Seminar Paper No. 240

A FORMULATION AND TEST OF A SIMPLE MODEL OF
WORLD BANK BEHAVIOR

by

Bruno S. Frey, Henrik Horn,
Torsten Persson and Friedrich Schneider

Seminar Papers are preliminary material circulated
to stimulate discussion and critical comment.

March, 1983

Institute for International Economic Studies
S-106 91 Stockholm
Sweden

A FORMULATION AND TEST OF A SIMPLE MODEL OF WORLD BANK BEHAVIOR*

Bruno S. Frey

Henrik Horn

Torsten Persson

and

Friedrich Schneider

1. Introduction

There exists a large literature describing the behavior of international institutions.¹ This literature is however, with few exceptions,² purely descriptive, i.e. it lacks an analysis based on clearly stated behavioral assumptions leading to falsifiable and hence empirically testable hypotheses. A positive theory of the behavior of international organizations is thus lacking.

This paper endeavours to provide a simple theoretical model of the behavior of such an international organization - The World Bank - using the traditional approach of maximizing a utility function subject to constraints (Sections 2 and 3). The theoretically derived hypotheses are empirically applied to the World Bank's granting of loans to developing countries during recent years (Section 4). A final part summarizes the main findings (Section 5).

2. The conceptual approach

The behavior of an international organization can be theoretically modelled in at least two different ways:

- (i) The organization is treated as an aggregate unit and is attributed a single utility function;
- (ii) The interests of the individual members of the organization are considered. The behavior of the organization as a whole is taken to be the (unintended) outcome of the individuals' actions.

The second approach is more ambitious and complicated as it may be necessary to explicitly model the bargaining and (changing) coalition formation of the various groups of members. It is not possible to determine which approach is in general preferable, of course, since that depends on the specific objective of the analysis. If the objective is to study the internal decision-making within the organization, it is necessary to use the individualistic approach (or at least so economists think). The unified-actor approach, on the other hand, might provide a convenient short-cut if the focus is on the outside interactions of an organization; these being the final outcome of any internal struggles and deliberations³. In this paper we use such a unified-actor approach. However, by relying on utility maximization we implicitly assume that the final outcome amounts to choices that do fulfill the well-known axioms of consistent decision making.

We consider an international organization whose budget is exogenously determined and whose official goal is to distribute this budget to various recipients according to certain, incompletely specified, rules. It is assumed that the organization does not simply aim for these official goals but that it may also seek to pursue its own goals, subject to the limits imposed by outside actors, in particular by the institutions designed to monitor its behavior.

A major objective of any institution is survival. The organization must make sure that it does not expend its resources (budget) available in such a way that its future possibilities are impaired or destroyed. The organization must also prevail against threats from other actors, especially against the official monitoring authority and the national governments ultimately providing the money for its budget. This is achieved by performing its official duties and also by satisfying its clientele; the potential recipients of the budget disbursements. An hypothesis often put forward is that the organization believes that its chance of survival improves if it behaves in a conservative way, avoiding risk as far as possible.

3. The World Bank's optimization problem

Let us now apply these general considerations to a particular type of international organization: the World Bank, an organization instituted to grant credits to developing countries. We then assume that the World Bank's choices can be represented by help of a utility function $B(\cdot)$ with the following arguments: First, the choice variables, i.e. the credits per capita granted to the potential recipient countries. We assume that utility is increasing, at a decreasing rate, in each countries credit level. Second, the income (or wealth) of the recipient countries. Here, we assume that the poorer a country, the higher the marginal utility of granting credits to this country. This captures, to some extent, a strive to fulfill the organization's official goals. Third, the expected default on the distributed credits. Here, we assume that utility is decreasing in total expected defaults: Apart from capturing risk avoidance in general, this can be given a formal motivation by assuming that the World Bank engages in intertemporal considerations and contemplates its credits over several periods.

Then, the more defaults on loans given in the current period, the less credits may be given in future periods, which reduces welfare.⁴

The World Bank's choices of how to distribute credits in a given period is then viewed as a standard optimization problem. It chooses a vector of credits per capita, $(c_1, \dots, c_n)$ to maximize its utility b , given by

$$b = B(c_1, \dots, c_n, w_1, \dots, w_n, E(D)),$$

where w_i denotes the income (wealth) of country i , $i = 1, \dots, n$, and $E(D)$ is the expected total default on the credits given in the period we consider.

