Chapter Title: Contingent Repayment Student Finance: Vj g Problem of Non-Participants in'the Labour Force and Reply by Stephen Dresch

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Chapter URL: http://www.nber.org/chapters/c9839

RESEARCH METHODOLOGY NOTES

CONTINGENT REPAYMENT STUDENT FINANCE:
THE PROBLEM OF NON-PARTICIPANTS IN THE LABOUR FORCE

BY GAIL C. A. COOK AND DAVID A. A. STAGER

In a recent article in this journal, Dresch and Goldberg added to the previous empirical analyses of income-contingent student loan plans.[1] Dresch and Goldberg argue that specification of the parameter values for the maximum repayment period, the interest rate charged the student and the repayment tax rate, together with the expected incomes of the student participants and the interest rate at which the program is funded, is sufficient to determine the financial viability of a contingent repayment student loan plan.

We missed a discussion of a significant problem raised in other analyses of contingent-repayment loan plans. This is that individuals with a low probability of labour force participation—notably married women—will have a low probability of complete repayment. The treatment of such persons in the analysis has important implications for the financing of student loan plans. To the extent that some borrowers do not participate in the labour force and therefore make no repayments, the contractual conditions to other borrowers must be more stringent.

To avoid these more severe borrowing and repayment conditions, some repayment, based on imputed incomes, would be required of persons not in the labour force. Alteration of such a basic feature of the plan entails a major policy decision on the appropriateness of requiring repayments from non-participants. The financial implications of alternative decisions on this question can be obtained using a simulation of the scheme.[2] The results displayed in Table 1 emphasize the sensitivity of the financial viability of the loan plans, measured by the internal rate of return (r), to alternative imputed income levels.

At a 7.5 percent tax rate on gross income, imputing $1,000 income to persons not participating in the labour force, requires an annual payment of only $75. But by imputing an income of $1,000, the financial viability of the loan fund is improved by two percentage points in the internal rate of return. This improvement diminishes with increasing levels of imputed income.

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[1] S. P. Dresch and R. D. Goldberg, "Variable Term Loans for Higher Education—Analytics and Empirics," *Annals of Economic and Social Measurement*, Vol. 1, No. 1 (January 1972) pp. 59–92.

Previous analyses were presented in Karl Shell *et al.*, "The Educational Opportunity Bank: An Economic Analysis of a Contingent Repayment Loan for Higher Education", *National Tax Journal*, Vol. XXI, No. 1 (March 1968) and in Gail Cook and David Stager, *Student Financial Assistance Programs* (Toronto: Institute for Policy Analysis, University of Toronto, 1969) and their article, "Student Aid: A Proposal and Its Implications", *Canadian Tax Journal*, Vol. XIX, No. 6 (November–December 1971). Karl Shell added to his analysis in "Notes on the Educational Opportunity Bank", *National Tax Journal*, Vol. XXIII, No. 2 (June 1970).

[2] Canadian data were used in the simulation, but the basic similarity of these and American data suggests that the results can be generalized to the United States. The parameter values were: maximum repayment period = 30 years; interest rate charged the student = 10%; and a repayment tax rate of 7.5%.

TABLE I

Internal Rate of Return (r) by Imputed Income ($\bar{w}$)
on which Non-Participants in the Labour Force
make Annual Repayments

$\bar{w}$ (S)	r (%)
0	5.1
1000	7.1
2000	8.2
3000	8.7
4000	8.9
5000	9.1

The above results assume a uniform imputed income for all persons not participating in the labour force, but variations among sub-categories of the non-participants may be desired. Karl Shell *et al.* proposed the following treatment for married women where husband and wife had both borrowed from the fund:[3]

$$P^h = r^h Y^h$$

$$P^w = r^w Y^w \qquad \text{if } W^w \geq \overline{W}$$

$$P^w = r^w Y^w + r^w \left(\frac{\overline{W} - W}{\overline{W}} \right) Y^h \qquad \text{if } W^w < \overline{W}$$

where

P^h = repayment of husband
P^w = repayment of wife
r^h = total repayment rate charged to husband
r^w = total repayment rate charged to wife

Y^h = total income of husband
Y^w = total income of wife
W^w = wage and salary income of the wife
$\overline{W}$ = some average of women's wage and salary income

A married woman who earned less than the average wage and salary income for women would pay on her earned income plus a proportion of her husband's income. That proportion would decline as the wife's wage and salary income approached the average for all women. In the extreme case, a woman with zero earned income would pay at her tax rate on her husband's entire income.

The Shell proposal required a wife to consider the financial consequences of not being employed in terms of her husband's income, rather than her own forgone income.

An alternative proposal would reduce the strong incentive to enter the labour force, implicit in the Shell proposal. This would relate payments of wives not in the labour force to the average wage and salary income of her age/education class,

[3] Karl Shell *et. al., loc. cit.*

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rather than to her husband's income:

$$P^w = r^w Y^w \qquad\qquad \text{if } W^w \geq \overline{W}$$

$$P^w = r^w Y^w \qquad\qquad \text{if } W^w < \overline{W} \text{ and proof of full-time job}$$

$$P^w = r^w \{Y^w + (\overline{W} - W^w)\} \qquad \text{if } W^w < \overline{W} \text{ and no proof of full-time job}$$

The wife's repayment is based on her own income if it exceeds the average income of women in her age/education category who are employed full-time, or if her income falls short of that average but she has proof of a full-time job. Should she have no proof of a full-time job, her payments would be based on that average income. This provides a minimum repayment related to a woman's earning opportunities as defined by her age and education.[4]

These two proposals are illustrative of several alternative arrangements which could be devised for calculating repayments based on the forgone income of non-participants in the labour force. Each of these will have varying effects on work incentives and the progressivity of repayments. A major concern in contingent repayment loan plans, however, should be with whether or not payments are required from non-participants in the labour force and the implications of this decision in terms of the financial viability of the plans.

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REPLY

BY STEPHEN P. DRESCH

Cook–Stager are concerned with the implications of non-participants in the labor force for the design of income contingent loans. They do not criticize our approach, but raise one (of many) problems encountered in its implementation. Our purpose was to develop the nature of the general interrelationships embodied in an income contingent loan of the VTL type. One dimension is that of projected borrower incomes. Obviously, each of the elements relevant to a VTL encompasses a wide range of alternatives, several of which were indicated in the paper. It is certainly true that break-even programs will be highly sensitive to alternatives in the dimension of the income base: income must be defined; any definition is in some sense arbitrary; and different definitions will have different implications for other parameters of the program. But, whatever the definition of income, the general shapes of the trade-offs between various parameters, e.g., between tax rates and student interest rates, will be basically as we have described them.

There was a fundamental reason (apart from space constraints) for our failure to explore the implications of alternative income base definitions: *any change in income base can be expected to have systematic effects on the self-selection of borrowers and on borrower behavior, e.g., labor force participation.* It is not that we considered this problem unimportant; on the contrary, we considered it *too important* for the casual treatment which others have given it and which we would have been forced to give it. These issues have been more extensively considered in a recent paper prepared for the Carnegie Commission by Robert Hartman, "Financing the Opportunity to Enter the 'Educated Labor Market'" (Brookings Institution, 1972, multilith), to which we refer the interested reader.

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