

The Long-Run Fiscal Impact of Privatisation: An empirical assessment of the Brazilian experience.

Jose Eusebio Santos. *

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Abstract

Although the privatisation impact on public finances in the short run is typically an increase in liquidity for the public sector, the important question is what the financial impact of the sale will be in the long term. In addition to obtaining privatisation proceeds, the state has to pay the costs of privatisation and forgoes future revenue from the assets which are sold. Therefore, the long-run fiscal impact of privatisation appears ambiguous. In this paper we analyse this question in the light of the Brazilian experience.

The results show that the net worth of the government was reduced essentially due to two factors: First the State was unable to extract full market valuation from the bidders due to the lack of more competition in the auction. We estimate that close to 14% of the true value of the firm was not extracted from bidders. Secondly, regression analysis shows no effect of change in ownership on company's pre-tax rates of return. These results combined with the transaction costs give evidence that "Selling the State" generated losses for the Brazilian Government.

JEL Classification:L33

Keywords: Privatisation; Public Finances; Underpayment; Profitability; Transaction Costs.

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1 Introduction

Among the many objectives in a privatisation programme¹, fiscal benefits appear to have a significant place. This is particularly true in developing countries where the fiscal crises have been the major determinants, if not the necessary condition, for governments to privatise.

In this paper we construct a comprehensive and complete estimate of the long-term impact of the Brazilian privatisation experiment on government finances. Has privatisation led to an improvement or deterioration in the resources available to the Brazilian government? What factors of the privatisation process have intervened on this result? The issue of gains or losses in government wealth resulting from privatisation has drawn the most critical attention and seems to have been subject of concern almost everywhere governments have privatised. Therefore this analysis is relevant for more than historical reasons. It may well be that Brazilian experience may have lessons for what we can expect elsewhere.

Different views have been put forward with relation to privatisation and its fiscal implications. Political leaders have widely proclaimed it as a method of restoring fiscal rectitude. Privatisation provides lump sum revenue that can be used to temporarily offset the deficit and it frees governments from the burden of subsidising loss-making state enterprises and investing in the companies sold.

Opponents of privatisation, on the other hand, have condemned it as “selling the family silver to pay the bills”. In their opinion, the government, and thus society at large, loses from privatisation because it gives up a positive stream of cash flows and puts it in the hands of private buyers.

To complicate the picture further, many economists have argued that privatisation will have essentially no impact on the government’s fiscal position. Therefore, the revenues motivation should not be the primary goal.

What explains the different perspectives with relation to the fiscal effects? The difference lies in the time horizon considered. The problem of fiscally motivated privatisations underlies on the gap between the government’s generally short decision horizon (given by a short electoral term) and the long term criteria that should be taken into account in this type of decision.

The short-term impact is clear (see for example Vickers and Yarrow, 1988). In the year of the sale, on the one hand, the government collects sale proceeds (net of the costs to organise the transaction) and perhaps avoids other capital expenses previously sustained to finance the public firm. On the other hand, it forgoes the annual company’s gross profits. Although the cash inflow will depend on the size of both forgone profits and investment expenditure, relative to the size of the net sale proceeds, the outcome in the short run is typically an increase in liquidity for public sector.

The important question though is what the financial impact of the sale will be in the long term. One view – the fiscal neutrality result – is that the present value of net proceeds from privatisation and earnings forgone are equal, so that there is no overall fiscal impact

¹For the purposes of this study, we define privatisation as a transfer of ownership and control from the public to the private sector, with particular reference to asset sales.

from privatisation in the long-run. The fiscal neutrality result has been used as a framework for theoretical discussions of the fiscal effects of privatisation (e.g. Mansoor, 1988; Adam et al., 1992).

There is, however, little evidence to support or refute any of the views. Therefore our main contribution to the literature will be to present empirical evidence for the fiscal discussion.