However, with a general form of B we do not get very specific results. To get such results and hence testable hypotheses, two simplifying assumptions are made. First, the World Bank is taken to hold subjectively certain probabilities (point expectations) for each country defaulting, $\rho_1, \dots, \rho_n$, which implies that $E(D) = \sum_i \rho_i c_i$. Second, the objective function is assumed to be additively separable in each country's credit and income, and total expected defaults, respectively. With these two assumptions the full optimization problem is,

$$\begin{aligned} & \text{maximize} \quad u = \sum_i U(c_i, w_i) - V(\sum_i \rho_i c_i) \\ & c_1, \dots, c_n \end{aligned} \tag{1}$$

$$\text{subject to } \sum_i c_i \leq \bar{y},$$

where the assumptions in our discussion above imply $U_c > 0$, $U_{cc} < 0$, $U_{cw} < 0$, and $V' > 0$. In addition, we postulate, $V'' = 0$; i.e. a constant marginal disutility of defaults which means that we may

interpret V as a positive constant (rather than as a functional operator).

For convenience, the maximization problem is assumed to have an interior solution.⁵ This solution is a vector $(c_1^*, \dots, c_n^*)$ which satisfies the first order condition⁶

$$\frac{\partial u(c_i^*, w_i)}{\partial c_i} = \frac{\partial u(c_j^*, w_j)}{\partial c_j}$$

or,

$$U_c(c_i^*, w_i) - U_c(c_j^*, w_j) = -V(\rho_i - \rho_j) \quad , \quad (2)$$

for all i and j .

The qualitative properties of the solution can be compactly summarized in the following proposition:

$$\begin{array}{l} \text{If } w_i \leq w_j \text{ and } \rho_i \leq \rho_j \text{ with at least one strict inequality,} \\ \text{then } c_i^* > c_j^* , \end{array}$$

and symmetrically, (P1)

$$\begin{array}{l} \text{if } w_i \geq w_j \text{ and } \rho_i \geq \rho_j \text{ with at least one strict inequality,} \\ \text{then } c_i^* < c_j^* . \end{array}$$

To verify the first part of the proposition, note that the RHS of (2) is non-positive if $\rho_i \leq \rho_j$. Suppose then $c_i^* = c_j^*$. Since $U_{cw} < 0$, the LHS of (2) is non-negative if $w_i \leq w_j$, however, which violates the first-order condition, unless both equalities hold so that both sides of the equation are zero. Consequently, $c_i^* > c_j^*$ since $U_{cc} < 0$. The second part of the proposition follows from exactly the same reasoning, with a switch of country indices.

These results are intuitively very plausible. In a pairwise comparison of country i and j , country i will unambiguously get more

(less) loans if it is both poorer (richer) and has a lower (higher) risk of default. But if it is poorer (richer) and has a higher (lower) risk of default than country j , the outcome is uncertain.

The comparative statics of a given equilibrium may also be investigated. To do this we express the first-order conditions as $\partial u_i / \partial c_i - \lambda = 0$ for all i , where λ is a Lagrange multiplier, and differentiate the resulting n conditions and the budget constraint in (1) totally. The resulting system can be expressed on matrix form, viz,

$$\begin{bmatrix} (U_{cc}) & (-1) \\ (-1)^T & 0 \end{bmatrix} \begin{bmatrix} dc^* \\ d\lambda \end{bmatrix} = - \begin{bmatrix} (U_{cw}) & (0) \\ (0)^T & 1 \end{bmatrix} \begin{bmatrix} dw \\ d\bar{y} \end{bmatrix} + V \begin{bmatrix} d\rho \\ 0 \end{bmatrix}, \quad (3)$$

where (U_{cc}) is an $(n \times n)$ diagonal matrix where $U_{cc}(c_i^*, w_i)$ are the diagonal terms: (U_{cw}) is a diagonal matrix with entries $U_{cw}(c_i^*, w_i)$; c^*, w, P are column vectors $(c_1^*, \dots, c_n^*)$, etc.; and (-1) and (0) are n -dimensional column vectors with -1 and 0 in all positions.

It is straightforward, if somewhat tedious, to solve (3) and derive the following results:

$$\frac{\partial c_i^*}{\partial w_i} < 0, \quad \frac{\partial c_i^*}{\partial w_j} > 0, \quad \frac{\partial c_i^*}{\partial \rho_i} < 0, \quad \frac{\partial c_i^*}{\partial \rho_j} > 0, \quad \text{and} \quad \frac{\partial c_i^*}{\partial \bar{y}} > 0,$$

which apply to all countries.

Hence, if a country gets (relatively) poorer it will get an increased share of the budget, while the shares of all other countries will decline. Similarly, if the probability of a country defaulting decreases, it will get more and all other countries less

credits. Finally, an increase in the budget will increase the credits for all countries.

