How the Financial Statements of Uruguayan Firms in 1973–81 Reflected Stabilization and Reform Attempts

Jaime de Melo
Ricardo Pascale
James Tybout

WORLD BANK STAFF WORKING PAPERS
Number 696

WORLD BANK STAFF WORKING PAPERS
Number 696

How the Financial Statements of Uruguayan Firms in 1973–81 Reflected Stabilization and Reform Attempts

Jaime de Melo
Ricardo Pascale
James Tybout

The World Bank
Washington, D.C., U.S.A.

This is a working document published informally by the World Bank. To present the results of research with the least possible delay, the typescript has not been prepared in accordance with the procedures appropriate to formal printed texts, and the World Bank accepts no responsibility for errors. The publication is supplied at a token charge to defray part of the cost of manufacture and distribution.

The World Bank does not accept responsibility for the views expressed herein, which are those of the authors and should not be attributed to the World Bank or to its affiliated organizations. The findings, interpretations, and conclusions are the results of research supported by the Bank; they do not necessarily represent official policy of the Bank. The designations employed, the presentation of material, and any maps used in this document are solely for the convenience of the reader and do not imply the expression of any opinion whatsoever on the part of the World Bank or its affiliates concerning the legal status of any country, territory, city, area, or of its authorities, or concerning the delimitation of its boundaries, or national affiliation.

The most recent World Bank publications are described in the annual spring and fall lists; the continuing research program is described in the annual *Abstracts of Current Studies*. The latest edition of each is available free of charge from the Publications Sales Unit, Department T, The World Bank, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A., or from the European Office of the Bank, 66 avenue d'Iéna, 75116 Paris, France.

Jaime de Melo is an economist in the Development Research Department of the World Bank; Ricardo Pascale and James Tybout, consultants to the Bank, are, respectively, professor of finance at the Universidad del Uruguay and assistant professor of economics at Georgetown University.

Library of Congress Cataloging-in-Publication Data

De Melo, Jaime.
How the financial statements of Uruguayan firms in 1973-81 reflected stabilization and reform attempts.

(World Bank staff working papers ; no. 696)
Bibliography: p.
Includes index.
1. Corporations--Uruguay--Finance. 2. Corporations--Uruguay--Accounting. 3. Economic stabilization--Uruguay. 4. Uruguay--Economic policy. I. Pascale, Ricardo, 1942- . II. Tybout, James R., 1953- . III. Title. IV. Series.
HG4128.D4 1985 338.7'4'09895 85-22671
ISBN 0-8213-0669-3

Abstract

This paper uses the financial statements of industrial firms to develop an integrated firm's eye view of the changes in the Uruguayan economy during 1973-81. In the first of three subperiods, 1973-75, real financial costs were very negative and tended to offset low returns on operating assets. During 1976-78 the dismantling of interest rate controls increased real financial costs, but other factors increased the returns on operating assets more rapidly. During 1979-81 financial costs jumped enough to more than absorb increases in gross earnings, which were probably due to Argentine demand. The rates of earning and capital formation were highest among exporters in the second subperiod, when a major export promotion program was in place. This pattern was reversed in the third subperiod, as the promotion programs were dismantled and real currency appreciation seemed to squeeze gross earnings of exportables relatively more. This unequal squeezing was probably due to redundant tariff and other protection for import-competing producers.

Outline

I. Background

A. Purpose of the Paper

B. Overview of Reforms and Macro Performance

C. The Plan for Analysis

II. Findings

A. Overall Manufacturing Sector Performance

B. Adjustment Patterns and Exposure to International Competition

C. Conclusions

Appendix A: The Error Components Model

Appendix B: Inflation Adjustments

I. Background

A. Purpose of the Paper

From the mid-1950s to the early 1970s, Uruguay's development strategy was based on import substitution and heavy state intervention. The results were disappointing: real GDP growth averaged less than one percent per annum, and by 1973 inflation was rapidly approaching one hundred percent, reflecting uncontrolled fiscal deficits that were monetized by the Central Bank. Because of these and other problems, the military seized power in June 1973. And when a new economic team was appointed in July 1974, government policies were changed across-the-board.

To deal with inflation, the new policymakers first pursued orthodox stabilization policies. Later, they adopted an exchange-rate-based strategy. But from the start, they also attempted to improve resource allocation and achieve higher growth by abandoning import substitution and deregulating the economy. To induce competition among oligopolistic firms, price controls and barriers to trade were relaxed. And to raise the profitability of exporting, taxes on traditional exports were dismantled while fiscal and financial incentives for nontraditional exports were created. Concurrent with the deregulation of product markets, capital flows and domestic interest rates were deregulated, and controls on the allocation of credit were progressively dismantled.

As these reforms were implemented, the Uruguayan economy responded almost miraculously. Output growth jumped, exports skyrocketed, the financial sector boomed, and new investment accelerated. But for reasons not completely understood, the economy was once more in crisis in 1982. This paper looks at why the combination of stabilization and liberalization policies brought the economy full circle over the 1973-81 period.

Our analysis is based on the annual balance sheets and income statements of 69 manufacturing firms. 1/ We begin by making comprehensive adjustments that undo the biases of inflation in each firm's books. Then, in an attempt to quantify various economic shocks and their consequences for the manufacturing sector as a whole, we examine changes in the consolidated balance sheet and income statement for our sample over time. Last, we divide our sample of firms into exportable goods producers and import-competing producers to address whether sector-specific incentives during the reform period were consistent with the objective of efficient resource allocation. This exercise involves numerous tests on earnings stream components and financial structures in one subsample vis a vis the other.

B. Reforms and Macroeconomic Performance 2/

To set the stage for our analysis, we first review the reforms and the associated changes in the economic environment between 1973 and 1981.

Reforms To begin, fiscal policies were changed in several respects under the new economic regime. Given that price controls had been removed, an attempt was made to bring down inflation by cutting budget deficits. And in 1974 the income tax was abolished and replaced with an 18-percent value-added tax. Various fiscal incentives to export were also instituted during 1975-79, but phased out later.

Quantitative restrictions on imports of capital goods were lifted early in 1975, those on other imports were also lifted, and maximum tariffs

---

1/ This group of firms includes the largest in Uruguay, and represents about sixty five percent of manufacturing employment.

2/ This section draws from Hanson and de Melo (1985).

rates were reduced. And starting in December 1979 a tariff reform was to lead to a uniform rate of protection of 35 percent by 1985. But, by 1981 little had been accomplished toward reducing dispersion in effective rates of protection across sectors (table 2, columns 6-8). Only toward the end of 1980 had redundant protection been eliminated (CINVE 1983) .

Major controls on the banking system and on international capital flows were also dismantled. Until 1974 credit was allocated by direct credit allocation rules, and for those who had access to formal sector credit, ex-post costs of funds were negative in real terms. But beginning in that year interest rate ceilings on deposits were progressively lifted and finally eliminated in 1977. Moreover de facto convertibility of the peso took place in 1974, when Uruguayans were free for the first time to buy and sell assets denominated in external currencies. Finally, the entry of new banks was allowed in 1977 for the first time since 1965, and commercial bank reserve requirements were abolished in 1979.

Exchange rate policy changed substantially in late 1978. Until then, price stabilization was pursued through fiscal restraint, and a passive crawling peg maintained a fairly stable value of the real exchange rate. But in October 1978 the authorities, frustrated with the persistence of 60-percent annual inflation, began attempting to stabilize by slowing the rate of devaluation according to a preannounced schedule (the "tablita"). Argentina pursued the same type of stablilization policy until 1981, when it began a series of major devaluations, thereby ensuring rapid changes in the real exchange rate between Uruguay and its main trading partner (table 1, column 10).

Macro performance In 1973, macroeconomic conditions were poor. Uruguay was about to experience a large terms-of-trade loss (table 1, column

Table 1: Macro Indicators

	GDP Growth (%)	Terms of Trade	Non-traditional Export Growth (%)	Private Investment/ GDP (%)	Of which Machinery & Equipment	Inflation (%)	Real Credit to Private Sector (million 1973 NU$)	Average Real Borrowing Rate	Ex-Post Peso-Dollar Spread	Competi-tiveness with Argetina	Real Exchange Rate Index: (PPP-ER)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1973	0.4	186.7	21.0	6.1	2.0	97.0	2.93	-30.2	-	98.5	111.4
1974	3.1	100.0	46.5	6.4	2.4	77.2	2.90	-21.9	-	100.0	100.0
1975	5.9	71.0	11.3	7.3	3.2	81.4	3.24	-13.6	-	71.1	111.9
1976	4.0	68.6	76.1	8.0	4.0	50.6	3.95	-1.5	-3.4	99.2	118.9
1977	1.2	76.2	12.2	7.9	4.2	58.2	4.64	-8.4	11.4	83.4	114.3
1978	5.3	82.9	8.9	8.0	4.0	44.5	5.50	3.6	25.9	105.4	111.2
1979	6.2	87.6	1.1	10.8	5.3	66.8	6.46	-21.0	15.9	128.5	88.5
1980	6.0	69.5	-0.3	12.4	5.5	63.5	8.10	4.5	30.8	131.0	58.6
1981	1.9	64.8	3.2	12.1	5.5	34.0	8.67	13.3	17.8	99.1	60.5

Sources: Unless otherwise stated, Banco Central del Uruguay (BCU).

Cols. 2, 3 : Camara Nacional de Comercio, p. 32

Col. 5 : IFS

Col. 6 : BCU end-of-year figures

Col. 7 : 1974 = 100

Col. 8 : Unpublished BCU figures. Annualized rates calculated as: $(1 + RP) / (1 + P) - 1$.

Col. 9 : Annualized rate computed as: $(1 + RP_t)(1 + E_{t+6}) - (1 + RD_t)$ where RP = 1-6 month peso deposit rate; RD = 1-6 month dollar deposit rate; E_{t+6} = Devaluation rate during next six months.

Col. 10 : Hanson and de Melo (1985, table 2) computed from indices (1974=100) as follows: $(CPI_a / CPI_u) ER_a$; where a = Argentina, u = Uruguay.

Col. 11 : Nominal exchange rate index times the ratio of world inflation (from IFS) to the consumer price index.

2) caused by the combination of increasing oil prices and declining prices for beef and wool. 1/ After the new economic regime came to power, the economy quickly responded to reform and stabilization policies. Manufacturing growth jumped from - 0.6 percent in 1973 to 2.5 percent in 1974, and in following years often exceeded 5 percent (table 2). Until 1979, when trade promotion schemes were phased out, this expansion was led by exports (table 1). Private investment as a ratio to GDP began a sustained upward trend, especially machinery and equipment, which could now be freely imported (table 1). Inflation came down from 97 percent in 1973 to between 40 and 70 percent thereafter, but a monetary squeeze was avoided as real credit in both pesos and dollars to the private sector expanded rapidly (table 1).

The decontrol of interest rates did not initially result in high real interest rates: ex post peso borrowing rates remained low (1978) or negative in real terms until 1980 (table 1). Dollar borrowing, which was no longer controlled by the government, became even cheaper after 1977 as reflected in the large ex-post peso-dollar spreads in table 1. And the real exchange rate (measured by the purchasing power parity (PPP-ER) index in table 1) began heading downward when the tablita was implemented in 1979. This fall in the real exchange rate coincides with a reduction in non-traditional export growth during this year and thereafter. However, the real exchange rate vis a vis Argentina moved upward until 1981, reflecting the fact that Argentine authorities were appreciating more strongly than their Uruguayan counterparts (table 1). But with the rapid Argentine devaluations in the spring of that

---

1/ The size of this external shock has been estimated at 10 percent of average GDP over the period 1974-78 (Balassa, 1981).

Table 2: Manufacturing Indicators

	Manu-facturing Growth (1)	Manufacturing Wholesale Price (2)	Real Wage (private) (3)	Hours Worked (4)	Unemployment (Montevideo) (5)	Protection a/ b/ Estimate (6) NRP	RP	ERP	Taxes on Exports c/ (7)	Export Subsidies (8)
1973	-0.6	117.9	100.5		8.9	-	-	-	21	17
1974	2.5	86.2	100.0	100.0	8.1	-	-	-	13	18
1975	5.6	82.1	92.1	107.7	8.1	52	-	-	2	18
1976	1.9	54.6	85.2	104.4	12.9	34	-	-	1	20
1977	6.3	49.8	74.0	108.8	11.8	36	-	-		
1978	5.8	40.2	71.2	106.3	10.1	25	23	-		
1979	7.8	72.4	64.3	106.3	8.4	-	-	-		14.3 b/
1980	3.1	51.6	60.9	104.1	7.4	36	16	-		13.7 b/
1981	-4.4	28.0	65.7	93.4	9.3	38	-	75		13.6 b/

Sources: Unless otherwise indicated: Banco Central del Uruguay.

a/ Rama (1982) for 1975-1977.

b/ CINVE (1983) for 1978-81.

c/ Bension and Caumont (1981).

Notes: NRP = Implicit average nominal protection for domestic sales
RP = Redundant Protection
ERP = Effective Rate of Protection (domestic sales). In 1981, the average ERP for export sales was 30%.
- = Not available.

year, a reversal occurred, marking the beginning of a downward tailspin for the Uruguayan economy and the end of our sample period.

C. Methodology

The initial success and ultimate failure of Uruguay's reform experiment were no doubt due to the interaction of real and financial phenomena. Hence it seems appropriate to analyse recent Uruguayan experiences using firms' financial statements, where such interaction can be directly observed. We will undertake this exercise, organizing our analysis around several basic issues: First, what overall and cross sectoral patterns of earnings rates on operating assets were generated by the reforms and stabilization attempts? Second, how did these earnings rates combine with financial costs on both peso and dollar loans to generate patterns of net return on equity? Finally, how did these net returns and the new Uruguayan system of incentives combine to induce changes in firms' asset structure, level and currency composition of borrowing, and dividend payout rates, and thereby affect the financial fragility of the industrial sector?

To address these questions, we draw on the financial statements of manufacturing firms during the reform period in two ways. First, we consolidate all the firms in our sample and use the resulting aggregate financial statement to examine how the manufacturing sector reacted to the new environment. Besides illuminating the sequence of adjustment to the reforms, this analysis checks the validity of our method because some results can be compared to the national accounts. This part of the analysis also introduces the financial ratios and earnings decomposition to be used later. Second, we classify firms according to product tradability and size, then study the relative performance of various subgroups.

