a low income country is worth US $510 – of which around half is the increased lifetime wages earned by the child over his or her lifetime. Maternal nutrition, pre-natal care and iron supplements during pregnancy are all examples of interventions that can reduce the risk of low birth weight, but are relatively expensive for a woman.

14.2.1 ICL and out-of-pocket (OOP) health care expenditure

The majority of health care financing systems do not provide complete coverage and individuals are required to make an out-of-pocket contribution. In developing and emerging economies individual out-of-pocket costs can be substantial or even catastrophic (Van Doorslaer et al., 2006) – over 50 per cent in Singapore, India and Vietnam (Chomik, 2013).

Even in the US Medicare system, which provides comprehensive insurance coverage for the aged, Webb and Zhivan (2010) estimate that of the US retiring households, almost 5 per cent may face out-of-pocket medical expenses of one-half million dollars over the remainder of their life.

These large out-of-pocket expenditures mean that cash-constrained individuals, who are unable to afford health care, might forego care that would restore their health and allow them to be productive.

However OOP also has a pro-efficiency role. They are intended to counteract the incentive for over-consumption of health care (that is, consuming beyond the point where marginal benefit is equal to marginal cost) amongst people who are insured. Moreover, since health care tends to be supplied in imperfectly competitive markets, completely insured consumers with inelastic demand will result in higher equilibrium prices (Vaithianathan, 2006). The attempt to mitigate against these problems means that incomplete insurance is offered and most people face out-of-pocket costs of health care.
To develop a framework for analyzing ICL in the context of health care financing, consider two people (low wage and high wage) both in good health. They each face some probability distribution over their health state. Health shocks almost always cause financial distress (that is, short term income or consumption falls), but only some illnesses (we refer to these as chronic conditions such as low birth weight or mental illness) have long lasting effects on labor market participation and hence cause lifetime income to fall. Acute shocks are transitory and while distressing, do not have long term effects on work and wages.

The sort of income contingent OOP that is commonly used in health-care systems means that a low income worker pays lower OOP than a higher income worker. However, such OOP arrangements do not distinguish between low wage and high wage workers. A high wage worker who has suffered a chronic shock (for example, mental health) and therefore suffers a fall in hours employed will be charged the same OOP as a low wage worker who has suffered an acute shock (for example, influenza) and who has no reduction in hours worked.

Now suppose treatment is perfectly effective and no-one is cash constrained. Then since the high wage worker facing a chronic shock receives a higher private return from investing in health (since his lifetime income will increase as a result of treatment), he will benefit more from treatment than the low wage worker with an acute condition.

Now, suppose the workers are both cash constrained so they cannot afford to pay the OOP. There are two ways to address this: one is to lower the OOP; and the other is to offer an ICL. If we lower the OOP, then both the low wage acutely ill workers and the high wage chronically ill workers will purchase more health care. Moreover, even those who are not cash constrained will increase consumption.

An ICL scheme for OOP targets cash-constrained high wage chronically ill individuals who expect to increase their income as a result of treatment. The reason is that the high wage worker with a chronic condition can pay off their loan in the future when their health is recovered and their income is high (and hence their marginal utility of income is low). On the other hand, a low wage worker with an acute condition would not be as willing to take out a loan, because even if they recover, their income remains low and their marginal utility of income high. Simply put, a high wage worker is willing to pay more to re-enter the labor market than a low wage worker is to overcome the discomfort of an acute illness. In this case, a low wage worker who faces an acute health problem will not accept the ICL to pay for treatment whereas a high wage worker with a chronic condition would take out a loan as long as the interest rate was lower than the labor market returns from treatment.

There is however one problem and that is a third type of worker (call them a very low wage worker) who expects their lifetime income not to be high
enough to be ever required to pay back the loan. Such a worker will also be attracted by the ICL since it provides them with an effective subsidy via an unpaid loan.

One of the challenges for policy-makers in implementing an ICL is this type of ex-ante moral hazard, where people who anticipate that their lifetime income would not meet the threshold for paying the loan, would then receive an effective subsidy for health care expenditure. As Chomik and Piggott note (see Chapter 15, this volume), government’s ability to collect against the estate would mitigate this ex-ante moral hazard problem somewhat (as long as there was a positive bequest motive). Restricting the loans to young people or requiring siblings or children to be cosignatories are also strategies that could be explored.

This suggests that ICL together with OOP might help distinguish between workers who are cash-constrained and those who are not; and those who want treatment for curing an illness which causes distress but not a reduction in paid work versus those experiencing an illness that causes them to reduce hours of work.

So far we have assumed that the outcome of treatment is certain. In general the outcome of treatment is risky and there is some probability that treatment will not be successful in which case a high wage worker could not return to work. One would ideally want to purchase insurance against the outcome of treatment (or preferably, one would want to pay for outcomes and not for treatment per se). An ICL would provide such a mechanism in that repayment would only be necessary when outcomes were achieved.

This would have two effects. First, it would provide the direct utility of an insurance contract. Second (and more importantly), it would improve allocative efficiency by increasing the consumption of treatment (which might be more effective) but with more uncertain outcomes.

14.2.2 An example: paying for Talking Therapy for mental illness.

In 2012 I completed an analysis of the costs and benefits of talking therapies such as cognitive behavioral therapies for people with diagnosed mental health disorders (Vaithianathan, 2012). Talking therapy provides a good example of a situation where an ICL might be effective.

Mental illness is a major source of disability amongst the working age population in New Zealand. The employment rate of working-aged people in New Zealand with a mental illness diagnosis is only 32 per cent, compared with 69 per cent for the rest of the population. People with a diagnosis of mental illness are also four times more likely to be on a sickness, invalid, or unemployment benefit than people without a diagnosis. Talking therapies, or psychological therapies, are based on psychological concepts and theory, and are designed to help people understand and make changes to their thinking, behavior and relationships in order to relieve distress and support recovery.
We estimated that talking therapy sessions cost an average of NZD 1,139.20 per user. However, using the best available evidence on the efficacy of talking therapy, we calculated that a person earning a median wage would be expected to earn an additional $9,193.78 in wages and reduced absenteeism over the course of the following two years.

Most health care systems are reluctant to fund talking therapies because the outcomes are highly uncertain, and success depends on the motivation of the client, the skill of the practitioner, and whether the particular condition is suitable for the treatment. Individuals suffering from mental illness may be cash constrained, and being risk-averse, might be reluctant to pay for counselling with an uncertain outcome (compared to say taking medication which has more certain outcomes).

Subsidising such services might lead to excessive consumption from people who obtain a consumption benefit but not an increase in income. An ICL scheme which funds talking therapy might be more acceptable.

### 14.2.3 Other possible examples

#### 14.2.3.1 Paying for investment in child health which is contingent on maternal income

There is considerable evidence, at least in advanced economies, that poor child health has a negative impact on maternal labor force participation, especially when the illness is chronic, time-consuming and follows an unpredictable course (Gould, 2004). Sole mothers often find themselves cash constrained. While many countries respond to the crucial role of child health in development by prioritising treatment for children – there might nonetheless be a residual role of ICL to cover a broader range of health improving investments. For example, insulation of a house for children suffering from asthma or Chronic obstructive pulmonary disease might reduce infections and increase maternal labor force participation. Such expenditure will generally not be paid by health care systems because it is not seen as treatment *per se* and it would be difficult to distinguish between those who insulate their house for other reasons apart from health.

#### 14.2.3.2 Paying for end of life care and nursing home care using children’s income

Many adults find paying for care for ageing parents burdensome. Elder care has been found to have negative consequences on the workforce participation of females in countries such as China (Cook and Dong, 2011). However, a woman’s temporary exit to care for elderly parents and parents-in-law might cause long term impacts on her life time earnings. Therefore, paying for nursing care might be seen by the woman as an investment which allows her
to stay in the labor market. An ICL program for eldercare might be one way of providing funding.

14.3 Conclusion

I believe that there are situations in which ICL could be explored for health care. The open question is how exactly ICL would differ from the current set of rich health care financing instruments that are available to governments. I believe that ICL does offer an opportunity in emerging economies where access to health care continues to be a serious problem and where it is not feasible for there to be universal health insurance. ICL relies on a robust tax administration system – but with improvement in tax record keeping and electronic filing, it is likely that the administration of an ICL system will become feasible for most jurisdictions.

References


We broaden the idea of an income contingent loan to one which takes account of resources more generally – a resource contingent loan (RCL). We then use Australian policies and policy proposals directed towards the country’s ageing demographic to illustrate how the idea of an RCL is more general than might be thought at first sight. The Age Pension, and the proposal to use housing equity drawdown to finance aged care (a kind of reverse mortgage) are two policy paradigms that fit the pattern of an RCL. The emphasis on age-related programs is deliberate – demographic change implies increasing public expenditure relative to GDP, and policy designs which work to contain these outlays will become increasingly important as populations age.

15.1 Introduction

Income contingent loans (ICL) have become a generic policy design following the innovative development of the Higher Education Contribution Scheme (HECS) by the Australian Government some 25 years ago. While the basic idea has a long history (for example Friedman, 1955), and there have been many papers analysing both implementation and impact, formal analysis of the policy category has remained elusive and its distinction from other transfer mechanisms not clearly understood.

In trying to identify which specific characteristics of an ICL make it different from other policies and products it is worth discussing broader resource contingent, or even event-contingent transfers, which might, for example, take account of wealth as well as income (we call this broader category a resource contingent loan [RCL]). In doing so, it becomes evident
that other existing policies can serve as examples of an RCL, with similar mechanisms and design considerations despite features that are different from those implied by the use of the terms ‘income’ and ‘loan’.

In what follows we use Australian policies and policy proposals directed towards the country’s ageing demographic to illustrate how the idea of an RCL is more general than might be thought at first sight. The Age Pension, and the proposal to use housing equity drawdown to finance aged care (a kind of reverse mortgage), are two policy paradigms that fit the pattern of an RCL. The emphasis on age-related programs is deliberate – demographic change implies increasing public expenditure relative to GDP – and policy designs which work to contain these outlays will become increasingly important as populations age. Australia’s Age Pension provides transfers contingent on income and assets means tests. Once access age is reached, all residents receive a pension subject to means tests. Recent aged care funding proposals in Australia involve a resource test and the likelihood of a forced sale of or the reverse mortgage of an individual’s house.

Below, we summarise the key concepts related to RCLs and demonstrate how these can also apply to the Age Pension. We then examine how reverse mortgage type arrangements for financing aged care (long term care) would work as an RCL. Finally, we speculate on how the introduction of heterogeneous preferences may be germane to any formal analysis, and may change results.1

15.2 Conceptual framework

Direct government intervention in financing household needs can take two general forms2 (see Figure 15.1). Government transfers can act as a grant or subsidy on the one hand or as a resource contingent loan on the other. The rationale for intervention in the form of a subsidy or grant is usually based on equity considerations. Rationale for government financing where a repayment of the initial transfer is required can be made on both equity and economic efficiency grounds. Whenever the government employs a resource test alongside a payment it is effectively operating an RCL – a transfer is offered but taken away as the recipient has access to some threshold level of private resources.

The following sections discuss the similarities and differences between standard ICLs, means-tested pensions, and aged care related reverse mortgages with reference to this framework.
15.3 How similar are education-related ICLs and means-tested pensions?

Government intervention in financing education or pensions is likely to rest heavily on concerns about equity (and positive externalities) and involve subsidies and grants. Indeed, a significant part of government intervention in education takes the form of subsidies to the sector, which makes education cheaper for participants. The Age Pension acts primarily as a grant, with 46 per cent of the Australian pension age population receiving the full benefit in 2010, or 60 per cent of those receiving any Age Pension (Commonwealth of Australia, 2012), although reliance on a full pension is expected to reduce in future.

But intervention in these areas also takes place because private markets fail. Markets often fail because the common information requirement is violated, so intervention regularly relates to problems of adverse selection, moral hazard, and the ability of private agents to handle the associated risk. For example, as Chapman (Chapter 1, this volume) and Barr (Chapter 5, this
volume) point out, educational investments are particularly risky as a result of limited information on likely labor market and income outcomes at the aggregate and individual level, the inability for prospective lenders to monitor eventual income, lack of economies of scale required for administering collection, and, importantly, the absence of loan collateral. Similarly, there are deficient markets in the provision of annuities in Australia, as elsewhere, which may justify government intervention in retirement provision.

Adverse selection and moral hazard both follow from asymmetric information. Adverse selection occurs before the contract – it is driven by the circumstance that buyer and seller hold differential information relevant to the contract. In the case of annuities, the annuity purchaser may have more information about his or her life expectancy than the insurer. Moral hazard refers to the circumstance that the insured may behave in ways to increase the probability and/or magnitude of payouts, outside the knowledge or control of the insurer.

Both adverse selection and moral hazard are present in private annuities markets, but adverse selection is far more important. Moral hazard in this context would involve people behaving to extend their lives to increase the annuity payout, but this probably occurs only to a very limited extent. Adverse selection, however, is a perennial inhibitor of annuities markets. If purchasers know more about their life expectancy than insurers, then absent mandatory annuitisation, good risks (which in this context are people likely to die sooner rather than later) will be priced out of the market. This idea is familiar from the context of health insurance, and motivates health insurance regulation, including especially community rating of premiums.

The Australian Age Pension is a transfer potentially available to everyone who has reached the access age, subject to a means test. If we treat the Age Pension as a longevity insurance instrument, then the mandatory nature of the Age Pension implies that adverse selection is contained. But the means test introduces moral hazard. Undoubtedly, some people change their behavior to increase their Age Pension payouts – by working less, and saving less, than they otherwise would.

Where an intervention takes the form of an RCL, participation in the scheme depends on some initial trigger. For example, starting a university course enrols individuals into the ICL associated with higher education and turning age 65 will mean that an Australian with residency of over 10 years will be eligible for the Age Pension. The policy design which determines participation in the scheme can have an effect on the level of adverse selection. While educational debt is based on the choice of entering university and of not paying fees up-front, there is little choice involved in turning 65.

This suggests that there may be adverse selection in financing education that is not present with age pensions, a key distinction between these two examples. The extent of adverse selection across different types of RCLs is
likely to vary dramatically with the level of mandated participation. For example, a discretionary educational expenses loan, that operated in Australia but is now discontinued (the Austudy Loans Supplement, 1994-2003), had lower levels of participation than the main loan scheme for educational fees, into which every university entrant was enrolled. The educational expenses loan consequently attracted higher risk borrowers and resulted in much lower levels of repayment than the educational fees loan (Chapman, 2010).

Once people are participating in the scheme, the question of repayment is prescient. There are various design features that can affect the mechanism of this trigger, which change the levels of moral hazard and the probability of eventual repayment. For example, lowering the income or asset threshold at which an educational loan starts being repaid, or an age pension starts being reduced, will increase repayment. If the resource test includes the couple’s or household’s income rather than just one individual it may be more difficult to avoid repayment, a point stressed by Higgins (Chapter 10, this volume) for extensions of ICL to paid parental leave. And if the resource test results in high effective marginal tax rates, such as it may from high repayment burdens or pension taper rates, it could increase the likelihood of moral hazard (less work and/or saving or anticipatory spending/gifting of private assets to increase pension eligibility).

While there are several similarities in the general design of repayment mechanism for standard ICL and means-tested pensions, there is one key distinction relating to the accounting period for repayment. If an individual with student debt has previously earned income below the set threshold and starts earning above the threshold, she still has the full amount of the total transfer to repay. A pensioner, on the other hand, who experiences an income or asset windfall, can pocket past transfers and only makes a repayment on the funds transferred in the year or years in which she has resources above a threshold.

Both examples can still be thought of as RCLs, but because of the difference in accounting period, means-tested pensions, as they are currently designed, may need to be thought of as term-RCLs, issued on a periodic basis. This difference is likely to be overstated, however, since the drawdown of most private resources that retirees have access to will be ‘front loaded’ and will reduce pension payments at the beginning of retirement before such resources are exhausted. If retirement is an absorbing state, then, windfall gains aside, a means tested age pension shares much with an RCL. This is probably true of many means tested programs focused on older cohorts.

What becomes evident from this exploratory discussion is that a means tested instrument, such as Australia’s Age Pension, can act in a similar way to an RCL. In administrative terms, Canada’s Old Age Security pension (OAS) mimics an ICL even more. Like in Australia, all Canadians over the age of 65 who meet the residency requirements are eligible for the OAS. Unlike in...
Australia, all those eligible receive the full amount of pension but it is ‘clawed back’ through the tax system at the rate of 15 per cent if total income exceeds a set threshold (CAN$67,688 in 2011, Social Security Association, 2011).

15.4 Aged care and reverse mortgages

Another helpful example of RCLs is the proposal in Australia to fund aged care by accessing housing equity. Aged care services can take the form of community support for ageing at home, but we will focus here on residential care. Access to residential care is usually determined by testing applicants on an Activities of Daily Living (ADL) metric, and a threshold score is the trigger for access to such facilities. Government funding is based on an asset test, and the Productivity Commission (2011) proposed that repayment take place through a publicly run reverse mortgage (RM) scheme.

Since participation in the scheme is based on an ADL assessment and the choice to apply for government funding, the scheme will include those who do not own a home or have already accessed its equity. As such, those who will never ‘repay’ the government aged-care transfer because of an initial lack of home equity may be over-represented in the scheme.

In an RM scheme, the repayment does not take place until the homeowner or their partner die or vacate the home, at which point the residence may be liquidated to repay the debt. The borrower is guaranteed tenure in his or her house until death. A RM loan is ‘non-recourse’ – that is, no other asset may be accessed by the lender to reclaim their loan. The lender therefore faces the risk of not recovering the full value of their loan despite it being collateralized by the equity in the home.

For several reasons, including the rising debt balance through time, accumulating drawdowns, and the ongoing accrual of interest, RMs can be expensive. Consequently, some retirees’ estates will be significantly diminished as owners borrow against their home equity during their lives. There is a risk that the value of the transfers for aged care will come to exceed the value of the property at the time of sale (so-called ‘cross-over’ risk), and the accruing interest rate charged reflects this risk.

Unlike means-tested age pensions where it is possible to escape the repayment of past transfers, reverse mortgages ensure that as long as the total value of the resource being tested is greater than the total eventual transfer, repayment will take place in full.

15.5 Non-standard preferences

One of the more frustrating aspects of the economic analysis of policy is that analysis is executed as though individuals behave rationally with respect to life cycle choices, when, often, the policy itself was introduced to address the
economic and social consequences of substantial numbers of people not behaving in this way. The classic example is social security, but human capital investment and other lifetime decisions, such as fertility, will also be affected by non-standard preferences. In formalising the analysis of resource contingent loans, it would be interesting to examine the implications of non-standard preferences, since they may act to differentially impact groups with different preference types.

It has been well-documented in the public finance literature that alternative (irrational?) preference specifications may be binding, in the sense that they induce optimal behavior that departs considerably from what is expected from agents endowed with standard preferences. As a result, careful fiscal policy evaluation requires the consideration of alternative preference specifications. Consider how standard analysis of a means tested age pension would be changed in a model with heterogeneous agents, some with self-control preferences (unlikely to invest in education, unlikely to save for retirement) qualifying for the age pension and others with standard preferences. The former group is unlikely to respond to and be affected by the incentive effects of introducing an age pension. Many in the latter group may be above the pension threshold. Imrohoroglu et al. (2003) and Fehr et al. (2008) use time-inconsistent preferences, Kumru and Thanopulos (2008) and Bucciol (2008) use self-control preferences to highlight that Pay As You Go (PAYG) social security welfare may be critically affected by preference specification.

Analysing various social insurance and tax policies in an environment where a proportion of individuals suffer from self-control problems is not only important for testing the robustness of the results of earlier studies, but it is also important to understand the underlying mechanism that can be used to address problems generated by individuals’ self-control problems.

15.6 Concluding remark

These comments have sought to demonstrate that ICL are part of a family of a broader class of government instruments that serve to support families and households, on the basis of some kind of payback contingent on resources being available. Such policies certainly have a place in a society with an ageing demographic, in which public liabilities linked to an ageing population will inevitably increase as a proportion of GDP.

Notes

This paper is based on notes initially prepared for the International Economic Association Roundtable on Income Contingent Loans, Bangkok, 16-17 March 2013. We acknowledge CEPAR support under Grant CE110001029.
1. Denniss (Chapter 22, this volume) also discusses the potential for extending the concept of income contingency to wealth contingency, and uses reverse mortgages as one of a number of examples.

2. This is in addition to acting as a guarantor in the private market.

3. Assuming we are thinking about the nominal amount and ignore value erosion due to interest rate arrangements.

4. Conceivably, pensions could be designed to claw back past years’ payments.

5. Standard ICLs also have a yearly accounting cycle that can result in more repayment from people who have lower expected lifetime income but which in some years strays above the repayment threshold compared to people who have higher expected lifetime income which remains consistently below the threshold.