4. Empirical test of the model's hypotheses

From our proposition in section 3, we directly get two empirically testable hypotheses:

- (i) If a country is poor (rich) - compared to the other recipient countries - in a year t , *ceteris paribus* it will get greater (smaller) loans per capita in the year $t+1$ from the Bank than the remaining recipients.
- (ii) If the probability of a country defaulting is low (high) - compared to the other recipients - in a year t , *ceteris paribus* it will get greater (smaller) loans per capita from the Bank in the year $t+1$ than the other recipients.

From these two hypotheses we may also predict that, if countries are classified into four groups according to whether their income is high or low, and whether they have a high or low risk of default, then:

- (iii) In a given year the group of countries which are both poor and have a low risk of default will unambiguously get more Bank loans than the group of countries which are both rich and have a high risk of default. But, comparing the group of rich countries with low default risk to the group of poor countries with high default risk, the outcome is ambiguous, *à priori*.

The first two hypotheses will be empirically tested using regression analysis and the last by help of covariance analysis. Our dependent variable, LC, is the amount of World Bank loans

per capita (measured in US-\$) received by less developed countries in the fiscal years 1980, 1981, and 1982, respectively. Our sample consists of 55 developing countries, which got loans during the years under study. A limiting factor on our sample was the availability of data on risk-ratings (see below), which essentially meant that we had to exclude the smallest countries that had obtained credits. The independent variable for income, GNPC, is GNP per capita (in US-\$), in the calendar year preceding the fiscal year studied. As for the risk of default, we use IICR, the Institutional Investors Credit ratings, similarly in the preceding calendar year. These ratings can take values on a scale of 0 to 100 with 0 representing the least creditworthy countries (those with greatest chance of default on their debt) and with 100 representing the most creditworthy.⁷

In testing hypotheses (i) and (ii) we estimate the following regression equation for each of the years 1980, 1981, and 1982:

$$LC_i^t = a_0 + a_1 GNPC_i^{t-1} + a_2 IICR_i^{t-1} + e_i ,$$

where e_i is a white noise error term, and where the subscript i indexes each separate country in our sample.

The empirical results of the cross section estimations - employing the OLS regression technique - for the three years 1980, 1981, and 1982 are shown in Table 1. In all three equations the two independent variables have a statistically significant influence with the expected sign. Our estimations explain statistically between 34 and 40 % of the variance of the Bank loans.

Table 1: Cross section analysis of the World Bank loans to 55 developing countries; OLS-estimates for the years 1980, 1981, and 1982[†]

Variable	Intercept	Income:	Risk of default:				
IBRD-loans per capita		GNP per Capita	Institutional Investors Country Ratings	$\bar{R}^2$	s.e.	F	d.f.
Year							
1980	2.435 (1.89)	-0.223** (-2.83) 0.218	0.269* (2.12) 0.342	0.34	11.21	3.84	52
1981	2.032 (1.56)	-0.384** (-2.99) -0.301	0.425* (2.61) 0.415	0.37	14.47	3.99	52
1982	1.984 (1.65)	-0.417** (-3.12) -0.323	0.497** (2.99) 0.455	0.40	17.41	4.71	52

† The figures in parentheses below the estimated coefficients are the t-values; underneath the t-values are the beta-coefficients. One asterisk indicates statistical significance at the 95 % level of confidence, and two asterisks at the 99 % level of confidence (both one tailed tests); $\bar{R}^2$ is the coefficient of determination corrected for degrees of freedom; s.e. is the standard error; and F indicates the F-value for testing the significance of the independent variables on the dependent variable.

A difference of US-\$ 10 in GNP per capita between two countries in 1981, ceteris paribus, leads to a difference in loans of US-\$ 3.80 per capita, while a difference of 10 points in risk rating gives a difference in loans of US-\$ 4.25 per capita. Clearly, these results do not say anything directly about the relative influences of the two independent variables, since the units of measurement are quite different. However, one way of coming somewhat to grips with this question is to standardize the ordinary regression coefficients by calculating the beta-coefficients. These coefficients, displayed in Table 1, indicate that differences in risk contribute more to differences in loans than do differences in income (in a standardized sense). Finally, when we compare the total influence of the income and risk variables on the loans over the three years investigated we find that the influence of these two

factors rises over time; the explained variance (adjusted for degrees of freedom) rises from 34 % in 1980 to 40 % in 1982.⁸

To investigate hypothesis (iii) the recipient countries are grouped in the following four categories for a particular time period:

	low risk	high risk
low income	1	2
high income	3	4

A low (high) risk country is one where the Institutional Investor credit ratings is greater (less) than 50.00 and a low (high) income country is one where GNP per capita is less (greater) than US-\$ 1000.⁹

We then use covariance analysis, employing as our dependent variable the Bank loans to the same 55 countries in each of the years 1980, 1981, and 1982, but corrected for the influence of the covariates (GNPC and IICR). The results are presented in Table 2.