In sorting out the influence of real and financial factors, we begin with the identity in equation 1, which is based on table 3:

(1) $Y = G1 - G2 - G4 - (G5 + G7)$.

Here Y is an inflation-corrected net income measure, G1 is sales revenue, G2 is the cost of goods sold, G4 is overhead expenses, G5 is explicit financial costs, and G7 is the net loss in value due to the effects of inflation on monetary items. 1/ All variables are expressed in units of purchasing power on the firm's closing date.

A simple rearrangement of these terms allows us to write earnings as a rate of return on net worth, decomposed into an expression involving various financial ratios:

(2) $Y/W = [(a-b)\ c - df] \ / \ [1-f]$

where

a = G_3/G_1 = gross margin per unit sale

b = G_4/G_1 = overhead unit per sale

c = G_1/A = asset turnover

d = $(G_5 + G_7)/D$ = average real financial cost

f = D/A = gearing, or debt per unit asset

1/ The effects of inflation correction on net income, financial costs and other financial costs are discussed in appendix B.

Table 3:

Financial Statement Format

Table 3(a): Income Statement

Sales Revenue	G_1
Cost of Sales (inputs and depreciation)	G_2
Gross Earnings ($G_2 - G_1$)	G_3
Administrative and Marketing Costs	G_4
Net Financial Costs ($G_{5.1} + G_{5.2} - G_{5.3}$)	G_5
Financial Expenses	$G_{5.1}$
Exchange Rate Losses	$G_{5.2}$
Financial Earnings	$G_{5.3}$
Net Operating Earnings ($G_3 - G_4 - G_5$)	G_6
Inflation Loss on Net Monetary Assets	G_7
Corrected Income ($G_6 - G_7$)	Y

Table 3(b): Balance Sheet

A_1	Short-term financial assets (peso denominated)	D_1	Short-term debt (peso denominated)
A_2	Short-term financial assets (dollar denominated)	D_2	Short-term debt (dollar denominated)
A_3	Inventories	D_3	Long-term debt (peso denominated)
A_4	Physical Capital	D_4	Long-term debt (dollar denominated)
A_5	Long-term financial assets (peso denominated)	D	Total debt
A_6	Long-term financial assets (dollar denominated)	W	Net Worth
A	Total Assets	D+W	Total Sources of Funds

Each ratio is defined and briefly discussed in table 4, where we note that (a), (b), and (c) are likely to pick up real side shocks, while (d) reflects financial disturbances, and (f) indicates the importance of these disturbances in influencing earnings. Clearly increases in gross margins (a) or asset turnover (c) improve earnings rates, while increases in unit overhead costs (b) or average real financial costs (d) drag them down. An increase in debt per unit asset (f) increases earnings rates as long as average real financial costs are less than the rate of return on assets, (a-b) c.

In principle, the ratios presented in equation 2 could be used to construct a behavioural model. However, to do so is to presuppose that important linkages are already understood, and that it remains only to calibrate them. We therefore undertake the more modest task of tracking each ratio's movements over time, looking for patterns of correlation between these movements and changes in the economic environment. In our discussions, causality implicity runs from macro variables to firm level flow variables, which combine with relative prices and expectations influence firms' future asset and liability stocks.

Below we first construct each ratio from our consolidated sample. This allows us to test the validity of our inflation adjustment by comparing the results to the national accounts and to see what we can learn about manufacturing performance beyond what is apparent from official statistics. 1/ Then we break our sample into groups that differ in their

---

1/ Because official statistics describing the manufacturing sector are based on consolidated data, we consolidate our sample in this subsection to maximize comparability. This permits validation of our methodology, but precludes statistical tests. Hence, statistical results based on mean ratio values across all sample firms are also reported in Table A2 of appendix A for the interested reader.

Table 4:

Indices of Sources of Fluctuations in Income and Financial Structure *

I. Income Fluctuation Indices

Gross Margin (G_3/G_1)

Reflects changes in relative prices of inputs (wages) and outputs (exchange rate, commercial policy)

Overhead (G_4/G_1)

(Administrative and marketing expenses per unit sale)
Reflects combination of changes in capacity utilization (in the face of sales fluctuations) and of flexibility of responsiveness (cut in overhead expenses) to market signals

Asset Turnover (G_1/A)

(Sales/Assets)

Moves in direct proportion to physical volume of sales for given asset and output prices. Measure of capacity utilization when asset and output prices are fixed

(G5+G7)/D: Measure of real financial costs. Approximates real interest rates under the assumption that firms expand nominal debt (to service interest payments) so as to maintain real stock of debt constant

II. Balance Sheet Structure Indices

Quick Ratio $(A_1+A_2)/(D_1+D_2)$

(Current assets less inventories/current liabilities)
Liquidity measure. Assumes inventories cannot be liquidated on short notice

Net Foreign Assets $(A_2-D_2-D_4)/A$

(net foreign assets)/(total assets)
Measures foreign exposure

Gearing (D/A)

(total debt)/(total assets)
Measure of solvency

III. Accumulation Indices

Debt Growth $D_t/D_{t-1}-1$

Indicates whether, and in what measure, net income flows were augmented by new real borrowing as a source of funds

Gross Fixed Investment I/K

Real rate of gross investment represents long-term resource commitment to the sector being analyzed

Dividend Payout Rate P/W

* All variables are expressed in prices on firm's closing date. Ratios of flows to stocks are constructed using averages of previous period and current period stocks but in current period prices.

exposure to international competition and statistically compare the same set of ratios across subgroups and time.

II. Findings

A. Overall Manufacturing Sector Performance

Our analysis of overall manufacturing sector performance is based on the consolidated sample. We start by looking at the relative contribution to net earnings of gross margins and overhead, both indicators of adjustment to real side shocks. We next examine the role of real financial costs and balance sheet structure, both indicators of how firms adjusted to the financial-reform-induced shocks (see equation 2). Finally, having shown how the reforms affected the trajectory of net earnings and having established that the trajectory generated by our inflation-adjusted data is plausible, we examine new debt and net earnings after interest payments were divided between new asset accumulation and dividends to shareholders.

Real-side Shocks. Gross margins and asset turnover both grow over time, reflecting rising overall earnings per unit operating asset (table 5, columns 2 and 4). The year 1973 stands out as especially bad, as would be expected in the light of the economy when the military took power. For gross earnings, 1980 and 1981 stand out as stellar performance years, consistent with the boom associated with high Argentine demand. 1/ That performance may also have partly reflected the declining real wage rate and a pass-through of financial costs (Cavallo 1977), which were rising dramatically (table 1).

1/ Table 1 shows this boom ending in 1981, but because most of our sample closed its books in midyear, the steep decline in output which came during the second half of the year should not be expected to show up in table 5 figures.

Table 5:

Sources of Fluctuations in Net Earnings: Consolidated Sample

	Real rate of return on net worth r*	Gross margin	Overhead	Asset turnover	Real financial costs per unit debt	Gearing	Quick ratio	Net foreign assets	Debt growth	Capital stock growth	Investment / Capital	Dividends / Net worth
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1973	-0.040	0.103	0.136	0.984	-0.532	0.506	0.736	-0.137	-0.203	-0.100	0.065	0.016
1974	-0.022	0.174	0.138	1.159	-0.338	0.472	0.741	0.116	0.025	0.103	0.089	0.024
1975	0.019	0.196	0.130	1.196	-0.283	0.494	0.740	-0.169	0.107	0.042	0.067	0.022
1976	-0.013	0.206	0.150	1.155	-0.035	0.487	0.772	-0.158	-0.038	-0.013	0.088	0.036
1977	0.089	0.221	0.148	1.209	-0.140	0.512	0.760	-0.214	0.134	0.083	0.161	0.023
1978	0.077	0.223	0.149	1.170	-0.128	0.517	0.787	-0.215	0.023	0.001	0.113	0.033
1979	0.031	0.190	0.150	1.216	-0.222	0.519	0.787	-0.224	-0.150	-0.187	0.103	0.036
1980	0.045	0.243	0.153	1.255	0.038	0.518	0.734	-0.219	0.185	0.215	0.183	0.040
1981	0.007	0.301	0.157	1.251	0.160	0.509	0.808	-0.223	0.050	0.094	0.182	0.055

The other real side determinant of earnings in equation 2 decomposition is overhead. Expressed as a ratio to sales revenue, this variable shows a slight rising trend despite growing sales per unit asset (table 5, column 3). Hence such costs do not appear to have generated major fluctuation in the return on assets, at least not in the manufacturing sector as a whole. One interpretation of this ratio's stability is that managerial compensation rose slightly more than proportionately with sales as optimism grew and executives began collecting some of the fruits of the recovery.

Financial Shocks How did financial costs affect the net earnings stream? After adjusting for the effects of inflation on firms' real net liabilities, the average financial cost per unit net liability was typically quite negative (table 5, column 5). This was especially true during 1973-75, just as the macro series on real interest rates in table 1 suggests. So, in the reform period, and to a less extent between 1976 and 1979, borrowing generated revenues rather than costs, and must have helped offset poor operating earnings.

Average real financial costs dipped in 1979, reflecting a sudden (and probably unexpected) jump in the inflation rate. But thereafter they turned suddenly very positive. (Both shifts faithfully reproduce real interest rate patterns in Table 1.) This movement therefore dampened the earnings growth noted earlier, and may have been partly responsible for rising price-cost margins (as speculated above). 1/

1/ For this to have occurred, producers would have had to be able to increase their output prices vis a vis foreign competitors, or reduce their real payments to labor. The former would have required limited substitutability between foreign and domestic goods or redundant protection, an issue that will be taken up later.

How much these fluctuations in average financial costs affected net earnings rates naturally depended on gearing (borrowing per unit asset). These were surprisingly stable for the consolidated sample (column 6, table 5). This is partly due to the valuation of inflation-corrected capital stocks at replacement costs, and the rise in the cost of capital relative to general prices during part of the sample period. 1/

Foreign borrowing was also stable as a ratio to total assets after 1976, when it represented nearly half the debt of the sample firms. But not surprisingly, before 1976 debt was being shifted from domestic to foreign currency denomination rapidly as capital inflows were being liberalized. By mid-1981, when expectations of a major devaluation had begun to mount, the manufacturing sector had still not reduced this dollar exposure. This behaviour was consistent with the popular belief that by 1981 loan officers were only willing to renew loans denominated in dollars, and firms had little choice but to go along. Whatever its cause, the heavy dollar exposure of the financial sector was to become a fundamental cause of financial crises when the devaluations finally came.

Net Earnings Rates We have shown thus far that operating earnings and financial costs moved to offset one another so that net earnings rates should be more stable than either of these components. In 1973, despite very poor operating earnings, the net real loss on inflation-adjusted equity was only -4 percent because of major financial subsidies from the interest-rate regime. As these subsidies fell over 1974-78, operating earnings improved to

---

1/ We replaced our capital price inflator with the CPI in our adjustments for inflation, and found that ratios other than gearing did not change much (see Appendix B). Sectoral results in section B below are based on this CPI-adjusted data set so that we isolate the influence of factors other than real capital stock prices which are present in table 5 results.

give real returns of 9 percent in 1977 and 8 percent in 1978. During the tablita period (1979-81), despite the surge in gross earnings and asset turnover until the first half of 1981, the spectre of suddenly positive real financial costs was enough to drag down net income. In 1980 and 1981 the net return on equity fell to 5 percent and 0 percent, respectively. Hence, although the national accounts showed the boom in real production during these last years of the reform period, that boom was a misleading indicator of manufacturing sector profitability 1/

Some Sources and Uses of Funds. Manufacturing earnings after interest payments (net income) must either become dividends to shareholders or finance new net asset accumulation. So the last issue we address is how these two variables performed. Because dividends and capital purchases can be financed with new debt as well as net income, we look at growth rates of debt at the same time.

Quite surprisingly, in spite of the increase in real credit availability to the private sector throughout the period, cumulative real debt growth over the period was insignificant (table 5, column 9). The reason is that new banking sector credit was channelled to feed the livestock and construction bubbles and the consumption boom. (Debt growth did jump in 1980-81, marking the beginning of a leverage increase that -- according to Central Bank figures -- continued after the ending of our sample period.) 2/

1/ An important transfer was taking place from shareholders and workers toward depositors at financial intermediaries, who ultimately reaped the benefits of increased output through their interest earnings.

2/ See de Melo and Suriyasat (1985, table 5). Data on manufacturing sector debt are available starting in 1975. They show that the ratio of debt to manufacturing sector value-added rose by 10 percentage points to 0.62 between 1979 and 1981. The ratio doubled as a result of the November 1982 maxi-devaluation.

Similarly, liquidity measured by the quick ratio, increases slowly but steadily throughout. 1/ Thus, even though manufacturing altered the composition of its financial structure towards dollar denominated debt, it did not partake of the increased available credit.

Official statistics show that investment grew rapidly, particularly during the construction boom in 1979-81 (table 1). The investment figures for the consolidated sample (expressed as a proportion of average capital stock) also reflect this surge, as well as the high investment rate reported for 1977. It is clear from this series that the reform period generated a recovery in investment rates in manufacturing that was sustained despite increasing interest rates and rapidly declining earnings during 1980-81. The investment surge during 1980 and 1981 is consistent with the conjecture that manufacturers were purchasing imported machinery and equipment probably in anticipation of capital gains that would occur when the peso would be devalued.

Dividends distributions grew steadily during the reforms, reaching 5 percent of net worth by 1981. These payouts were equal to or exceeded the rate of return to net worth during the last three years of the reforms, which meant that relatively rapid debt growth was necessary (table 5, last column). So, toward the end of the reforms, the dividends to shareholders largely represented cash generated with borrowed funds. Households presumably used this income (and funds obtained directly from banks), to finance the

---

1/ The fall in 1980 reflects the rise in real debt during that year. Note that insofar as dollar exposure was increasing while the real exchange rate was appreciating and the maxi-devaluation was on the horizon, the rising quick ratio values are misleading indicators of liquidity.

consumption boom that took place in anticipation of a devaluation (Hanson and de Melo 1985).