6. This tends not to be true of the principal residence, but such housing is exempt from the Age Pension means test.

7. However, the level of adverse selection may be limited because age care quality available through basic government funding may be lower than that available with higher reverse mortgage funding.

8. RMs can also be for a fixed term, but these are less common since they can necessitate the sale of the residence while the borrower is still alive: a considerable upheaval.


References


16

Income Contingent Loans for the Unemployed: A Prelude to a General Theory of the Efficient Provision of Social Insurance

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16.1 Introduction

Income contingent loans (ICL) have mainly been discussed in the context of the finance of education. But, in fact, they are equally relevant whenever there is a simultaneous need for smoothing across states of nature and over time. This chapter explores in detail one such application, to unemployment.

Some macro-economists have tried to argue that the costs of business fluctuations are small (Lucas, 1987), using models where there are perfect capital markets, and ignoring the differential effects of business cycles on different individuals. Were those assumptions correct, the conclusions might be correct, but then economic downturns would not be the subject of such concern among the body politic. But they are, and rightly so.

Most bouts of unemployment are relatively short, and represent a relatively small diminution in an individual’s lifetime income. Nonetheless, unemployment can have severe welfare consequences, because individuals cannot easily smooth out the shortfall of income that occurs during such episodes. There are both institutional and economic reasons for the inability of individuals to smooth. This is especially the case when unemployment occurs early in life, before individuals have had a chance to build up their savings. But with social security taking on such an important role in the provision of retirement income for individuals in the bottom half of the income distribution, they can’t draw upon these savings to help smooth out their consumption even
later in life. Individuals save less for their retirement, and hence have less of a savings buffer to protect them against an episode of unemployment.

Governments have typically imposed restraints on individuals using their social security retirement income as collateral against borrowing, even in the case when individuals are unemployed. And for good reason: they worry that individuals may borrow excessively from their retirement funds, leaving them destitute in old age. This would defeat one of the main purposes of compulsory retirement savings programs – to ensure that individuals don't become a public burden in their old age. Modern societies know that they can't simply ignore such destitution no matter how it originates, so they take strong actions to prevent the occurrence.

Typically, the risk associated with an episode of unemployment is thought best dealt with through unemployment insurance (UI), not loans. But UI has been criticized because of its adverse incentive effects. It would be preferable (so it is conventionally argued) if individuals smooth their own consumption, self-insuring, using loans to do so if they have not previously accumulated savings, rather than relying on market or publicly provided insurance. Doing so would avoid the adverse incentives. For most individuals, the fraction of lifetime income that is lost as a result of episodic unemployment is small, so that individuals are close to risk neutral with respect to such losses.

To understand the above, consider an individual with a single bout of unemployment lasting six months who would have worked for 45 years; such an individual would lose just over one per cent of his or her lifetime income, if income were constant and we ignore discounting. With low real interest rates but normal wage profiles, the fraction of lifetime income lost with a bout of unemployment early in life is even smaller. With combined (employer and employee) social security payments of, say, 12 per cent a year, at the point of retirement (again ignoring interest) the individual would have a savings account of 540 per cent of annual income (assuming constant income), far more than should be required as collateral on a loan covering a half year's unemployment.

All of this would presumably work out if there were perfect capital markets. The problem is that, with imperfections in capital markets, temporarily unemployed individuals who have not accumulated savings are forced to cut consumption. Several studies (Chetty, 2008) have shown that the liquidity constraint is one of the most serious difficulties facing unemployed individuals. But allowing borrowing against one's retirement savings can effectively 'resolve' the market imperfection created by capital market constraints.

In a model where the unemployment shock is small (so that there is no risk of default associated with loans), Stiglitz and Yun (2005) show that under seemingly fairly weak conditions and provided that the duration of unemployment is limited, self-insurance through borrowing (for example,
against future retirement benefits), could enhance the welfare of workers by providing them with intertemporal income smoothing without attenuating incentives. The optimal mix between loans and insurance always entails a positive amount of loans, collateralized by pension savings: Contrary to current practice, individuals should be allowed to borrow at least a limited amount against their future retirement benefits when they are unemployed. There should not be complete reliance on UI. Indeed, when unemployment risk is negligible compared to lifetime income, there should be no reliance on UI. Since there is negligible risk to lifetime income, the only market failure is related to the inability to borrow, and government loan programs should be relied upon.

There are two reasons that government loan programs (for example, enabling individuals to tap into their retirement accounts) do not fully address the problem of unemployment. First, while government loan programs provide intertemporal consumption smoothing (which would not otherwise be possible given capital market imperfections), with little incentive cost they do not provide any interstate consumption smoothing (that is, insurance across states of the world where there are episodes of unemployment). This is unimportant if an individual faces a single short episode of unemployment, since the impact on an individual's lifetime budget constraint is, as we have seen, relatively small, but it is important if there are large unemployment shocks, for example, extending cumulatively over a significant fraction of an individual's working life.

Of course, early in an individual's life, the individual doesn't know whether a particular episode of unemployment will be a small, isolated one, or whether he or she will be unlucky, and face many other bouts of unemployment. So even early in life, with the first small bout of unemployment, the individual has to contemplate the possibility of larger 'losses'. Unemployment insurance provides interstate smoothing, but with some incentive costs. This suggests that a desirable form of income support for unemployed individuals may involve a combination of loans and UI benefit, which is what Stiglitz and Yun (2005) established.

However, when there is a risk of extended unemployment, the benefits of loans may be limited. With extended unemployment, there is the risk that the borrowing against retirement savings required to smooth consumption results in individuals depleting their pension accounts. If the individual faces a series of bouts of unemployment, the obligations undertaken in a conventional loan would impose extreme hardship later in life. The benefits of improved incentives (relative to a conventional insurance program) may be outweighed by this adverse effect. An income contingent loan program provides a resolution to this apparent dilemma: in the event of these adverse outcomes, some, or all, of the loan would be forgiven.
Income contingent loans can thus be thought of as a ‘compromise’, providing better incentives than a pure insurance program, but far better risk sharing than a conventional loan program. Moreover, the risks that they insure against are quite different: unemployment insurance is insurance against a current risk – the risk of being unemployed today. Of course, the conventional UI program also provides insurance against the future risk of being unemployed at some date in the future. An unemployment ICL provides money today in the event of a bout of unemployment, with the repayment contingent on some future risk. It is, then, essentially a ‘compound’ insurance policy and, as a result, the incentive effects differ.

Better risk sharing itself cannot only improve the well-being of risk averse individuals directly, but it can also improve the efficiency of the economy. Risk averse individuals will be tempted to accept any job offer, no matter how badly matched it is to their skills and preferences, lest they face the prospect of unemployment. With ICL, the risk of continued search is shared: if the individual is successful, part of the gain accrues to the loan fund. ICL in this context are in effect ‘equity’, and there is a large literature explaining why equity contracts are superior to debt contracts in sharing risk and therefore in encouraging activities with high returns and high risk.

One might ask, if ICL are so desirable, why hasn't the market provided them? (For more discussion on this point for ICL generally, see Quiggin, Chapter 20, this volume.) There are a number of reasons related to the similar question, if UI is so desirable, why doesn't the market provide it? A reason is that private provision suffers from adverse selection; government can force a pooling equilibrium, avoiding the incentives and associated costs that arise in private insurance markets to cherry-pick, to differentiate among individuals who may face differential risks.

But as in other areas of ICL, government provision benefits from another distinctive advantage: lower costs, since tax authorities can simultaneously verify income and collect what is due (see Stiglitz, Chapter 2, and also Denniss, Chapter 22, this volume).

### 16.2 The optimal design of income contingent loans

So far we have explained why it makes sense to make the repayment of a loan made to enable an individual to manage his or her way through a bout of unemployment contingent on income. That leaves open the questions of the design of the ICL and the balance in any unemployment program between insurance and loans.

Conventional educational ICL are in fact highly ‘non-linear’. Repayment is not just proportional to (lifetime) income. There is typically a cap on repayment limited to the amount borrowed plus interest, for those who manage to do very well; and for those who do very poorly, the remaining debt
is typically forgiven after, say, twenty years, or on death. Here, we explore a similarly non-linear contingent loan scheme, where if the individual is very unfortunate, experiencing a series of bouts of unemployment, all or part of the debt is forgiven. (We sometimes refer to this provision as a ‘bailout’.) This addresses one of the criticisms most often leveled against programs that would provide for intertemporal smoothing by allowing borrowing against social security savings (which, for many individuals, is the only form of financial savings they have), a criticism that we noted earlier, which is that such borrowing would increase the risk of old-age poverty and destitution.

16.2.1 The role of income contingent loans in an unemployment program

We argued earlier that when the risk associated with unemployment was small enough, the optimal unemployment program entailed only loans. There was no real need for interstate smoothing, and intertemporal smoothing was best done through a loan program, which would ensure full incentives.

But when risks are not small – where there is, for instance, some prospect that an individual will be unemployed for a non-negligible fraction of his or her life – then the unemployment program should entail a mix of UI and ICL. This chapter and the more formal paper on which it is based (Stiglitz and Yun, 2013) discuss the optimal mix. We explain, for instance, that this mix should vary over the individual's lifetime, and depend on the individual's work history and on the elasticity of search – how much individuals change their search intensity in response to incentives (that is, on the size of the moral hazard problem).

Obviously, in the absence of any incentive effects, the optimal design of the unemployment program focuses only on risk sharing, and so there is need only for an insurance program providing interstate smoothing (with the presumption that if the market understood that the government would provide full interstate smoothing, the market would provide full intertemporal smoothing; if the market failed to do so, the government would also have to engage in intertemporal smoothing).8

One of the factors that makes the analysis of the optimal unemployment program with ICL so difficult is that making loans income contingent improves interstate smoothing, but precisely because it reduces the penalty associated with not getting a job, has adverse incentive effects: there is the familiar trade-off between risk reduction and incentives. Not surprisingly, when the risk is high enough (that is, the variability in consumption across states is large enough) with the optimal conventional loan program, then it is optimal to provide some debt forgiveness, even though there will be some adverse incentive effects.
16.3 The critical role of cross-market and cross-instruments externalities

Central to our analysis is an exploration of cross-market and cross-instrument externalities. We focus on the moral hazard (adverse incentive) effects that arise in labor and capital markets, and their interactions. The provision of loans at one date affects search at not only the same date, but other dates, and especially if loans are income contingent. As we have noted, an income contingent loan at any date affects the cost of being unemployed, and thus adversely affects search. If an individual experiences a loss of a job at a later date, but has an overhang of debt from a previous bout of unemployment, incentives to search will be attenuated by the knowledge that that debt will be (partially) forgiven if the individual does not get a job. The fact that incentives can be adversely affected means not only that the likelihood that loans will not be fully repaid is increased, but also that there will be greater losses in the unemployment insurance program. (The individual does not take into account either of these in making search decisions.) These externalities, which we refer to as cross-instrument externalities, are important in shaping the optimal unemployment program, as the analysis below will explain in greater detail.

But just as one government program (government provided income contingent unemployment loans) affects another government program (unemployment insurance), private savings and borrowings affect the (marginal) benefits and costs to government UI and loan programs. In particular, actions individuals take in private capital markets (both savings and borrowing) exacerbate the adverse incentive effects associated with government unemployment programs. For instance, in earlier periods, individuals save too much, not taking into account the adverse effects of such savings on search, and therefore on, say, the UI system. And were private capital markets to work in ways consistent with rational expectations, there would be excess lending in earlier episodes of unemployment, because the private sector would not take into account the effect of such borrowing on search in later periods.

On the other hand, a non-market group (such as a family or village) that has a superior monitoring ability (to that of government or markets) and a sense of peer pressure among its members, can through loan-cosigning mitigate the adverse incentive effects, improving welfare. The informational advantage and the peer pressure associated with a non-market group can interact with each other, leading to an equilibrium where loans for one member are voluntarily cosigned by another member. This equilibrium can be Pareto-superior to one without cosigning. In these situations, there is a positive externality between individual actions and government programs.
16.4 Basic results

In the appendix we summarise a simple three period model, in which individuals can be unemployed in either the first or second period, or both, and are retired in the third. Search in each period can be modeled in a particularly simple way: if the individual searches, he or she finds a job, but has to decide on whether to search; different individuals randomly face different search costs, and in making a decision about whether to search or not, they assess the expected benefits with the costs. The cost-benefit calculus depends, of course, on the unemployment program, the mix of unemployment insurance and loans.

With this approach a change in the unemployment program may induce more or fewer people to search, with the percentage increase in the number of people searching depending on the search elasticity. In the event that an individual is unemployed in the first period, the second period, or both periods, the unemployment program consists of: insurance benefits, which provides income the individual receives that doesn't have to be repaid; and loans which do have to be repaid, in full or partially (contingently) out of retirement benefits. We assume that each loan program (to those who are unemployed when young and to those who are unemployed when old) is self-sustaining, that is, they charge an interest rate high enough to recuperate returns actuarially. And we assume that the UI program is financed by taxes on those who work.

16.4.1 First best allocations

With perfect information, the optimal allocation is relatively easy to describe: (a) those with low search costs (below some critical threshold) will search and those with high search costs will remain unemployed: and (b) income will be smoothed over all states and times. In particular, assume that at each date the utility function is separable between consumption and search costs, that is $W = U(C) - e$ where $C$ is consumption, $e$ is expenditure on search, $U$ is the utility associated with consumption $C$, and $W$ is overall utility, depending on the level of consumption, $C$, and the level of expenditure on search $e$. (This implies that having to spend more effort at search has no effect on the marginal utility of consumption.) Assume moreover that there is complete separability in utility between different periods – so consuming more or searching more at one date has no effect on the marginal utility of consumption at another. We also assume that the utility $U(\cdot)$ of consumption at each date is the same – young people and old people get the same ‘utility’ out of the same consumption and that the time-preference rate and interest rate are equal to each other (which are assumed to be zero in the model). Under these conditions, there will be perfect smoothing of consumption across states and times. Smoothing requires the marginal utility of consumption to be the
same in all states and all times, and under the special assumptions above, that entails the same level of consumption at all times and all contingencies. In this first best world, workers don't have to be motivated to work. Since the costs of search are observable, we get the efficient outcome, where workers agree to work when it is socially optimal for them to expend $e$ to find the job, that is, when the benefits of the job exceed the costs of search.

This simple model illustrates strongly the limitations of the Arrow-Debreu securities framework: there would have to be an Arrow-Debreu state contingent security for each unemployment shock and each outcome of the draw of search costs. The key failure is the lack of observability of search costs, which gives rise to the moral hazard problem.

Since $e$ is not observable, unemployment benefits can only be based on the observable variable, which is whether the individual is unemployed. And that means that were we to offer the UI benefits implicit in the first best allocation, individuals with search costs just below the critical threshold would not search; they would receive no consumption benefits, but have to bear the costs of search. As usual, the consequence of moral hazard is that the insurer (here the government) only provides partial insurance. And it is why, if the risk is small, individuals should self-insure. But as we noted, this chapter is about non-negligible risks in which self-insurance is not optimal.

16.4.2 Optimal provision of income contingent loans and unemployment insurance

If there were only one episode of unemployment, say early in life, we can easily describe the optimal unemployment program. There is partial insurance, because we want to motivate more search than would occur with perfect insurance. But partial insurance in the presence of imperfect capital markets means that the individual faces far more consumption volatility than is optimal: consumption is highly constrained in the first period.

In this situation a loan program helps smooth consumption over the individual's life. It is clear then that, in general, one would want to supplement the unemployment insurance with a loan. But there are incentive effects even of a loan program: because a loan reduces the cost of not getting a job, it leads to less search, which imposes a cost on the unemployment program; hence, the optimal loan will also depend on the search elasticity. And it will also depend on the curvature of the utility function: the greater the curvature, the greater the benefit of intertemporal smoothing. But the greater the curvature, the greater the incentive to search provided by risk aversion.14

If there were only one episode of unemployment, but it occurred later in life, we can again easily describe the optimal unemployment program and, as before, we will want partial insurance. However in this situation, a loan program can't achieve quite the same degree of smoothing. When the unemployment occurs early in life, consumption can be potentially smoothed
over all three periods. Because of our concern about incentives, however, we may leave consumption in the first period at a level below that of the last two periods, should the individual not experience the unemployment shock. When the unemployment occurs later in life, we can't go back in time. In earlier periods, the individual will have recognized that there is a risk of unemployment, but if that risk is small, he or she may make only limited provision. This provision is referred to as precautionary savings.

Thus with this situation, consumption in the first period will be higher than in the last two periods in the event of unemployment later in life. Now, the loan in the second period is simply intended to smooth out consumption between the retirement period and the last period of his or her working life. Again, there are the same kinds of benefits and costs of such smoothing (costs in terms of reduced incentives for search) as in the case when unemployment occurs in the first period. But it should be noted, both because the elasticity of search may differ when unemployment occurs in different periods, and because the benefits of smoothing differ as well, there is no reason that the unemployment package – either the amount of insurance or the size of the loan – should be the same. It follows that the unemployment program should be contingent on age (the point in one's life that one experiences the unemployment episode).

16.4.3 Cross-markets and cross-instruments externalities

Even in this simple case there are cross-period externalities. By saving more the first period, the individual is better protected against an unemployment shock the second period. The result is that individuals near the threshold search costs will be induced not to search – imposing costs on the unemployment insurance system. If savings were observable and government could tax savings (and this were the only reason for savings), it would be desirable for the government to discourage this savings.

By the same token, if an individual who is unemployed the first period could get a loan, it would affect search incentives (since the penalty of not getting a job is reduced) and thus the losses borne by the unemployment insurance program. So again, if loans were observable, and government could tax these ‘unemployment loans’ (and separate out these loans from other loans), it would be desirable for the government to do so. But, of course, this can’t be done.

The critical idea is that loans and insurance need to be seen as interactive, in some ways complementing each other, in some ways substituting for each other. Search is affected both by insurance and loans, since each reduces the penalty of not getting a job. Each imposes a cost on the other.

There are externalities both cross-instruments and cross-periods. If an individual faces an unemployment shock later in life, but has an outstanding loan as a result of an earlier unemployment episode, it affects search in that
later period. Because now the penalty of not getting a job is even higher, the individual is more likely to search. And an awareness of the consequences of a later potential episode of unemployment affects his or her search behavior earlier in life.

The possibility that there can be two episodes of unemployment thus raises two further issues: (a) more extensive cross market (cross-period) and more complicated cross-instrument externalities; (b) in the event that the individual has two episodes of unemployment, it may be optimal not to repay the loan fully – it is optimal to have income contingent loans.

We can ask: (a) how does the mix of unemployment insurance and loans change over an individual’s life?; (b) how does the mix of unemployment insurance and loans depend on various parameters, like the search elasticities in different periods?; and (c) how does the optimal unemployment program change when we move from ordinary loans to income contingent loans? Each of these turns out to be complicated, largely because of the cross-period and cross-instrument externalities, because, as we have noted, the unemployment program (loans and insurance) each period must take into account the effect of the program on search behavior in other period(s).

To get some hints at the answers to these questions, we need to take a closer look at each of the externalities described above. Consider a situation where we do not need to employ income contingent loans. Assume, say because the search elasticity is low, the amount of insurance in the event of a first period episode of unemployment is high, and there is little reliance on loans in the first period, so there is no need for debt forgiveness if the individual experiences a second episode of unemployment. But providing first period loans decreases unemployment in the second period, as we have already noted, because the cost of not getting a job is increased: the optimal first period program must take that into account. This implies that, especially if the second period search elasticity is large, because of the cross-period externality, first period loans will be larger than they otherwise would be, and the insurance component of the unemployment program will be smaller. This effect will be larger the greater the likelihood that the individual faces two episodes of unemployment, that is, the higher the correlation across unemployment episodes.

At the same time, individuals in making their search decisions in the first period, look forward to the consequences of not searching this period, and in particular, to the possibility that they might be unemployed in the next period as well. The consequences of that second episode will be greatly mitigated if there is very good insurance in the second period, for example, because there is a very low search elasticity for those with two episodes of unemployment. But that means that the provision of insurance in the second period will have to be sensitive to the impact it has on first period search. Second period
insurance is smaller than it otherwise would be because of the adverse effect of that insurance on first period search.