Table 2: Analysis of covariance of the per capita IBRD-loans for 55 developing countries; adjusted cell means of the per capita Bank-Loans [†]

Year		F-statistic	
		low risk	high risk
1980	low income	13.25	6.07
	high income	9.95	4.86
			8.81
1981	low income	19.47	8.47
	high income	14.36	4.98
			9.47
1982	low income	26.27	10.04
	high income	18.62	5.69
			9.62

[†] An adjusted cell mean is the mean of the dependent variable (Bank loans) adjusted for the covariates (per capita GNP and IICR).

They clearly do not reject hypothesis (iii) in that group 1 countries get the greatest loans and group 4 countries get the smallest loans in all three years, and the F-values indicate that the differences between the adjusted cell means are statistically significant at the 99 % confidence level. Furthermore, considering the countries in groups 2 (high risk, low income) and 3 (low risk, high income), the ones in group 3 get more loans per capita than the countries in group 2 - a result which is in line with the regression results where the coefficients of the risk variables had a greater impact on the loans than the income variable.

Finally, we turn to a crude test of the comparative statics results that were derived in Section 3. Let us assume that the World Bank's preferences were unchanged during the period 1980-82, and that its lending decision in each of these fiscal years was independent of how it chose to distribute its loans in the year before. Under these circumstances, we can test the model's predictions about comparative statics, by relating the change in loans to each of the countries, to the change in the two explanatory variables. More precisely, then the result in Section 3 suggest that

- (iv) The more a country's income falls (rises) the more its loans will increase (decrease) between year t and $t+1$, *ceteris paribus*.
- (v) The more the risk of a country defaulting falls (rises) the more its loans will increase (decrease) between year t and $t+1$, *ceteris paribus*.

We tested these hypotheses by estimating the regression equation

$$\Delta LC_i^t = b_0 + b_1 \Delta GNPC_i^{t-1} + b_2 \Delta IICR_i^{t-1} + \Delta e_i ,$$

where all variables are the same as earlier and Δ denotes the first difference operator. The same sample of countries as earlier was used, and the equation was estimated for the changes between 1980 and 1981, and 1981 and 1982 respectively (LC and GNPC were deflated by the US GNP-deflator).

The results are shown in Table 3.

Table 3: Cross section estimates of the change in World Bank loans (first differences) to 55 developing countries; OLS-estimates for the changes 1981-1980 and 1982-1981[†]

Variable IBRD-loans per Capita, 1st differences Year	Intercept	Income: GNP per per Capita, 1st differences	Risk of default: Institutional Investors Country Ratings, 1st differences	$\bar{R}^2$	s.e.	F	d.f.
1981 - 1980	4.641 (0.47) -0.317	-0.312* (2.05) 0.591	0.409* (2.23)	0.30	2.47	3.60	52
1982-1981	5.470 (1.21)	-0.570* (-2.12) -0.336	0.801* (2.47) 0.701	0.33	3.48	3.82	52

[†] The figures in parentheses below the estimated coefficients are the t-values; underneath the t-values are the beta-coefficients. An asterisk indicates statistical significance at the 95 % confidence level (one-tailed tests). $\bar{R}^2$ is the coefficient of determination corrected for degrees of freedom; s.e. is the standard error; and F indicates the F-value for testing the significance of the independent variables on the dependent variable.

Also here, all the coefficients come out statistically significant, and with the expected signs. Like before, changes in default risk seem to generate greater changes in loans than do changes in income (cf. the beta-coefficients). This squares well with the results regarding hypotheses (i) through (iii) which also suggested that default risk was the more important factor of the two.

5. Summary and concluding remarks

In this paper we provided a simple theoretical framework for the analysis of the behavior of the World Bank using a unified-actor, utility maximizing approach. The utility function had the amounts of credits given to the recipient countries, the income of these countries and the total expected default on credits given to potential recipients as its arguments. The constraint was the Bank's total budget. From the solution to this maximization problem we derived five hypotheses regarding the loans to developing countries and tested them empirically. None of the five hypotheses could be rejected.

From the simple model and the empirical results we conclude that income and risk of default are important factors determining the amount of loans by the World Bank to developing countries. Using only these two factors as independent variables one can explain between 30 and 40 % of the variance of World Bank loans distributed during 1980 - 1982. Also, the risk of default seems to be more important than the income situation when World Bank officials decide on the amount of loans to be distributed to recipient countries.

Footnotes

* The first and last authors are professor and lecturer at the University of Zürich, the second and third are Research Fellows at the Institute for International Economic Studies, University of Stockholm. The paper was initiated during the two Swiss authors' stay at the institute, September-November, 1982.