B. Patterns of Adjustment and Exposure to International Competition

The patterns of adjustment revealed by our consolidated sample provided new evidence of the interaction between real and financial shocks during the reforms. They also confirmed that our method yields results that conform to other evidence on the manufacturing sector. But consolidated figures mask differences in patterns of adjustment by subgroups of firms. So, having shown how financial ratios can be used to infer behavior, we analyze these same ratios for several subsamples.

We classify firms by the scheme outlined in table 6. First we separate firms into exportable and import-competing firms, using the criterion of whether, sales under "normal" circumstances, are destined to the home market or abroad. 1/ Then we further subdivided firms into those with high and those with low protection, reasoning that the first group must have borne a disproportionate share of the costs of adjustment to tariff reductions. They may also have been highly protected in the first place because they were out of line with the country's comparative andvantage and may therefore have fared worse after the opening to foreign trade. This classification of firms

---

1/ In Uruguay such a classification is very hazardous, especially during the period we are analyzing because the real exchange rate index with Argentina and Brazil fluctuated a lot. Indeed, when Argentina appreciated dramatically vis-a-vis Uruguay in 1979 and 1980, many import-competing firms were able to export temporarily to Argentina. But it is plausible to assume that this exporting was perceived as temporary, so that one can keep this classification subject to caution in interpretation for the years when competitiveness with Argentina and/or Brazil fluctuated drastically.

Table 6: Classification of Firms

Sector	Number of firms	Effective protection on domestic sales	
		MIN	MAX
Exporters	10		
Import Competing High Protection	33	102	545
Import Competing Low Protection	26	-17	82
Total	69		

Note: Average effective protection on domestic sales for manufacturing: 86%.

by protection is on the basis of effective protection figures that CINVE estimated at the product level for 1980. 1/

Once again, the ratios described in table 4 are constructed and analyzed for each subgroup. But now we construct means of firm-specific ratios rather than ratios constructed from a consolidated financial statement. This allows us to perform statistical tests of constancy across subgroups and time using an error components model (see appendix A for details. Among other things, we formally test: (1) whether mean ratios do not change over time and are common to all sectors; (2) whether they follow the same path in all sectors; and (3) whether there is a significant correlation between firm size and the ratio analyzed. Statistical results are reported in their entirety in table A1 of appendix A.

Real Side Shocks It is generally believed that the combination of commercial policy reforms and exchange rate regimes that characterized 1973-81 had important effects on sector-specific variations in earnings rates. Special export subsidies and changes in international markets are also believed to have played significant roles. In this section we begin by quantifying these effects with sector-specific means of gross margins and asset turnover rates.

We first consider the conjecture that an overvalued exchange rate hurt exportable goods producers more than import-competing producers during both 1972-75 and 1979-81. This is believed to have occurred because redundant

---

1/ Because firms produce a variety of technologically unrelated products (for instance, joint products) classification biases will result. But such occurrences are rare in Uruguay, and there is a clear cut in the range of effective protection estimates for each group (see table 6) which reduces the impact of biases.

protection for import-competing industries made them invulnerable to reductions in the real exchange rate (CINVE 1983 and table 2).

For gross margins, the relative performance of exportable goods producers is in line with this belief until at least 1980 (figure 1.1). Their average margins were extremely poor during the 1973-75 period and then jumped dramatically during 1976 and 1977, when the real exchange rate rose and several major export promotion schemes were instituted. Then, as these promotion schemes were dismantled and the exchange rate began to appreciate during 1978 and 1979, exportable margins became very low once more. In contrast, import-competing firms show much less variation, and clearly enjoy higher average margins. This is what one would expect, given the existence of widespread redundant protection noted in table 2. Not surprisingly, the difference between the paths of margins for exportable and import-competing firms is significant (appendix A, table A1).

Margins during 1980 and 1981 do not seem to be explained by the real exchange rate, at least not that against the dollar. Despite the fact that real appreciation accelerated during these years, exportables exhibit a dramatic (albeit partial) recovery and importables register their highest margins ever. 1/ There are two plausible explanations. First, and perhaps most important, during these years the Argentine peso appreciated against the Uruguayan peso (table 1, column 10) inducing a major shift of Argentine demand toward Uruguayan goods. (This may explain why exportables recover relatively more.) Second, during 1980 and 1981 real financial costs in Uruguay increased dramatically, and many producers may have been able to pass on at least part

---

1/ The t ratio for the increase in exportable margins between 1979 and 1980 is 1.80.

of these costs to consumers by increasing their output prices, or backward to laborers through reduced real wages.

It is likely that exportables margins catch up with importables because redundant protection for importables was falling rapidly in 1980 and 1981. This fall was due to the combined effect of the real exchange rate appreciation and the tariff reduction program. Thus while all tradables were benefiting from the Argentine shift towards Uruguayan goods, importables were probably more constrained.

For importables there is a surprisingly strong negative association between size and margins (table A1, lines 2 and 3). This was not true among exportables. Neither exportables nor importables showed any significant association between size and margins in Chile or Argentina (see Galvez and Tybout 1985, and Petrei and Tybout 1985). One possible explanation is that larger firms compete more directly with foreign producers, an effect that might not show up in the other countries simply because Uruguayan small firms are much smaller than their Chilean or Argentine counterparts.

The importance of commercial policy reforms is best gauged by the breakdown of the import-competing sample by high and low protection. The gross margins of low-protection firms were larger than those of high-protection firms throughout the reform period, and the gap is remarkably constant at roughly 0.15 (figure 1.2). Hence we have striking corroboration of an earlier study (CINVE, 1983) which concluded that commercial policy reforms did <u>not</u> squeeze high-protection firms relatively more. Or, in other words, such things as reference pricing and redundant protection seem to have offset any tendency for tariff reductions to force down the relative price of

highly protected import-competing firms vis a vis others. 1/ Nonetheless, barriers to foreign competition notwithstanding, these highly protected firms performed much worse in terms of margins. One can easily imagine why authorities were not eager to bring additional pressure to bear on this already weak enclave of producers.

Low turnover rates compounded rather than offset the problems of exportable goods producers with low margins (figure 2.1). This index of capacity use was always lower for exporters than for import-competing firms, though it did rise with margins in 1977 -- probably because of an increase in real output prices. In 1980 and 1981 exportables register very low turnover rates despite improved margins, suggesting that capacity use may have been falling some too. (Table 2 shows a slowdown in manufacturing growth, especially during 1981.) A similar drop in turnover rates appears for import-competing firms. 2/

A comparison of importable goods producers with high and low protection confirms that here too, relatively low turnover rates compounded rather than offset the impact of their relatively poor margins on earnings. So, just as with exporters, problems of low capacity use and small price-cost differences dragged down the earnings of import-competing firms that had began the reform period from a position of high protection.

1/ Such a result stands in contrast to an analogous study of import-competing firms in Chile (Galvez and Tybout 1985), where margins for highly protected firms fell much more dramatically than for firms with low protection as tariffs were reduced.

2/ This result is somewhat puzzling because it did not appear in our consolidated figures (table 5). The explanation for this must be that small firms began to experience turnover problems as early as 1978, but that the consolidated figures did not reflect this because large firms -- which received heavier weights -- were improving their turnover.

Turning to unit overhead costs, the last component of operating earnings, we find that some interesting cross-sector contrasts were disguised by our stable consolidated figures. Specifically, overhead costs among exporters start downward after 1977 while those of import-competing firms continue upward (figure 3.1). Recalling that 1977 is the peak year for exporters' margins and turnover rates, it must be that overhead costs per unit sale are being cut in this sector despite falling sales. This must have helped cushion the effect of increasingly adverse markets on these firms, and may reflect an increase in managerial efficiency. Among highly protected importable-goods producers, which also had margin and turnover problems, the economizing in overhead expenses is similar (figure 3.2).

Financial Shocks. Some authors have emphasized that exportable-goods producers enjoyed particularly low costs when special financial subsidies were in place (1976-78), and likewise had the most arduous adjustment problem when the dismantling of these subsidies coincided with the rapid increase in real interest rates (Mezzera 1980). 1/ Also, it is commonly speculated that exporters relied relatively heavily on dollar credit throughout the period because their sales revenues were tied to the price of dollars. (If true, this factor should have offset poor operating earnings to some extent after the tablita period began.) We investigate both of these issues with our series on average real financial costs and dollar borrowing.

1/ The government lent dollars to banks for them to convert to pesos and use to finance exports. The exporters who received this money paid interest amounting to 10 percent of the dollar loan, translated into pesos at the exchange rate prevailing upon loan maturity. But the principal was repaid at the exchange rate which prevailed when the loan was granted, making the effective real interest rate very negative.

As with the consolidated figures presented earlier, the time path of real peso borrowing rates is faithfully recreated in the disaggregated figures (figure 5.1). Firms receive large financial subsidies early in the reform period, and the negative rates give way to positive rates in the last several years. Surprisingly, however, the exportable-goods producers appear to have payed higher rates than the import-competing firms. During the pre-tablita phase (1974-76), the heavier dollar debt of exportable-goods producers might explain why exportables had higher financial costs because dollar credit was relatively expensive in those days. But such an explanation does not account for the continuing high price that these producers paid during 1977-81. We can note only that these measures of financial cost vary considerably from firm to firm in each subsample, and hence the difference in average financial costs between exportable and import-competing producers is far from significant.

Did exportable-goods producers really rely more heavily on dollar credit? Here the answer is a resounding yes (figure 5.1). Net dollar liabilities of these firms as a ratio to total assets reached an amazing average of 0.36 by 1981, compared with 0.12 for import-competing firms. As apparent in table A.1, the larger firms clearly were more exposed in dollars than others. And although this correlation was significant in all subsamples, it was much more pronounced for exporters. We can conclude that although the impact of dollar borrowing on exporters' credit costs was not clear enough to emerge from our sample, exportables were very exposed in dollars by 1981. As mentioned already, this exposure may not have been so much a choice by managers as something forced on them by banks. Whatever the cause, this dollar exposure meant that the very sector authorities had set out to promote

in the mid-1970s was, by 1981, at a relative disadvantage in financial and real operations.

Net Earnings Rates. It remains to discuss how real and financial shocks combined to generate cross-sectoral differences in net earnings rates. Referring to figure 6.1, note that net income follows statistically distinct time paths in each sector (figure 6.1). We can easily reject the null hypotheses that both trajectories are flat and that both sectors follow the same time path (table A.1). Because the two sectors had statistically indistinguishable financial costs, it is unsurprising that these net earnings rates seem to correspond to changes in real side factors. Notice that the jump in gross margins and turnover rates during the export promotion period (1975-78) translated into unprecendented profit rates for exporters. Notice also that the subsequent drop in these margins and turnover rates seem to play a large role in pulling the profits of exporters back down. We conclude that the combined effects of export promotion programs and a reasonable real exchange rate helped manufacturing sector's export performance while they lasted.

The pattern for high and low protection importable-goods producer also is an apparent reflection of differences in real rather than financial factors (figure 6.2). High protection firms had consistently worse margins and turnover rates, and this seems to translate directly to poor net earnings.

Some Sources and Uses of Funds. Adjustments in borrowing rates, dividend payout rates, and investment rates are the three ways firms can adjust their cash flow to changing earnings and expectations. Once again, several beliefs are commonly held. First, it is often maintained that firms doing well were not retaining much of their income during the boom of 1979-81 (Pascale 1982). Second, the investment that did take place was mainly by exporters during the export promotion period of 1976-78 (Hanson and de Melo

1985). Third, the liberalizing of financial markets allowed this investment to be financed by debt; and negative real interest rates during the late 1970s led to rapid debt expansion simply as a revenue source (de Melo and Suriyasat 1985).

On the issue of earnings retention, firms that did better in the mid-1970s (exporters) were paying virtually no dividends, while import-competing firms paid roughly a third of their profits out (figure 9.1). Although high-protection firms paid out a bit less than the more profitable low-protection firms, this result challenges the view that dividends were closely related to earnings (figure 9.2). Indeed, in 1981, when high protection firms had zero real earnings and low protection firms only earned around 5 percent, these two sectors paid out 2 percent and 2.6 percent of their net worth, respectively.

Why didn't exporters pay out more during 1976-78? Apparently they were rapidly accumulating assets. Perhaps inspired by the new government's resolve to promote international trade, and buoyed by high profits, they registered gross fixed investment rates considerably higher than those of the importable sector between 1975 and 1978 (figure 10.1). Retained earnings alone were insufficient to finance growth in these and more liquid asset stocks -- so, as has often been asserted, real exportable borrowing also rapidly expanded (figures 7.1 and 8.1). Both variables show sectoral contrasts that are significant (appendix A, table A1). When the earnings rates of exporters fell in 1979 and 1980, real fixed investment and real debt growth both dropped abruptly.

Importable firms took over as the leading sector in 1979-81. Both high and low protection firms register rising fixed investment rates, despite climbing interest costs and in some cases faltering earnings. Partly because these firms continued to pay out dividends at 2-3 percent of net worth, this

expansion meant that the growth of real debts had to pick up briskly. The ultimate effect on their balance sheet structure was a marked increase in gearing rates among import-competing firms.

Conclusions

The basic objective of this paper was to provide an integrated firm-level view of the changes in economic conditions which transpired during recent Uruguayan reforms. After establishing that our method yielded results that conform to what already was known, we went on to report a number of new findings. To begin, in studying the manufacturing sector as a whole, we found three clear phases in the 1973-81 reform period. During the first phase the real earnings rate for productive assets was rather low, but because real interest rates were highly negative, manufacturers managed to survive. During the second phase financial liberalization had notably increased financial costs, yet operating earnings had rebounded enough for net earnings rates to improve. During the third phase real financial costs jumped so much that high operating earnings (probably induced by Argentine demand for Uruguayan goods) were insufficient to prevent a clear drop in the return on equity.

These earnings patterns were not uniform across sectors of activity. As the economy moved into the second phase, several export promotion schemes were instituted, and these had a clear positive effect on the real operating earnings of exporters. But during the third phase these programs were dismantled and new anti-inflationary policies had the effect of appreciating the exchange rate. Exporters ceased to be the most profitable sector, despite increased Argentine demand, while import competing sectors boomed.

Throughout all three phases, import-competing firms that were highly protected did much worse than other importable goods producers. This poor performance was due to low gross margins and turnover rates, which more than offset their low overhead costs. It seems likely, therefore, that protection had been largely determined by each sector's ability to compete with foreign substitutes. Interestingly, we found that the difference between high and low protection firms' margins and turnover rates was very stable, suggesting that commercial policy reforms -- though highly publicized -- had little effect on profits.

