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Credit Subsidies for Higher Education

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Credit subsidies are one of the main ways that governments subsidize and increase access to higher education. However, credit subsidies tend to be significantly undervalued in government budgets. That creates incentives for lawmakers to excessively rely on credit in lieu of other types of assistance such as grants that may be more effective at encouraging educational attainment and that avoid the problems associated with high indebtedness. The government also has limited incentives to improve the design of student loans because private competitors cannot compete with deeply subsidized products.

Analysis of the student loan consolidation option provides insights on several of these issues. The option is a feature of the U.S. government's student loan program that has a high cost to taxpayers that often goes unrecognized, and which confers subsidies fairly randomly across different cohorts of students. At the same time it provides a useful laboratory for studying how unsophisticated borrowers respond to financial incentives in government programs.

The consolidation option allows borrowers with variable-rate student loans to lock in their current rate over the remaining life of the loans. For some borrowers, it also allows them to lengthen loan maturity and thereby lower monthly payments. The value of exercising the option varies over time. It is most valuable when short-term rates are low and when the yield curve is steep. It is most beneficial to students with large amounts of debt, such as medical students and students at expensive private institutions.

Using 700,000 loan records from the National Student Loan Data System over the period of 1998 to 2005, Damien Moore and I estimate a behavioral model of student loan consolidation behavior. The model is used as an input into calculating the fair value subsidy associated with the consolidation option. Regarding student behavior, we find that borrowers responded to the time-varying incentives to consolidate although some left sizeable amounts of money on the table; that more indebted borrowers were more likely to optimize; and that there is some evidence of learning over time, probably aided by the financial incentives of private lenders to obtain consolidation business. The ex-ante cost of the option to the government was significant--it ranged from 0.8 percent to 6.4 percent of loan principal between 1998 and 2005.

More broadly, an earlier paper (also with Damien Moore) and work conducted by the Congressional Budget Office, shows that the practice of using Treasury rates as the government's cost of capital, rather than recognizing the full cost of risk to taxpayers by taking a "fair value" approach to subsidy estimation, creates a significant downward bias in the reported costs of the student loan programs. Those analyses show that reported subsidy costs and fair value subsidy costs differ by about 25 cents on the dollar. The effect in recent years has been for the federal student loan programs to "make money" for the government, reducing the reported budget deficit, whereas on a fair value basis they generally represent a cost to the government.

Leverage and the Foreclosure Crisis

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This paper falls within the working group mission to develop theoretical frameworks for analyzing when/why financial markets do not extend "enough" credit to some individuals and the optimal role of government policies in these situations. The authors ask "How much of the recent rise in foreclosures can be explained by the large number of high-leverage mortgage contracts originated during the housing boom?" They study an environment with incomplete markets and idiosyncratic earnings realizations which generates endogenous wealth inequality. Heterogeneous households then select from a set of mortgage contracts and choose whether to default on their payments given realizations of income and housing price shocks. The set of mortgage contracts consists of loans with high downpayments and loans with low downpayments. They run an experiment where the use of low-downpayment loans is initially limited by payment-to-income requirements but then becomes unrestricted for 8 years. The relaxation of approval standards causes homeownership rates, high-leverage originations and the frequency of high interest rate loans to rise much like they did in the US between 1998-2006. When home values fall by the magnitude observed in the US from 2007-08, default rates increase by over 180% as they do in the data. Two distinct counterfactual experiments where approval standards remain the same throughout suggest that the increased availability of high-leverage loans prior to the crisis can explain between 40% to 65% of the initial rise in foreclosure rates. Furthermore, they run policy experiments which suggest that recourse could have had significant dampening effects during the crisis.

The Impact of Social Activities on Cognitive Ageing: Evidence from Eleven European Countries

Dimitris Christelis, European Central Bank

Using micro data from eleven European countries, we investigate the impact of being socially active on cognition in older age. Cognitive abilities are measured through scores on numeracy, fluency and recall tests. We address the endogeneity of social activities through panel data and instrumental variable methods. We find that social activities have an important positive effect on cognition, with the results varying by gender. Fluency is positively affected only in females, while numeracy only in males. Finally, recall is affected in both sexes.

Pension Funding and Human Capital

Fabian Kindermann, University of Wuerzburg

The reform of the pension system has been a major concern in the world wide public discussion for many years. With rising life expectancies and declining birth rates, the sustainability of pay-as-you-go (PAYG) social security regimes seems at risk in the near future. Recent reforms in OECD countries therefore aimed at reducing the upcoming burden that arises from the combination of generous PAYG pension schemes and the recent demographic developments. Typical measures to do so were increasing normal retirement age and indexing the level of pensions to life expectancy. In addition, several reforms paved the way for tax promoted old-age savings. All in all, these reforms have one goal in common: to reduce the size of public pensions and strengthen the role of private savings in retirement income.