In analysing this issue of the long-term effect of each sale, the key concept is the net worth of the government, i.e. the capitalized value of the various revenue and expenditure flows incurred by the government. So we start by outlining the theoretical framework that measures the effect of privatisation on the government's net worth. According to that framework, if the sale price reflects the future value of the company, and if the company is equally profitable before and after privatisation and finally assuming zero transaction costs, then it is clear that privatisation does not change the government's net worth².

Following the framework outlined, we first need to assess whether the firm was sold at a price equal or smaller than the market value of the firm. The method used by the Brazilian government to sell the firms was first price auctions. Like in many developing countries, given the reduced number of market participants in many of the privatisation auctions, the government is unlikely to be able to extract full market valuation. Indeed, one can expect that the few private agents negotiating with the government will be able to extract an even greater surplus than in developed countries, where underpricing is a rather common phenomenon (Mansoor, 1988). Therefore, we have to take account of this fact in the analysis. We model bidders' behaviour based on the idea that the degree of competition in the auction is responsible for the difference between the observed bid and the true value that the bidders attach to the asset. We proceed to estimate an equation which assumes that the bid observed is a function of the bidder's true valuation, several company characteristics, as well as the number of bidders. Based on this estimation with 76 observations, we evaluate a Taylor approximation on the number of bidders which we then use to adjust the observed bid obtaining an estimate of the true value of the firm for the winners.

The second point to be analysed is whether the profitability of the companies was changed due to the change in ownership. Many studies document improvements in financial performance after privatisation (see Megginson (2005) for a recent survey)³. The potential

²Note, however, that for public revenues to remain unchanged, the condition alone that public sector net worth must remain unchanged is not sufficient. Returns differ at the margin among assets (shares in public enterprises compared with cash or foreign reserves, likely means of payment for divestitures), and the flow costs to the government of various public liabilities (such as bonds in the hands of foreigners) also differ. The allocation of divestiture proceeds can also be influenced by mistakes and political pressures. Thus, changes in composition of public assets and liabilities would affect government revenues, given a certain level of net worth.

³Megginson et al (1994) and La Porta and Lopez-de-Silanes (1999) support the hypothesis that privatisation leads to an increase in profitability. Dewenter and Malatesta (2001) do not find much evidence that privatisation itself increases a firm's profitability. They show that net income-based profitability measures improve after privatisation, but EBIT-based profitability measures do not. Villalonga (2000) finds that privatisation does not increase firm profitability- defined as rate of return on net assets. He argues that political

profitability of the enterprise in private hands has direct and indirect implications for fiscal effects. Potentially, the government can sell the company at a higher price, and it will obtain higher tax revenues in the future. Using a sample of 113 Brazilian companies that were privatised in the years of 1988 to 2003 we make a regression analysis to assess the effect of change in ownership on company's gross profitability (measured by the pre-tax rates of return) and to get the average measure of the impact of privatization on each firm's earnings (panel data analysis). If that value is statistically significant, then it can be used to approximate the difference in companies' performances between the pre and post privatization periods. We will include different control variables used in the literature that refer to external factors not implied by privatisation that may affect firm profitability, and therefore, should be discounted in order to estimate the net effect of privatisation.

However, as argued by Villalonga (2000), privatisation has other implications, political and organizational, that are likely to affect the firm's profitability, either positively or negatively, and therefore, reinforce or counteract the effect of the change in ownership per se. Political implications of privatisation are all the government decisions triggered by the decision to privatise a given firm. These may affect firm's profitability either positively or negatively. Organizational implications of privatisation are all the decisions taken by the new owners or managers of the privatised firm that cannot be predicted by government at the time of choosing who to sell the firm to. Again, these can affect the firm's profitability either positively or negatively. To examine these factors that may have intervened in the observed relationship between privatisation and profitability we regress different political and organizational factors of the Brazilian programme on the change observed in rates of return before taxes between the two periods, before and after privatisation. This will provide a valuable guide to privatisation dos and don'ts.