Gross fixed investment rates showed a clear jump between the first and second phases and were sustained through the third phase despite falling net earnings rates. Borrowing thus played an increasing role in finance late in the reform period. As with other variables, these indicators of performance exhibited some cross-sectoral contrasts. During the second phase, characterized by export promotion, exporters were purchasing capital goods most rapidly. Later, in the third phase, import-competing firms were the most enthusiastic about capacity expansion. So the export promotion regime, whatever its merits, had a discernable impact on long-term resource allocation in the manufacturing sector. Not surprisingly, the relatively unprofitable high-protection importable goods sector did less capacity expansion than other import-competing firms, but the distinction between these subgroups was not significant.

Finally, dividend payout rates picked up from close to zero in the first phase to around 2 or 3 percent of net worth during the second and third phases. In the second phase this translated into about a quarter of profits, not inordinate. But by 1981 such payout rates must have necessitated considerable new borrowing, given that profit rates were close to zero and

fixed investment rates marched on unabated. (Closer inspection of the data reveals that, regardless of the phase, only import-competing firms were paying significant dividends.) Rather imprudent dividend and investment policies combined with a long standing heavy exposure in dollar debt thus provided the ingredients for a financial crisis when major devaluations ended the reform period.

FIGURE 1.1: NET EARNINGS RATE
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

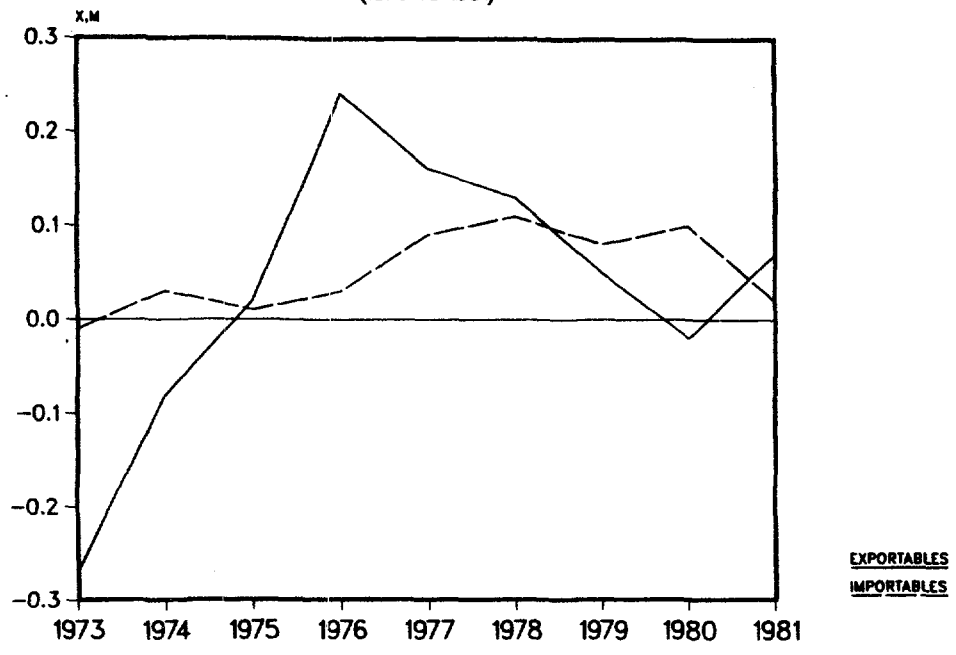


FIGURE 1.2: NET EARNINGS RATES
HIGH VS. LOW PROTECTION (H/L)
(1973 TO 1981)

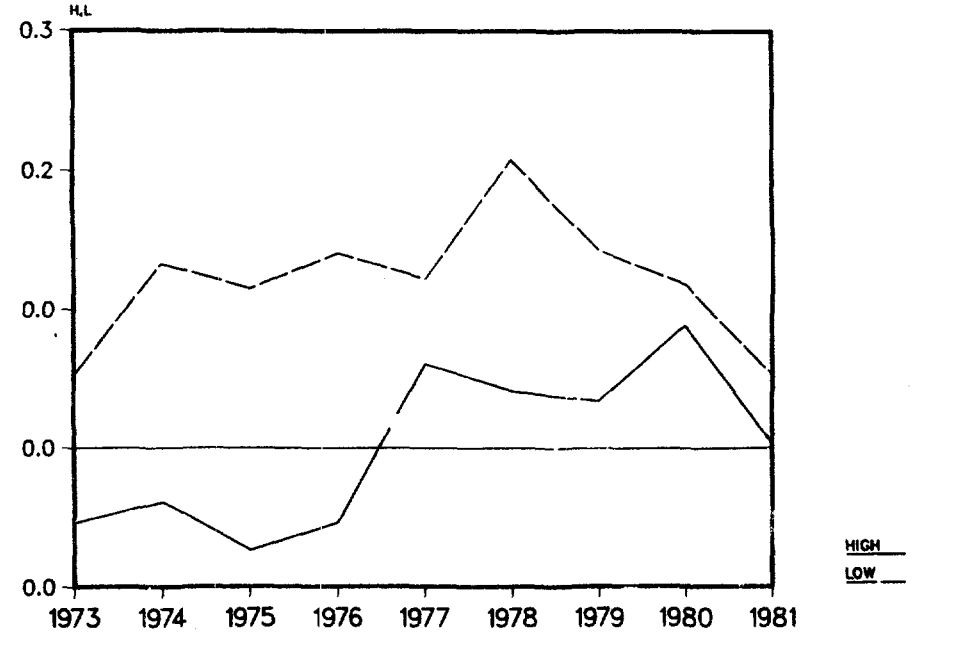


FIGURE 2.1: GROSS MARGINS
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

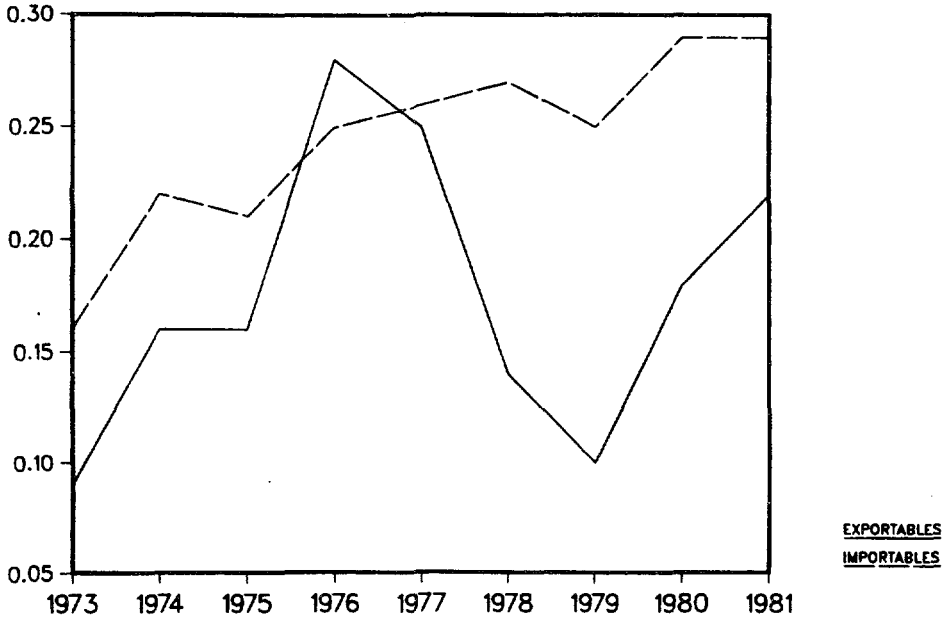


FIGURE 2.2: GROSS MARGINGS
HIGH VS. LOW PROTECTION
(1973 TO 1981)

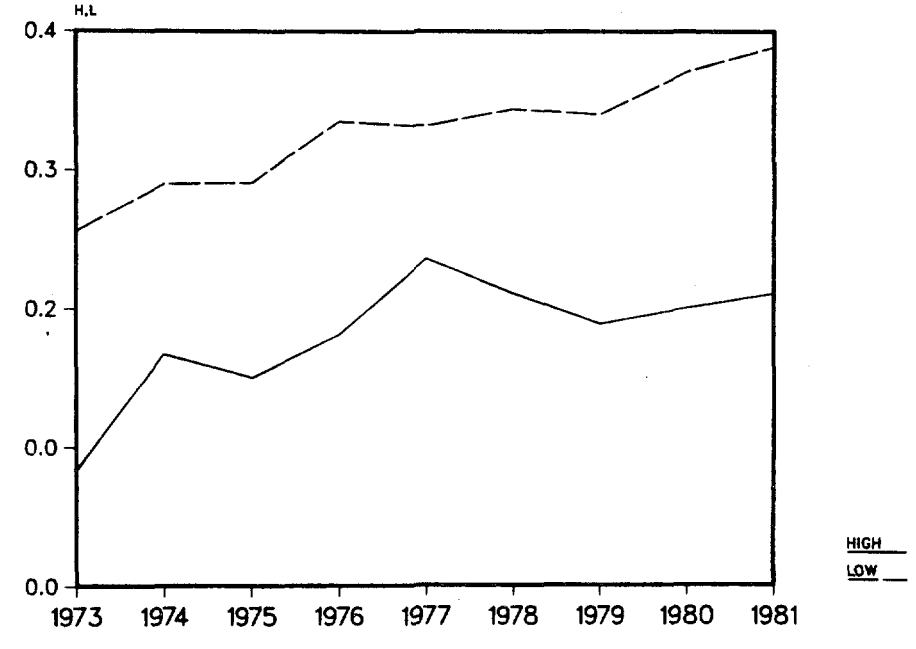


FIGURE 3.1: ASSET TURNOVER
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

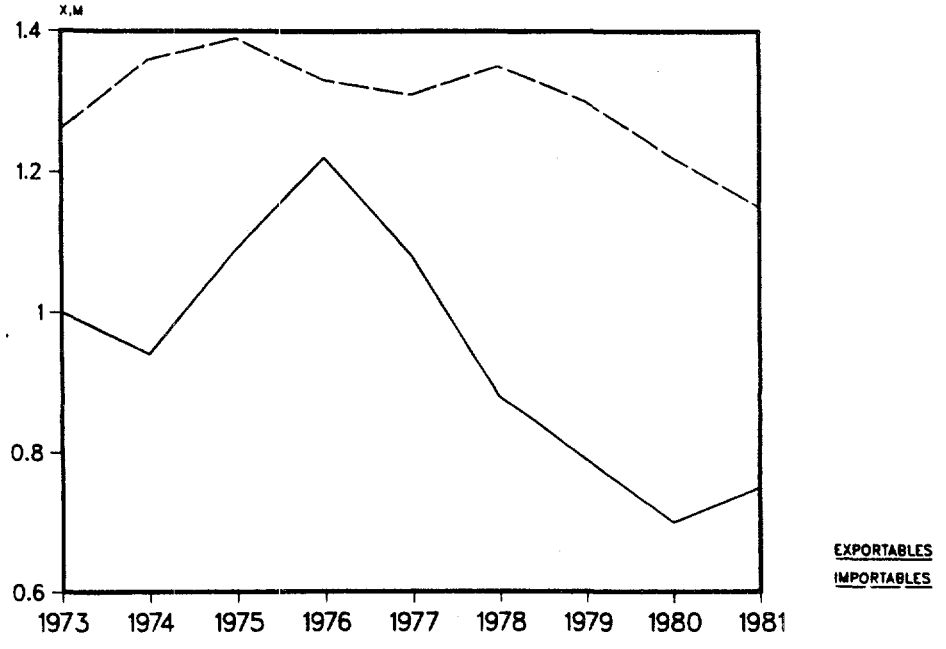


Figure 3.2. Asset turnover
HIGH VS. LOW PROTECTION
(1973 TO 1981)

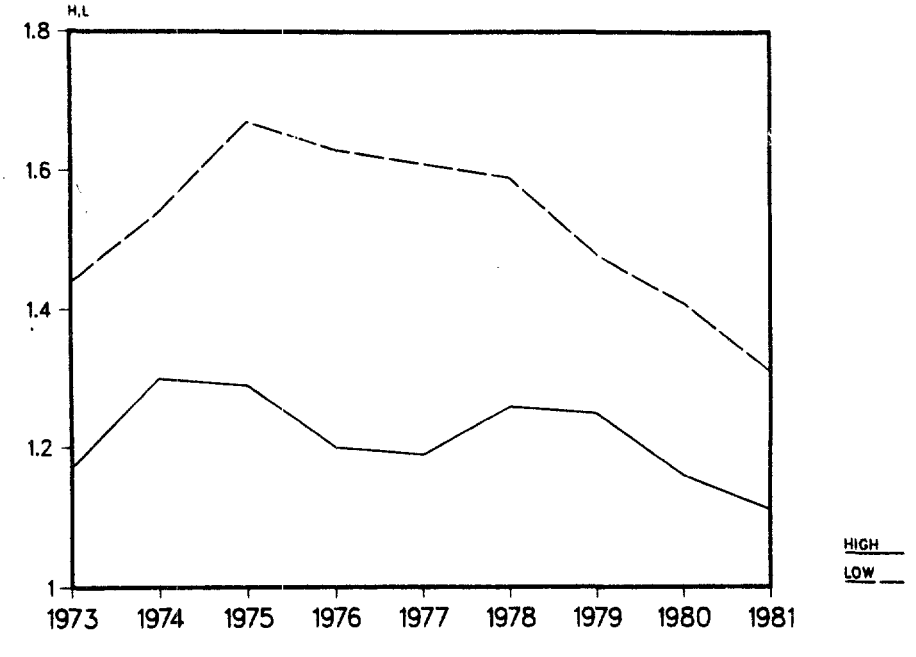


FIGURE 4.1: OVERHEAD
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

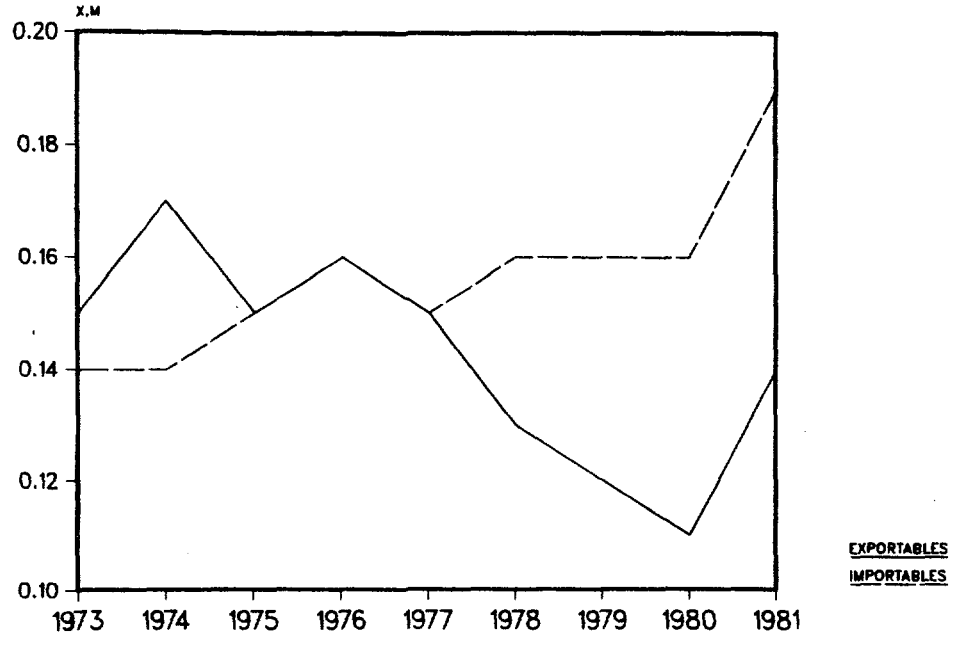


FIGURE 4.2: OVERHEAD
HIGH VS. LOW PROTECTION
(1973 TO 1981)