There is another effect: if the probability of unemployment in the second period is dependent on the work history – if, for instance, an individual who is unemployed in the first period is more likely to be unemployed in the second, or if the costs of search are greater,\textsuperscript{19} then the cost of not getting a job in the first period is greater (than it would be if the unemployment shocks were uncorrelated). Of course, the individual will recognize this, and this will provide motivation to search harder the first period. But in his or her search calculus, the individual doesn’t take into account the social cost imposed on the government through the second period UI program. (This effect is even more important if there is an ICL, because there is then a social cost associated with the first period loan program.)\textsuperscript{20}

In short, because of the cross-market externalities, there is an even stronger presumption than we noted earlier that loans will play a more important role in the unemployment program early in life than in later life.\textsuperscript{21}

Matters get even more complicated once we introduce income contingent loans. If the amount of outstanding loans is sufficiently large, then it is optimal to forgive all or part of the loan if the individual experiences two episodes of unemployment. That is, it is optimal to make the loan an ICL. There is now a new parameter that has to be settled: the fraction of the loan that should be forgiven; and there is a new set of moral hazard issues.

Return to the analysis of the impact of the design of the second period unemployment program on first period search, and assume we have a significant amount of income contingency, that is, large debt forgiveness for someone experiencing two periods of unemployment. A larger first period loan will increase the benefit of not-searching in the second period, that is, the individual will receive a large implicit subsidy. Moreover, the magnitude of the consumption variance should the individual not get a job is reduced (compared to an ordinary loan). On both accounts, second period search is reduced.

On the other hand, one of the major drawbacks in providing (non-income contingent) loans rather than insurance is that, in the event of a second bout of unemployment, individuals could face hardship – depending on the curvature of the utility function, there can be a very large cost associated with insufficient interstate smoothing.

Hence, it is ambiguous whether the optimal first period loan is reduced or increased relative to what it would be without the income contingency provision. If the curvature of the utility function is large and the elasticity of search is low, we would expect loans to play a more important role in the first period, reinforcing the earlier result that we expect loans to play a more important role in the unemployment program for an episode of unemployment early in life.\textsuperscript{22} Whatever adjustment is made to loans, we expect a partially
offsetting adjustment to insurance. For example, if the level of loans is reduced, we might normally expect the adverse effects on interstate and intertemporal smoothing would be partially offset by more first period insurance.23

The reciprocal externalities going the other way are also affected by the fact that loans are income contingent. Consider the individual in the first period; knowing that should he or she be unemployed in both periods, there will be debt forgiveness. The first period loan now has an element of insurance in it. If the individual doesn't get a job this period, and also doesn't get a job next period, it will be (partially or totally) forgiven. Hence the incentive benefit of loans is reduced. This in turn means that there will be fewer incentives for search, and the first period unemployment program (loans combined with insurance) gets cut back. But while loans have less of an incentive effect, the fact that they are income contingent means that their welfare benefit (ignoring the incentive effect) is greater; they not only facilitate cross-period smoothing, but they also enhance cross-state smoothing. It thus may be desirable to increase the amount of first period unemployment loans relative to what they would be without the income contingency provision. This is especially so if the adverse incentive effects are limited. (Depending on the design of the ICL program, this may well be the case. If the expectation on the part of most individuals is that they will fully repay the loan – debt forgiveness only occurs under the worst contingencies – then ICL can be very effective in intertemporal smoothing, with very little effect on incentives (see Quiggin, Chapter 3, this volume); but, of course, under these conditions, there is very little interstate smoothing. The more important interstate smoothing becomes, the greater the potential for an adverse incentive effect.)

The critical parameters determining the nature of the unemployment program in this model are the search elasticities (which we have noted can vary from period to period and can depend on work and search history), the curvature of the utility function (which affects both aversion to risk and the importance of intertemporal smoothing) and the correlation of the bouts of unemployment. With zero search elasticity (no incentive effects), not surprisingly, we get perfect interstate and intertemporal smoothing in this model. Conventional loans allow some intertemporal smoothing, provide no interstate smoothing, but accordingly, do not have the adverse incentive effects associated with insurance.

ICL can, in fact, be thought of as a mixture of a conventional loan with an insurance program – which provides a payout (equal to the amount of loan forgiveness) in the event of two bouts of unemployment (more generally, low income in the future). The new insurance has, like any insurance, adverse effects on incentives – here, we observe on search both periods; and because of the cross-instrument externalities, on the losses experienced in other insurance programs (here, unemployment insurance).24
It is thus apparent that, in general, the nature of the unemployment program should differ not only over the individual’s life, but should also depend on his or her employment history. For instance, loans for the long-term unemployed are zero in this model, as they have no future income to borrow against. On the other hand, as we have noted, loans may play a more important role in the optimal unemployment package for an individual who is unemployed when young than is the case when his or her bout of unemployment occurs when old. Not surprisingly, the mix of insurance and loans depends on the search elasticity and the likelihood that an individual who is unemployed when young will face another bout of unemployment when old, as well as the curvature of the utility function.

16.4.4 Why private savings and loan markets may lower welfare

Earlier, we explained why private savings generates an externality: it induces less search in later periods. The same is true for private loan markets, but the problems are, in some ways, even worse, especially with income contingent loans. We noted earlier that loans, while they facilitate cross-period income smoothing, lead to less search. And so long as there is any UI, less search imposes a cost on the providers of UI. But if there is an ICL program, there is also an adverse effect on the implicit subsidy of the loan – a greater likelihood of the necessity of loan forgiveness as a result of two episodes of unemployment.

If the government can directly intervene in these other markets, to ‘correct’ the externality, it should. But there are good reasons to believe it can’t, or can’t do so ‘perfectly’. In that case, in implementing the optimal package the government needs to take into account the adverse incentive on the part of private markets.

In particular, the optimal design of the unemployment program (the level of insurance and loans, and the extent of forgiveness) will need to respond to the existence of private savings and loan markets. The excessive precautionary savings, while increasing the ability of individuals to smooth out consumption on their own, aggravates incentive costs (when individuals have a large ‘nest egg’, they search less intensively). Normally, we would expect the programs (both insurance and loans) to be reduced, both because the costs of the programs will have increased (because of reduced search) and the benefits are reduced.

Similarly, unfettered markets may offer excessive loans, since lenders will not take into account the adverse externalities to either the public income contingent loans or UI programs. With more private loans, individual incentives to search are reduced. But it would seem that there is some ambiguity about the optimal level of forgiveness, especially if the bankruptcy laws are such as to make it difficult for individuals to discharge their debts. The reason is that the private loans may (when compounded with public loans)
result in further hardship in old age in the event of two episodes of unemployment, and government programs will need to take this into account. Thus, the existence of private loans may, in effect, ‘force’ the government to respond by providing more cross-state insurance through ICL.\textsuperscript{26}

16.4.5 Loan-cosigning in the provision of loans
Faced with the possibility that an individual might not be able to repay, without undue hardship, a loan if facing extended unemployment (in our model, two episodes of unemployment), the government may want the loans to be cosigned by other employed workers. An employed worker who has cosigned a loan with an unemployed worker makes (partially) good on the loan. This provides the employed worker with an incentive to monitor – to ensure that the person for whom he cosigns searches for a job.

An individual who is close to the cosignee, such as member of the same informal group (for example, the same family or close friends) is in a superior position for loan-cosigning for a couple of reasons. First, he or she may be in a position to monitor the actions taken by the cosignee more effectively than others. Second, the cosignee may be subject to so-called peer pressure from an individual within the same informal group.\textsuperscript{27} How much an individual cares about the peer pressure within a group and how much one can effectively control actions taken by the others would depend upon many other factors (cultural ones, for example) exogenous to this model.\textsuperscript{28}

It can be shown that loan-cosigning increases welfare so long as an individual cosigner is better informed of the realized search cost for the cosignee than the government. Cosigning reduces the moral hazard (adverse incentive) problems, implying that the government could offer to those with cosignees better terms for their loans. \textit{Ex ante}, there would be incentives for two individuals in a position to monitor and exert peer pressure on each other to agree to co-sign an unemployment loan, should one or the other of them become unemployed.

16.5 Conclusion
There is little doubt that under current arrangements those who face a bout of unemployment suffer a great deal: there is imperfect consumption smoothing over time and imperfect risk-sharing across states.

Markets, on their own, did not provide UI – government had to step in to fill the lacuna. But government programs have been criticized for their adverse effects on search. In the United States, for instance, normally benefits are cut off after six months because of the concern that extended benefits would greatly attenuate search and job acceptance.

One of the reasons that unemployment extracts such high costs – even when the loss of lifetime income is relatively small, as a result of a short term bout
of unemployment – is that individuals are unable to smooth consumption over their lifetime: capital markets are imperfect. That is why models assuming perfect capital markets ascribe so little cost to economic fluctuations (Lucas, 1987). It was that insight that motivated our earlier paper (Stiglitz and Yun, 2013) which showed that, indeed, if episodes of unemployment are short enough, one could make extensive use of loans: a well-designed government loan program could ensure income smoothing without the attenuation of incentives, while only a limited UI program might be needed. In fact, however, most advanced industrial countries do not make use of loans, whereas Singapore, with its Provident Fund, in effect relies heavily on loans.

Some individuals do experience episode(s) of unemployment that represent a significant fraction of their potential lifetime income, and in that case, one cannot rely simply on loans, and especially on conventional loans. As we have suggested above, ICL by simultaneously providing cross-state and cross-period smoothing, represent a welfare improvement over conventional loans.

This chapter analyzes the optimal combination of UI benefit and loans for unemployed individuals from a lifetime perspective. Taking into consideration the possible interactions between UI and loans and the interactions between the government program and private savings (and loans), it examines how the level and composition of benefits (say the proportion of benefits provided in the form of loans) changes over time in a model where unemployment may occur in any period.

Not surprisingly, even though the optimal mix of loans and UI changes over time, it does not achieve perfect consumption smoothing, so long as there are any incentive effects; it should entail more loans when unemployed young than when old, while the amount of consumption for those unemployed when young should be greater than for those unemployed when old. After all, those unemployed when they are young anticipate that the losses are likely to be made up over the rest of their lives; while those who are unemployed when they old know that that cannot be the case.

The above in turn means that there is greater need for insurance when an unemployment episode occurs later in life: the UI benefit should be smaller in the earlier periods than in the later periods. But this in turn means that those who are unemployed when young especially need intertemporal consumption smoothing – that is, there is a role for loans. But the possibility of long-term unemployment reduces the amount of loans for the young unemployed (from what it would be if there were not this risk), and the amount of consumption for those unemployed (that is, the combined loan plus UI benefit) is decreasing in the probability of extended unemployment.

Of course, with government programs, unemployment may be higher than it would be without government programs, but optimally designed government programs balance out carefully the benefits of risk reduction and the costs of any induced unemployment. The private sector does not. Alleged
improvements in capital markets – increasing the availability of private loans for the unemployed – can be welfare reducing.

This chapter can be viewed as a first theoretical attempt to extend the notion of income contingent loans to unemployment programs. As we have noted, ICL can be thought of as a compromise providing better incentives than a pure insurance program, but far better risk sharing than a conventional loan program.

An important direction of future research is the optimal design of such an ICL. In analyzing this, we need to think carefully about why it is that markets fail to provide the ‘risk products’ that would ameliorate key risks that individuals face, and what advantages that government might have. For instance, one of the reasons for the absence of equity markets is costly state verification and contract enforcement; but government, especially through its role in taxation, has a comparative advantage in enforcement of debt contracts.

Another reason for the absence of risk markets is adverse selection; but in some instances, government can enforce a pooling equilibrium, at least mitigating the adverse effects that arise from adverse selection. While the adverse incentive effects that arise from insurance will be present whether such insurance is publicly or privately provided, the government has at least the incentives to take account of the cross-market and cross-instrument externalities that have been at the center of the analysis of this chapter.

This chapter has explored the implications of a number of externalities which, to date, have received insufficient attention, and which result in market inefficiency with and without government programs. While earlier literature had called attention to the externalities within and across insurance markets (that is, the provision of insurance by one firm affects the risk-taking behavior of individuals, and therefore the losses experienced by other insurance firms (Arnott and Stiglitz, 1990)), here we show that such externalities are more pervasive, for example, between savings, credit markets, and insurance.

This chapter has uncovered a new market failure – the risk that the market provides too much income smoothing, both as a result of excessive savings and possibly excessive lending. Unrestrained loan markets and excessive precautionary savings are socially dysfunctional, leading to too little effort at job search, with private agents not taking into account effects on losses on unemployment insurance and contingent loan programs. Indeed, even a private loan program that carefully balanced the benefits of interstate and intertemporal smoothing with the private costs of adverse incentives would not be Pareto-efficient. Well-designed government programs take these externalities into account, thereby limiting the effects.

One set of externalities upon which we have focused and which has sometimes been given short shrift in the literature are those that arise from the interactions between government programs, markets and non-market institutions. The latter is particularly important, given the limitations in the
ability of government to monitor and control externality generating activities. We show how non-market institutions (such as family) may be used to enhance the welfare performance of government programs: a government program of cosigning can be welfare enhancing, and can be implemented voluntarily by members of a group, if members of the cosigning group have an informational advantage over the government and can exert peer pressure to induce ‘better’ behavior. (In this context, better behavior means that some individuals with say, medium search costs, search for a job when they otherwise would not have.)

The externalities and market failures that we have analyzed here arise whenever there are insurance markets (public or private), and whenever individuals take actions at one date that may affect their willingness to take actions at a subsequent date that will affect the magnitude or likelihood of a loss. Moreover, similar effects arise in all loan markets in which there is a probability of default – and since virtually all individuals pay interest rates in excess of the T-bill rate, there is a presumption that such risks are relevant for all consumption smoothing loans. These are examples of diffuse externalities – hard for any insurance firm to control. A health insurance company might naturally try to restrict smoking, which is directly related to a number of risks insured by the company. But individuals save and borrow for many reasons, and savings and debts affect behavior in many ways – including individual risk-taking behavior, and their incentives and ability to repay loans to others. In this chapter we have illustrated the risk of excessive lending (borrowing) in one particular context, but the problem is more pervasive. A loan by one lender may reduce the likelihood of another lender being repaid. Excesses in this market played a big role in the financial crisis of 2008. Those excesses may partially be attributable to miscalculations of risk (hardly consistent with assumptions of rational expectations); but even with rational expectations such problems could arise, as we have noted, simply because individual market participants do not take into account the externalities that their actions impose on others.

The analysis of this chapter suggests that there is considerable room for improvement in most UI programs. Most important, our analysis suggests that optimal policy maximizing lifetime utility involves greater reliance on income contingent loan programs, since with such a loan program there can be (especially for the young) greater consumption smoothing with less incentive-attenuation. The loan programs, like the insurance program, have to be sensitive to: (a) the impact that they have on search; (b) the risk of not being repaid; and (c) private incentives for savings and lending which, too, may attenuate search incentives. It seems clear too that unemployment benefits should depend on the individuals’ work and unemployment experience.

In our model, the optimal policy involves a larger UI benefit for those with past episodes of unemployment. This stands in contrast to current US
programs, which pay no attention to longer term employment experience, but give a smaller benefit to those who have been unemployed at least in the recent past.

On the other hand, we are not convinced of the robustness of our result on how the relative reliance on UI benefits versus loans should change with age. In our idealized model, those who are unemployed when older have less ability to compensate for an adverse shock by smoothing over time, and that suggests the UI benefit for the young should be smaller. But in a more general model, the relationship between UI and age is not so clear; because the lifetime benefits of search are greater when young, adverse effects on search may be weaker, suggesting a higher UI benefit for the young.

There is one more qualification to the direct application of our results: we have conducted our analysis within the usual rational individuals with rational expectations framework, modified only by a recognition of certain market failures. If young people excessively discount the consequences to their retirement consumption, then switching from UI benefits to loans may not have the positive incentive effects predicted in this chapter; instead, it may simply result in greater poverty among the elderly and/or a greater need to engage in loan forgiveness for those who have had the misfortune of experiencing several unemployment shocks over their lives.

The chapter has focused on how governments, with limited information, and limited ability to correct these market failures, can intervene to improve welfare. It assumes that when individuals search for a job, there is a job to be found; if the number of jobs is less than the number of job seekers, more search simply increases the length of queues for the jobs that are available, and can worsen welfare. The implication is clear: UI systems should be made contingent on the state of the economy.

We have focused too on how market forces affect individuals’ willingness to search. There are other market externalities that might affect the ability to search, some manifest in the current crisis. Excessive indebtedness may, for instance, restrict the ability to invest in search over longer distances and may inhibit the ability to purchase a home in another locale (particularly important in countries with limited rental markets).

Given the suffering associated especially with extended periods of unemployment, and given the significance of potentially adverse incentive effects for job search posed by poorly designed unemployment systems, there is need for thinking carefully about how one can structure systems which improve the well-being of the unemployed while limiting societal costs from adverse incentives.

But the issues raised here have a broader import, going well beyond unemployment. Firstly, each bout of unemployment can be thought of as a separate risk. We have explained how it makes sense to pool these risks together, to have a lifetime unemployment program. By pooling risks together,
one can rely more on loans, and the adverse incentive effects of insurance are mitigated without the adverse consequences of limited intertemporal smoothing. But the same arguments apply to pooling other risks together, for example, those associated with health or longevity or disability. This is, of course, what the Singapore Provident Fund does. Secondly, even with risk pooling across a large number of risks, there is a risk of large losses (relative to an individual’s lifetime income). One cannot rely just on intertemporal smoothing. There has to be interstate smoothing – that is, insurance against such large losses. ICL effectively provide such insurance.

Over the past century, the provision of social insurance has increased security and individual well-being enormously. Recent years have seen an attack on social insurance, based on concerns about the adverse incentive effects. We believe that a Provident Fund, an integrated social insurance program, based on ICL, provides an effective way of simultaneously providing for interstate and intertemporal smoothing with minimal adverse effects on incentives. This chapter can be thought of an initial exploration, in the context of unemployment, of some of the key considerations in the design of such a program.

Notes

This paper was inspired by discussions at the International Economic Association Roundtable on Income Contingent Loans, Bangkok, March 2013. The authors acknowledge helpful comments from Bruce Chapman. Stiglitz is indebted to the Institute for New Economic Thinking for financial support.

1. This is particularly the case in the United States. A significant number of other countries provide grants-based welfare to the unemployed and this is not the comparison pertinent to this chapter.
3. There would of course be some additional lifetime income costs from unemployment arising from the depreciation of human capital and the non-accumulation of labor market experience while unemployed.
4. Imperfections which themselves can be explained by imperfect and asymmetric information.
5. See also Altman and Feldstein (1998), and Costain (1997).
6. As the discussion that follows will make clear, this is not quite accurate, because if there is a risk of default, there is some interstate smoothing.
7. There is similarly a large literature (based on imperfect and asymmetric information) explaining why private markets in human capital equity are essentially absent. Indeed, the imperfections in these equity markets are even greater than in debt markets. See the discussion that follows.
8. Interstate smoothing implies that the individual's lifetime income is the same whether or not they face a bout of unemployment since the government makes up for the loss. But if the private market knew that the individual's income was guaranteed, regardless of whether or not the individual faced an episode of unemployment, it would be willing to lend sufficient amounts to smooth consumption over the individual's life. To
a large extent, at least, the inability to borrow follows from the insecurity of the individual's income (There are, in addition, important problems in contract enforcement).

9. If an individual has an outstanding non-contingent debt, he will search harder in the event of an episode of unemployment later in life, because the consequences of not getting a job are more severe. An ICL (of any given size) has weaker incentives compared to a straight loan. It is a more difficult matter to ascertain whether the net effect is positive or negative.

10. There is a small literature directed at the moral hazard/incentive effects arising from unobservable savings. See, for example, Arnott and Stiglitz (1985), Koehne (2010), and Abraham and Pavoni (2011). Hopenhayn and Nicolini (1997), Kocherlakota (2004) and Shimer and Werning (2008) analyze a model of repeated moral hazard with hidden savings to characterize the optimal profile of UI benefits over a single unemployment spell. The externality that they are concerned with is, therefore, the one that the savings made by the unemployed (out of UI benefits they receive) may exert upon incentives in the next period within the same episode of unemployment, while this chapter deals with the externality that precautionary savings made by employed workers early in life would exert upon incentives for them when they get unemployed in the future.

11. This can be compared to Arnott and Stiglitz (1991), who argue that the presence of a non-market group may not be welfare-increasing in the provision of insurance unless it has control of the actions taken by its members.

12. Readers interested in the full analysis are referred to Stiglitz and Yun (2013).

13. Defined more precisely in the appendix.

14. What matters for the extent of loan provision is the *marginal* reduction in incentives. We would normally expect that the marginal effect on search is greater the greater the curvature of the utility function, in which case *a priori* the effect of the curvature of the utility function on loan size would appear to be ambiguous.