1. See e.g. von Maerhaege (1980) for a general survey, and Gold (1979) for the World Bank.
2. Dreyer and Schotter (1980) have empirically analyzed the voting power within the International Monetary Fund on the basis of a game theoretic (Banzhaf) index; Fratianni and Pattison (1982) have developed a rather general theory which is, however, difficult to test.
3. The two approaches are well visible in the economic theory of (national) bureaucracy where Tullock (1965) and Downs (1967) use the individualistic and Niskanen (1971) uses the aggregate approach.
4. Assume, for example, that the bank looks over a horizon of two periods and consider the following problem

$$\begin{aligned} & \text{Max}_{c^1, c^2} U(c^1, w^1) + U(c^2, w^2) \\ & \quad \Sigma c_i^1 \leq \bar{y}^1 \quad \text{and} \quad \Sigma c_i^2 \leq \bar{y}^2 + \bar{y}^1 - D(c^1), \end{aligned}$$

where c^t and w^t are n -vectors of credits and income levels in period $t = 1, 2$, where $\bar{y}^t$ is the bank's total budget in period t , and where D is total defaults. The envelope function to this problems is the indirect utility function

$$v = V(\bar{y}^1, w^1) + V(\bar{y}^2 + \bar{y}^1 - D(c^1), w^2),$$

where $\frac{\partial v}{\partial y} > 0$. In this setting, clearly, $\partial v / \partial D < 0$.

5. This may be ensured formally by putting appropriate restrictions on the utility function. However, it would be a straightforward extension, in terms of Kuhn-Tucker analysis, to handle corner solutions where some countries did not get any credits.

6. Since the preference function is concave and the constraint linear we know that the second-order condition is fulfilled.

7. The Institutional Investor credit ratings are compiled by using input from the world leading bankers. About 75 banks participate in the compilation. The series is provided by the Institutional Investors Magazine. This series was chosen because it was the only one available for the years 1979, 1980, and 1981 as well as for the most of the IBRD loans recipients. The sources of the data used is described in the Appendix.

8. We also tested formally, whether there was a structural break in the explanatory power of the equation as a whole and for the individual coefficients. First, comparing 1981 to 1980, an F-test for the regression as a whole yields $F = 3.24$, and t-tests for income and default risk yield $t = 2.01$, and $t = 2.12$, respectively; all these are statistically significant. Second, comparing 1982 to 1980, we get the following test-statistics: $F = 4.56$, $t = 2.46$, and $t = 2.51$, which are all significant, too.

9. The exact values for the grouping into the four categories are chosen in such a way that each of the four cells has at least 10 observations. The grouping of poor and rich countries follows roughly the categories used by the World Bank (e.g. in the World Development Report, years 1980, 81, 82) and the one used to group into low and high risk countries goes back to a grouping of the Institutional Investor magazine.

Appendix: Variables and sources of data

World Bank loans: IBRD loans in US\$ per capita, received by 55 developing countries in the years 1980, 1981 and 1982. Source: World Bank Annual Report 1980, 1981 and 1982 statistical Appendix, Table 3, Washington D.C. 1980, 1981, 1982.

Income : GNP per capita in US\$ in the years 1979, 1980, 81. Source: World Development Reports 1972-82, Oxford

Risk of default : Institutional Investor country credit ratings, years 1979, 1980 and 1981. Source: Institutional Investor Magazine, 1979-1982 various issues, New York.

References

Downs, Anthony, 1967, Inside Bureaucracy, Boston: Little Brown & Co.

Dreier, Jacob S. and Schotter, Andrew, 1980, Power Relationship in the International Monetary Fund: The Consequences of Quota Changes, Review of Economics and Statistics 62, p. 97-106.

Fратиanni, Michele and Pattison, John, 1982, The Economics of International Organizations, Kyklos 35, p. 244-262.

Gold, Joseph, 1979, Legal and Institutional Aspects of the International Monetary System: Selected Essays, Washington: International Monetary Fund.

Meerhaege, van M. A. G., 1980, A Handbook of International Economic Institutions, London: Longman Second Edition.

Niskanen, William A., 1971, Bureaucracy and Representative Government, Chicago: Aldine-Atherton.

Tullock, Gordon, 1965, The Politics of Bureaucracy, Washington D.C.: Public Affairs Press.

SEMINAR PAPER SERIES

The series was initiated in 1971. For a complete list of Seminar Papers see the Institute's annual brochure.