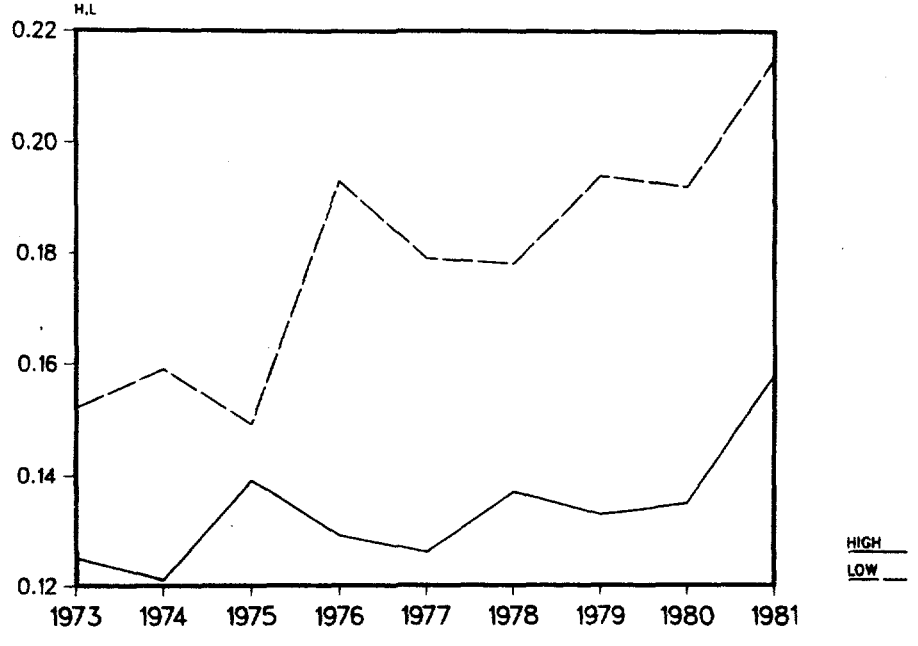


FIGURE 5.1: AVERAGE REAL FINANCIAL COSTS
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

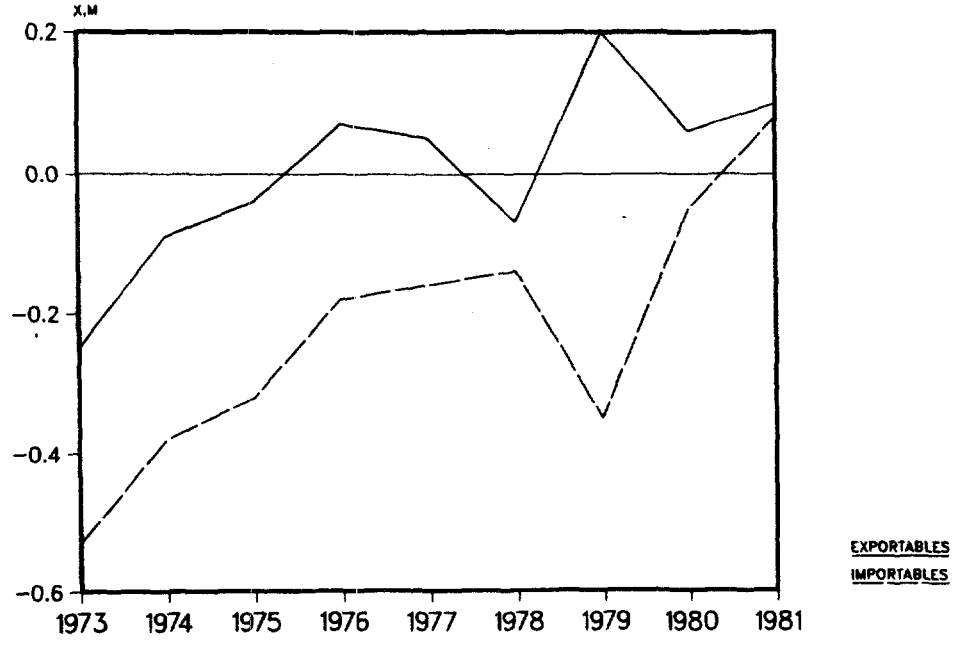


FIGURE 5.2: AVERAGE REAL FINANCIAL COSTS
HIGH VS. LOW PROTECTION
(1973 TO 1981)

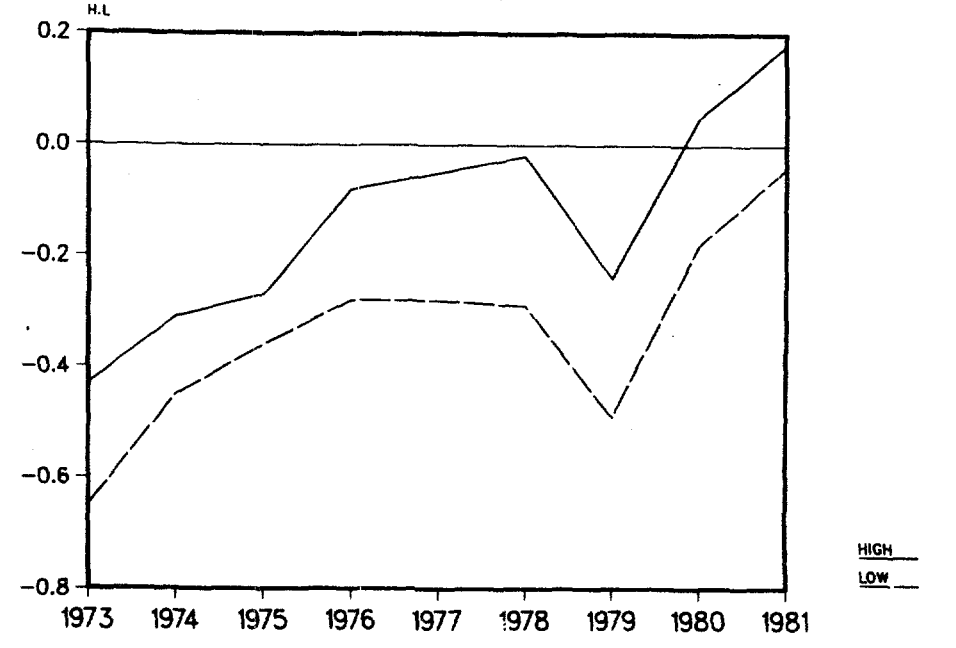


FIGURE 6.1 : NET FOREIGN ASSETS PER UNIT ASSET
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

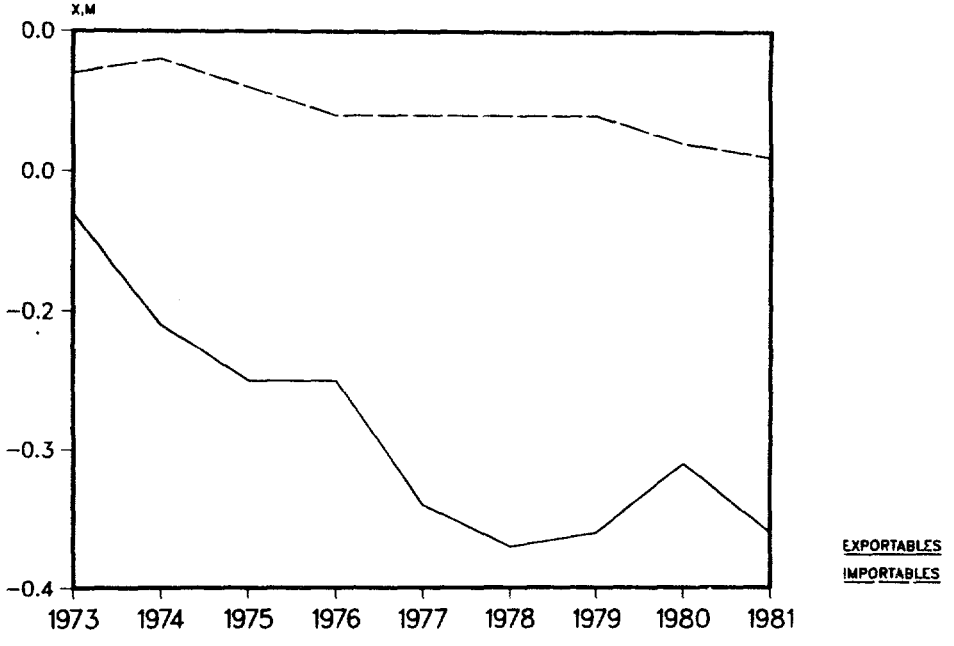


FIGURE 6.2 : NET FOREIGN ASSETS PER UNIT ASSET
HIGH VS. LOW PROTECTION
(1973 TO 1981)

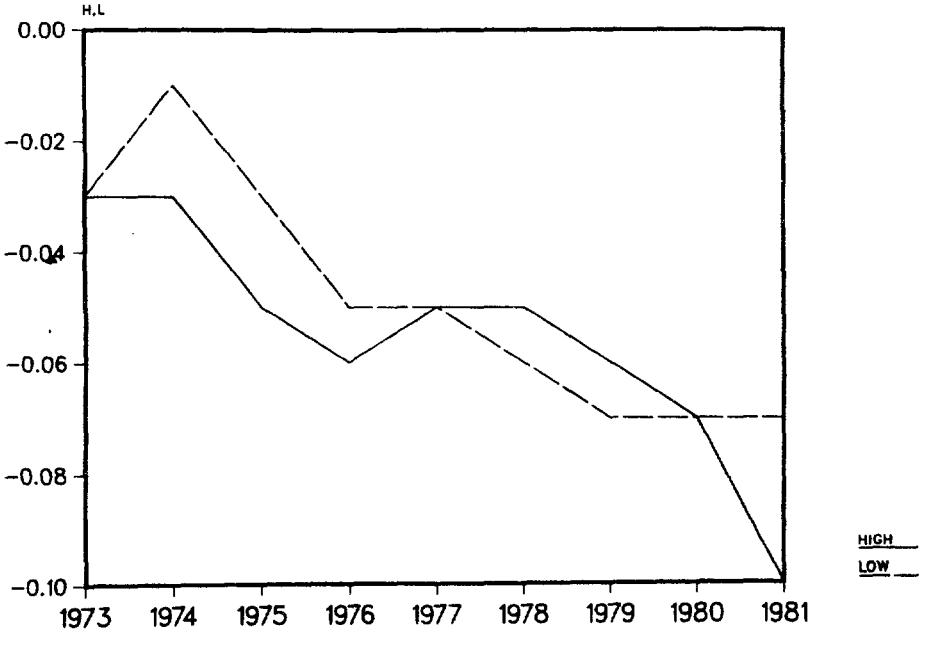


FIGURE 7.1: GEARING RATIOS
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

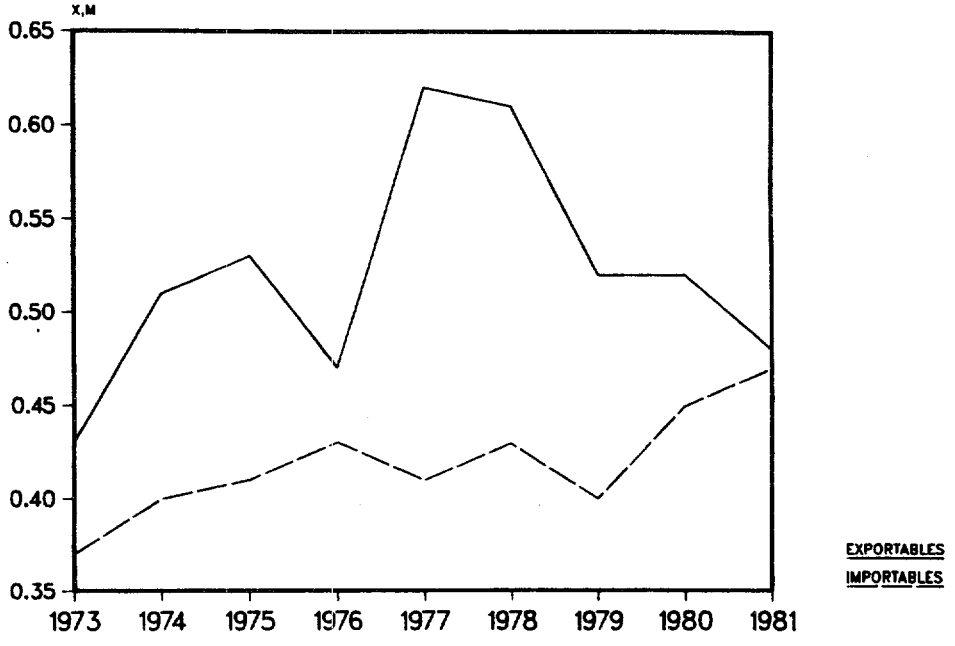


FIGURE 7.2: GEARING RATIOS
HIGH VS. LOW PROTECTION
(1973 TO 1981)