15. If there were a full set of Arrow-Debreu securities, he would be protected should he have a bout of unemployment later in life, so he could have complete smoothing. But with moral hazard, there has to be consequences for not searching, so that consumption in the second period in the event of unemployment has to be lower than it would be with full insurance.

16. But it does suggest that government should not encourage unemployment loans, beyond the amount which is optimal, for example, by allowing individuals to borrow freely against their pensions. Access to borrowing should be limited.

17. Of course, even in the absence of an externality, the optimal unemployment program will depend on the period of an individual's life that the unemployment occurs, as we explained above. The discussion that follows highlights additional reasons that the unemployment program will differ at different stages of an individual's life and depend on his employment history.

18. Note that there is no reason that the search elasticity of those unemployed in the second period, who have not had a previous bout of unemployment, should be the same as those who have had a bout of unemployment. In the model in the appendix, we allow the two search elasticities to differ (and to differ from the first period search elasticity).

19. That is, the search costs of an individual experiencing an unemployment shock in the second period may depend not just on whether the individual experienced an unemployment shock in the first period (as the model described in the appendix
assumes), but also of whether he succeeds in getting a job the first period. Note the effects can be ambiguous: having searched in the first period, he may be more expert in searching (he has learned how to search), reducing his search costs, but he may be ‘tainted’ as a result of not having found/accepted a job, and that would increase his second period search costs. Normally, we would expect the second effect to dominate.

20. The effects that we have just described are in addition to those noted earlier: as we observed, an individual who is unemployed in the first period has the possibility of smoothing consumption over his entire life; but an individual who is unemployed in the second period (in the absence of full insurance) will already have consumed more in the first period than he would have, had he known that he would be unemployed in the second period. Income smoothing possibilities are thus reduced.

21. We say presumption, because the mix of loans and insurance depends on other parameters, such as the search elasticities. If the search elasticity in the first period was substantially less than that in the second period, there might well be greater reliance on insurance in the first period than in the second.

22. In the model formulated in the appendix, we are able to show that loans are larger and UI benefits are smaller earlier in life, unless the probability of being unemployed long term is high.

23. Indeed, the provision of ICL also reduces search in the first period, since the consequences of not getting a job in the first period are also reduced. Thus, if the incentive effects are large enough, the optimal unemployment program might entail not just fewer loans, but also less insurance. The reduction of risk vis-a-vis the worst contingencies (two episodes of unemployment) that results from income contingent loans is partially (but only partially) offset by an increase in risk bearing in the event of a single first-period episode of unemployment.

24. Arnott and Stiglitz (1990) discuss at some length the externalities imposed by one insurance program on other insurance programs.

25. In our simplified model, in which there are no problems of adverse selection, there is excessive private lending. In more general models, this may not be the case.

26. In some countries, such as the United States, there seems to be insufficient precautionary savings, but this probably has to do more with ‘behavioral economics’ considerations; for example, individual’s underestimation of the risk of their facing spells of unemployment. In this model, we have assumed rational expectations.

27. The incentive effects created by the peer pressure in a group have been discussed by Kandel and Lazear (1989).

28. Here we suppose that an individual does not care about the well-being of the others within a group, implying that there is no need for intra-group transfers, ex post.

29. Of course, some governments may have provided UI benefits in excess of the optimum. Our analysis shows that to obtain the optimal level of unemployment, restrictions have to be placed both on the amount of insurance that government provides and the amount of borrowing that individuals can undertake.

30. Because, in our model, repayment depends on whether individuals get a job in subsequent period, the loans are, in that sense, ‘income contingent’ but, of course, they would be more-so if the wages individuals received when employed were variable, and repayment depended on those wages. If the extent of search affected the wages individuals received, then the design of the income contingent loans would affect the extent of search. See Stiglitz and Yun (2013). Also see Chapman and Hunter (2009), Chapman and Tan (2009), and Chapman (2010) for a discussion more generally about ICL design considerations.
31. Greenwald and Stiglitz (1986, 1988) show that whenever there is asymmetric information (such as that associated with incentive issues, including those of the kind analyzed here) there are pecuniary externalities that matter, so that the market equilibrium is not constrained Pareto-efficient.

32. In a sense, this market failure is related to that analyzed by Arnott and Stiglitz (1990), who point out that the provision of insurance against one risk may affect other insurance contracts. This, in turn, is related to the fundamental non-decentralizability theorem of Greenwald and Stiglitz (1986). Chetty and Saez (2010) discuss how the presence of private insurance market affects the optimal social insurance.

33. See Higgins (Chapter 20, this volume) for discussion of the benefits of cosigning in the application of ICL to paid parental leave.

34. As asserted by much of the recent literature in behavioral economics (Kahneman and Tversky, 1992; Benartzi and Thaler, 2004).

35. Delli Gatti et al (2012a, 2012b) have raised this possibility in the context of the current recession. The role of capital constraints in affecting migration was long noted in the development literature (Stiglitz, 1969).

References


Outline of the model

Consider a 3-period model in which an individual may work for period 1 and 2 at the wage $w$ per period, and then retires in period 3. For simplicity, we
assume $u$ is fixed and there is no discounting. The worker may be confronted with an unemployment shock in each of the two periods. The probability of an unemployment shock occurring to an individual in period 1 is $q$, while that in period 2 depends upon whether or not the individual is unemployed in period 1. The probability of a shock in period 2 for a worker who was previously employed is $p_N$ while that for a worker who was unemployed is $p_U$.

There are thus three different unemployment shocks in the model: unemployment shock in period 1 (called unemployment shock 1), unemployment shock in period 2 for those who have not been unemployed (unemployment shock 2), and unemployment shock in period 2 for those who have previously been unemployed (unemployment shock 3). After each shock, a worker may choose to search or not to search for a job. If the individual spends sufficient search effort $e$, then he or she finds a job; if the individual does not search, he or she is unemployed that period. Search costs may differ across the three shocks: we denote $e_1, e_2, e_3$ for the amount of search required to find a job, given the unemployment shock 1, 2, 3, respectively. The search costs $\{e_1, e_2, e_3\}$ are independent random variables with distribution functions $F_1, F_2, F_3$, respectively. The individual finds out his or her search costs before committing to search. It is easy to show that there exists a threshold level $\bar{e}_i (i = 1, 2, 3)$, such that the unemployment rate among those who have faced the shock is $1 - F_i(\bar{e}_i)$. We denote by $h_i = \frac{f_i(e)}{1-F_i(e)} (i = 1, 2, 3)$ the search elasticity of unemployment, that is, the sensitivity of unemployment with respect to search activity, for shock $i$, and assume that $h_i$ is constant over $e$.

An unemployed worker (under shock $i$) receives money from the government consisting of two components: an unemployment insurance (UI) benefit $r_i (i = 1, 2, 3)$ which is financed by a tax imposed upon employed workers, and a loan in the amount of $R_i (i = 1, 2, 3)$. In particular, the UI benefits for shock 1, 2 and $3-r_1, r_2$ and $r_3 - r$ are financed by the tax $T$ that is imposed upon those who are employed. Loans taken out are repaid in the third period for all the workers except for those who are unemployed in both of the two periods. These are allowed to default on their loans. The expected cost of the bail-out for defaulted loans is borne by borrowers at the time of borrowing as part of the price for the loan.

The model described above characterizes the optimal package $\{r^{*}_i, R^{*}_i\}$ ($i = 1, 2, 3$) of UI and loans for the unemployed at each shock $i$, taking into account individual worker decisions on savings and search. Examining the features of the optimal mix of UI and loans, the model yields a set of the following results:

(i) Desirability of Loan Provision. A set of parameters under which loan provision is desirable is identified. (In this model, because of the
cross-market externality with those who face extended unemployment, it is possible that there is a corner solution in which no loans are made – that is, an increase in the amount of loans, even from zero, induces less search, increasing the losses on the unemployment insurance program.)

(ii) Comparative Statics. The model analyzes how the benefit mix of UI and loans varies with timing of unemployment as well as with incidence and duration of unemployment.

(iii) Presence of Private Loan Market and Excess Savings. The model examines how the optimal package of UI and loans changes in the presence of excessive private savings and loans.

(iv) Welfare Effects of Loan-Cosigning in the Provision of Loans. The model shows how loan-cosigning improves welfare through the interaction of informational advantage and peer pressure among the members within an informal group.

The detailed propositions on the above results and their proofs can be found in Stiglitz and Yun (2013).
Part IV
Commentary
Overemphasized Costs and Underemphasized Benefits of Income Contingent Financing

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Asymmetric information and moral hazard are often emphasized prominently in the literature studying income contingent financing, such as income contingent loans, graduate taxes, and, human capital contracts. I argue that both issues need not be as relevant in certain contexts. For instance, young students have information about themselves that those providing financing do not, but those financing likely have much more information about the job market and career prospects than young students. As for moral hazard, a short or medium horizon of payments need not be as distortionary as a lifelong horizon because the trade-off between leisure and work at the beginning of a graduate's career should consider the impact of today's work on the lifelong value of future earnings. Furthermore, some benefits of income contingent financing, in particular of human capital contracts, are not emphasized often enough. The biggest is the information – and consequent impact in behavior – that a competitively priced contract would provide regarding the future income prospects of studying at different higher education institutions, or following different fields of study.

17.1 Introduction

Income contingent financing, of which income contingent loans is the most common example, offers many apparent benefits to those who receive it and its use has increased around the world significantly, mostly led by governments enacting it as some part of a national policy. A major consideration when evaluating and promoting income contingent financing is
a better understanding of its agency costs, as these can potentially be severe. In this chapter, I comment on the importance that agency costs have in the design and implementation of these instruments. Unlike what is often written, I argue that in certain contexts agency costs are not as high as typically thought. I conclude by outlining the benefits – and plausibly the costs – that the current design of income contingent financing, based on the paradigm of large agency costs, is missing. My comments are in the context of income contingent financing for students in an environment in which they can choose from a variety of financing mechanisms. When no such choice exists for the majority of students, as is the case with several government-run income contingent loans (for example, Australia and New Zealand), the literature has long recognized that the agency costs, and adverse selection in particular, are much smaller. Thus, I am extending this view to areas where the assumption is that agency costs are large. A caveat, however, is that my comments cannot be automatically generalized to include other types of income contingent financing. Throughout the text, I point out the other settings, such as unemployment insurance or health insurance, in which agency costs are potentially much higher.

17.2 Asymmetric information and moral hazard in a student financing context

The greatest advantage offered by income contingent financing is that it offers a form of insurance. Yet, the very fact that income contingent financing offers insurance means it has to deal with agency costs. Two sources of agency problems are relevant in this case: asymmetric information and moral hazard. Asymmetric information arises because when signing an insurance contract, the insured party is likely to have more information about his or her propensity for risk than the insuring party, leading to adverse selection. Moral hazard, on the other hand, arises because after signing an insurance contract, the insured party loses an incentive to be careful and is likely to behave more recklessly. Either problem results in a world where the efficient allocation of risk does not take place. In the particular case of people's future income, these two problems present themselves when students with low income prospects relative to the cost of education embrace the contracts and when individuals who sign up for the contracts afterwards choose to earn a lower wage in exchange for a more leisurely lifestyle. To these two issues one should add high monitoring costs to determine income.

Agency costs without question explain much of what we observe of people's behavior, yet they do not need to be so large as to destroy any possibility of arrangements prone to these problems. Adam Smith famously argued against the viability of corporations due to the perverse incentives created by the separation of ownership and control, yet today corporations dominate
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economic activity around the world. He was not completely wrong, for large corporations suffer from significant economic inefficiencies due mostly to managers favoring themselves rather than their shareholders. However, large corporations overcome other significant economic inefficiencies and therefore did not disappear.

I argue below that whereas agency costs are central to the analysis of income contingent financing, the literature has followed Smith in pointing out the problems that income contingent schemes have, at the expense of the benefits that they could have. Whereas these agency problems are real and likely to be binding in a world where individuals have good information about their future and where the value of leisure is high relative to higher wages and better career paths, I will argue that in many instances individuals do not have good information about their future prospects and their decision to work hard early in their careers has a large impact on their future income decreasing the incentive to shirk induced by income contingent payments.

Consider first the question of asymmetric information. A little introspection on my part reveals that I had very little knowledge on what my future income was going to be. I had a vague idea of how much it could be, but the standard deviation of what I could expect was huge. As it turns out, my experience is not unique and I have yet to find someone – friend, colleague or fellow economist – who states that they had a precise estimate of their future income at age 18. In general, the financial consequences of a long-lived contract on future income – wages to be earned in twice one's current life span – is probably beyond the grasp of anyone, most especially a student in his or her teens or 20s.

This observation has also been corroborated by my experience as the co-founder of Lumni, a company that finances students with income contingent instruments: graduates frequently find themselves earning much more than what they anticipated. Based on these observations I find models where ability is unknown to the student at the time of the investment closer to reality than those where students know their ability but those financing them – either a private party or a public entity – do not. I stress here that this conclusion does not apply to all settings in which one might want to use income contingent financing. Offering unemployment insurance to a 45 year-old person is a very different circumstance, as a 45 year-old has a much more precise estimate of what his or her future income will be like.

Consider now the question of moral hazard. The concern in this case is that a graduate who takes income contingent financing will choose a leisurely lifestyle since payments are not a burden if income is low. This concern is most important when considering a graduate tax or what I have called elsewhere a human capital contract, since unlike income contingent loans, high earners not only pay faster, they pay a larger overall amount than low earners. Quiggin (Chapter 3, this volume) shows that when the probability of
paying back the full amount of the loan is high, the distortion caused by moral
hazard disappears. Yet, when the probability of paying back in full is not large,
or when the contract is such that a graduate’s total payments are proportional
to lifetime income (as is the case for graduate taxes), the distortion exists.

However, this distortion is likely to be smaller in circumstances typical for
higher education students. To see this, first consider the classic specification
for this problem which is to have a utility function that depends on
consumption and leisure, for example, as found in Quiggin (Chapter 3, this
volume), albeit using slightly different notation:

\[ V(c_t, h_t) = u(c_t) - g(h_t), \quad y_t = h_t w_t, \]

where \( c_t \) is consumption, \( h_t \) represents hours worked, \( y_t \) is total labor income,
\( w_t \) is an exogenous wage rate, all at time \( t \), and \( V(\cdot), u(\cdot), \) and \( g(\cdot) \) are
functions satisfying typical continuity, monotonicity, and concavity
requirements. The well-known solution for the agent’s decision on how much
to work under the above assumptions satisfies:

\[ u'(c_t) w_t = g'(h_t). \]

In the presence of an income contingent payment the agent’s optimal work is:

\[ u'(c_t) w_t (1 - \tau) = g'(h_t), \]

where \( \tau \) is the fraction of income committed. Comparing equations (2) and
(3), one can see that the agent will work less when the tax is present if the
disutility from working is convex, a reasonable description of reality.

However, by assuming the wage rate as exogenous, the setup above ignores
the impact that \( h_t \) has on the wage rate in the future. In other words, effort
today is likely to produce higher wage rates tomorrow so that instead of
agents equating the contemporaneous marginal value of working with the
marginal value of leisure, agents equate the marginal value of leisure with the
marginal impact of work on the value of the agent’s lifetime income. More
precisely, when the agent is choosing consumption and leisure in a setting like
the one below, the relationship between current effort and current wages
breaks down. Consider an agent with the following problem:

\[
\max_{\{c_t, h_t\}_{t=1}^{T}} E_t \left[ \sum_{t=1}^{T} U(c_t, h_t) \right]
\]

s.t. \( W_{t+1} = (W_t + h_t w_t - c_t) \tilde{R}_t \)
and \( w_{t+1} = f(h_t) * w_t * g_t \)
where $W_t$ is the agent's wealth at time $t$, $R_t$ is the random return on financial wealth at time $t$, $g_t$ is the growth rate of wages, and $f(\cdot)$ is an increasing, concave function of $h_t$. $f(\cdot)$ captures the idea that future wages depend on the agent's current decision to work. In this setting, the individual's optimal decision implies:

$$-U_{h_t}(c_t, h_t) = w_t \left( U_{c_t}(c_t, h_t) + f'(h_t)g_t \rho E_t[V_{w_t+1,t+1}(\cdot)] \right). \quad (5)$$

where $V(\cdot)$ is the agent's continuation value function, and $V_{w_t+1,t+1}(\cdot)$ is the derivative of the value function with respect to the wage level. The analogous solution in the presence of an income contingent payment is:

$$-U_{h_t}(c_t, h_t) = w_t \left( U_{c_t}(c_t, h_t)(1 - \tau) + f'(h_t)g_t \rho E_t[V_{w_t+1,t+1}(\cdot)] \right). \quad (6)$$

Thus, whether the distortion created by the income contingent payment is large or not depends on the relative size of $U_{c_t}(c_t, h_t)$ and $f'(h_t)g_t \rho E_t[V_{w_t+1,t+1}(\cdot)]$. That is, the distortion created by the income contingent payment depends on whether leisure affects mostly the agent's contemporaneous consumption or their lifetime utility from future consumption and leisure. Leisure will have a high impact on lifetime utility if the experience given up today has a large impact on wages tomorrow, that is, if $f'(h_t) >> 0$. The opposite is true with the more common assumption in which leisure only affects consumption today, implying that $f'(h_t) = 0$.

The impact of leisure will also depend on the length of the income contingent contract. For example, if the income contingent payments are required for a short period of time, but the agent will earn income for a long time, then the continuation value of income will dominate the agent's decision of how much effort to exert today, and the distortion will be small. Similarly, if the impact of effort on future income is important ($f'(\cdot)$ is large), the continuation value of income will again dominate the agent's decision of how much effort to exert today, and the distortion will be small. Long income contingent payments, or a small impact of effort today on future income, will increase the distortion as usually assumed.

What this exercise implies is that the classical model in which $f'(\cdot) = 0$ possibly overstates the distortion income contingent payments have due to moral hazard. This small change elevates the cost of shirking to the individual, since now they decide to work up to the point where the extra effort equals the benefit from the consumption they get today plus the benefit from higher future wages given their extra effort today. This effect lowers the distortion created by a contract in which the agent pays a percentage of income for some period of time.
17.3 The benefits of income contingent financing that should receive more attention

Having argued that the current literature overstates the agency costs caused by asymmetric information and moral hazard, I now turn to issues that in my opinion are important and have not received enough attention in the literature. They mostly relate to the benefits provided by long-lived, high-maximum payment, privately underwritten forms of income contingent financing. Two income contingent instruments that exhibit some of these characteristics are human capital contracts and graduate taxes. A human capital contract is an agreement between a student and a private investor in which the student agrees to pay a percentage of their income upon graduation for a predefined period of time in exchange for financing. The main difference with income contingent loans is that with a loan a graduate’s obligation ends when the balance on the loan drops to zero (something that can happen very quickly in some cases), whereas with a human capital contract the obligation persists for a fixed period of time regardless of the total amount paid by the student. A graduate tax can be thought of as a human capital contract financed by the state. Human capital contracts have been more famously tied to alternative routes of human capital development, such as investing in an athlete’s development. Cassius Clay (now Muhammad Ali) used human capital contracts to finance the beginning of his boxing career. More recently, human capital contracts for students and young graduates have been explored, with varying degrees of success, by several firms in Europe (CareerConcept, Deutch Bildung), Latin America (Lumni) and the US (MyRichUncle, Pave and Upstart).

Human capital contracts and graduate taxes are the income contingent financing schemes that under the standard assumptions about asymmetric information and moral hazard would seem to have the largest agency costs. However, as discussed above, these costs have likely been overestimated because students typically do not have as much knowledge about their prospects as is often assumed, and the distortion caused by payments tied to income is likely not as large either, whereas their benefits have not been widely discussed.

There are three benefits of income contingent financing that, in my opinion, have not received enough attention in the literature. First, income contingent financing not only reduces ‘liquidity’ risk for a borrower, it also reduces ‘lifetime’ risk in the value of the graduate’s earnings. Second, when the financing is underwritten by a private party, the parameters of the contract reveal information about the most valuable asset in the economy, namely, people’s future earnings. Third, when financing is underwritten by a private party, the parameters of the contract offer the student relevant information that
can shape their decision of where and on what subject to pursue a higher education degree. I discuss these benefits in more detail below.

First, income contingent financing, besides providing insurance against short-term fluctuations in income, provides insurance against lifetime fluctuations in income. Empirical evidence shows that individuals face large, idiosyncratic and highly persistent income shocks throughout their lifetimes. This suggests that income contingent financing plausibly has a large welfare enhancing effect on individuals. This benefit also exists for those who are exposed to fluctuations in the value of wages, in particular corporations. Wages are the largest cost for most firms and in incomplete markets shareholders would benefit from effective hedges against firm's costs.