1980

136. *Stanley W. Black:* Central Bank Intervention and the Stability of Exchange Rates. 26 pp.*
137. *Gordon C. Winston:* The Timing of Work and Consumption, I: A Time-Specific Household Production Model. 50 pp.
138. *Per M. Wijkman:* Effects of Cargo Reservation: A Review of UNCTAD's Code of Conduct for Liner Conferences. 63 pp.
139. *Pekka Ahtiala and Jean M. Blin:* Inflation Risk, Resource Allocation and the Social Cost of Inflation. 18 pp.
140. *Carl Van Duyne:* Food Prices, Expectations, and Inflation. 39 pp.
141. *Torsten Persson:* Currency Areas and Alternative Exchange Rate Regimes in a Simple Three-Country General Equilibrium Model. 36 pp.
142. *Clas Wihlborg:* Commodity and Labor Market Rigidities in a Monetarist Model of Exchange Rate Determination. 37 pp.
143. *J. Peter Neary:* Intersectoral Capital Mobility, Wage Stickiness and the Case for Adjustment Assistance. 36 pp.
144. *Peter J. Lloyd:* 3 x 3 Theory of Customs Unions. 41 pp.
145. *Peter J. Lloyd:* Economies of Scale Due to the Length of Production Runs. 34 pp.
146. *Peter J. Lloyd:* The Effects of Trade Interventions on International Price Instability and National Welfare. 34 pp.
147. *Ake G. Blomqvist:* International Migration of Educated Manpower and Social Rates of Return to Education in LDCs. 41 pp.
148. *Assar Lindbeck:* Tax Effects versus Budget Effects on Labor Supply. 41 pp.
149. *Richard T. Selden:* The Inflationary Seventies: Comparisons among Selected High-Income Countries. 27 pp.
150. *Lars E.O. Svensson:* National Welfare in the Presence of Foreign-Owned Factors of Production: A Note on the Dual Approach. 19 pp. (Also as Reprint No. 173)
151. *Ronald W. Jones:* Comparative and Absolute Advantage. 45 pp. (Also as Reprint No. 153)

152. *Carl Hamilton and Lars E.O. Svensson:* On Welfare Effects of a "Duty-Free Zone". 39 pp. (Also as Reprint No. 194)
153. *James R. Markusen:* Trade and the Gains from Trade with Imperfect Competition. 28 pp.
154. *James R. Markusen and James R. Melvin:* Trade, Factor Prices, and the Gains from Trade with Increasing Returns to Scale. 35 pp.
155. *Elhanan Helpman and Assaf Razin:* Monopolistic Competition and Factor Movements. 23 pp.
156. *Elhanan Helpman and Assaf Razin:* A Comparison of Exchange Rate Regimes in the Presence of Imperfect Capital Markets. 42 pp. (Also as Reprint No. 184)
157. *Elhanan Helpman:* International Trade in the Presence of Product Differentiation, Economies of Scale, and Monopolistic Competition: A Chamberlin-Heckscher-Ohlin Approach. 58 pp. (Also as Reprint No. 168)
158. *J. Peter Neary:* International Factor Mobility, Minimum Wage Rates and Factor-Price Equalization: A Synthesis. 32 pp.
159. *Assaf Razin:* Capital Movements, Intersectoral Resource Shifts, and the Trade Balance. 33 pp.
160. *James R. Markusen:* Multinationals and the Gains from Trade: A Theoretical Analysis Based on Economies of Multi-Plant Operation. 40 pp.
161. *Dennis Warner and Mordechai E. Kreinin:* Determinants of International Trade Flows. 31 pp.
162. *Michael Michaely:* The Terms of Trade between Poor and Rich Nations. 36 pp.
163. *Michael Michaely:* Capital Imports, Economic Structure, and Dependence. 32 pp.
164. *Assar Lindbeck:* Work Disincentives in the Welfare State. 60 pp. (Also as Reprint No. 176)
165. *Roy J. Ruffin:* Taxing International Capital Movements in a Growing World. 38 pp.
- 1981
166. *Torsten Persson:* The Neutrality of Money and the Analysis of Alternative Exchange Rate Regimes. 28 pp.
167. *Roy J. Ruffin:* Trade and Factor Movements with Three Factors and Two Goods. 19 pp. (Also as Reprint No. 170)