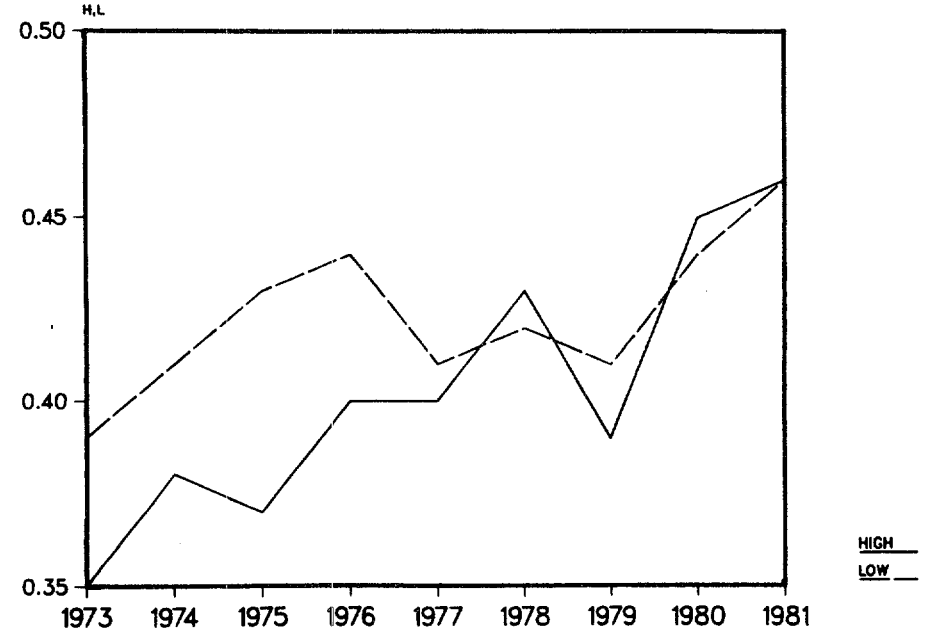


FIGURE 8.1 : REAL DEBT GROWTH
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

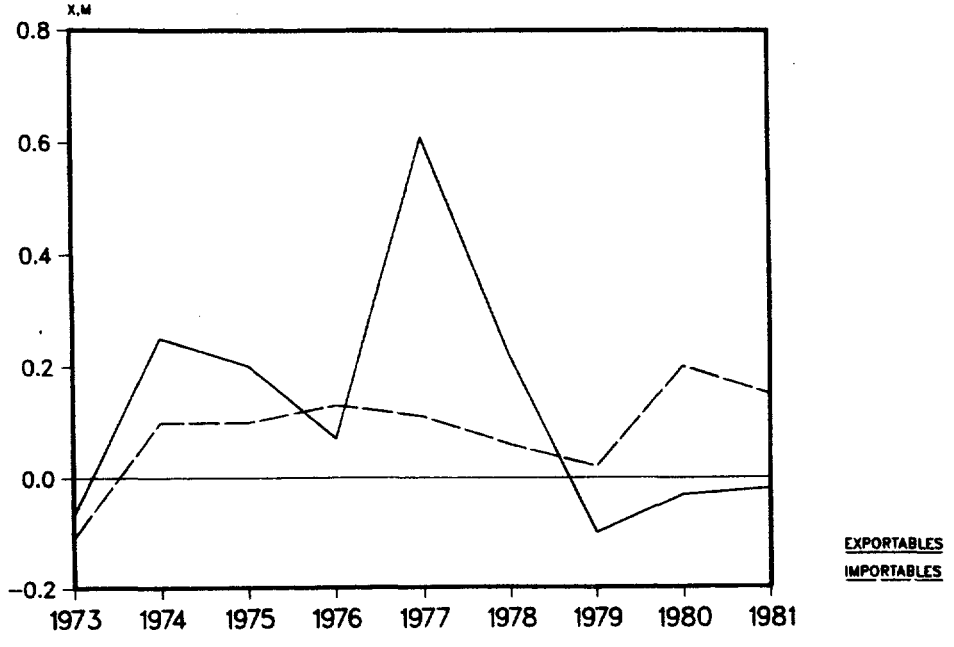


FIGURE 8.2 : REAL DEBT GROWTH
HIGH VS. LOW PROTECTION
(1973 TO 1981)

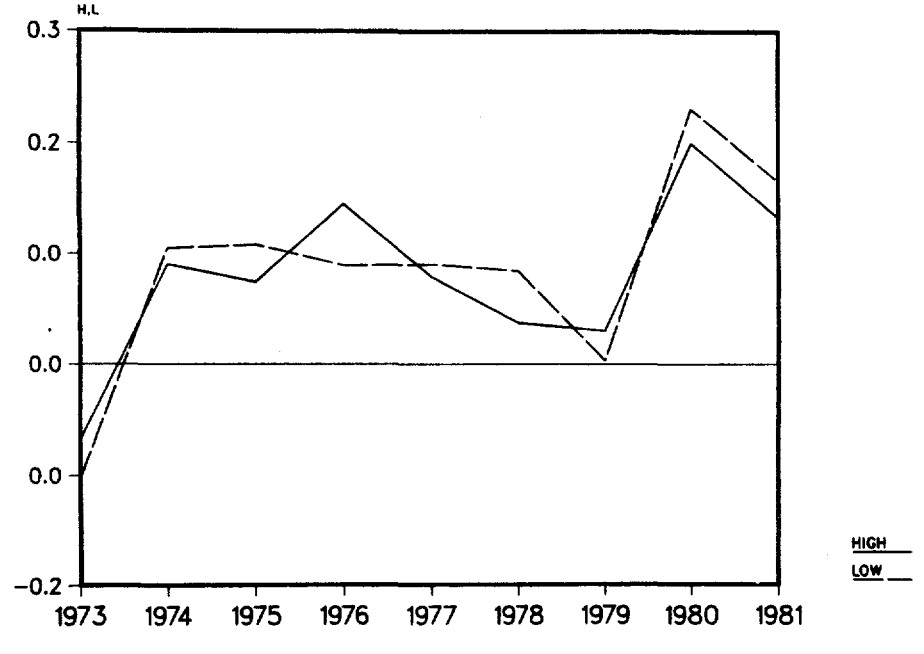


FIGURE 9.1 : REAL DIVIDEND PAYOUT RATES
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

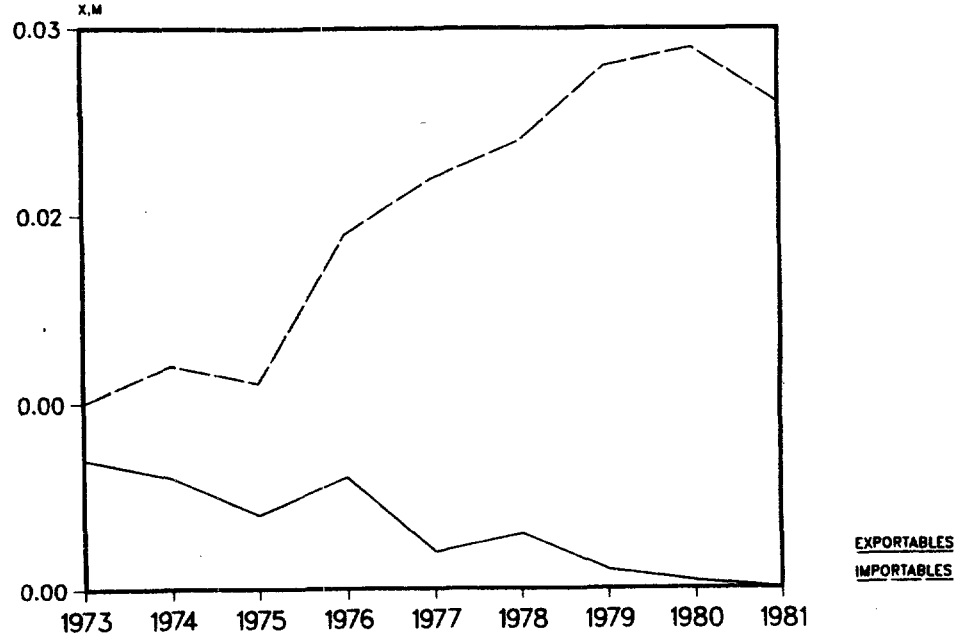


FIGURE 9.2: REAL DIVIDEND PAYOUT RATE
HIGH VS. LOW PROTECTION
(1973 TO 1982)

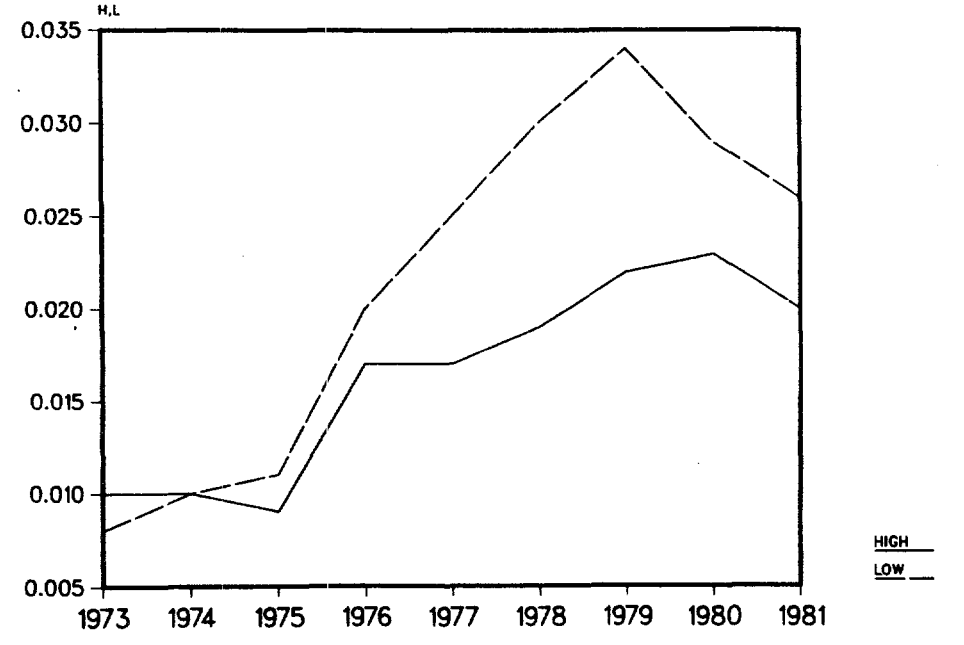


FIGURE 10.1 : FIXED INVESTMENT (GROSS) PER UNIT CAPITAL
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

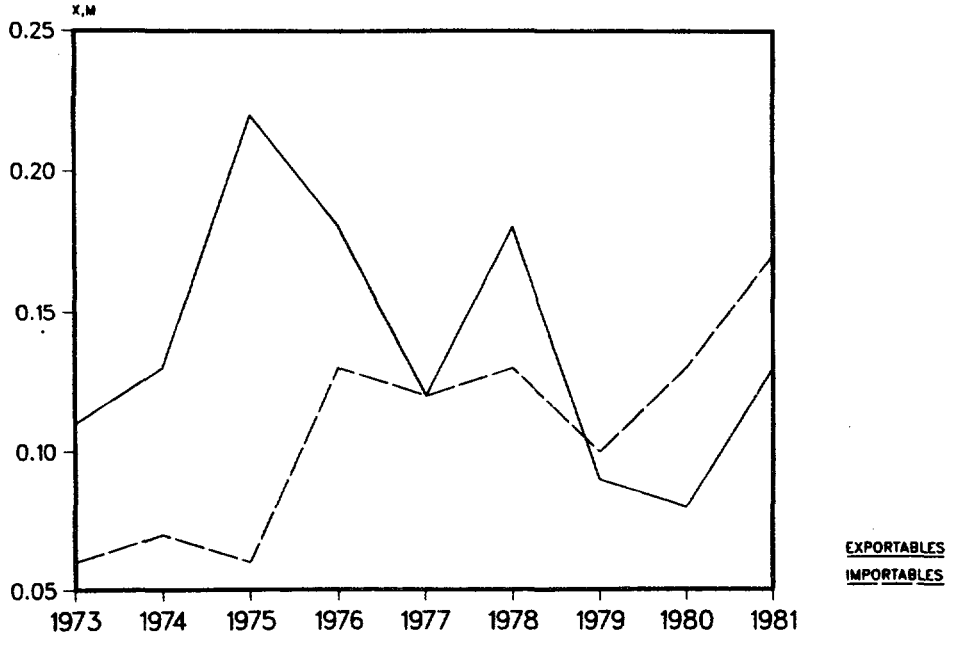


FIGURE 10.2 : FIXED INVESTMENT (GROSS) PER UNIT CAPITAL
HIGH VS. LOW PROTECTION
(1973 TO 1981)

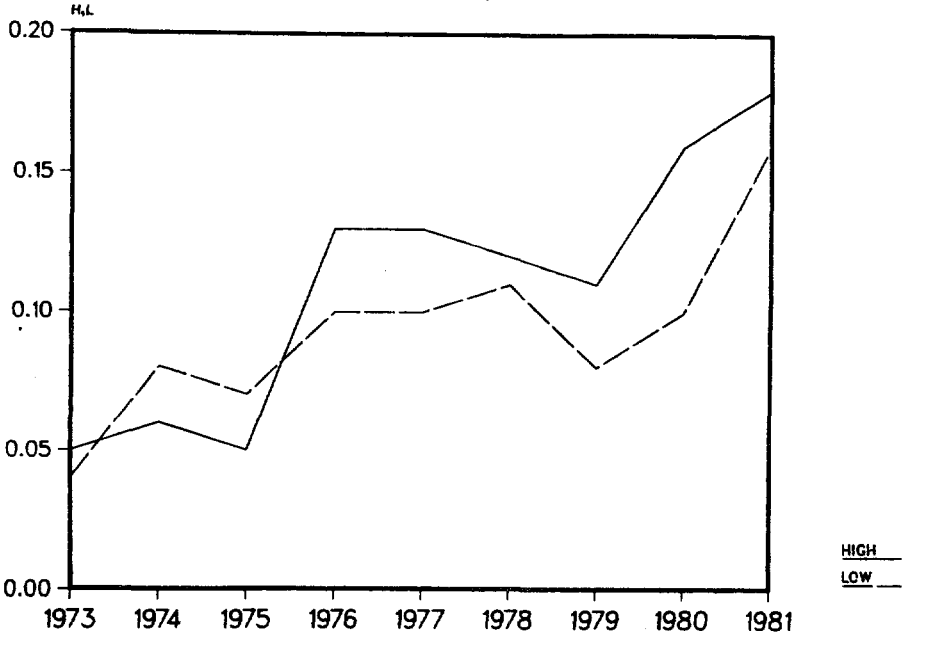


FIGURE 11.1: QUICK RATIOS
EXPORTABLES VS. IMPORTABLES
(1973 TO 1981)