The goal of this project is to quantify the consequences of reducing the size of a public PAYG pension system on household decisions as well as the macroeconomy, individual welfare and aggregate efficiency. To do so, I construct a large scale model of overlapping generations. Markets in this model are incomplete in the sense that households can neither insure income nor life span risk and are borrowing constraint throughout the whole life cycle. In addition to letting individuals decide about their savings, consumption and labor supply at the intensive margin, I explicitly allow for human capital formation both via formal schooling and via on-the-job training. The effects of pension reforms on the propensity of individuals to invest in human capital have been widely neglected in the literature.

In this model, which I calibrate to the German economy, I simulate the complete privatization of the public PAYG pension system. In contrast to most of the literature, I do not only compare long run equilibria, but calculate a full transition path. This enables me to look at short-run effects and to do an analysis of both welfare and efficiency effects of the pension system. I thereby clarify the roles of (i) the implicit tax structure of an earnings related pension system, (ii) the absence of annuity markets and (iii) factor price movements on the decision of individuals to form human capital.

I find that as a result of its implicit tax structure, which features decreasing marginal tax rates over the life cycle, an earnings related pension system like the German one is regressive with respect to education, meaning that the higher skilled get out more for their contribution than the lower skilled. Consequently, when the pension system is abolished, college enrollment rates will decline. The effects on on-the-job training are however ambiguous. Pension funding significantly increases private savings and, under the absence of annuity markets, accidental bequests. In a dynamically efficient economy this induces a positive income effect on future cohorts, which causes leisure consumption to rise and therefore depresses both labor supply and human capital investments in the long-run. Factor price adjustments can only partially offset these negative effects on human capital formation. In terms of aggregate efficiency, I find pension funding to come along with neither significant losses nor gains.

Financing Human Capital Development for Economically Disadvantaged Children: Applying "Pay for Success" Social Impact Finance to Early Childhood Development

Janis Dubno, Voices for Utah Children

"Pay for Success" (PFS) Social Impact Finance refers to performance based financing and contracting between government, investors and services providers. Investors bear the risk of performance of the

intervention rather than government and are only repaid if the performance targets of the program are met. Success has two meanings: outcome performance and cost avoidance.

Early childhood research shows a significant reduction in special education assignment for low income children who attend high quality prekindergarten. Reduction in special education costs may be sufficient to pay for a prekindergarten PFS project. In addition to reductions in special education, sources of short and long term cost avoidance for government include grade retention, crime, welfare, and increased earnings.

The financial model proposed in the paper captures cost avoidance in special education. There are three important relationships in a PFS project for high quality prekindergarten: (1) the ratio of the cost of the intervention (prekindergarten) to the cost of the remediation (special education); (2) the ratio of intervention impact to non-intervention impact: i.e., how much does the prekindergarten program reduce special education assignment rates; and (3) the combination of private investor funding, state funding, and federal funding for PFS scholarships for economically disadvantaged children to attend high quality prekindergarten.

The paper examines two loan structures: (1) the guaranteed fixed interest and principal structure whereby interest and principal guaranteed by accrued savings and a philanthropic backstop; and (2) The unguaranteed payment pass-through structure. In this structure, a percentage of the savings are passed-through to the investor, and there is no philanthropic guarantee. Pass through amounts will vary year to year.

The model uses information from the Bethlehem School District prekindergarten program: a reduction of the special education assignment rate of 18% to 3% for low income children; $7,850 per year cost of the prekindergarten program per child, and a cost per child per year of $12,141 (only 80% or $9,713 captured in the model) of special education.

The base case scenario examines a combination of 75% investor funding, and 25% state funding for the PFS project and 500 children are funded. The results for the Fixed Debt structure include a 4.17% IRR to the investor and a 1.26% IRR for the state. The results of the model for the Pass-through structure include 6.0% IRR to the investor; -6.27% IRR for the state.

The paper examines variations of combinations of investor, state and federal funding of PFS scholarships for both financial structures. The combinations examined were: (1) 75% investor funding, 10% state funding, and 15% federal funding; (2) 50% investor funding and 50% state funding ; and (3) 50% Investor funding, 25% state funding, and 25% federal funding .In this latter combination, the IRR to the state increases to 7.45% in a Fixed Debt structure (4.17% for the investor), and to 11.63% to the state for the Pass-Through structure (6% for the investor). The introduction federal funding increases the returns to the state. The inclusion of federal funding is appropriate as the federal government also funds a portion of special education costs to districts, and benefits from improved educational outcomes, as well as improved social outcomes and reduction in long term costs for other social programs.