168. *Carl Hamilton:* A New Approach to Estimation of the Effects of Non-Tariff Barriers to Trade on Prices, Employment and Imports: An Application to the Swedish Textile and Clothing Industry. 65 pp.
(Also as Reprint No. 160)
169. *Marian Radetzki:* Has Political Risk Scared Minerals Investments away from the Deposits in Developing Countries? 24 pp. (Also as Reprint No. 174)
170. *Lars E.O. Svensson and Assaf Razin:* The Terms of Trade, Spending, and the Current Account: The Harberger-Laursen-Metzler Effect. 43 pp.
171. *Assar Lindbeck:* The Distribution of Factor Income versus Disposable Income in a Welfare State: The Case of Sweden. 84 pp.
172. *Åke G. Blomqvist:* Education, Unemployment and Government Job Creation for Graduates in LDCs. 35 pp.
173. *Per Magnus Wijkman:* Seigniorage, Financial Intermediation, and the International Role of the Dollar, 1960-1971. 48 pp.
174. *Carl Hamilton:* Public Subsidies to Industry: The Case of Sweden and Its Shipbuilding Industry. 31 pp.
175. *Lars Calmfors:* Output, Inflation and the Terms of Trade in a Small Open Economy. 25 pp.
176. *Carl Van Duijne:* Price Determination in Markets for Storable Commodities. 30 pp.
177. *Peter Svedberg:* Colonialism and Foreign Direct Investment Profitability. 35 pp.
178. *Carl Hamilton and Lars E.O. Svensson:* On the Choice Between Capital Import and Labor Export. 47 pp. (Also as Reprint No. 203)
179. *Henrik Horn:* Some Implications of Non-homotheticity in Production in a Two-sector General Equilibrium Model with Monopolistic Competition. 39 pp.
180. *Thorvaldur Gylfason and John F. Helliwell:* A Synthesis of Keynesian, Monetary, and Portfolio Approaches to Flexible Exchange Rates. 37 pp.
181. *Elhanan Helpman and Assaf Razin:* The Role of Saving and Investment in Exchange Rate Determination under Alternative Monetary Mechanisms. 33 pp.
182. *Mario I. Blejer and Hans Genberg:* Permanent and Transitory Shocks to Exchange Rates: Measurement and Implications for Purchasing Power Parity. 36 pp.
183. *Torsten Persson:* Global Effects of National Stabilization Policies under Fixed and Floating Exchange Rates. 45 pp.

184. *Lars E.O. Svensson:* Oil Prices and a Small Oil-Importing Economy's Welfare and Trade Balance: An intertemporal approach. 55 pp.
185. *Michael Hoel:* Short Run and Long Run Effects of a Tax Cut in an Open Economy with a Sticky Real Wage. 60 pp.
186. *Martin Feldstein:* Inflation, Tax Rules and the Accumulation of Residential and Nonresidential Capital. 32 pp.
187. *Jeffrey Sachs:* The Current Account in the Macroeconomic Adjustment Process. 20 pp.
188. *J. Peter Neary and Douglas D. Purvis:* Sectoral Shocks in a Dependent Economy: Long-Run Adjustment and Short-Run Accommodation. 58 pp.
189. *Tomas Björk, Johan Myhrman, and Mats Persson:* Consumption and Savings under Price Uncertainty. 40 pp.
190. *John F. Helliwell, Paul M. Boothe, and Robert N. McRae:* Stabilization, Allocation and the 1970s Oil Price Shocks. 53 pp.
191. *Nancy P. Marion and Lars E.O. Svensson:* World Equilibrium with Oil Price Increases: An Intertemporal Analysis. 38 pp.
192. *Lars Calmfors:* Employment Policies, Wage Formation and Trade Union Behavior in a Small Open Economy. 39 pp.
- 1982
193. *Michael Bruno:* Adjustment and Structural Change Under Supply Shocks. 39 pp.
194. *Assaf Razin and Lars E.O. Svensson:* The Current Account and the Optimal Government Debt. 21 pp.
195. *W.M. Corden and J.P. Neary:* Booming Sector and De-Industrialisation in a Small Open Economy. 45 pp.
196. *Torsten Persson and Lars E.O. Svensson:* Is Optimism Good in a Keynesian Economy? 19 pp.
197. *Lars E.O. Svensson:* On Variable Capital Utilization and International Trade Theory. 14 pp.
198. *Wilfred J. Ethier:* International Trade and Labor Migration. 30 pp.
199. *Harry Flam, Torsten Persson, and Lars E.O. Svensson:* Optimal Subsidies to Declining Industries: Efficiency and Equity Considerations. 28 pp.
200. *Lars E.O. Svensson:* Factor Trade and Goods Trade. 37 pp.
201. *Thorvaldur Gylfason and Michael Schmid:* Do Devaluations Cause Stagflation? 27 pp.