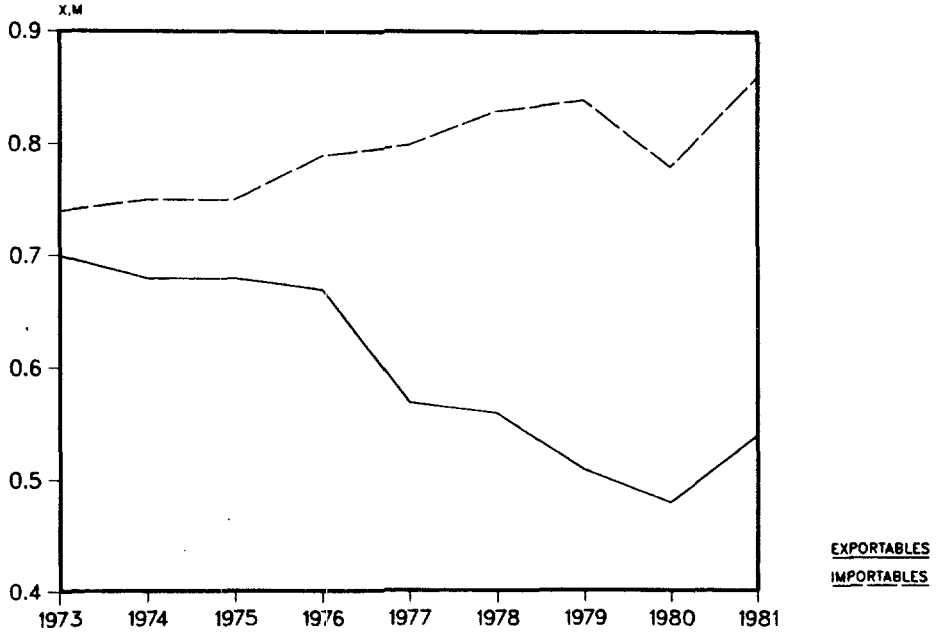
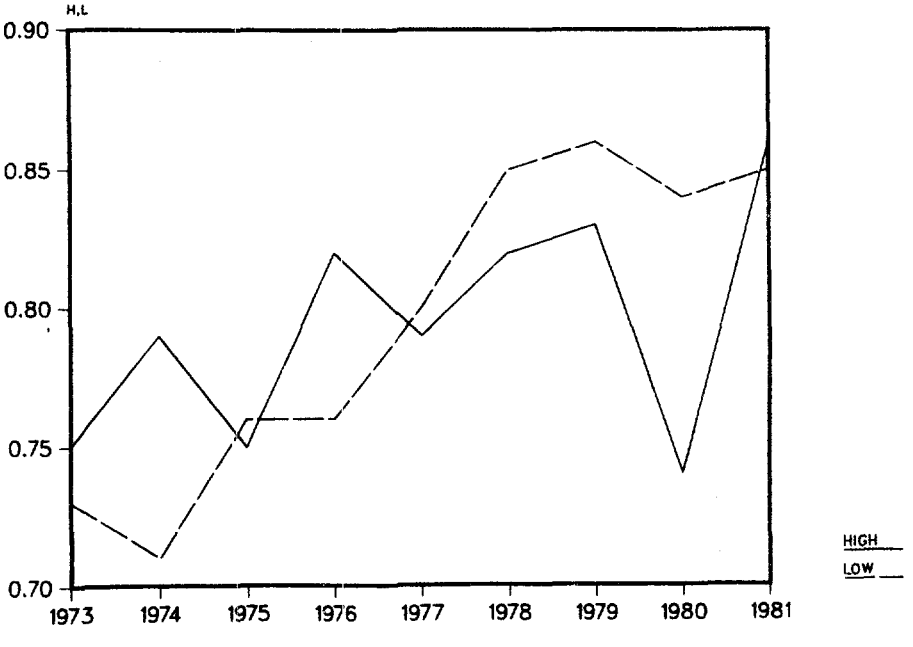


FIGURE 11.2: QUICK RATIOS
HIGH VS. LOW PROTECTION
(1973 TO 1981)



References

Balassa, B. (1981), "The Newly Industrializing Developing Countries After the Oil Crisis," Review of World Economics, pp. 142-94.

Belsley, Kuh and Welsch (1980), Regression Diagnostics, New York, Wiley.

Bension, A. and J. Caumont (1981), "Alternative Trade Strategies and Employment," pp 495-528 in A. Krueger et al. eds. Trade and Employment in Developing Countries, Chicago, University of Chicago Press.

Camara Nacional de Comercio (1984), Comercio Exterior del Uruguay, Publicacion No. 14, Montevideo.

Cavallo, Domingo (1977), "Stagflationary Effects of Monetarist Stabilization Policies," Ph.D dissertation, Harvard University.

CINVE (1983), "Industria y Proteccion en un Contexto de Apertura Externa: Uruguay, 1978-82" (mimeo), Montevideo.

Fuller, W. and G. Battese (1974), "Estimation of Linear Models with Crossed Error Structures," Journal of Econometrics, pp. 67-68.

Galvez, Julio and James Tybout (1985), "How the Financial Statements of Chilean Firms Reflected Stabilization and Reform Attempts during 1977-81," (mimeo), The World Bank.

Hanson, J. and J. de Melo (1983), "The Uruguayan Experience with Liberalization and Stabilization: 1974-81," Journal of Interamerican Studies and World Affairs, pp. 477-507.

Hanson, J. and J. de Melo (1985), "External Shocks, Financial Reforms, and Stabilization Attempts in Uruguay: 1974-83," (mimeo), The World Bank.

Maddala, G. S. and Mount (1973), "A Comparative Study of Alternative Estimators for Variance Component Models," Journal of the American Statistical Association, pp. 324-8.

Melo, J. de and K. Suriyasat (1985), "Uruguay: Problems and Prospects for Manufacturing," (mimeo), The World Bank.

Mezzera, J. (1980), "El Proceso de Apertura en la Esfera Real," ECIEL, Santiago.

Pascale, R. (1982), El Comportamiento Financiero de la Industria Manufacturera Uruguaya, Banco Central del Uruguay, Montevideo.

Petrei, Humberto and James Tybout (1984) "How the Financial Statements of Argentine Firms Reflected Stabilization and Reform Attempts during 1976-81," Staff Working Paper No. 706, The World Bank.

Rama, M. (1982), Proteccion y Crecimiento Industrial: 1975-80, Estudios CINVE, No. 3, Montevideo.

Tybout, J. (1984), "The Algebra of Inflation Accounting," DRD Discussion Paper No. 84, The World Bank.

World Bank (1982), Economic Memorandum on Uruguay, Report No. 3652-UR, Washington D.C.

Appendix A:

The Error-Components Model

Suppose we are interested in analyzing some financial indicator, say y, whose value is y_{ij} for i^{th} firm in the j^{th} year. One approach would be to assume simply that observations on y are independent across time and, at a given point in time, are identically normally distributed within each subsample. Then simple comparisons of mean values from each subsample could be done within an analysis of variance framework, or equivalently with regression on dummy variables. But, firms with lower than average values of y in one period tend to have lower than average values of y in other periods. So for any firm, y is correlated across time, and at any point in time the distribution of y varies across firms within a subsample.

These problems of cross-period correlation and heterogeneous distributions can be dealt with in an error components framework. To do this, we express the value y_{ij} as the sum of a parameter and two stochastic components:

$$y_{ij} = \gamma_j^s + v_i + \varepsilon_{ij}$$

Here γ_j^s is the expected value of y_{ij} within the subsample s (to which the i^{th} firm is assumed to belong), v_i is a deviation from this mean which does not vary across time (reflecting inherent characteristics of the i^{th} firm), and ε_{ij} is an additional deviation from γ_j^s that varies across time (to ensure that the equality always holds). Statistical tests regarding γ_j^s values can be constructed if we assume that $E(v_i) = 0$,

$$E(\varepsilon_{ij}) = 0,\ E(v_i^2) = \sigma_v^2,\ E(\varepsilon_{ij}^2) = \sigma_\varepsilon^2,\ E(\varepsilon_{ij}\varepsilon_{ik}) = 0$$

$$E(\varepsilon_{ij}\varepsilon_{mj}) = 0,\ E(v_i v_m) = 0, \text{ and } E(v_h \varepsilon_{ij}) = 0 \text{ for all } h, i, j,$$

$k \neq j$, $m \neq i$. For example, to estimate sectoral means for exportable goods, importable goods, and nontradable goods (s=1,3) in each of five years, the error component model would be

$$y_{ij} = \sum_{s=1}^{3} \sum_{t=1}^{5} \gamma_t^s D_{ijt}^s + v_i + \varepsilon_{ij},$$

where D_{ijt}^s is a dummy which takes on the value 0 unless t=j and the i^{th} firm is a member of sector s, in which case its value is unity. An appropriate generalized least squares (GLS) procedure would be used to deal with the special error structure.

Just as in ordinary regression analysis or analysis of variance, GLS estimation of the above model will result in γ_t^s values that are simply the sample means for sector s and period t. But by employing an error component estimator, we are able to estimate covariance matrices for these random variables under more appropriate assumptions.

The coincidence between sample means and γ_t^s estimators would generally be destroyed if additional explanatory variables were added to the model. But, in the special case where each additional variable is orthogonal to all dummy variables (D_t^s's), the coincidence is preserved. So, taking care to maintain orthogonality, we add a size index to the model for each sector and study the effects of the firm, size, sector, and time period on y simultaneously. The model becomes:

$$(1) \qquad y_{ij} = \sum_{s=1}^{3} \sum_{t=1}^{5} \gamma_t^s D_{ijt}^s + \sum_{s=1}^{3} \beta_s X_{ij}^s + v_i + \varepsilon_{ij},$$

where X_{ij}^s is a size index (the logarithm of total assets) expressed in deviation form. This variable takes on nonzero values only when the i^{th} firm is a member of sector s, in which case it is measured as the deviation of the i^{th} firm's size in period j from average firm size in sector s during period j.

Equation 1 is estimated for each financial ratio that is studied, using the feasible GLS procedure described in Fuller and Battese (1974). 1/ After values for γ_t^s and β_s are found, the residuals are analysed for outliers. Any firm that exhibits a studentized residual of absolute value greater than 2.0 in at least one period (i.e. for at least one j value) is omitted from the sample for all periods, and the model is estimated one more. 2/ Only the parameter estimates after outlier exclusion are reported, along with relevant test statistics, values of each variance component, and the number of firms excluded as outliers in each sector.

In table A1 we present the results of estimating this model for each financial ratio described in table 4 of the text. For the aggregate sample, exporters versus importers, and high versus low protection firms, a set of summary statistics is reported:

1/ There are many feasible generalized least squares approaches to estimating our model. The Fuller and Battese technique is chosen because Monte Carlo experiments (Maddala and Mount, 1973) indicate that techniques of its class are indistinguishable from others, and it happens to be a procedure for which results can be checked at various stages against a packed program.

2/ Studentized residuals are defined and discussed in Belsley, Kuh, and Welsch (1980).

n = number of firms in the sample after outlier exclusion

$\hat{\beta}$ = correlation of dependent variable with firm size

t = t ratio for the null hypothesis that β is zero

$\hat{\sigma}^2_\varepsilon$ = estimate of "pure noise" error component

$\hat{\sigma}^2_v$ = estimate of unexplained cross-firm variation

F_1 = statistic for the null hypothesis that the mean value of the dependent variable is the same in all subsamples and constant across time (i.e., $\gamma^s_t = \gamma^k_\ell$ for all s, k, t, ℓ).

F_2 = statistic for the null hypothesis that the mean value of the dependent variable follows the same time path in all subsamples (i.e., $\gamma^s_t = \gamma^k_t$ for all s, k).

F_3 = statistic for the null hypothesis that β is the same in all subsamples (i.e., $\beta_s = \beta_k$ for all s, k).

The coefficients for time dummies (γ's) are not reported for our exportable versus importable estimates, nor for our high versus low estimates, because they have been graphed in figures 1 through 10 in the text. But, since only consolidated ratio values were reported for the aggregated sample in the text, the time dummy coefficients associated with this sample are presented in table A2.