Lifetime insurance increases when the maximum payment relative to the amount financed is very high. Thus, both human capital contracts and graduate taxes offer larger lifetime insurance than a comparable income contingent loan, that is, an income contingent loan with the same expected present value of payments. The reason is that with income contingent loans, high-lifetime-income graduates, in particular those who reach the maximum payment, end up paying less than they would with a similar human capital contract or graduate tax. To keep the expected present value of payments due to the income contingent loan equal to those due to a human capital contract, the shortfall in payments from high-income earners must somehow be compensated by lower-income earners. Thus, income contingent loans leave some potential gains from insurance on the table.

Second, when underwritten by private parties, income contingent financing provides information regarding the value of human capital and, though less directly, the value of education. The largest asset in any economy is, plausibly, the value of people's future earnings, or human capital. However, we do not have a reliable way of measuring it. This matters because human capital is an important component for answering questions that range from explaining why the expected returns of some assets are larger than others to understanding basic household finance decisions such as consumption and investment. Human capital's value is also relevant for policymakers involved in the valuation and management of pensions, in particular the appropriate allocation of savings between risky and riskless assets. Answering these questions requires knowledge of the value of human capital.

Third, when underwritten by private parties and the maximum payment is very high relative to the amount financed (in a human capital contract the maximum is, in fact, unlimited), income contingent financing provides information regarding the comparative value offered to students by different degrees and universities. This point is particularly relevant in places with a competitive higher education market, such as the United States. An implicit, and often explicit, assumption shared by those who argue for increased funding for higher education is that higher education is valuable and the
resources directed toward it will be better placed in education than in some other investment, like infrastructure or security. Yet, observing the continuous increase of education costs during the last few decades, commentators and policymakers alike are publicly questioning whether the investment in education is still worthwhile. Income contingent financing, priced by private parties, offers a partial solution to this problem: If the percentage of income required from attending a particular university is lower than the percentage of income required for attending a different university, then the first university plausibly adds higher value. Privately priced human capital contracts offer a tangible incentive for students as they make decisions about what and where to study; decisions for which they typically do not have much information. If students behaved like rational actors, they would gather information about different programs and choose based on the one that offers the highest value, appropriately accounting for benefits that will accrue far in the future. Yet, ample evidence exists that students will likely ignore benefits far away in the future and focus instead on more immediate concerns, such as loan payments. By creating a tangible, shorter-term incentive for students in their decision where to study (namely, the percent of income they commit to attend one or another program), human capital contracts likely influence the behavior of students and improve the efficiency of the match-making process between students, institutions and fields of study.

The previous two benefits, information to the market about human capital and information for potential students about the value offered by their options of what and where to study, depend on private underwriting of the contracts. Although there is nothing that prevents privately underwritten income contingent loans, in practice they have been underwritten by governments where they exist. Graduate taxes have yet to be implemented, and when they are they will most likely not be privately underwritten. Thus, the benefits described above are a feature of income contingent financing via human capital contracts. In general, the degree to which different income contingent instruments produce such benefits depends on their design. Longer contract periods, higher maximum payments, and private underwriting of the contracts all increase the benefits offered by income contingent financing.

Even when focusing on human capital contracts, the previous benefits have limitations, as any financing provided by private funding has. The most important is that the pricing of human capital contracts would not reflect the benefits of education not captured by the individual. As with other externalities, the result is that not enough financing will take place. In particular, human capital contracts would not be offered, or be too expensive, in cases where the social value of education is much larger than the private one. Thus, human capital contracts complement other policies aimed at investments with large social returns and should not substitute them.
17.4 Conclusion

Different types of income contingent financing offer consumption smoothing and insurance to those who engage in them. The current literature focuses on income contingent loans provided by governments, since these loans do not exhibit the severe agency costs that other types of income contingent financing offering more insurance would have. I argue that these agency costs are not as high as typically assumed when considering income contingent financing for students, and that researchers and policymakers should focus instead on the benefits of privately underwritten income contingent financing. Whether a private party or a government decides the percentage of income graduates will have to pay, and how much financing they receive in exchange, has important consequences. Privately underwritten income contingent financing has at least two advantages over government underwriting: it provides information about the market value of education, and it provides information to students about the comparative value of different degrees and schools. The resulting information about the value of human capital following private underwriting would increase the information available for students, and improve the competitiveness of the higher education market.

Notes

1. The following section describes in more detail the similarities and differences between income contingent loans, human capital contracts, and graduate taxes. Barr (Chapter 5, this volume) also explains the differences between income contingent loans and graduate taxes.
2. If the contract is long-lived then the distortion will remain large, since any extra wages will still be subject to the income contingent payment. However, if the contract is shorter than the expected work life of the agent then the distortion falls because the agent gets to enjoy 100% of the benefits of her future income after the contract expires.
3. More recently, human capital contracts have been referred to as income share agreements by several authors, including myself.
4. Clay was sponsored by ten businessmen from Louisville, Kentucky, who provided an initial $10,000 payment, travel expenses, and $4,000 guaranteed income for two years. This human capital contract had a steep 50% committed payment above $4,000.
5. The author is one of Lumni’s founders.
6. In practice several of these firms use a maximum payment in their contract, making their product an income contingent loan with a relatively high interest rate. An income contingent loan with an infinitely high interest rate and debt forgiveness after a predefined period is a human capital contract.
7. See, for example, Storesletten et al. (2004)

Reference

We discuss the welfare implications of income contingent loans (ICL) as a government aid program for higher education. We start by introducing some Korean experiences of student loans programs and present more general arguments on both the efficiency and the equity aspects of ICL as compared to other government programs such as normal (mortgage-type) loans, grants and government guaranteed loans. Lastly, we suggest a scheme that could enhance the efficiency of loan programs.

18.1 Introducing the Korean case

The Korean government has implemented subsidy programs which target a specific group of students from low-income families as well as all students. However, it did not intervene into the loans program for students in need until 2005, when it started to offer guarantees for the loans provided by private banks. It was only recently, in 2010, that the government financed the loans by issuing government bonds and introducing an ICL. Currently, the loans program for students in need is managed by the government and consists of two types of loans provision: normal mortgage-type loans and ICL for higher education financing.

The ICL of the two-tier system targets students from low-income families (below the 70th percentile of the income distribution), whereas normal loans are open to most families. The ICL does not collect debts from a debtor unless his or her income is above a certain level, and imposes a repayment rate of as much as 20 per cent of income in excess of the threshold level. Direct loans, on the other hand, are offered to students from all other families (higher than...
the 70th percentile). Debt is repaid over a 10 year period following an initial 10 year grace period.

Statistics from the Korean Ministry of Education, Science and Technology (2012) show that the amount of loans for students increased considerably in 2006, immediately after the government started to intervene into the loan program: from 0.3 million students receiving loans in 2005 to 0.5 million in 2006. Since then, it has been increasing steadily up to the present, such that the number of students receiving loans is 0.7 million out of 2 million students in total in Korea. The introduction of ICL in 2010 has not changed this trend, as the amount of loans demanded by students has always been constrained by the budget set by the government.

18.2 Welfare effects of ICL for higher education financing

In addition to a set of welfare effects of ICL specified by Quiggin (Chapter 3, this volume), we consider some additional features of ICL from a more general perspective. Specifically, we highlight different welfare aspects of ICL depending upon which alternative aid programs (including government subsidies and guarantees) ICLs are compared with.

18.2.1 Compared to mortgage-type loans (ML)

In this section we will contrast ML with ICL from the perspective of efficiency and equity.

One of the most important efficiency aspects of ICL is that, relative to ML, it allows for more efficient intertemporal consumption smoothing given an income stream for an individual, while it is subject to a lower probability of default by the inclusion of default insurance, in that debtors do not repay when their incomes are low.

On the other hand, default insurance means that the non-repayment rate may be higher under an ICL than under ML so long as there is no cross-subsidy among debtors. This raises the issue of how the non-repayment associated with ICL should be financed; through general taxes or by higher repayments from successful debtors (via higher loan interest rates). Racionero (Chapter 19, this volume) points out that the burden of ICL to be borne by successful debtors would be limited by moral hazard and adverse selection problems, while Stiglitz and Yun (Chapter 16, this volume) show that in the absence of adverse selection it is welfare-decreasing to transfer the burden of ICL to general tax-payers from successful debtors.

The relative performance of ICL on repayment is complicated by the incentive aspects associated with ICL and ML. As workers have concave utility functions and as the marginal return to effort is smaller under ICL than under ML, the latter type of loan may provide greater work incentives than the former. As for unemployed workers, however, those with ICL may have
better incentives for job searching than those with ML as the expected return to job searching would be higher under ICL. In fact, the relative repayment rate for ICL or ML would depend upon the favorable and unfavorable incentive effects, suggesting that more empirical studies on the actual repayment rates for each of the two regimes are required.¹

In terms of equity, ICLs may be superior to ML, as ICLs exempt lower income individuals from repayment (and, therefore, involve some level of cross-subsidisation), whereas ML do not.

The welfare advantages (and disadvantages) of each type of loan would imply differential welfare effects for individuals with different incomes: ICL has an equity advantage and provides relatively strong benefits of income-smoothing for low income families, whereas ML have repayment advantages for the lender but a relatively larger burden of fixed repayment for low-income families. This could lead us to consider as a potentially optimal loan program for higher education a two-tier system, which, as has been introduced in Korea, provides ICLs for those from low-income families and ML for others. While the type of loan one is entitled to is determined by their parent’s income, the two-tier system presumes that a debtor’s future income would be positively affected by their parent’s current income through the subsidies they may provide to their children in the future.

From a theoretical point of view, however, without taking into account the administrative costs associated with ICL, we can argue that ML are never optimal even for high-income individuals since the incentive costs of introducing ICL initially are negligible.² This suggests that the only factor that can justify the efficacy of a tier-system in Korea would be whether or not the administrative costs of ICL, relative to those of ML³, outweigh the welfare benefits, especially for high-income individuals. As an ICL for higher education has been introduced in Korea only recently, however, statistics on the administrative costs are not currently available. While we cannot presently evaluate with certainty the efficacy of the Korean system, we may instead consider some related facts on this issue. First, Chapman (2006) showed that the size of administrative costs of ICL is in fact small in the case of Australia and the UK; and Stiglitz (Chapter 2 of this volume) and Denniss (Chapter 22 of this volume) note considerable transactional efficiencies associated with ICL. Second, on the other hand, the so-called informal sector is significant in Korea (constituting about one-third of all workers), which may contribute to high administrative costs of implementing ICL.⁴

Finally, we could design a repayment schedule of ICL by taking into consideration income-smoothing, insurance, and possible moral hazard. The repayment may be better designed, for example, if it is conditioned upon cumulative earnings rather than upon period-by-period earnings.
18.2.2 Compared to grants

The government may provide grants for higher education both to specific groups of individuals or to everyone choosing to undertake higher education. The loans program (including ICL and ML) has favorable and unfavorable welfare implications relative to grants.

From an efficiency point of view, each program has conflicting implications. First, when an individual knows his or her future better than the fund provider, the loans program would have better incentive consequences compared to grants in the following sense: the loans program would deter those with lower potential from choosing higher education as individuals have to finance higher education themselves under this program. The grant program, however, may encourage those with lower potential to choose higher education as they would be subsidized by all tax-payers. The loans program thus leads to better outcomes in terms of individual choice of higher education compared to the grant program.

Second, however, the grant program may better insure individuals choosing higher education against the risks associated with future earnings. As an individual does not know their future returns to higher education with certainty, the choice of higher education would be a risky investment, especially for low-income individuals. To the extent that the grant program lowers the costs of higher education for an individual by more than the loans program, the burden of risk associated with the education investment would be reduced more effectively, implying that grants would improve investment incentives more so than loans.

The incentive effects of loans and grants are, as the above suggests, two-fold. The presence of positive private information about a student’s future potential may lead to desirable investment incentives for that student under a loans program, whereas imperfect information about their future potential and risk-aversion may imply better incentives under a grant program. In this respect an ICL, which is closer to a grant than a ML as it involves cross-subsidies to low-income debtors, can be viewed as a specific type of support for higher education that can mitigate both types of adverse incentives associated with grant and loan programs.

Third, the various externality aspects of higher education may be an argument for the grant program compared to the loans program as grants reduce the private costs of choosing higher education.

As for the equity performance of loans compared to grants, there are some conflicting arguments. Grants may be superior to loans to the extent that they reduce the cost of higher education, which is more burdensome for those from poor families, and they enable poor individuals to have access to education (which may not be feasible without grants). This may be especially true if the government can provide grants selectively to those from poor families. On the other hand, however, grants may aggravate inequality by reducing the cost of
higher education for rich individuals, while the opportunity for higher education may remain infeasible for poor individuals despite grant provision.\(^5\)

These efficiency and equity arguments suggest that a desirable form of the government aid program for higher education may be a combination of grants and loans. An optimal form of the government aid program may involve a certain amount of grant as the base plus an additional amount of loan provision. A specific form of combination of these two funding instruments would depend upon various country-specific factors.

18.2.3 Compared to other programs: government guarantees, loans for other uses

The government may provide guarantees for loans provided by private banks to students choosing higher education. Government guarantees would enhance such loans by eliminating the risk of default without raising large amounts of funds that it would otherwise need. In this case, however, there is possible moral hazard in terms of the collection effort by private banks, which could increase the rate of default; once loans are guaranteed by the government, private banks may not make serious efforts to collect the debts. This was one of the reasons why the Korean government decided in 2006 to provide loans to students directly.

The loans program for educational use, which is basically a loans program for the young, is relatively more effective compared to loan programs for other uses. This is because the benefit of consumption-smoothing is greater when loans are offered to the young, who have longer periods of remaining lifetime over which they can smooth their consumption, than when they are offered to older persons.

18.3 Enhancing efficiency of loans programs: loan-cosigning

The welfare effects of loans programs for higher education largely depend upon the repayment formula, which should be designed to minimize moral hazard in the debtor’s choice of earnings effort in order to enhance the repayment rate, while maximizing consumption-smoothing benefits.

One way to improve the efficiency in designing the repayment mechanism would be to introduce loan-cosigning.\(^6\) An argument for loan-cosigning is that it can effectively control moral hazard behavior on the part of a debtor by taking advantage of possible informational superiority that a cosigner may have about a cosignee (or a debtor) and of potential peer pressure between debtor and cosigner.\(^7\) Suppose that the government mandates (at least a part of) the loans to be cosigned by a family member or a close relative of a debtor whenever a credible cosigner is available. Since a cosigner of this type is better informed than an outsider (such as government or a bank) of the actions taken by a debtor, the debtor’s behavior can be more effectively monitored.
Furthermore, a debtor could be subject to 'peer pressure' from a cosigner that can rise from the burden-sharing scheme and from informal relationships between them.

The informational advantage on the part of a cosigner and the peer pressure upon a cosignee (or upon a debtor) can work together to improve the efficiency of the loan program by reducing moral hazard behaviors of a debtor. Stiglitz and Yun (2013) have shown that it is always desirable to introduce cosigning for at least a part of loans by an individual close to a debtor if a credible cosigner is available. This does not suggest that the government should mandate loans to be cosigned, but that it may offer debtors the option: cosigned loans with relatively lower interest rate charged, or un-cosigned loans. As cosigning reduces the price (interest rate) of loans for debtors, the possibility of loan-cosigning would facilitate implementation of ICLs even when a credible cosigner is not available for every debtor.

18.4 Other issues

In this chapter we outlined welfare effects of ICL as compared to other types of government aid programs such as mortgage-type loans, grants and others: including efficiency arguments for ICL in terms of (intertemporal) consumption-smoothing, insurance and incentives, as well as equity arguments in terms of cross-subsidization among individuals. This suggests that a desirable form of government aid program for higher education may entail a certain amount of subsidy as a base because of reasons of equity, insurance and externalities, and some additional amount of loan. In particular, we suggest that if high administrative costs are associated with ICL, then this may lead to a two-tier system that implements an ICL for low-income families and a mortgage-type loan for higher income earners. This is because the welfare effects of ICL may be outweighed by high administrative costs. As noted earlier, however, the efficacy of a two-tier system adopted in Korea has not yet been substantiated by the information on the administrative costs of ICL and ML.

Finally, we would like to make a point on the role of government: loans have to be managed by the government because of certain capital market failures. In particular, as Chapman (Chapter 1, this volume) mentions, although the private sector could provide funds for the ICL, loan collection requires the public sector with the necessary legal and administrative mechanisms.

Notes

1. While it has been emphasized that ICL may be subject to relatively more serious moral hazard compared to mortgage-type loans (Chapman, Chapter 1, this volume),
partly because the former provides insurance against the risk of low earnings, the relative incentive effects of ICL need to be analyzed more completely (see Racionero, Chapter 19, this volume, for a summary of recent research into preferences for ICLs versus tax subsidized schemes).

2. The optimality of introducing ICL has been established in the absence of its administrative costs by Stiglitz and Yun (Chapter 16, this volume).

3. Note that there may also be high administrative costs associated with collecting repayments from ML loan defaulters.

4. The informal sector in most developed countries is small (for example, the proportion of informal sector workers in Australia and the UK is around 5 per cent) and further, generally only a very small proportion of graduates are employed in the informal sector. However, the informal sector is so large in Korea that it is possible that a non-trivial number of college graduates with ICL may end up with jobs in the informal sector, and may benefit from either non-collection due to non-disclosure of income, or loan forgiveness due to low wages.

5. Furthermore, since ICLs provide greater intertemporal consumption smoothing compared to grants, the equity consequence of the former may be more favorable than suggested by the amount of cross-subsidy. This may be especially true when considering the fact that the income risks created by education investment tend to be more burdensome for the poor.

6. Note that loan-cosigning would not be able to completely resolve market failures associated with loan provision because full cosigning is not optimal in general (as shown by Stiglitz and Yun, 2013), since a certain portion of loans would remain un-cosigned. Also, to the extent that economic shocks are systematic, loan-cosigning would not be able to resolve the problem of loan-defaults even if cosigning is complete.

7. See also Higgins (Chapter 10, this volume), who recommends compulsory cosigning from both parents to reduce moral hazard for an ICL for paid parental leave.

8. To the extent that a cosigner is negatively affected, however, one might wonder if the government can actually implement loan-cosigning. Two points can be made on this issue: First, loan-cosigning may be viewed as an implicit contract that can be arranged among the members in an informal group, which leads to Pareto improvement, ex ante; Second, in the presence of this type of an implicit contract, due to the peer pressure within an informal group, one member of the group would find it very difficult not to agree to cosign the loans for another member, ex post. These arguments may be particularly relevant in the context of LDCs. On the other hand, however, implementation of loan-cosigning may be not be feasible for many financially disadvantaged in LDCs, since they may lack financially secure family members who could act as credible cosigners.

References

19
Income Contingent Loans for Higher Education and Beyond

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The role of income contingent loans (ICLs) as a risk-management device is being increasingly emphasized. Many countries have adopted ICLs to finance higher education and alternative uses have been proposed. In this chapter I first outline the main features of existing ICL schemes for higher education and discuss alternative designs. I then identify issues to be addressed when considering novel applications. Many existing ICL schemes for higher education imply large implicit subsidies: the interest rate is often highly subsidised and the shortfall from non-repayment is typically financed from general taxes. Increasing the share of the cost borne by successful graduates could help alleviate the negative consequences of current designs, but the extent to which this is feasible depends on whether there are significant moral hazard and adverse selection effects. These problems have traditionally seemed relatively minor in the higher education context but could be quite significant for some of the proposed applications.

19.1 Introduction

Australia was the first country in the world to implement a universal income contingent loan scheme to finance the cost of higher education – the Higher Education Contribution Scheme (HECS) – in 1989. Several countries have adopted similar schemes since then. These include New Zealand in 1992 shortly after Australia and most recently the UK in 2005.¹ Income contingent loans (hereafter, ICLs) provide insurance against adverse labor market outcomes by making repayments contingent on earned income. In particular,
they protect low income earners since no repayment is typically due when earnings fall below a minimum income repayment threshold.

The role of ICLs as a more general risk-management device has been increasingly emphasized and, accordingly, there are a growing number of proposals to extend the use of ICLs to other contexts. Chapman (2006a) considered applications of ICLs to drought relief, criminal reparations, provision of finance to economically disadvantaged regions, and support to low-income households. The *Australian Journal of Labour Economics* devoted in 2009 a special issue to further explore some of these applications and propose novel ones such as mature age training, paid parental leave and innovation, among others.²

This chapter is organised as follows. In Section 19.2 I discuss some aspects of existing ICL schemes for higher education and review some of the main results in the literature. In Section 19.3 I identify some of the issues that require in my view careful attention when considering extending the use of ICLs to other contexts. In Section 19.4 I comment on the general theoretical framework proposed by Quiggin (Chapter 3, this volume) and suggest avenues for further research. Finally, I provide some concluding remarks in Section 19.5.