Finally, and when we have all the previous results, all that information can be combined with estimates of all relevant transaction costs (administrative, costs of sale and enterprise restructuring) for each sale to evaluate the long-term effect of privatisation on the government's net worth. We will be able to answer whether privatization increased or reduced the government net worth.

The results show that, with relation to the effect of auction competition on prices, it is estimated that due to the lack of more competition in the auction, participants underbid close to 14% of the calculated true value of the firm. This number can be interpreted as money not extracted from bidders as a result of low bidder participation in the auction or money left on the table and needs to be considered when evaluating the long term effect of privatisation on government net worth.

Regression analysis on the pre-tax rates of return shows that change in ownership alone did not significantly alter the average Brazilian company's profitability. The results give also evidence that the manner in which privatisation was carried out matters and explains the discrepancy of this result with the evidence reported in previous studies that

factors such as the business cycle during which the firm is privatised and foreign ownership are important determinants of firm profitability.

ownership has a positive effect on profitability. Factors unrelated to ownership that have significantly intervened in the observed relationship between privatisation and profitability are: the industry structure of the firm, the year in which firm is privatised, the nationality of the buyer, and the initial performance level of the firm.

Finally, combining the results obtained in the previous sections with the transaction costs from selling the companies, we have evidence that selling the State had a negative effect on the Brazilian public finances. We show that the popular notion that privatisation entails a “permanent fiscal gain” is therefore incorrect. Greater importance should be given to designing a privatisation programme to promote competition and maximize efficiency.

The paper is organised as follows. In the next section we outline the framework that measures the impact of privatisation on government’s net worth. In Section 3 we describe the institutional framework of the Brazilian programme, the data collection process and the data used on the paper. In section 4, we estimate the surplus the bidders were able to keep due to the lack of competition in the auction. In section 5, regression results on the impact of privatisation on the pre-tax rates of return are presented as well as the results of the impact of different characteristics of the process on the changes observed in the pre-tax rates of return. In section 6 we assess the net effect of the privatisation policy on the Brazilian public budget. The results are summarized in Section 7.

2 Privatisation and Government’s Net Worth

Suppose that in period t the government sells a state-owned company i to the private sector and that it does so through the auction of a package of company i ’s shares to different investors. According to the financial theory, the value of a package of firm i ’s shares at the beginning of period t is equal to the present value $V_{i,t}$ of the expected stream of future net dividends:

$$V_{i,t} = \sum_{j=1}^{\infty} \left(\frac{1}{1 + \delta} \right)^j D_{i,t+j/t} \quad (1)$$

where δ is the constant rate of return on capital investment and $D_{i,t+j/t}$ is the expected value of period $(t + j)$ net dividends, taken at time t . Dividends are net of taxes. The formula assumes that the dividend earned on the package of shares in period t is paid at the end of the period. Assuming that after-tax profits are entirely distributed as dividends, D reflects the company’s after-tax profitability. Therefore we can rewrite the value of the package of company i ’s shares at time t as:

$$V_{i,t} = \sum_{j=1}^{\infty} \frac{(1 - \tau_{t+j})r_{i,t+j}^{PR}W_i}{(1 + \delta)^j} \quad (2)$$

where τ is the tax rate on corporate profits, $r_{i,t+j}^{PR}$ is the pre-tax rate of return under private management and W_i is the book value of company i ’s shares being sold in the auction. So

the equation reflects the discounted flow of future net profits expected to be obtained from company i .

The government sets a minimum price prior to the sale and receives a value equal to the highest bid offered in the auction. The amount received from the sale of firm i 's shares is given by $B_{i,t}$. This amount can be equal to or smaller than the expected net future value of firm i 's shares, namely $B_{i,t} \leq V_{i,t}$.

The government's total expected revenues from the sale of company i 's shares are given by:

$$TR_{i,t} = B_{i,t} + \sum_{j=1}^{\infty} \frac{\tau_{t+j} r_{t+j}^{PR} W_i}{(1+\delta)^j} \quad (3)$$

which is the sum of the amount received and the future stream of taxes collected from the private company.