Table A1-a

		Aggregate	By Sector		By Protection	
			Exportables	Importables	High	Low
Gross Margin	n	58	9	51	29	22
		-.031	.054	-.035	-.035	-.030
	t	(-3.22)	(1.42)	(-3.58)	(-3.24)	(-1.65)
	σ_e^2	.010	.009		.008	
	σ_v^2	.023	.023		.020	
	F_1	10.71	6.65		6.10	
	F_2		2.65		1.89	
	F_3		5.15		0.60	
Net Earnings Rates	n	55	6	48	28	20
		.008	.086	-.01	-.017	.007
	t	(.47)	(1.24)	(-.57)	(-.92)	(.26)
	σ_e^2	.045	.038		.038	
	σ_v^2	.033	.029		.028	
	F_1	2.23	2.75		2.07	
	F_2		2.24		1.69	
	F_3		1.80		0.53	
Asset Turnover	n	53	8	46	29	18
		-.35	-.19	-.37	-.39	-.35
	t	(-14.09)	(-1.96)	(-14.29)	(-14.09)	(-5.97)
	σ_e^2	.051	.052		.049	
	σ_v^2	.205	.202		.205	
	F_1	5.97	4.76		3.71	
	F_2		2.70		1.97	
	F_3		2.86		0.39	
Average Real Financial Costs	n	48	8	36	22	18
		-.029	-.040	-.038	-.034	-.043
	t	(-1.21)	(-.45)	(-1.38)	(-1.16)	(-.87)
	σ_e^2	.068	.072		.069	
	σ_v^2	.076	.080		.074	
	F_1	21.07	9.57		9.99	
	F_2		1.23		1.01	
	F_3		.001		0.02	

Table A.1-b

		Aggregate	By Sector		By Protection	
			Exportables	Importables	High	Low
Gearing	n	49	8	45	27	17
	$\hat{\beta}$	.044	.06	.04	.03	.07
	t	(3.59)	(1.68)	(3.12)	(1.85)	(2.98)
	σ_e^2	.009	.009		.01	
	σ_v^2	.019	.021		.02	
	F_1	3.27	3.63		2.19	
	F_2		2.93		0.64	
	F_3		0.31		2.22	
Net Foreign Assets	n	51	3	46	27	19
	$\hat{\beta}$	-.025	-.256	-.018	-.02	-.01
	t	(-4.66)	(-4.65)	(-3.28)	(-4.23)	(-.64)
	σ_e^2	.004	.003		.003	
	σ_v^2	.007	.005		.003	
	F_1	9.23	8.52		3.61	
	F_2		7.56		0.71	
	F_3		18.61		2.17	
Fixed Investment per Unit Capital	n	50	7	44	25	18
	$\hat{\beta}$	.001	-.032	.009	.01	.01
	t	(1.26)	(-1.13)	(1.21)	(1.16)	(1.39)
	s_e^2	.011	.011		.009	
	σ_v^2	.003	.004		.003	
	F_1	4.85	3.30		3.67	
	F_2		2.14		0.70	
	F_3		1.95		0.08	
Real Debt Growth	n	56	9	48	29	19
	$\hat{\beta}$	.0004	.034	-.002	-.01	.02
	t	(.038)	(.71)	(-.12)	(-.74)	(.86)
	σ_e^2	.110	.109		.111	
	σ_v^2	.002	.003		-.001	
	F_1	3.76	3.61		1.46	
	F_2		3.10		0.13	
	F_3		0.51		1.30	

Table A1-c

		Aggregate	By Sector		By Protection	
			Exportables	Importables	High	Low
Real Dividend Payout Rates	n	51	6	44	27	16
	$\hat{\beta}$	.002	.00	.002	-.00	.01
	t	(.87)	(.43)	(.91)	(-.05)	(2.53)
	σ_e^2	.001	.00		.00	
	σ_v^2	.001	.001		.00	
	F_1	3.68	2.81		2.36	
	F_2		1.27		0.48	
	F_3		0.05		4.92	
Overhead	n	58	10	48	28	19
	$\hat{\beta}$	-.007	-.005	-.007	.001	.001
	t	(-1.43)	(-.30)	(-1.40)	(.16)	(.12)
	σ_e^2	.002	.002		.002	
	σ_v^2	.007	.007		.006	
	F_1	2.61	2.71		3.37	
	F_2		2.73		2.11	
	F_3		0.01		0.00	
Quick Ratio	n	55	9	46	26	20
	$\hat{\beta}$	-.069	-.068	-.065	-.066	-.076
	t	(-3.14)	(-.82)	(-2.85)	(-2.32)	(-1.63)
	σ_e^2	.058	.057		.064	
	σ_v^2	.092	.092		.107	
	F_1	0.68	1.36		0.85	
	F_2		1.96		0.45	
	F_3		0.001		0.04	

Appendix B:

Inflation Adjustments

A. The Problem of Inflation Bias

Financial statements prepared during periods of inflation are subject to a number of potential distortions. First, in the balance sheet, physical assets will be understated relative to financial items if they are recorded at purchase cost rather than current worth. Second, simple flow items in the income statement such as "sales" or "financial costs" represent aggregations over time, and will be understated relative to balance sheet items that represent values on the closing date (e.g., debt). Third, some flow items in the income statement such as "costs of goods sold" and "depreciation" involve stocks of real assets in their calculations. If these real assets are understated (for the reasons mentioned above), such flow items are also subject to bias. Finally, income statements may not include adjustments for the fact that assets and liabilities whose nominal values are fixed by contract ("monetary items") generate capital losses and gains respectively when the price level changes.

Accountants have developed several systems for undoing these biases in the relative magnitude of financial statement items. One popular and relatively simple system is to assume that the market value of all real assets rises at the rate of increase in some general price index. This approach is called the "general purchasing power" (GPP) system of adjustment. A second, less widely used approach is to assume that each real asset increases in market value according to its own specific price index. This assumption leads to a more complicated system of corrections known as "current value

accounting" (CVA). We tried variants of both systems on our Uruguayan data base.

B. Balance Sheet Adjustment

As detailed in Tybout (1984), the CVA adjustments to inventory stocks may be represented as 1/

$$IN_t^a = IN_t^b \cdot (P_{t,12}^{IN} / \bar{P}_t^{IN})$$

Here IN^a is adjusted inventory stocks, IN^b is inventory stocks before adjustment, $P_{t,j}^{IN}$ is the period t, month j price index for inventories, and $\bar{P}_t^{IN}$ is the average price level at which inventories held at the end of year t were acquired. With few exceptions, Uruguayan firms used the "weighted average" method of bookkeeping rather than LIFO or FIFO, so we calculated $\bar{P}_t^{IN}$ as

$$\bar{P}_t^{IN} = (1 - z_t)^{12} \bar{P}_{t-1}^{IN} + \sum_{j=1}^{12} (1 - z_t)^{12-j} P_{t,j}^{IN}.$$

Here z_t is the year t inventory turnover rate, calculated as average monthly sales divided by inventories (after crudely putting both incomparable prices). We used a general price index for $P_{t,j}^{IN}$ because firm-specific data were unavailable.

For our CVA adjustments to the capital stock, we began with reported capital stocks in the year 1972 (t = 0), because these figures had been

---

1/ We abandon the notation of text tables 3a and 3b here to aid the reader in keeping track of variables.

prepared by firms to roughly reflect current values. Then, since our survey data did not include capital stocks for subsequent years, we built our series forward using the formula:

$$K^{a}_{t,m} = (P^{km}_{t,12} / P^{km}_{t-1,12})K^{a}_{t-1,m}(1-\delta_m) + I^{b}_{t,m}(P^{km}_{t,12} / \bar{P}^{km}_{t})$$

Here $K^{a}_{t,m}$ is the adjusted stock of machinery and equipment (m = 1) or land and building (m = 2) in year t, $P^{km}_{t,j}$ is the price index for capital good type m in year t, month j, S_m is the depreciation rate for capital good type m($\delta_1 = .05$, $\delta_2 = .02$), and $I^{b}_{t,m}$ is gross fixed investment (before correction) in capital good type m during year t. 1/ The index $P_{t,m}$ is calculated under the assumption that such investment took place smoothly over the fiscal year:

$$\bar{P}^{km}_{t} = \frac{1}{12} \sum_{j=1}^{12} P^{km}_{t,j}$$

The series $P^{km}_{t,j}$ were taken from Central Bank price indices for machinery and equipment (m=1) and construction (m=2), using linear extrapolation to obtain monthly observations. (Since each firm had its own closing date, attention to months, observation by observation, was necessary.)

To obtain our GPP-corrected balance sheets, we simply replaced all price indices described above with the Uruguayan CPI and repeated our

---

1/ It was inferred from national accounts that new machinery and equipment constituted 92% of all investment during the sample period, then this percentage was used to break down reported gross investment figures into our two subcategories.

calculations. This changed only the capital stock estimates because, recall, it was necessary to use the CPI for inventory corrections.

C. Income Statement Corrections

Because firms had adjusted their depreciation figures themselves, income statements were not subject to all the possible biases mentioned in part "A" above. Also because depreciation was not a separate line item, we were unable to experiment with the impact on depreciation costs of switching from a CVA to a GPP system of corrections. Our figures are best viewed as a hybrid of both.

Simple flow variables in the income statement were converted to year-end values by weighing them with the weight:

$$W_t = P_{t,12} / \bar{P}_t$$

where, as before, $P_{t,j}$ is the Uruguayan CPI for year t month j, and $\bar{P}_t$ is its average year t value. Variables thus weighted included gross sales, administrative expenses, marketing expenses, nominal financial costs, and nonoperating income.

Other income statement items required more involved attention. To correct "cost of goods sold" (COG), purchases (PUR) were first retrieved as

$$PUR_t^b = COG_t^b + IN_t^b - IN_{t-1}^b.$$

(This is a restatement of the identity: cost of goods sold equals initial inventories, plus purchases, less ending inventories.) Next, since PUR_t^b is a

simple flow variable, it was converted to end-of-year prices and used with our corrected inventory figures to reconstruct purchases:

$$COG^a_t = (P_{t,12} / \bar{P}_t) \cdot PUR^b_t + IN^a_{t-1}(P_{t,12} / \bar{P}) - IN^a_t$$

Finally, our income statements needed adjustments to reflect the fact that monetary items generated capital gains and losses over the fiscal year. Defining M_t as net monetary assets in year t (i.e., total assets less non-financial assets and total debt), we calculated the net capital loss as

$$L_t = M_{t-1}(P_{t,12} / P_{t-1,12} - 1) + (M_t - M_{t-1})(P_{t,12} / \bar{P}_t - 1)$$

This figure was deducted from our corrected nominal financial cost figures to yield a "real" financial cost. (See Tybout, 1984, for a derivation of this formula).

D. Results

To examine the effects of these corrections, we consolidated our corrected financial statements and compared with a consolidation of our uncorrected financial statements. Table B-1 briefly summarizes our findings with several ratios.

1. Real Inventory Growth

$$INV_t / [(P_{t,12} / P_{t-1,12})INV_{t-1}] - 1$$

Table B-1

Ratios From Consolidated Financial Statements

Before and After Inflation Correction

	1974	1975	1976	1977	1978	1978	1979	1980	1981
Gross Margins									
Uncorrected	.31	.33	.32	.33	.32	.32	.32	.32	.36
GPP, CVA	.10	.17	.20	.21	.22	.22	.19	.24	.30
Asset Turnover									
Uncorrected	1.17	1.22	1.34	1.33	1.39	1.34	1.45	1.41	1.32
GPP	.98	1.15	1.20	1.17	1.21	1.16	1.17	1.19	1.20
CVA	.99	1.16	1.20	1.16	1.21	1.17	1.22	1.26	1.25
Average Financial Cost									
Uncorrected	.16	.24	.26	.34	.26	.28	.36	.34	.37
GPP. CVA	-.53	-.34	-.28	-.04	-.14	-.13	-.22	.04	.16
Net Return on Equity									
Uncorrected	.12	.14	.16	.19	.23	.22	.28	.25	.15
GPP	.04	-.01	.02	-.02	.09	.08	.03	.04	.01
CVA	-.04	-.02	.02	-.02	.09	.08	.03	.05	.01
Inventory Growth									
Uncorrected	-.19	.14	.06	-.02	.06	-.03	-.16	.27	.00
GPP,CVA	-.18	.09	.09	-.11	.06	-.01	0.15	.19	-.03
Capital Stock Growth									
GPP	-.07	.08	.01	-.02	.13	.03	-.03	.12	.07
CVA	-.10	.10	.04	-.01	.08	.00	-.18	.22	.09

2. Asset Turnover

$$2(SALES_t) \; / \; [ASSETS_t + (P_{t,12} \; / \; P_{t-1,12}) \; ASSETS_{t-1}]$$

3. Average Financial Cost

$$2(FINANCIAL\ COST)_t \; / \; [DEBT_t + (P_{t,12} \; / \; P_{t-1,12}) \; DEBT_{t-1}]$$

4. Gross Margins

$$(SALES_t - COG_t) \; / \; SALES_t$$

5. Net Return on Equity

$$2(NET\ INCOME_t) \; / \; [NETWORTH_t + (P_{t,12} \; / \; P_{t-1,12}) \cdot \; NETWORTH_{t-1}]$$

Each ratio is constructed with corrected and uncorrected figures. When uncorrected figures are used, the factor $P_{t,12} \; / \; P_{t-1,12}$ is omitted from flow/stock ratios because flows are presumably expressed in prices closer to midyear than year-end.

Clearly the corrected ratios correspond more closely than the uncorrected ratios to what is known about the Uruguayan economy during the sample period, and it does not make a great deal of difference whether CVA or GPP series are used. Notice, for example, that the uncorrected gross margin series fails to pick up both the 1973 recession and the trend toward expansion over 1974-81. (Stability in the uncorrected gross margin series reflected the

fact that COS was understated in proportion to the inflation rate, and as "true" margins expanded, inflation fell.)

Perhaps the most dramatic adjustment occurs in average financial costs. Notice that the uncorrected series implies firms were paying extremely high rates throughout the sample period. However, from Central Bank statistics we know real rates were very negative until 1980, at which point they began a steep ascent. This is exactly what our corrected financial cost series indicates, reflecting the fact that the typical firm had net monetary liabilities ($M_t < 0$).

Because the overstatement of gross margins more than offset the overstatement of financial costs, the return on equity seemed implausibly high if interpreted as a real rate, or implausibly low if interpreted as a nominal rate. In contrast, our corrected rate of return on equity, which is a real measure, tracks the experiences of the industrial sector quite well -- first rising with the expansion in production that was apparent in gross margins, then falling as real financial costs skyrocketed. We conclude that our inflation corrections were essential to reveal the experiences of the industrial sector.

The World Bank

Headquarters
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

Telephone: (202) 477-1234
Telex: WUI 64145 WORLDBANK
RCA 248423 WORLDBK
Cable Address: INTBAFRAD
WASHINGTONDC

European Office
66, avenue d'Iéna
75116 Paris, France

Telephone: (1) 723-54.21
Telex: 842-620628

Tokyo Office
Kokusai Building
1-1 Marunouchi 3-chome
Chiyoda-ku, Tokyo 100, Japan

Telephone: (03) 214-5001
Telex: 781-26838

Paper Number 696

How the Financial Statements of Uruguayan Firms in 1973–81 Reflected Stabilization and Reform Attempts

The World Bank

ISSN 0253-2115/ISBN 0-8213-0669-3