The paper conducts sensitivity analyses for the different funding combinations, varying the percent reduction in special education assignment rates. The 50% Investor funding, 25% state funding, and 25% federal funding combination provides positive returns to the state in the Fixed Debt structure even if the special education assignment rate is reduced only to 7% (instead of 3% used in the case model). Positive returns to the state are evident in the pass through structure if the assignment rate is reduced to 6% (instead of the base case reduction to 3%).

More research is needed regarding standard errors in program effectiveness, PFS capital structures and risk allocation, cost avoidance in other remedial and government programs, and research and evaluation methodologies.

Several in the audience questioned why the federal government (or taxpayers) should participate. The federal government also benefits from a reduction in the federal portion of special education, as well as the other long term benefits such as reductions in crimes, welfare, and increases in workforce development, earnings and employment. While we had discussed the cost of capital, explicit inclusion of a cost of capital calculation would round out the analysis. In addition, we will include the IRR of the underlying cost avoidance in special education before examining the returns relevant to the financing model.

Consumption Inequality and Family Labor Supply

Luigi Pistaferri, Stanford University

There is a growing debate on the trends, the causes and the consequences of inequality in the US. However, inequality has many dimensions (going from wages to earnings to family earnings, income, and consumption). The link between these various types of inequality is mediated by the presence of "multiple insurance mechanisms" (or even exacerbating factors).

For example, moving from the wage to the earnings distribution involves labor supply choices (which may attenuate or exaggerate any inequality trends in wages), as well as consideration of the roles of labor market institutions, contracts, etc.

Similarly, the move from individual to family earnings requires considering the role of family labor supply, or what labor economists call "added worker effects", which may act in the sense of smoothing shocks received by one family member and reduce inequality.

The traditional role of taxes & transfers matter when moving from the distribution of family earnings to the distribution of family disposable income.

Finally, saving and borrowing, as well as less formal channels (such as networks of relatives & friends etc.) may create a divergence between trends in consumption inequality and trends in income inequality, as many researchers have found in the data.

Our goal with this paper is try to understand the importance of these various sources of consumption smoothing.

To this goal, we allow for four different potential smoothing or insurance devices: savings, labor supply of primary earner, labor supply of secondary earner (typically the wife), and other mechanisms that we will leave un-modeled, but are meant to capture other formal or informal devices (such as insurance provided by governments, networks of family and friends, etc).

We examine the importance of each step in the chain that goes from wages to consumption, assuming that hourly wages are the primitive source of uncertainty faced by workers.

Our study has two distinctive features:

1) From a theoretical point of view, we have a rich framework in which we allow for consumption and family labor supply; the possibility that preferences are nonseparable, and as we shall see this is a key thing;

heterogeneous preferences, in the sense that husband and wife may have different preferences for leisure; and the possibility that due to assortative mating or other mechanisms, the wage shocks faced by the two spouses are correlated.

2) We use data that as far as we know are untapped for addressing the type of question we are interested here, i.e., we use data from the redesigned PSID 1999-2009, which unlike its predecessor has a lot more comprehensive consumption data, and as before it offers good quality data on earnings, hours and assets.

We find that nonseparability is important and that female labor supply is an importance insurance device for smoothing consumption against permanent wage shocks faced by the husband. Once saving, labor supply and taxes are taken into account, there is no evidence of extra smoothing provided by outside insurance mechanisms.

The Chosen Few: How Education Shaped Jewish History, 70-1492

Zvi Eckstein, Interdisciplinary Center Herzliya - IDC

The author summarized the main findings from his book with Maristella Botticini on Jewish economic history from the year 70 to 1492. Our journey begins in Jerusalem, following the destruction of the Temple, continues in Tiberius, moves to Babylon and Baghdad in the second half of the century. At the turn of the second century we move to Cairo and Cordoba following with western Europe and back to Baghdad in the 1250s before ending in Seville in 1492.

The purpose of this passage through 1,500 years of Jewish economic history is to ask and answer three major questions:

- Occupation: Why are there so few Jewish farmers since the 8 - 9 centuries? Why ever since then are the Jews an urban population of traders, entrepreneurs, bankers, financiers, lawyers, physicians, and scholars?
- Population. Why did the Jewish population shrink from 5–5.5 million at the time of Jesus (about 10% of the world population) to 1–1.2 million (about 2% of the world population) in the days of Mohammed? Why did the number of Jews reach its lowest level (less than 1 million) on the eve of the mass expulsion from the Iberian Peninsula in 1492–97?
- Migration. Why have the Jewish people been one of the most scattered diasporas in world history, living as a minority in cities and towns across the globe for millennia?