202. *Lars Hörngren,
Johan Myhrman,
Per-Åke Nilsson,
Staffan Viotti and
Anders Vredin:* The SSEM Model - A Brief Description. 24 pp.
203. *Hans Tson Söderström
and Eva Uddén-Jondal:* Does Egalitarian Wage Policy Cause Wage Drift? An Empirical Study of Sweden 1960-1979. 49 pp.
204. *Jonathan Eaton and
Henryk Kierzkowski:* Oligopolistic Competition, Product Variety and International Trade. 36 pp.
205. *Pehr Wissén:* Growth Models for Open Economies with Non-Shiftable, Malleable Capital and Nontraded Goods. 63 pp.
206. *Carl Hamilton and
Lars E.O. Svensson:* Should Direct or Total Factor Intensities be Used in Tests of the Factor Proportions Hypothesis in International Trade Theory? 22 pp.
207. *John T. Cuddington:* Portfolio Balance and IS-LM: A Marriage under Fixed Exchange Rates. 40 pp.
208. *Carl Hamilton and
Lars E.O. Svensson:* Revealed Comparative Advantage: The Case of Sweden. 20 pp.
209. *Carl Hamilton and
Lars E.O. Svensson:* Testing Theories of Trade among Many Countries. 62 pp.
210. *Avinash Dixit:* Growth and Terms of Trade under Imperfect Competition. 25 pp.
211. *M June Flanders:* The Balance-of-Payments Adjustment Mechanism: The Doctrine According to Ohlin. 31 pp.
212. *Ronald W. Jones and
Douglas D. Purvis:* International Differences in Response to Common External Shocks: The Role of Purchasing Power Parity. 38 pp.
213. *Åke Blomqvist
and Henrik Horn:* Public Health Insurance and Optimal Income Taxation. 32 pp.
214. *Carl Hamilton:* Agricultural Protection in Sweden 1970-1980. 25 pp.
215. *Thorvaldur Gylfason:* Why Rational Expectations do not Neutralize Monetary Policy. 8 pp.
216. *John T. Cuddington:* Currency Substitution, Capital Mobility and Money Demand. 25 pp.
217. *Michael Schmid:* International Adjustment to an Oil Price Shock - The Role of Competitiveness. 49 pp.
218. *Wilfred J. Ethier:* Higher Dimensional Issues in Trade Theory. 96 pp.
219. *Paul R. Krugman,
Torsten Persson and
Lars E.O. Svensson:* Inflation, Monetary Velocity and Welfare. 27 pp.

220. *Assaf Razin and Lars E.O. Svensson:* An Asymmetry between Import and Export Taxes. 11 pp.
221. *Wilfred Ethier and Henrik Horn:* A New Look at Economic Integration. 39 pp.
222. *Assar Lindbeck:* The Recent Slowdown of Productivity Growth. 58 pp.
223. *Henrik Horn:* Product Diversity, Trade, and Welfare. 32 pp.
224. *Thorvaldur Gylfason and Assar Lindbeck:* Competing Wage Claims, Cost Inflation, and Capacity Utilization. 38 pp.
225. *Thorvaldur Gylfason and Assar Lindbeck:* Wage Rigidity and Wage Rivalry: An Oligopolistic Approach. 20 pp.
226. *Harry Flam:* A Heckscher-Ohlin Analysis of the Law of Declining International Trade. 21 pp.
227. *Bruno S. Frey and Friedrich Schneider:* International Political Economy: An Emerging Field. 94 pp.
228. *Torsten Persson and Lars E.O. Svensson:* Misperceptions and Welfare. 21 pp.
229. *Charles P. Kindleberger:* The World Economic Slowdown Since the 1970s. 31 pp.
230. *W.M. Corden:* The Normative Theory of International Trade. 120 pp.
231. *Charles P. Kindleberger:* Standards as Public, Collective and Private Goods. 27 pp.
232. *Thorvaldur Gylfason and Assar Lindbeck:* The Macroeconomic Consequences of Endogenous Governments and Labor Unions. 34 pp.
- 1983
233. *Kalyan K. Sanyal:* Trade in Raw Materials in a Simple Ricardian Model. 17 pp.
234. *Charles P. Kindleberger:* Financial Institutions and Economic Development: A Comparison of Great Britain and France in the Eighteenth and Nineteenth Centuries. 42 pp.
235. *Lennart Ohlsson:* Structural Adaptability of Metropolitan Sweden to Changing Comparative Advantages During Periods of Growth and Stagnation. 43 pp.
236. *Parameswar Nandakumar:* Government Policies in Mixed Open Economies. 31 pp.
237. *Torsten Persson:* Real Transfers in Fixed Exchange Rate Systems and the International Adjustment Mechanism. 38 pp.

238. *Lars Calmfors
and Henrik Horn:* Employment Policies and Centralized Wage
Setting.
239. *John T. Cuddington:* A Fix-Price Trade Model with Perfect Capital
Mobility: Fixed versus Flexible Exchange
Rates. 38 pp.
240. *Bruno S. Frey,
Henrik Horn,
Torsten Persson and
Friedrich Schneider:* A Formulation and Test of a Simple Model of
World Bank Behavior. 17 pp.