### 19.2 ICLs for higher education

In this section I discuss some aspects of existing ICL schemes for higher education and review some of the main results in the theoretical literature.

#### 19.2.1 Implicit subsidies

Many of the existing ICL schemes for higher education imply large implicit subsidies, which stem from the fact that the real interest rate imposed on the loan is often highly subsidised. This is for instance the case of the Australian HECS, where the real interest rate applied to the loan is zero.³ As a consequence, students who defer the payment receive larger subsidies the longer it takes them to repay the debt (that is, the net present value of the debt decreases with the time it takes to repay).

These implicit subsidies lack transparency, which is among the desirable characteristics of any public policy.⁴ In addition, they contribute to increase the share of the cost of the loans that falls on the taxpayer. Barr (2012b and Chapter 5, this volume) identifies the cost of loans to the taxpayer as the root of the problem and attributes part of this cost to badly targeted interest subsidies.

Barr claims that ‘interest rates do not help students (graduates make repayments, not students); and they help low-earning graduates only slightly, since they are protected by income contingent repayments and, for graduates with low lifetime earnings, eventual forgiveness’ (Barr 2012b, p. 486). He
argues that in an income contingent scheme higher interest rates increase the duration of the loan, with no effect on monthly repayments, and illustrates, by means of a simple example, how the major beneficiaries of interest subsidies are in fact successful professionals in mid-career. The high cost from bad targeting of interest subsidies is explored in detail in Shen and Ziderman (2009), a study that compares the hidden grants and repayment ratios for 44 loans in 39 countries.

19.2.2 Who should pay for the shortfall?
Most of the existing ICL schemes rely on contributions from general taxes to finance the cost of the education of unsuccessful students. This is for instance the case of the schemes in place in Australia and the UK. This type of scheme is often denominated a ‘risk-sharing’ ICL because the risk is shared with the taxpayer. An ICL in which successful graduates are made responsible for the cost of the education of unsuccessful students is often called a ‘risk-pooling’ ICL and would typically be self-financing.5

There are very few examples of risk-pooling ICLs. One such scheme was implemented by Yale University in 1971: the Tuition Postponement Option program. All students graduating in a given year with an outstanding debt were grouped in repayment cohorts with collective repayment responsibilities: an individual student's contractual obligation concluded only when his or her cohort repaid the aggregate loan balance, or after 35 years. The discontinuation of the Yale Plan was partly attributed to adverse selection: Nerlove (1975) argued that, for such a university, hoping to attract the highest quality students, the scheme had the perverse effect of encouraging those students who expected to be successful in the labor market to seek enrolment at universities offering non-ICL financial assistance. This conveyed the idea that self-financing schemes were not feasible.

However whether risk-pooling schemes induce adverse selection depends crucially on the availability of attractive funding alternatives, and hence on the degree to which the scheme is sufficiently universal and/or compulsory. In 2001 Hungary first implemented a broad-based self-financing ICL.6 Proposals such as repayment extensions and surcharges, like those put forward by Barr (2010), would impose a larger share of the cost on successful graduates, and can be interpreted as introducing a certain degree of risk-pooling.

García-Peñalosa and Wälde (2000) and Del Rey and Racionero (2010) analyse higher education participation under several alternative financing schemes, including tax-subsidy and mortgage-type loans alongside risk-sharing and risk-pooling ICLs.7 In García-Peñalosa and Wälde (2000) individuals differ in inheritance whereas in Del Rey and Racionero (2010) they differ in ability. When individuals differ in ability it is possible to compute an optimum ability threshold (that is, an optimal level of
participation in higher education) and study whether the alternative schemes induce insufficient or excessive participation.

Del Rey and Racionero (2010) identify the subsidy and insurance components of the different schemes considered and show that when risk aversion is sufficiently large the risk-pooling ICL, which provides more insurance, yields higher participation. Participation remains inefficiently low however because none of the higher education financing schemes considered provides full insurance at actuarially fair prices. They propose an alternative financing scheme that induces optimal participation by fully insuring the lowest ability individual who should enrol in higher education, and show that this scheme is equivalent to a risk-pooling ICL that covers both financial costs of education and forgone earnings.

19.2.3 Extending the loan beyond tuition fees?
Existing ICL schemes for higher education differ in what is covered by the loan: for example, in Australia the loan only covers tuition fees while in New Zealand and the UK the loan can also be used to finance living expenses. Insufficient finance can represent a significant impediment for academically deserving but cash constrained individuals to pursue higher education. Higgins (2011) shows that in Australia, despite changes aimed at improving the financial situation of university students, financial hardship remains prevalent and the rates of paid student employment are relatively high. According to the Universities Australia 2006 survey of undergraduates about 70 per cent of undergraduate students worked during the semester, at an average of almost 15 hours, and over 40 per cent of full-time undergraduates (and 50 per cent of part-time undergraduates) reported a significant negative effect on their academic experience as a consequence.

Higgins (2011) estimates that as little as AUD $1,500 per annum could result in improved participation and educational outcomes for many existing and prospective students. He examines the case for extending ICL to income support under two alternative scenarios – a loan surcharge and real loan indexation – and argues that a surcharge would be more attractive to students, and cross-subsidisation from higher earning to lower earning graduates would reduce the cost to the taxpayer.

An extension of the ICL to income support using a risk-pooling mechanism would be in line with the theoretical results mentioned in Section 19.2.2. In 2010 the Australian government introduced Start-up Scholarships, which amounted to $2,050 per annum in 2013, to help with the living costs for eligible students. In April 2013 it was announced that from 1 January 2014 the Start-up Scholarships would be replaced by Start-up Loans to be repaid in an income contingent manner following the existing Higher Education Loan Program (HELP) parameters (that is, risk-sharing rather than risk-pooling).
19.2.4 Moral hazard and adverse selection effects in higher education?

One of the main features of ICLs is that, by making repayment contingent on earned income, they provide insurance. Moral hazard and adverse selection are however two well-known problems associated with the provision of insurance when there is asymmetry of information. The moral hazard problem stems from the fact that the insured-against event may happen more often when the insurer is unable to observe the effort of the insuree because, due to insurance, the insuree has less incentives to avoid the risky outcome. The adverse selection problem concerns the fact that an insurer unable to observe the risk type of the insurees may end up trading more often with the most risky individuals, who are those that stand to gain more from insurance.

Self-financing schemes such as risk-pooling ICLs, which make successful graduates bear a larger share of the cost of higher education, can arguably affect their willingness to exert effort. Risk-pooling may also affect the willingness of students who expect to be successful to take such a loan if they have alternative funding options. A risk-sharing ICL that relies partly on tax revenues for the cost of education of unsuccessful students could be viewed as a compromise between pure mortgage-type loans, with no taxpayer contributions and no insurance, and risk-pooling ICLs, with no taxpayer contributions but a certain degree of insurance, even if as illustrated in Del Rey and Racionero (2010) it falls short of providing full actuarially fair insurance.

The extent to which moral hazard and adverse selection are indeed relevant problems in the context of higher education deserves further investigation. Palacios (Chapter 17, this volume) argues that agency costs are not as high as typically thought when dealing with students. He uses a simple dynamic example to illustrate that, when present effort affects future earnings, the effect of moral hazard is likely to be smaller than often considered. The cost of shirking today increases when the individual takes the loss in future earnings into account, and this reduces the distortion associated with the income contingent contract. He acknowledges that income contingent contracts may be more distortionary when future earnings do not depend on current effort, or when the expected work life of the individual is relatively short. However, the impact that current effort has on future earnings is likely to be more significant for young graduates, making them less prone to moral hazard. He also claims that adverse selection effects may be less important when students do not perfectly know their own ability.

19.2.5 Political economy aspects of switching between schemes

Ultimately whether a particular higher education financing scheme is implemented depends to a large extent on whether it can gather sufficient political support. The level of support in turn often depends on the comparison of the proposal with the scheme in place. A few recent
contributions have explored the political economy of higher education finance in frameworks that include ICLs as options. Borck and Wimbersky (2009) study voting over a relatively comprehensive set of higher education financing schemes in an economy where risk-averse households differ only in wealth. Del Rey and Racionero (2012a, 2012b) consider risk-averse individuals who differ both in ability and wealth and focus on the choice between two financing schemes at a time to illustrate the tensions countries face when attempting to switch between schemes.

Del Rey and Racionero (2012a) analyse the choice between tax-subsidy and risk-sharing ICLs to capture the situation of countries that have traditionally financed higher education from general taxation and consider increasing students’ contributions through partially subsidised ICLs. Many Western European countries have experienced, or are considering, this type of reform. In their simple framework there is an ability threshold below which individuals prefer the risk-sharing ICL and above which they prefer the tax-subsidy scheme. The composition of the groups and the final voting outcome depends however on the comparison of this ability threshold with the ability thresholds that determine participation under each financing scheme.

Risk aversion plays a key role: an increase in risk aversion reduces participation and hence support for the tax-subsidy, since those who do not study unambiguously prefer the ICL; in addition, if the college premium is large a larger degree of risk aversion increases support for ICLs among some students - those with relatively lower ability and wealth. Two types of support patterns are possible, and both are shown to arise in numerical illustrations: either the support for the tax-subsidy comes from those who study regardless of the scheme in place, and some – those with relatively higher ability and wealth – who study with tax-subsidy but not with ICLs; or the support for the tax-subsidy scheme comes exclusively from only some individuals – those with relatively higher ability and wealth – who study regardless of the scheme in place. The higher probability of success of higher ability individuals induces them to support the tax-subsidy instead of ICLs because they expect to contribute more under the latter; the lower absolute risk aversion of wealthier individuals reduces their demand for schemes that provide insurance, and hence their support for ICLs. However, when the degree of risk aversion is particularly large ICLs become relatively more attractive.

Del Rey and Racionero (2012b) focus alternatively on the choice between risk-sharing and risk-pooling ICLs to capture the situation faced by countries considering switching from partly subsidised to mostly self-financed funding schemes, while still providing insurance through income contingent repayments. They show that larger degrees of risk aversion imply increased support for the risk-pooling ICL. In their numerical illustration the risk-pooling ICL is preferred by a majority for all the combinations of parameter values considered.
These results cast a positive light on policy recommendations for full recovery of loans in an income contingent fashion, such as the repayment extensions and surcharges proposed by Barr (2010) in order to increase the burden on successful graduates and reduce the burden on the taxpayer. The cost to the taxpayer compromises in Barr's view the objectives of (better) quality, (wider) access and (larger) size.

A problem of risk-pooling schemes is that they may lead to adverse selection when alternative funding arrangements are available: high-ability individuals may want to opt out because, with higher probabilities of success, they are likely to be the ones made responsible for the cost of education of unsuccessful students. One solution is to make risk-pooling schemes compulsory but this might not be enforceable when students are mobile and can seek alternative, more favourable, funding arrangements elsewhere.

Del Rey and Racionero (2012b) explore the possibility of letting students self-select into two schemes: a self-financing ICL and a pure loan, where the latter is more attractive to wealthy high-ability individuals. In essence, the government offers loans to students and lets them choose whether to have them insured in a risk-pooling fashion or not insured at all. They show that risk-pooling ICLs can be guaranteed without resorting to coercion. If risk aversion is sufficiently large the possibility of opting out becomes less attractive and the participation pattern is then similar to that obtained when only risk-pooling ICLs are offered: the extra cost successful graduates bear, above the cost of their own education, can be interpreted as the risk premium they are willing to pay for the insurance risk-pooling schemes provide.

19.3 Novel applications

Chapman and Hunter (2009) briefly discuss some alternative applications of ICLs to contexts such as drought relief, paid parental leave and mature aged training, among others. These proposals are explored in further detail in the papers of the special issue of the *Australian Journal of Labour Economics*. In the concluding piece of the special issue Gregory (2009) highlights the reasons that in his view made the introduction of HECS so successful: in particular, he mentions that there wasn't any sufficiently attractive alternative at the time, and that adverse selection and moral hazard problems seemed relatively minor in this particular context. Many of the novel proposals may however be more prone to moral hazard and adverse selection effects, and in many cases there are existing – even if imperfect, still attractive to many – alternatives in place.

19.3.1 Tackling adverse selection and moral hazard

When moral hazard and adverse selection effects matter, addressing them affects the design of the policy. To fight the moral hazard effects associated
with the provision of insurance, governments typically use deductibles, co-payments and/or co-insurance, which are designed to increase the individual’s exposure to risk and induce him or her to exert more effort to avoid the insured-against event. To tackle adverse selection effects, governments often employ discriminatory rules, in the form of menus that include different policies for different types. These menus are designed to induce individuals to reveal their types by their choice and typically involve distortions being imposed on particular types. These solutions can render the policies complex and costly to administer.

It is worth exploring whether the costs of addressing moral hazard and adverse selection problems are small enough or too large to make a particular proposal worth pursuing. To a certain extent this is an empirical issue. However, a sound theoretical framework can help to identify the parameters of interest. It can also help to explain why, when asymmetry of information is an issue, a policy feature that seems counterintuitive may indeed be optimal.12

Chapman and Higgins (2009) explore an optional ICL supplement to paid parental leave, beyond the 18 weeks taxpayer funded scheme announced by the Australian government in 2009.13 This study provides a good illustration of the complexities an ICL scheme has to contend with when moral hazard and adverse selection effects are significant. The authors indeed recognise that moral hazard and adverse selection may be critical policy issues in the context of paid parental leave and highlight how they are addressed in the scheme design. Solutions put forward to fight moral hazard and adverse selection problems include, among others, restricting loan duration and size, restricting eligibility to parents with workforce attachment, reducing minimum repayment thresholds to those below used for HECS, and making the debt an obligation of both parents.

19.3.2 Existing policies and political support

For many of the novel applications of ICLs explored in the special number of the *Australian Journal of Labour Economics* there is an existing policy already in place. In some cases the proposed scheme seeks to replace the existing policy. In other cases, such as the paid parental leave extension explored in Chapman and Higgins (2009), the purpose is to supplement, not replace, another policy. In cases where the ICL is conceived as a supplement, it is crucial to understand whether individuals correctly perceive it as such or believe on the contrary that the existing support may be removed or reduced upon the introduction of the ICL, as this will significantly affect the political support for such a proposal.

Higgins and Withers (2009) examine the community views on HECS and on ICLs more broadly, including several of the novel applications. The survey results indicate strong community support for HECS, an ICL for Research and Development, and repayment of government assistance to elite athletes while
opinion on repayable assistance to farm businesses for drought relief is more evenly distributed. They find however little support for introducing an ICL scheme for child care, and especially so from those who have received government assistance for child care in the past. With respect the ICL scheme for child care, the authors remark that responses would have substantially differed if the question had instead indicated that the ICL was intended to supplement, rather than replace, the existing government benefit. They acknowledge that this deserves further investigation.

19.3.3 Accumulation of ICL debts

An accumulation of individual and/or family ICL debts is likely to result if several ICL proposals are implemented and individuals are allowed to apply for more than one. Such a situation would for instance arise if a couple of young graduates, with outstanding HECS debts, have children and obtain an ICL for parental leave support.

ICLs are designed with the twin objectives of consumption smoothing and default insurance. In order to continue to honour these objectives the overall repayment schedule, if several ICLs are simultaneously offered, should remain manageable from the individual's perspective: that is, the combination of repayment thresholds and repayment rates should remain sufficiently generous to avoid inflicting financial stress to individuals with more than one ICL. However, the government would need to carefully design the ICL policies, taking the full set simultaneously into account, to ensure that the cost to the taxpayer does not escalate. Risk-pooling ICLs that charge real interest rates are better suited to accomplish this since they impose a smaller burden, if any, on the taxpayer.

19.3.4 Compensation versus responsibility

The use of ICLs is often justified on efficiency grounds: ICLs help overcome capital market imperfections in instances where risk and uncertainty place important limits to what can be achieved by traditional loans.

Many existing ICL schemes for higher education impose however a significant burden on the taxpayer. This is particularly so when the real interest rate is highly subsidised and/or the debt of unsuccessful individuals is mostly financed out of general taxes. Many of the novel applications of ICLs address problems that affect subsets of the population, such as farmers, parents or mature students. If the design of the ICL implies substantial subsidies, and hence redistribution, to a particular group I believe that a detailed explanation of why that group receives a favourable treatment is necessary.

There is a strand in the social choice literature devoted to understanding how compensation and responsibility arguments shape public policies. When individuals differ in several characteristics, it may be deemed that they
deserve compensation for some of the differences, for which they are not responsible, but not so for other differences, for which they are held responsible. Fleurbaey (2008) notes that risk and insurance issues complicate the analysis of compensation and responsibility: when individuals take risks and are especially unlucky it seems harsh to consider that they should bear the full consequences of their behavior. One solution, proposed for instance by Le Grand (1991), essentially implies making all those undertaking a risky activity pay a special tax to fund the indemnity to the unlucky ones among them.

If individuals are held responsible for their decision to belong to a certain category (that is, they choose to become farmer, parent or student) but these decisions involve risks, the planner should then focus on providing insurance in the most efficient way possible. The optimal design of the insurance policy will depend on the particular circumstances in the market, and very importantly on the extent of adverse selection and moral hazard effects of insurance, but the argument above suggests risk-pooling ICLs should be preferred when feasible. If there are significant public benefits stemming from the individual decisions it may be possible to justify providing subsidies, alongside insurance, preferably transparent and commensurate with the value of the public benefit.

19.4 Towards a general theoretical framework

In Chapter 3 of this volume, Quiggin proposes a theoretical framework that seeks to be sufficiently general to embed a diverse set of ICL applications. In a model where individuals have identical preferences, differ only in ability and face wage uncertainty, he compares ICLs to both market loans and tax-financed public subsidies. This comparison is particularly relevant in the presence of asymmetric information and the possibility of default. He concludes that, under reasonable circumstances, ICLs are superior to either of the alternatives considered.

When compared with tax-financing, ICLs are more equitable when the initial transfer is positively correlated with wages. ICLs can also be more efficient: this is the case when the individual expects to repay the loan in full. When compared with market loans, ICLs provide insurance against wage uncertainty. Quiggin notes that ‘adverse effects on labor market efficiency only arise for wages in the interval where the optimal effort, given the repayment schedule, would lead to partial, but not complete, repayment.’ (p.46)

The model aims to remain sufficiently general to be able to serve as the basis for the analysis of different ICL proposals. It would be worthwhile exploring how the general conclusions adapt to particular ICL applications. For instance, it seems worth exploring how large the wage interval for which adverse effects on labor arise is, and also how the distortion on labor
compares with the gain from default insurance. Numerical simulations calibrated to represent particular ICL proposals could shed more light on the extent to which the labor supply distortions are small enough, and the gains from default protection are large enough, to support the ICL proposal.

In the context of higher education, and concerning the comparison between mortgage-type repayment loans and alternatives, including income contingent options, Felicia Ionescu has published a series of papers that seek to quantify the welfare effects of different policy options on individuals of different characteristics, taking into consideration how these options affect a series of individual decisions including the decision to default, the decision to participate, the choice of consolidation regime, and so on (see Chatterjee and Ionescu (2012), Ionescu (2008), Ionescu (2009) and Ionescu (2011) for details on the modeling strategy and the main outcomes). These papers could provide a good basis to undertake further analysis of the kind within the present framework.

The model proposed by Quiggin (Chapter 3, this volume) shares a few common features with models employed in the so-called ‘new dynamic public finance’ literature. Contributions in this field emphasize the roles of risk and time: taxpayers typically face a sequence of uninsurable shocks to the value of their human capital. It may be worth exploring the links to some of the contributions in this literature. In particular, Andenberg (2009) examines the optimal design of education and redistributive policies in an environment where individuals invest in education and face idiosyncratic wage risk. A key feature of human capital investments is whether they increase or decrease wage risk. He shows that this feature alone determines whether a constrained optimal allocation should be characterized by a positive or a negative education premium. One key limitation of his framework is that individuals are ex-ante identical.

Findeisen and Sachs (2012) consider both ex-ante heterogeneous individuals and risky educational investments. They study the optimal combination of income tax and education policies in a dynamic asymmetric information environment with heterogeneous agents and uncertainty, where both education and labor supply decisions are endogenous. They show that the Pareto-optimal labor distortions are history-dependent: the implicit tax rates depend on education in addition to income. The Pareto-optimal allocation can be implemented by simple policy instruments: income contingent student loans in addition to standard taxes on labor earnings and savings.