Most people answers are that Jews are not farmers because they were prohibited from owning land. They were a diaspora population for almost 2,000 years after the destruction of the Second Temple in Jerusalem and were persecuted in and expelled from Eretz Israel and many other countries. Jewish numbers dwindled through the centuries because they were repeatedly massacred. Are these answers correct?

We start by describing how many Jews there were, where they lived, and how they earned their living from the year 70 C.E., to the mass expulsion of Spanish Jewry, in 1492. Analyzed from the point of view of an economist, the historical record shows clearly that none of the above common views is valid. Massacres during the revolts of 67-70 and 133-135 in Eretz Israel and of 115 in Egypt can account for at most half of the entire decrease of the population during the first half of the first millennium. Furthermore, the occupational transition and the diaspora were voluntary actions by the Jews who were living in Mesopotamia and other locations under the Islamic Abbasid Empire during the last two centuries of the first millennium.

The true explanation, we suggest, lies elsewhere. The distinctive characteristics of the Jewish people were the outcome of a profound transformation of the Jewish religion after the destruction of the Second Temple in 70 C.E. This change shifted the religious leadership within the Jewish community and transformed Judaism from a cult based on ritual sacrifices in the temple to a religion whose main norm required every Jewish man to read and to study the Torah in Hebrew and to send his sons from the age of six or seven to primary school or synagogue to learn to do so.

The implementation of this new religious norm during the Talmud era (third to sixth centuries), coupled with the development of institutions fostering contract enforcement, determined three major patterns in Jewish history:

- the growth and spread of literacy among the predominantly rural Jewish population, as well as a slow but significant process of conversion out of Judaism, which caused a significant drop in the Jewish population during the first half of the first millennium
- a comparative advantage in urban skilled occupations (e.g., crafts, trade, and moneylending), which literate Jews chose to enter when urbanization and the development of a commercial economy provided them with the opportunity to earn pecuniary returns on their investment in literacy and education
- the voluntary Diaspora of the Jews in search of worldwide opportunities in crafts, trade, commerce, moneylending, banking, finance, and medicine.

In the two centuries after the death of Mohammed, in 632, the Muslim Umayyad and, later, Abbasid caliphs, established a vast empire stretching from the Iberian Peninsula to India and China, with a common language (Arabic), religion (Islam), laws, and institutions. Concomitant with the ascent of this empire, agricultural productivity grew, new industries developed, commerce greatly expanded, and new cities and towns developed. These changes vastly increased the demand for skilled occupations in the newly established urban.

Between 750 and 900, almost all the Jews in Mesopotamia and Persia—nearly 75 percent of world Jewry —left agriculture, moved to the cities and towns of the newly established Abbasid Empire, and entered myriad skilled occupations that provided higher earnings than as farmers. Having abandoned agriculture as their main occupation, many of these Jews began migrating to Yemen, Syria, Egypt, and the Maghreb. The tide of migrations of Jews in search of business opportunities also reached Christian Europe. Migrations of Jews within and from the lands of the Byzantine Empire, which included southern Italy, may have set the foundations, via Italy, for much of European Jewry. Similarly, Jews from Egypt and the Maghreb settled in the Iberian Peninsula, and later, in Sicily and parts of southern Italy.

The literacy of the Jewish people, coupled with a set of contract-enforcement institutions developed during the five centuries after the destruction of the Second Temple, gave the Jews a comparative advantage in occupations such as crafts, trade, and moneylending—occupations that benefited from literacy, contract-enforcement mechanisms, and networking and provided high earnings. Once the Jews were engaged in these occupations, they rarely converted, which is consistent with the fact that the Jewish population grew slightly from the 7th to the 12th centuries.

Already during the 12th and 13th centuries, moneylending was the occupation par excellence of the Jews in England, France, and Germany, and one of the main professions of the Jews in the Iberian Peninsula, Italy, and other locations in western Europe. Why? A popular view contends that both their exclusion from craft and merchant guilds and usury bans on Muslims and Christians segregated European Jews into moneylending during the Middle Ages. We show that this argument is untenable. Based on the historical information and the economic theory we present in earlier chapters, we advance an alternative explanation: the Jews in medieval Europe voluntarily entered and later specialized in moneylending because they had the key assets for being successful players in credit markets: capital, networking,

literacy and numeracy, and contract-enforcement institutions. Earnings in money lending were higher than most alternative urban occupations.