The government's total expected costs of the sale are:

$$TC_{i,t} = C_{i,t} + \sum_{j=1}^{\infty} \frac{r_{i,t+j}^{SOE} W_i}{(1+\delta)^j} \quad (4)$$

where $C_{i,t}$ indicates the sale transaction costs, which include administrative, costs of sale and enterprise restructuring, and the other term is the present value of the projected stream of gross profits under the assumption that the firm remained state-owned. In short, it represents the opportunity cost of the government's decision to privatise company i .

From (3 - 4), the change in the net worth of the government is given by:

$$\Delta GNW_{i,t} = \left(B_{i,t} + \sum_{j=1}^{\infty} \frac{\tau_{t+j} r_{t+j}^{PR} W_i}{(1+\delta)^j} \right) - \left(C_{i,t} + \sum_{j=1}^{\infty} \frac{r_{i,t+j}^{SOE} W_i}{(1+\delta)^j} \right) \quad (5)$$

Re-arranging the equation, we have⁴ :

$$\Delta GNW_{i,t} = [(B_{i,t} - V_{i,t}) - C_{i,t}] + \sum_{j=1}^{\infty} \frac{(r_{i,t+j}^{PR} - r_{i,t+j}^{SOE}) W_i}{(1+\delta)^j} \quad (6)$$

The change in GNW consists of two elements. The first $(B_{i,t} - V_{i,t} - C_{i,t})$ represents the cost of the sale: if $B_{i,t} = V_{i,t}$ (sale price is equal to the expected net future value of the assets, i.e. no underpayment), then the cost is purely a transaction cost. If there is underpayment $B_{i,t} < V_{i,t}$, then this represents an additional cost. If we rule out overpayment of shares, then this term has to have a negative impact on GNW . The second term is the change in the present value of profits given by the difference between what the company's profits

⁴From (2):

$$\sum_{j=1}^{\infty} \frac{\tau_{t+j} r_{i,t+j}^{PR} W_i}{(1+\delta)^j} = \sum_{j=1}^{\infty} \frac{r_{i,t+j}^{PR} W_i}{(1+\delta)^j} - V_{i,t}$$

will be under private ownership and what they might have been under public ownership. This can be positive or negative, but for privatisation to increase NW , the increase has to be sufficiently positive. If there is no significant increase in profitability as a result of privatisation, one would expect that the overall change in NW would be negative.

Therefore, when estimating the long-term effect of privatisation on government finances, one has to consider two important factors, beside the revenues and the transaction costs associated with the sale. First, the difference between the amount received and the net present value of the company under privatisation. Secondly, the change in future profitability as a result of privatisation.

3 The Brazilian Privatisation Programme and the Data Set

A. The Brazilian Privatisation Programme

In this section we briefly describe the Brazilian privatisation programme. We first start by looking at the role of the state in Brazilian economy prior to privatisation. We then comment on the motives that led to the privatisation programme and the objectives established by the Brazilian government at the outset. Finally we present the scope of the programme in the country.

A.1 Pre-privatisation Role of the State

The Brazilian economy has been always a market economy and state intervention was relatively small until Getúlio Vargas came to power in 1930. With the establishment of Vargas's New State (Estado Novo), import-substitution-industrialisation (ISI) was introduced in the country as a reaction to the Great Depression of the 1930s and became the major development strategy after World War II. In the subsequent decades, SOE presence in the economy grew steadily. One of the reasons was the need to create and develop a diversified industrial sector in areas in which the private sector lacked the interest or the financial muscle to invest. A typical case was steel, which was deemed necessary as a requirement for a vertically integrated industrialisation process. The same kind of motivation was behind public investment in infrastructure, as in highways.