19.5 Concluding remarks

This chapter includes some insights on existing ICL schemes for higher education, the novel applications of ICLs to other contexts and the general theoretical framework proposed by Quiggin in Chapter 3.
Existing ICL schemes for higher education impose a large share of the cost on the taxpayer. This can significantly harm access, quality and size. In particular, some existing ICL schemes do not cover income support, which hinders participation. A move towards charging real interest and increasing the share of the cost borne by successful graduates would reduce the cost to the taxpayer and help alleviate some undesirable consequences of existing ICL schemes. The final design is however likely to fall short of complete risk-pooling (that is, self-financed cross-subsidisation of unsuccessful students by successful graduates) since the incentives for those who expect to be successful have to be considered, especially if there are relevant informational asymmetries.

The higher education finance experience with ICLs should help in the analysis of a growing number of proposals to extend the use of ICLs to other contexts (for example, drought relief, mature age training and paid parental leave). Moral hazard and adverse selection problems are likely to be more significant in these contexts. It is worth exploring whether the costs of addressing moral hazard and adverse selection are small enough or too large to make a particular proposal worth pursuing, when for many of these proposals there are alternative, relatively attractive, policies already in place.

To a certain extent this is an empirical question. However, a sound theoretical framework can help to identify the main issues at stake. In Chapter 3, Quiggin proposes a theoretical framework that aims to be sufficiently general to enable the analysis of diverse ICL applications. He compares ICLs to both market loans and tax-financed public subsidies and concludes that, under reasonable circumstances, ICLs are superior to either of the alternatives considered. Further work, such as performing numerical simulations for particular applications and exploring the links to the new dynamic public finance literature, could shed more light on those general results.

Notes

1. See Chapman (2006b) for an overview of the international experience with income contingent loans for higher education, and Chapman (Chapter 1, this volume) and Barr (Chapter 5, this volume) for some more recent applications.
3. Those who choose to pay their fees up-front have up to date received a discount, which was originally 25 per cent but was progressively reduced to 10 per cent. The up-front discount means that in effect HECS incorporates an implicit interest rate. The Australian government announced in April 2013 that it plans to abolish the up-front payment discount.
4. The desirable properties of a tax system, and generally any public policy, are efficiency, equity, administrative simplicity and transparency (often also called political responsibility).
5. There is not yet a consensus on student loan terminology. I employ the terminology from Chapman (2006b) for consistency with my previous contributions (for example, Del Rey and Racionero 2010, 2012a, 2012b). Nicholas Barr, in, for example, Barr (2012a) section 4.1.2, frames the question in terms of where the cost of the loss falls: (a) on the taxpayer, (b) on the cohort of graduates, (c) on universities via a university-specific risk premium, or (d) on a mix. The risk-sharing and risk-pooling ICLs correspond to (a) and (b), respectively.


7. García-Peñalosa and Wälde (2000) do not use the term risk-pooling ICL but the system they describe as graduate taxes resembles the idea of risk-pooling ICL in Del Rey and Racionero (2010).

8. This result is similar to that obtained by García-Peñalosa and Wälde (2000) in a slightly different context.

9. The mortgage-type pure loan scheme with no taxpayer contribution and no insurance should be treated as a benchmark and differs in some respects from the mortgage-type loans that are offered in reality. For instance, in the US student loans have traditionally received interest subsidies and/or been guaranteed by the government, among other concessions. Clearly, in these cases, taxpayers do contribute to the cost of higher education, either by financing the interest subsidy or the default. As highlighted in Ionescu (2008), the default rates were indeed quite large in the late 1980s.

10. Many countries are raising tuition fees and some of them have considered offering ICLs to counterbalance liquidity constraints associated with increased tuition fees. The UK government first introduced tuition fees of £1,000 per year in 1998, together with loans with income contingent repayments to cover living costs but not fees. In 2006 the UK government extended the ICL cover to tuition fees, which were then allowed to vary up to £3,000. Reforms in 2012 raised the fees cap to £9,000 (Barr, 2012b). These fee increases generated some heated protests from students in late 2010 when first proposed.

11. The Australian Budget 2013-2014 papers predict that students will owe the government AUD $42.1 billion by the end of the forward estimates in 2016-17. The amount of student debt that will never be repaid to government has increased by close to AUD $1 billion from 2012 to 2013, to AUD $6.2bn. Andrew Trounson and Christian Kerr point out in "Lost HECS debt $6.2bn, and rising" (The Australian, January 21st 2013), that ‘[t]he rising doubtful debt and forgone interest of the Higher Education Loan Program, most commonly known as HECS, has fuelled a fresh call for the government to look at reinning in the cost.’

12. The optimal non-linear taxation framework provides a number of examples of such policy features. For instance, marginal distortions, in the form of positive marginal tax rates, are imposed on low-ability individuals not to raise revenue from them, but to raise revenue from higher ability individuals who then find pretending to be low-ability less attractive.

13. Also see Higgins (Chapter 10, this volume) for a summary of the proposal.

14. In the case of the paid parental leave application explored in Chapman and Higgins (2009) the authors note that there may be a case for contributions from taxpayers, employers and parents. The paper however does not dwell on the appropriate balance and focuses instead on how families might be able to finance their own optional extension.

15. Salanié (2011) includes a brief introduction to the new dynamic public finance literature. For a more detailed discussion see Kocherlakota (2010).
References


Since the Australian government introduced the Higher Education Contribution scheme (HECS) in 1989, a number of countries have adopted income contingent loans (ICL) as a method of financing higher education. The advantages of income contingent loans have been thrown into sharper relief by the crisis surrounding student loan debt in the United States, where financing is provided through traditional mortgage-type loans.

Despite this success, and the fact that HECS was consistent with existing schemes for the payment of parental support obligations, suggestions to expand the use of income contingent loans as a policy instrument have found little favour so far. Policies that have been put forward as candidates for income contingent loans include drought relief, parental leave and the payment of criminal fines, but none of these suggestions has attracted significant political support.

The most obvious source of resistance is the fact that many proposals involve the replacement of existing grants with loans. Unsurprisingly, existing recipients would prefer to keep things as they are (for example, see Higgins and Withers, 2009).

The replacement of grants with loans would permit an increase in the number of recipients, as occurred with higher education places in Australia. An obvious instance of this kind relates to the funding provided to elite athletes through the Australian Institute of Sport (Denniss, 2003). By a historical accident, this Institute, unlike, for example, art schools and conservatories, is not part of the higher education system, being funded through the Australian Sports Commission. Proposals to make high-earning graduates, some of whom earn millions of dollars, repay some of the cost of their training, have met with
vigorous, and effective, resistance. The exclusion of elite sports education from the general system of income contingent loans is an obvious anomaly, so proposals to apply the ICL system received at least some attention. However, the untouchable political status of elite athletes ensured the proposals failed.

In other cases, the idea of replacing a perceived entitlement with a loan has been even less successful. The existence and survival of a grant program usually implies that the participants are perceived as deserving, so proposals to replace grants with loans face immediate political difficulties. The fact that access to grants is, in general, tightly rationed, is far less obvious. Those who miss out on grants, but might have benefitted from a loans program, are politically invisible – they may not even be aware of the fact themselves.

Other features of the HECS system which work well in the context of higher education, but may be seen as more problematic elsewhere, include redistribution and risk-sharing, which are closely linked.

By their construction, income contingent loans typically yield greater benefits to those who experience low incomes during the repayment period. If the loan is interest-free, or bears a below-market interest rate, there is a benefit inherent in delaying repayment. On the other hand, charging full market rates almost inevitably involves a substantial risk of default (but for options to address this, see Barr, Chapter 5, this volume). If it did not, there would be no policy problem for income contingent loans to solve, since market loans would function effectively. This benefit may be financed either by government or by cross-subsidies from high-income loan recipients.

The same point may be made in terms of risk-sharing and risk transfer. In the higher education context, income contingent loans reduce the risk inherent in undertaking education. Students who fail to complete their degrees, or face bad labor market conditions on graduation, receive an effective insurance benefit.

In the case of HECS, the most consistent cross-subsidy, or risk transfer, is from students undertaking studies such as business and law, whose tuition charge is close to (arguably, above) the full cost of provision and who mostly earn high incomes after graduation, and towards students studying humanities and sciences. This subsidy has fairly wide community support, and does not attract significant criticism.

It is not immediately clear why similar cross-subsidies and risk transfers are less acceptable in other contexts. However, the recent debate over parental leave in Australia suggests the existence of sharp divisions over such questions as whether leave should be paid at a fixed rate (the current policy) or proportional to income (the policy proposed by the newly elected government). It follows that the use of an income contingent loan could not be regarded (as it largely was in the case of higher education) as a technical improvement in policy. It would be necessary to take a position on distributional issues, thereby alienating some potential issues while attracting others.
Another possible view is that crisis creates opportunity. Income contingent loans for higher education attracted little attention in the US until the recent emergence of a full-scale crisis. Perhaps something similar will be needed to push policymakers away from the view that ‘if it ain’t broke, don’t fix it’.

References

Future Directions for Income Contingent Loan Theory

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A focus in contemporary analysis of income contingent loans is to firmly and formally embed it in rational individual choice theory. Special attention is paid to the associated market inadequacy characteristics that imply a need for loan arrangements beyond conventional finance market mechanisms. This chapter suggests that there are also complementary possibilities for additional new directions for income contingent loan theory and research. New directions are argued to be especially promising in positive political economy analyses of the role of voters, politicians, bureaucrats and interest groups, in normative political economy relating to social welfare function optimisation and in ‘grand theory’ relating to the fiscal crisis of the state.

21.1 Introduction

In some ways income contingent loans are a product of policy ‘muddling through’. Their emergence first as an actual policy instrument was in Australia in 1989 and was driven by a particular constellation of political forces of that time (Chapman, 1997). Since then a number of interesting potential extensions to new areas beyond the original application to higher education has also occupied analysts, though few of these ideas are implemented in practice yet (Chapman, Chapter 1, this volume). However a current ‘Holy Grail’ preoccupying some is the different task of ex post the event of the actual policy to develop a rational choice model for income contingent loans in micro-economic theory. As Lady Pliant expresses it in Congreve’s Double Dealer: ‘Don’t tell me about this and that and all the world, give me a mathematical demonstration’ (Congreve, 2008). There is a
strong sentiment abroad to this effect in income contingent loan analysis. This chapter looks at this theoretical imperative and also the potential for other approaches to this area in political economy and beyond.

### 21.2 The pure theory of income contingent loans

The extant economic analysis of income contingent loans typically assumes a benevolent dictator model of government behavior. It looks to design an instrument of government intervention that redresses identified market failure or equity concerns or objectives.

Standard market failures from public good, externality, commodity merit, risk and uncertainty or monopoly factors have not been advanced as a principal concern in designing loan schemes. Public good, externality and merit concerns can be met with a subsidy intervention. Competitive finance and insurance markets mean that neither private monopoly nor the existence of risk and uncertainty per se are rationales for government loan intervention. Rather it is asymmetric information, wealth distribution and human values merit arguments that seem most to have been advanced as rationales for loan intervention. Asymmetric information as to prospects and realisation of return on investment is relevant in undermining private loan repayment, but:

1. It is only a problem where the investment financed is intangible so that physical collateral is not supplied; and
2. No alternative physical collateral is able to be supplied by the (poor) borrower; and
3. Embodied collateral (including that from a successful investment) may not be offered due to merit based anti-slavery conventions imposed.

In the presence of these market inadequacies, governments may seek to offer:

1. Partially or fully subsidised access to services in the area concerned. In the limit, fee-free and time compensated access may be provided (for example, Continental Europe); or
2. Government guaranteed time contingent loans with fixed repayment (mortgage-style) provided through financial market institutions (for example, USA), with the guarantee being for the loan provider; or
3. Income contingent loans provided by government through the taxation system (for example, Australia).

The first of these government interventions transfers the cost to the general taxpayer. The latter two transfer cost to the borrower, with default protection
for the loan provider common to both because of the intervention, but with
default protection for the borrower and consumption-smoothing added to
distinguish the third instrument. This consumption smoothing that applies to
all borrowers is a distinctive benefit of the income contingent loan and is seen
by proponents such as Chapman (1997) and Barr (2001) as perhaps even the
major virtue in this approach. Naturally, mixed models are nevertheless
feasible.

The government’s power to oblige full income information and to possess a
monopoly over income taxation means that asymmetric information and
transaction costs may be less in an income contingent loan approach than for
time contingent loans. This efficiency gain is argued strongly by Stiglitz
(Chapter 2, this volume) and Denniss (Chapter 22, this volume). However
moral hazard/adverse selection issues are seen in turn as a major challenge to
successful implementation of any of the three instruments – as they affect cost
and completion and/or loan default. Complementary mechanisms for selection
and monitoring are crucial to the success of using such instruments and their
respective costs and benefits. The formalisation of these considerations and
the examination of how they work out for individual choices under specific
policy settings is the current focus of much new further discussion (also see
Klein et al., 2013). There are also interesting extensions feasible with the new
economics of behavioral choice too and in thinking of inter-generational
choice and intra-family choice.

However this paper does wish to point out that there are other
complementary options that also exist for growing this field of analysis of
income contingent loans, beyond conventional market failure analysis and
beyond rational choice micro-economics. Indeed it is the burden of this paper
that together these opportunities form an amazingly rich and important
direction for economics, ranging from grand theory through political economy
to choice analysis, and their empirical manifestations.

21.3 The political economy of income contingent loans

Such theorising, especially as it becomes increasingly formalised, has tended
to sideline any pure analysis of the political economy of finance intervention,
including for income contingent loans. As stated, the approach assumes a
benevolent dictator for the purposes of policy design and implementation.

The standard process is essentially to identify a market inadequacy, look at
alternative intervention instruments and choose the instrument with the least
net cost of meeting the rectification or amelioration objective arising from the
market inadequacy. There may be some disagreement over non-market
valuation, especially for equity or merit goods, but the technical design
character of the approach seems clear. This approach is not unusual in
economics. But it is actually historically a little ironic in this field since,
putting aside Friedman’s (1955) early brief speculations on the topic, practice has really preceded theory. Even the abortive experiments at Yale in 1976 were fairly pragmatic and discussion of Australia’s introduction of its income contingent loan scheme for higher education fees in 1989 is replete more with ‘war stories’ of the governmental gymnastics required for the scheme’s implementation than it is with theorising the nature of the scheme. The devotion of the IEA Workshop on income contingent loans to such theorising was therefore a consummation devoutly to be wished by scholars in the field.

At the same time further development of the evaluation of the design competition, for example, the intricacies of appropriate cost-benefit analysis of alternative instrument characteristics would also continue to be welcome.

That said, the further area that seems very much an orphan still is positive theory and analysis of political economy or fiscal choice. Here the suggestion is also to formalise the ‘war stories’ and build in the rich inter-temporal and cross-country experience to analyse the behavior of governments and their stakeholders in making their actual decisions in this domain. Here economists have theories regarding the behavior of politicians, bureaucrats, interest groups and voters and predictive hypotheses that result from assumptions about say the vote maximising objectives of politicians or the budget maximisation of officials or the rent-seeking of lobbyists. These operate within the constraints of the institutions for collective decision-making.

Recent work by Acemoglu and Robinson (2013) has exhorted economists to undertake precisely this kind of analysis and suggested approaches as to how it might proceed more productively than in the past. There are numerous experiences of those who developed practical adoption of income contingent loans to motivate this theorisation. This can begin with the role of voters where Stiglitz (2013) has emphasised at the Public Lecture preceding the IEA Workshop the crucial role of such voters in determining some of the economic impasse at present to be found in the United States and, to an extent, in Europe, including in areas of student income support as examples.

It can continue to the role of interest groups where Palacios (2004; and Chapter 17, this volume) has explicated the role of the private sector in influencing development of such loans. And it can extend to officials where Chapman has emphasised the crucial role played by national tax authorities in helping or hindering governments looking at such loans (Chapman, 1998).

21.4 A case study in political economy of income contingent loans: public attitudes

Politicians who determine policy settings must be elected and re-elected. The attitudes of citizens, which underpin their voting patterns, is important information. Matters of voting systems intermediate. In 2008 a survey of Australian voters was undertaken to determine attitudes to income contingent
loans (Higgins and Withers, 2009). Familiarity was in place for the extant HECS system for higher education. A range of hypothetical new ICL initiatives was then also proposed and the contrast was drawn for evaluation compared to arrangements currently in place for each area. Three key hypotheses were derived:

(i) Public support for the use of ICL will vary directly with the extent of social rather than business content of the activity.
(ii) Public support for the use of ICL will vary directly with the extent of private consumption of the activity by the respondent.
(iii) Public support for the use of ICL will vary directly with the extent of progressivity in the determination of the income threshold for repayment.

The survey results showed that over 90 per cent of the respondents were familiar with the higher education use of income contingent loans. Equally there was strong support for this approach to higher education. Like support was also found for an ICL scheme for research and development, and an ICL for government assistance for elite athletes. However opinion was evenly balanced as regards repayable assistance for farm businesses for drought relief. And there was strong majority opposition to introducing a repayable loan scheme for child care assistance. It is therefore a public choice fact that public support for the income contingent loan approach will vary significantly with the nature of the area of application proposed. As hypothesised:

(i) The more ‘social’ the area the lower will be support, all else equal.
(ii) Current receipt of support without repayment requirements substantially reduces support for an ICL alternative.
(iii) The perceived progressivity of the repayment threshold and structure for repayment improves support.

Further work is under way on this specific topic as regards socio-demographic determinants of attitudes (Higgins and Withers, 2010). It is concluded that the area is ripe for new theory and empirical work on the political economy of income contingent loans. The pure theory may assist with this, but complementary work will also help advance knowledge in an area that has much policy potential.

21.5 Beyond political economy

Some grander theorisation is also possible if the analysis of income contingent loans turns to welfare optimisation theory and estimation. There is already a
well-established literature on optimal tax. Income contingent loans are a close substitute policy instrument for general revenue taxation. Some time back Cooter and Helpmann (1974) defined how tax arrangements consistent with various alternative welfare functions can be derived (for example, Rawlsian, Utilitarian, Nozickian, and so forth). They also found that the actual tax arrangements for the USA closely approximated median voter preferences rather than conforming to the broader social philosophy alternatives. Stiglitz would not be surprised (2013), and work such as that of Weinzierl (2013) shows how to develop these notions further.

What could be done for income contingent loans is to examine designs that likewise correspond to alternative welfare specifications and/or examine existing designs for the implied welfare function. Long (Chapter 4, this volume) presents a possible analysis framework for this task. One interesting way forward would be to look at the repayment burden calculations now being conducted by researchers in this area and backwards impute the welfare functions implied. Or redesign the repayment burden profile to conform to a preferred welfare specification, for example, that which can be reasonably borne by the least advantaged (Rawlsian).

In moving to social justice interpretations of this policy instrument the area is opened up to grand themes. This could proceed even further in another way. Writers such as Barr (2001), Moss (2002) and White (1992) have provided holistic conceptions of the role of the state as a risk manager. In this spirit Denniss draws attention to what has been called in the past ‘the Fiscal Crisis of the State’ (Chapter 22, this volume). Stiglitz (2013) succinctly outlined how this notion remains all too relevant today in many of the industrialised countries.

One conceptualisation of income contingent loans within the notion of the state as risk manager is that their extension to the range of areas mooted at this workshop and elsewhere (for example, see Chapman, 2006), such as paid parental leave, research and development, low level criminal fines, drought relief payments, brain drain payments and more, might begin to add up to a new narrative about a solution to the fiscal crisis. The safety net aspect of income contingent loans combined with the repayment from success, can define an economical welfare state distinct from the dominant contemporary model.

References


This chapter argues that the administrative costs of contingent loans are likely to be substantially lower than the costs of providing traditional financial products via the private banking system. Building on the notion of ‘transactional efficiencies’ discussed by Stiglitz in Chapter 2, this chapter argues that recent technological developments have created unique opportunities for governments to extract economies of scope and scale by utilising the information, administration and debt collection assets associated with the tax and transfer systems of a developed nation state as the 'infrastructure' needed to provide low cost loans to individuals in a wide range of circumstances. The ability of the taxation and welfare systems to recover debts at low cost from future income flows also creates opportunities to design loan repayment schedules which the private sector have proved unwilling to provide and which are welfare enhancing at both the individual and macroeconomic level. The chapter provides examples of where the tax system is already being effectively used as a 'bank' in multiple countries and concludes that the main barrier to making greater use of the low transaction costs associated with 'contingent banking' are likely to be ideological rather than economic.

22.1 Introduction

While specific forms of contingent loans, such as income contingent loans, have been well described in the literature this chapter describes the potential operation of a broader range of contingent loans including asset contingent
loans (an issue also covered by Chomik and Piggott, Chapter 15, this volume), state dependent loans and hybrid contingent loans. Having done so, the chapter analyses the potential benefits that such loans have over both existing policy instruments and over existing financial products provided by the market sector.