The Mongol invasion of Persia and Mesopotamia beginning in 1219 and culminating in the razing of Baghdad in 1258, contributed to the demise of the urban and commercial economy of the Abbasid Empire and brought the economies of Mesopotamia and Persia back to an agrarian and pastoral stage for a long period. As a consequence, a certain proportion of Persian, Mesopotamian, and then Egyptian, and Syrian Jewry abandoned Judaism—whose religious norms, especially the one requiring fathers to educate their sons, had once become again a costly religious sacrifice with no economic return—and converted to Islam. This process of conversions of Jews in the Middle East and North Africa, as well as episodes of persecutions, massacres, and plagues (e.g., the Black Death of 1348) in these regions and in western Europe, explain why world Jewry reached its lowest level by the end of the 15th century.

In the end, the authors highlight some puzzles that punctuate Jewish history from the mass expulsion of the Jews from the Iberian Peninsula in 1492–97 to today. They intend to address these puzzles in their next book.

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Partial Insurance and Investments in Children

Rita Ginja, Uppsala University

According to the National Center for Children in Poverty at Columbia University, 15 million children in the United States live in families with incomes below the federal poverty line. This means that more than one in every five children is poor. In the United Kingdom, the Office of National Statistics puts the number of children in poverty at 2.3 million (or 18% of all children). Child poverty is at the center of the debate about social policy, and the main reason is that growing up in poverty is strongly associated with future disadvantage (see President Obama's 2013 State of the Union address).

For many families poverty is not a permanent condition, and we need to distinguish episodic from the much more severe permanent poverty. For those experiencing permanent poverty the question is how to address the structural problems behind their permanent condition. But for those going in and out of poverty, the question is how well can they insure against fluctuations in income. It is important to insure families against income fluctuations, but the case for public insurance is perhaps stronger for families with children because negative income shocks that deprive children from investments early in their lives can have long term negative (and potentially irreversible) consequences.

Our paper presents the first estimates of the response of parental investments in children to permanent and transitory shocks to income. We find that investments react to fluctuations in family income in the US. This is true whether we look at the raw data in a simple way, just accounting for permanent differences across children through fixed effect regressions, or if we decompose income fluctuations into permanent and transitory components. This decomposition allows us to learn that investments in children react to the permanent but not to the transitory component of family income, especially when the child is younger than 9 years of age, in non-Black families, and in families where the mother attended at least some college. Our results suggest that, if income fluctuations affect child outcomes, one possible channel is through the reaction of parents to permanent income shocks.

Although we find that insurance is less than perfect, the magnitude of the response of investments in children to income shocks is very small. Therefore, our results suggest that the main differences between the outcomes of poor and non-poor children are likely to come almost exclusively from the permanent factors affecting the lives of the poor, and not fluctuations in income over time.

There is, however, still a tremendous amount of work to do in this research area. Our paper is quite simple because it gives us a first approach to this problem, and nevertheless produced very interesting and novel results using an approach mainly borrowed from the study of non-durable consumption. What is required is a better study of the theory, the measurement of investments in children, and the distinction between different types of inputs, such as time and money investments. Finally, we need a better study of dynamics, the role of the timing of different types of shocks, and the possible interactions between shocks taking place in different time periods.

Early and Late Human Capital Investments, Borrowing Constraints, and the Family

Lance Lochner, University of Western Ontario

This paper investigates the importance of family borrowing constraints in determining human capital investments in children at early and late ages. We begin by providing new evidence from the Children of the NLSY
(CNLSY) which suggests that borrowing constraints bind for at least some families with young children. Next, we develop an intergenerational model of lifecycle human capital accumulation to study the role of early versus late investments in children when credit markets are imperfect.
We analytically establish the importance of dynamic complementarity in investment for the qualitative nature of investment responses to income and policy changes. We extend the framework to incorporate dynasties and use data from the CNLSY to calibrate the model. Our benchmark steady state suggests that roughly half of young parents and 12% of old parents are borrowing constrained, while older children are unconstrained. We also identify strong complementarity between early and late investments, suggesting that policies targeted to one stage of development tend to have similar effects on investment in both stages.

We use this calibrated model to study the effects of education subsidies, loans and transfers offered at different ages on early and late human capital investments and subsequent earnings in the short-run and long-run. A key lesson is that the interaction between dynamic complementarity and early borrowing constraints means that early interventions tend to be more successful than later interventions at improving human capital outcomes.
http://www.csef.it/9th_C6program.htm