The concern to keep exploitation of the subsoil in Brazilian hands determined the creation of both CVRD and Petrobras, respectively the largest mining and oil companies in the country. This was a reflection of economic nationalism and the intention of guaranteeing Brazilian control over the country's non-replaceable resources such as oil and iron ore.

Nationalisation or foundation of public utilities by the Brazilian government (both federal and local governments) was common over the three decades following World War II (Baer and McDonald, 1998). The reason was basically the fact that regulation failed to attract the levels of investment required by Brazil's high economic growth. Domestic and foreign investors were not interested in the modernization and expansion of these sectors due to the fact that regulated tariffs resulted in low rates of return, therefore discouraging further investment.

The establishment of commercial banks by the federal and state governments was also common during the ISI and pos-ISI periods. The motivation was to provide credit to sectors or regions which were neglected by private banks. At the same time, the need for long term financing and the fact that the country's capital market was still very weak, led the government to create a development bank (BNDE) responsible for making long term loans and/or buying stocks in newly established or expanding industrial enterprises.

The importance of the state by the 1970s and 1980s was clear from the following facts: a 1974 survey of the 5113 largest incorporated firms showed that over 39% of assets belonged to SOEs, while these same firms were responsible for 16% of the value of sales; a 1985 survey of the 8094 largest firms revealed that the share of net assets of state enterprises amounted to 48% while the share of these enterprises in total sales totalled 28.1%⁵. In 1990, the size of the of the Brazilian public enterprise sector was considerable. A study by the Getulio Vargas Foundation, surveying the 500 largest non-financial enterprises in the country, found that eighty of them belonged to the federal or state government⁶. These eighty SOEs accounted for 37 per cent of total gross revenues, 63 per cent of total net worth, and 75 per cent of total fixed assets of GDP as shown in table 1.

⁵See Baer (2001).

⁶Getulio Vargas Foundation, *Conjuntura Económica*, August 1991.

Table 1: Brazil: Leading Public Enterprises and Largest Companies: Financial Results in 1993*

Sector	Largest Companies (US\$ billion)			Public Enterprise (US\$ billion)			Participation of Public Enterprises (%)		
	Gross Revenues	Net Worth	Net Assets	Gross Revenues	Net Worth	Net Assets	Gross Revenues	Net Worth	Net Assets
Agriculture	1.34	0.67	0.49	0.02	0.09	0.03	1.57	13.86	8.04
Industry	135.28	73.47	74.36	49.87	40.24	54.53	36.87	54.78	73.34
Mining	20.55	9.88	6.90	18.21	8.47	5.75	88.63	85.72	83.33
Manufacturing	76.22	36.00	29.50	9.62	10.90	13.34	12.62	30.27	45.23
Mettallurgy	13.07	10.91	14.20	6.30	7.09	11.62	48.23	64.97	81.83
Chemicals	13.16	8.93	5.12	3.25	3.78	1.71	24.72	42.38	33.37
Printing	0.71	0.20	0.18	0.06	0.02	0.01	8.68	9.66	5.41
Others	49.27	15.94	9.98	0.00	0.00	0.00	0.00	0.00	0.00
Construction	16.19	6.58	1.73	0.00	0.00	0.00	0.00	0.00	0.00
Public Utilities	22.31	21.00	36.21	22.04	22.87	35.43	98.78	99.37	97.85
Services	52.06	41.66	25.90	20.30	33.31	21.46	39.00	79.97	82.84
Commerce	30.69	3.41	2.04	6.33	0.34	0.11	21.63	10.10	5.44
Transportation	5.35	7.35	13.56	2.81	6.64	12.03	52.69	90.34	88.75
Communication	6.83	6.41	7.34	6.70	6.19	7.14	98.20	96.68	97.32
Other Services	9.19	24.47	2.95	4.13	20.12	2.16	45.02	82.22	73.21
TOTAL	188.68	115.80	100.75	70.19	73.64	76.02	37.21	63.60	75.47

Source: Conjuntura Economica, Getulio Vargas Foundation and Pinheiro and Giambiagi (1994)