Significantly, while the existing literature on contingent loans places the issues of moral hazard and adverse selection at the heart of analyses of the potential benefits of such schemes (see for example Chapman 2006, 2008), this chapter starts from the premise that publicly administered contingent loans are likely to have significantly lower transaction costs, debt collection costs and administrative costs than a wide range of privately provided loans or publicly provided grant based schemes (see Stiglitz, Chapter 2, this volume). When such benefits exist then the magnitude of any moral hazard and adverse selection costs need to be weighed against welfare enhancement that flows from both the reduction in the cost of service delivery and the benefits to the economy of greater access to lower cost financial services.

Furthermore, the potential to reduce transaction costs and, in turn, increase the number and range of welfare enhancing transactions in the community potentially leads to a much larger range of areas in which the state may be willing to provide improved access to capital. That is, while much of the existing literature on contingent loans is based on the premise that they should only be developed in areas that are associated with a recognised area of policy need, this chapter argues that the ability of the state to reduce transaction costs leads directly to an increase in social welfare. In turn, the existence of positive spill over benefits, while enhancing the case for contingent loans, are not necessary to justify public provision of loans on a contingent basis. The consequences of this conclusion for the optimal size of the state are discussed.

A contingent loan is defined here as a loan that is only repayable under a defined set of circumstances. The most widely examined form of contingent loans are income contingent loans (ICLs) (which are repayable only when the recipients income meets pre-defined levels) for higher education. For a comprehensive overview of the history and theory of ICLs see Chapman (2006) and for a summary see Chapter 1 of this volume.

This chapter treats ICLs as members of a broader set of contingent loans which includes state dependent loans, asset contingent loans and hybrid contingent loans. The chapter considers, for example, the possible benefits of contingent loans to augment paid parental leave where repayments commence on return to work (state dependent) and reverse mortgages that are contingent on age (state dependent) and house value (asset dependent).
22.2 The low costs of government lending

Modern nation states with the capacity to collect income tax payments, pay tax refunds and pay welfare benefits possess the rudimentary transaction and information infrastructure required to provide simple saving and loan functions to citizens. Furthermore, the direction of technological change in recent years, in particular the reduction in the cost of electronic communications, the development of secure online transaction capacity and the consumer uptake of internet access, smart phones and tablet computers has significantly lowered the transaction costs of using government’s tax/welfare capacity to provide simple financial services.

That is, citizens with a tax identification number linked to their name and, against which a balance is recorded, effectively have a government ‘savings account’. In many countries it is common for individuals to hold a positive balance in their ‘tax account’ and to make infrequent ‘withdrawals’, often only annually, in the form of a ‘tax return’. While interest payments are not usually made for those with positive balances interest rates are often applied to negative balances. As discussed below, governments already use their tax/welfare architecture to make a wide range of loans.

The experience from Australia suggests that the average cost of operating income contingent loans is very low, less than 5 per cent of annual revenue according to Chapman (2006). When the information and administrative infrastructure associated with the architecture of a national tax/welfare system are viewed as the fixed costs of a broad saving and loan transaction system the ‘economies of scope’ associated with using such infrastructure for a wider range of financial services become apparent and the marginal cost for some transactions will likely approach zero.

Further, when it comes to collecting ‘bad debts’ national tax offices have significant cost, information and access advantages over private lenders. In most countries it is a crime to conceal income from the tax agency and employers are often required to automatically make withdrawals on behalf of the tax agency. Additionally, governments typically have access to funds at lower costs than private sector lenders.

The combination of low cost access to loanable funds with the economies of scale, economies of scope, and low debt collection costs available to governments implies that governments have the capacity to provide simple transaction and lending services to citizens at lower cost than private sector providers.

It is important to note that the potential for contingent loans to form the basis of a public sector bank have been advanced in the past (see Chapman, 2008). This chapter merely suggests that a focus on the benefits of low transaction and debt collection costs associated with publicly provided contingent loans, rather than a focus on the positive spill overs of loans for
some purposes, means that such public sector banks could provide a much wider range of financial products than has previously been suggested.

22.3 Categories of contingent loans

As described above, a contingent loan is a form of loan in which the existence, and size, of repayments is contingent on a predetermined set of circumstances being met by the borrower.

While the literature and recent policy experimentation concerning contingent loans has focused on the potential of income contingent loans this article suggests that it may be welfare enhancing for governments to explore the creation of loans based on a wider range of contingencies. This section begins with a brief overview of ICLs before providing an overview of other possible contingencies against which government backed lending could be welfare enhancing including asset contingent loans and labor market state contingent loans.

22.3.1 Income contingent loans

The theory, history and practice of ICLs have been comprehensively described by Chapman (2006) and is summarised by Chapman in Chapter 1 (this volume) and Barr in the context of higher education in Chapter 5 (this volume). Put simply, an income contingent loan implies that repayments will commence when income reaches a predetermined income threshold and, possibly but not inevitably, that the contingent loan repayments will rise with income above that threshold. Income contingent loans have been well described in the academic literature and have become an important and growing source of policy innovation in a number of countries, especially Australia. As described in Chapman (2008), income contingent loans for education have been developed or proposed in a wide range of countries including New Zealand, South Africa, Hungary, Thailand and the UK.

As income contingent loans allow individuals to borrow against future earnings they are particularly low risk when they are used to fund investment in assets, such as education, that are likely to increase lifetime income. However, as discussed above, the low transaction and debt collection costs associated with government lending through the tax and welfare system means that income contingent loans that are small relative to the willingness to garnishee minimum welfare benefits could be welfare enhancing regardless of the use to which the loan is put.

22.3.2 Asset contingent loans in theory and practice

While income contingent loans have particular advantages for individuals with no collateral seeking to invest in intangible income producing assets, some people, such as retirees who own their own homes, have collateral but
lack their desired level of cash flow. A government provided asset contingent loan could effectively operate as a reverse mortgage or line of credit for citizens with significant illiquid assets. That is, secured, interest bearing loans can be issued by government to individuals, which would be repaid either on death or on the sale of the asset against which the loan was secured.

In jurisdictions in which death duties or estate taxes are payable such a wealth contingent loan would, in effect, allow an individual to borrow against future tax payments. Given the desire of many people to live in their own home for as long as possible the low transaction costs and low cost of funds available to a government lender creates significant potential for lifetime income smoothing for those with illiquid assets.

It is important to highlight that allowing any individual to access a government backed reverse mortgage represents a significant departure from the usual notion that governments should only be involved in services delivery when significant market failure exists. That is, the benefits of government provision of a secured loan to an individual would flow primarily to the individual if and when the transaction costs and risk premium required by the government were lower than those required by a private bank. That said, to the extent that fewer resources would be needed for the government to provide the service than the private sector requires, the community would benefit via the freeing up of scarce resources for use in other areas. Significantly, when the government provision of contingent loans is justified on the basis of lower cost there is no economic reason to ensure that a wealth contingent loan, for example, was spent on income earning assets such as education as long as the level of security provided by the individual was sufficient to cover potential reductions in the value of the asset that the loan was secured against.

Governments around the world already provide asset contingent loans. For example, some countries allow some residents to delay the payment of land taxes or other property taxes and instead allow such taxes to be paid, with interest, at the time of death or the sale of a property. Such schemes are generally considered to be both equitable and have the advantage of allowing those who wish to continue living in their own homes to do so even if their retirement incomes are not sufficient to cover the full ongoing cost of maintaining their property.

From an economic point of view, however, if governments are willing to lend money to older residents to cover their tax obligations then there is no obvious reason why they should not be willing to lend money to older residents to meet their lifestyle expectations. The risk and transaction costs associated with advancing a $100,000 interest bearing loan for property taxes are no different to the risks and transaction costs of advancing $100,000 for travel or grandchildren’s education.
While the maximum amount of such a loan, if full repayment is expected, would need to be based on a conservative actuarial assessment of longevity and property valuations it is unlikely that the maximum loan that a government should be willing to make should be zero. Indeed, given the differential between government borrowing costs, private sector lending costs, the risk pooling available to government and the low marginal transaction and debt collection costs faced by government it is likely that such a scheme could generate a substantial surplus if desired.

An example of an existing asset contingent exists in Australia. The Australian Government currently offers low interest reverse mortgages to Australian citizens who have too many liquid assets to be eligible for the taxpayer funded age pension scheme. The Australian Pension Loan Scheme allows those of age pension age who are ineligible for the grant based scheme to apply for an interest bearing loan from the government that is paid fortnightly through the welfare system and capped at the fortnightly maximum age pension grant. In effect the Australian Government is offering a low interest reverse mortgage, albeit a very poorly marketed one.

22.3.3 State dependent or rule dependent contingent loans in theory and practice

Under an income contingent loan, repayments are triggered by reaching an arbitrary income threshold. It is, of course, possible to design repayment conditions that are based on contingencies other than income or asset value. For example, loan repayments can be triggered when an asset is sold or purchased, when the debtor turns an arbitrary age, or when they die. It is also possible to design repayment rules based on the labor market state that a person is in (for example unemployed, caring for a family member, or working less than an arbitrary number of hours) rather than on the income they receive.

In discussing state contingent loans it is important to distinguish the decision to make loans when an individual is in a given state (for example when a person is unemployed, caring for a child or recovering from illness), and to require repayments when a person is in a given state (for example when a person finds a job, turns a particular age, acquires or disposes of a particular asset or dies). As discussed below, hybrid contingent loans can be developed where, for example, a loan can be offered to a person in one state (for example, unemployed) and repayments commence when they change state (for example, when they become employed or die) while the repayments themselves could be contingent on income or could be defined in nominal terms or have a nominal minimum repayment.

It is likely that the wider provision of such state dependent loans would be highly attractive to individuals experiencing unemployment or illness or those who wish to take time out from the labor market to help care for children or
other family members. While Chapman and Higgins (2009) have previously proposed an income contingent loan for paid parental leave, the point being made here is that it is possible to offer loans to any group experiencing a temporary reduction in income and, if desired, secure such loans not just against the future income of the applicant but the income or assets of their partner or any other. Similarly, repayments can be made contingent on income, workforce status, or some combination of the two.

It is also important to note that in jurisdictions that provide welfare payments to those on low incomes small loans to citizens can, in effect, be secured against the future eligibility of citizens to welfare payments. Put another way, contingent loans can allow individuals to smooth their lifetime flow of welfare payments at low cost to both themselves and to the agency administering the provision of existing grant based welfare payments.

The cost of assessing, monitoring and enforcing eligibility criteria is significant for both the agencies and the individuals concerned. Significantly, a trade-off exists between a society’s desire to differentiate between categories of ‘need’ and ‘deserve’ in relation to welfare provision and the cost of administering and enforcing such categories. Put simply, there is a trade-off between the provision of a ‘fair’ system and the pursuit of low administrative costs.

The fact that government provided contingent loans are repayable, and that individuals, within broad constraints set by policy makers, could draw from them at the rate they themselves deem necessary, creates the potential to provide income support in a much more flexible way while simultaneously providing the capacity to reduce both the number and cost of arbitrary categories of differential entitlement.

As with asset contingent loans, governments around the world already offer state dependent loans. For example, the Australian government will provide an unsecured loan up to $1,100 to current welfare recipients, which is repayable via deductions from future welfare payments. Individuals can access such loans directly via the welfare agencies website and only people who are in the ‘state’ of receiving welfare are eligible. Intriguingly, while there has been much concern in the literature about the impact of adverse selection on the implementation of contingent loan schemes it is important to note that the Australian scheme is only accessible to low income earners and those with higher incomes and greater capacity to repay loans are specifically excluded from accessing these loans.

Similarly, welfare agencies in the UK, Canada and the US provide ‘advances’ on welfare payments under a range of arbitrary conditions. The policy issue is not whether or not governments should or could make state contingent loans to citizens but how existing schemes should be reformed to increase their efficiency and maximise community welfare.
22.3.4 Hybrid contingent loans

As mentioned above, it is possible to develop contingent loans that draw on multiple contingencies such as income, wealth, health, state and arbitrary administrative rules. For example, an income contingent loan could be provided for education (state based) for first degrees (rule based) and recouped when income reaches an arbitrary threshold (income based) and on death (state based) if part of the debt remained unpaid and the individual died with assets above a predetermined threshold (wealth based).

Similarly, contingent loans can be combined with other policy instruments. For example, Chapman et al. (2006) have proposed an income contingent loan be used to help collect low level fines due to the high rate of default on such penalties. The use of a contingent loan for part of the penalty does not, however, preclude the simultaneous use of other forms of sanction such as incarceration, community service or good behavior bonds.

Similarly, when governments offer wealth contingent loans to retirees to help them boost their retirement income (such as the Australian Pension Loan Scheme), such schemes can co-exist with existing government provided pensions. As discussed above, there will likely be conflicting concerns by those who suggest that either the government has no role in offering loans or that the government should offer higher retirement pensions. However such views about the role of the state should not prevent the thorough examination of the potential benefits of contingent loans by economists interested in the development of policy options from which policy makers can then choose.

22.4 There is no such thing as a bad debt with contingent loans

Private financial institutions anticipate, and cost in, the inevitability of bad debts when pricing loans. While it is in the interests of a financial institution to write as few bad loans as possible, it is not within their ability to foresee all of the economic, legal or personal circumstances which may result in the non-repayment of a loan. Indeed, the expectation that a percentage of loans will not be repaid leads to the cost of those bad loans being spread across the remaining borrowers proportionate to their current level of debt.

Depending on the degree of market power, the cost of bad loans is borne, or shared, by shareholders, customers or, in extremis, the tax payer if their governments have offered to underwrite bank deposits or shareholder capital. In times of rising estimates of bad debts the costs are disproportionately borne by those who have recently taken out mortgages and almost entirely avoided by those who have already repaid their mortgage and those who have not taken one out.

With government backed contingent loans, however, it is not meaningful to refer to ‘bad loans’. It is, of course, possible that a greater than expected number of borrowers may fail to meet thresholds or states on which their
repayments were contingent, but such failure is distinct from a bad loan in two significant ways.

First, the fact that fewer than expected people met a particular contingency in a given year does not mean that the loan will not be repaid, potentially with interest if desired, in the future. While private lenders may treat the failure of an individual to make regular repayments for a year or more as a temporary cash flow problem rather than an indicator of risk, the government’s superior access to low cost debt collection in the form of the tax system is likely to result in a reduced desire to pursue bankruptcy. An unexpected downturn in the number of people repaying contingent loans to the government may lead to a cyclical reduction in the rate at which outstanding loans are repaid but it says nothing about the long run level of repayments. Put another way, while unexpected cyclical reductions in the value of contingent loan repayments may impact on government cash flows, such impacts are largely unrelated to the value of outstanding loan assets measured on an accruals basis. The tax collection system of a nation state has an absolute advantage over the debt collection system of a private bank which, in turn, means that delays in recouping repayments are not a good proxy for the likelihood of ultimately collecting repayments.

Second, and more significantly, the non-repayment of a loan by people who do not reach democratically determined income, wealth or circumstantial thresholds cannot meaningfully be seen as ‘bad debts’. Rather, the non-repayment of loans, or part of loans, is more accurately described as the cost of a policy choice. Whereas banks spread the cost of ‘bad debt’ among those who meet their repayments, proportionate to their level of debt, governments face a number of choices about how the cost of non repayments can be shared. Following the design of the Hungarian income contingent loan scheme the cost of non-repayment can be pooled across other borrowers, proportionate to the size of their loans (see Barr, Chapter 5, this volume). Alternatively, it can be spread across all taxpayers, proportionate to the distribution of the existing democratically determined tax system, or it can pursue a combination of the two.

Put simply, while bank debts are avoided by those whose legal circumstances allow it, contingent debts are avoided by those who meet democratically determined criteria.

22.5 The implications of technological change and contingent loans for the role of the state

The argument that the tax and welfare system are sunk costs which provide nation states with the capacity to deliver a wide range of financial services to citizens at very low marginal costs is enhanced by a range of recent technological advances. For example, private banks have shown that it is
possible and profitable, to develop private online banks with no physical infrastructure and no face to face transactions which significantly reduces the marginal cost of banking transactions.

Similarly, technological change has led in recent years to the redrawing of boundaries within the private sector. For example, while the boundary between manufacturers, wholesalers and retailers was once clear, online retail has blurred, and in some industries removed, such boundaries altogether. The emergence of online retail allows some manufacturers to sell directly to consumers with no need for wholesalers or retailers. It is likely that those same technologies which have lowered retail transaction costs have also transformed the boundary between the services which are most efficiently provided by the market and those that are most efficiently provided by the state. Such changes are unlikely to be unidirectional.

For example, to the extent that email and postal services are substitutes, technological change has likely shifted the most efficient provider of some forms of communication away from publicly owned postal monopolies and towards privately operated internet service providers.

In relation to financial services, however, the ability of citizens to use their own communications devices to directly interact with government databases at near zero marginal cost is likely to have significantly shifted the boundary between those banking services which can most efficiently be provided by the private sector and those in which consumer welfare is enhanced via public sector provision. While there has been extensive economic debate about whether technological change favours capital, labor, or is neutral there has been much less analysis of the implications of technological change on the optimal role of the state.

The choice of the financial services that have been developed in recent decades in Australia (for example, HECS, child support, and cash advances for low income earners) appears to have been motivated by the pursuit of equity rather than efficiency objectives. That is, contingent loans for education and cash advances for low income earners appear to have been justified primarily by the potential benefits of investing in services with a high social return or to address the market failure associated with the financial hardship faced by low income earners with poor access to private financial markets. However, while the existence of positive externalities and/or equity objectives provide strong justifications for government intervention they are not necessary when it can be demonstrated that the cost of public provision is significantly lower than the cost of private provision. To the extent that economists are interested in maximising consumer benefit, if technological change shifts the location of the boundary between optimal provision by market or state then, as the boundary changes, so should the policy prescriptions.
Consider the following thought experiment: Some households do their own laundry while some households pay to have their laundry done. Economists pay little attention to such choices but, to the extent that they do, they likely focus on the cost of commercial laundry services, the time and cost to perform those services within the home, the opportunity cost of time and the relative convenience of the two modes of production.

If a new technology was developed that significantly reduced the time taken to launder clothes within the household and, in turn, there was a significant shift away from household demand for commercial laundry services, would economists be concerned about the impact on private laundry providers, measured GDP or lost tax revenue?

Why then, if technological change significantly reduces the costs of providing financial services via the government (that is, the collective representation of the household sector), should economists be worried about the impact of a new, lower cost and more convenient technology on existing private sector providers?

22.6 Conclusion

For economists and policy makers interested in the efficient allocation of scarce resources the recognition of the value of government taxation and transaction infrastructure combined with the recognition of the declining cost of operating online transaction interfaces should raise significant questions about the relative role of the state and the private sector in a wide range of simple financial products such as savings accounts, unsecured personal loans and secured mortgage and reverse mortgage lending.

Just as the invention and installation of GPS tracking makes the introduction of time of day and distance based road taxes for heavy vehicles economically, if not politically viable, so too does the emergence of online banking interfaces make it economically, if not politically, viable for governments to offer low cost, low risk banking products at prices the private sector could not match.

The capacity of new technology to allow citizens near zero cost access to existing tax/welfare databases for transactional and lending purposes, combined with the nation state’s low cost of debt collection, creates the possibility for the creation, and extension, of a wide range of welfare enhancing contingent loans.

While the issues of adverse selection and moral hazard are important considerations in the design of particular contingent loan policies it is important for economists to view the magnitude of these problems within the context of the significant welfare benefits that flow from the low transaction and administrative cost associated with contingent loans. It is also important
to recognise that governments are already providing a wide range of loan type services to citizens in a wide range of inconsistent financial circumstances.

The notion that the government should use its administrative infrastructure to provide lower cost transaction banking, unsecured loans and secured loans than the private banking system will no doubt be anathema to some economists. Indeed, some may argue that the only reason that the government can provide such low cost services is because they have the ‘unfair’ advantage of a monopoly on tax and welfare administration. While such a critique may well prove politically powerful, it confuses political preferences for a particular size of government with a consistent approach to economic theory and policy advice. Put simply, the purpose of markets is, in theory at least, to deliver low costs and maximum welfare to consumers. Similarly, those who argue that governments should not be able to exploit the economies of scope that flow from their information and administrative assets would no doubt agree that conglomerations of personal and investment banking should be broken up, along with conglomerations such as Google which draws significant market advantages from the information it gains from its search business in monetizing its other businesses.

Of course, the private sector could still play an important, albeit less profitable, role in the provision of government backed contingent loans. Indeed, it may well be that a perfectly competitive, and welfare enhancing market in building the technological interface between consumers and government owned banking infrastructure may quickly develop.

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