*The data include the 80 largest federal and state companies and the 500 largest Brazilian companies (private and public companies)

A.2. Privatisation Motive and Objectives of the Programme

At the end of the 1970s, the country's macroeconomic situation was deteriorating, making control of inflation and external balance top priorities, to the detriment of short-term growth. The rapid expansion of the state business sector was inconsistent with the objective of stabilization. It was starting to be clear that the state's presence in the economy had an increasingly negative impact on Brazil's economy. The government used state firms as instruments of macroeconomic policies, forcing firms to charge low prices in order to fight inflation, causing large deficits in their operations and forcing the government to provide large subsidies. Political pressures for over-employment and having monopoly positions in many markets made state firms highly inefficient. At the same time, as the state sector contributed towards increasing the government's budget deficit, it became a 'crowding-out' phenomenon in relation to the private sector (Baer, 2001).

As a response to the tensions that arose, the government created the National Debureacratization Program and the Special State Enterprise Secretariat in 1979, and the Special Privatisation Commission in 1981. Nevertheless, privatisation efforts in the 1980s were concentrated on attempts to contain the expansion of the state productive sector. The

sale of SOEs played an ancillary role in economic policy. It was only in the 1990s that the country became fully committed to the process.

The deterioration in the macroeconomic environment has been the single most important driving force behind Brazilian privatisation. This link between privatisation and macroeconomic policy is very clear from different factors. First, political support for privatisation increased because it was necessary to curtail public expenditure and because the unsuccessful attempt to use SOEs as an instrument of macroeconomic policy in the 1980s led to a profound deterioration in the quality of the services offered by these companies. Therefore, privatisation was seen as a way of limiting the government's freedom to pursue interventionist economic policies, compelling it to adopt a more market-oriented development policy. Second it was a way for signalling a commitment to state retrenchment, which was crucial for Brazil to obtain access to foreign capital markets. Finally it was a way of sustaining the Real Plan. The large privatisations of 1997-98 enabled Brazil to attract significant foreign direct investment, which helped finance the large current account deficit and keep the public debt from getting out of control, despite the large public deficits registered since 1995.

The arguments in the early 1990s for increasing the scope of privatisations interestingly did not emphasise their macroeconomic importance. Rather, the PND⁷ enumerated the following points for justifying privatisation⁸:

(i) Reorganizing the strategic position of the state in the country's economy through the transferring to the private initiative of economic activities unduly exploited by the state sector. Freed from the duty of providing new and increasing investment the federal government will benefit from gains in its global efficiency.

(ii) Promoting the modernization of domestic industry by forcing competition into the economy.

(iii) Strengthening domestic capital markets through popular capitalism.

(iv) Allowing the federal government to concentrate its efforts and resources on social policies like health, education, housing, public safety, and support for research and development.

(v) Stimulating investment in areas where the private sector can bring in greater capital and maximize results better than the government.

It is clear, however, that more than a change in ideology or political fashion, the moti-

⁷Banco Nacional de Desenvolvimento Econômico e Social, 1991, Brazilian Privatization Program: Brazil Company Handbook.

⁸According to article 1 of Law 8,031 the 'main purposes' were the following: 'I- To change the federal strategic approach to economic policy through the transfer of activities unduly performed by the public sector to private initiative; II-To reduce the government debt and thus help to bring relief to public finance; III- To assist in the resumption of investment in companies and activities transferred to the private sector; IV- To help modernize the Brazilian industrial complex, improving its competitiveness and strengthening the entrepreneurial capability of the several sectors of the economy; V- To free the public administration to centre its efforts in areas where government action is vital in order to accomplish national priority goals; VI- To help strengthen the capital market by an increased offering of tradable securities and opening up equity ownership in the companies included in the program.'

vation behind the Brazilian privatisation was a pragmatic response to short-term macroeconomic problems arising from the state of disarray of national fiscal accounts. Privatisation was increasingly seen as contributing to fiscal adjustments in two ways. First, the use of the proceeds to repay the public debt would bring an immediate fiscal benefit. Public debt servicing costs had dramatically risen in the 1980s. Second, privatisation would free the government from the obligation to finance investment in the privatised companies, and by removing deficit-ridden enterprises from the public sector the prospects for attaining future fiscal balance were enhanced.

A.3. The Scope of the Privatisation Programme

Although some privatisation had taken place in the 1980s, its scope and speed was small, amounting to only US\$533 million. Clearly privatisation at that time was not a top priority for the public sector and the motivation was basically to free the government of some problematic, loss-making companies.

It was only in the 1990s that the country became fully committed to the process. The programme began with very optimistic targets in terms of revenue and timetable, which turned out to be impossible to fulfil due to the bad financial situation of the SOEs and the complexity of these companies' stockholders' agreements. The first company was sold only at the end of 1991, a largely federally owned steel enterprise, for US\$ 1.9 billion. Most manufacturing SOEs were privatised in 1991-94, including all public companies in the steel and fertilizer sectors, most in the petrochemical sector, and a number of SOEs in other sectors such as the airplane manufacturer Embraer. Twenty firms were sold in this period, netting a total of US\$ 7.8 billion.

From 1994 on, the privatisation programme expanded rapidly to a ranking it had not previously enjoyed. This was related with a number of institutional changes which permitted the inclusion of public utilities. In 1995, constitutional amendments ended public monopolies in telecommunications, necessary to permit the privatisation of Telebras, the distribution of gas by mains and in the oil sector. Important as well were the amendments that abolished the distinction between Brazilian companies owned by domestic residents and those controlled by foreign capital, paving the way for privatisation in mining and electricity generation sectors.

At the same time, the scope of the privatisation was extended with the creation of the privatisation programmes at the state and municipal level. In 1997 alone proceeds surpassed the total collected in the six previous years. Twenty-eight of the 115 companies privatised by early 1999 belonged to the states, and their privatisation accounted for about a third of the revenues and debt transfers.

From a sectoral distribution perspective, in 1999, the telecommunications and electric power sectors accounted for 69 percent of all revenues, with 36 per cent and 33 per cent of the total, respectively. This naturally reflects the size of each sector, with the telecommunications industry being the largest sector for privatisation, most of which was auctioned in July 1998. The sales of electric power companies were dominant on the state government privatisation.

By 2002, receipts for privatisation amounted to US\$105.3 billion. Of this, foreign participation totalled US\$42.1 billion⁹.

B. The Data Set

From the framework outlined in section 2, establishing the long term effect of the Brazilian privatisation programme on the government's public finances requires several pieces of information. Revenue and costs from the sales of the firms provide information on the immediate effect of each sale on the government's budget. For a correct long-term financial evaluation, information on the implicit cost of possible underpayment is required, as well as data on companies' pre-tax rates of return over time. In this section we describe the sources of the data relevant to the analysis.

Pre-privatisation data was obtained mainly when the National Bank for Economic and Social Development (BNDES) allowed the author to review some of the files in their archives. From this field work, we were able to collect firm-level data from the following documentation: (i) sale prospectus, (ii) audited financial statements, (iii) documents describing the auctions and the bids, (iv) the sale contract and (v) reports from BNDES' staff. This data was also complemented with financial data from the Ministry of Planning, Budget and Management and some government institutions at the State level. The number of groups of bidders in each auction, which will be used to analyse competition in the auctions, was obtained from the Stock Exchange of Rio de Janeiro.

Post-privatisation data, mainly financial statements, were obtained from: (i) the Securities and Exchange Commission of Brazil (CVM), (ii) the National Archive, (iii) a consulting firm, Economática, (iv) a non-governmental organisation, Getulio Vargas Foundation, (v) the National Agency of Telecommunications (ANATEL) and (vi) the National Agency of Electric Energy (ANEEL).

The revenues and costs of each sale were gathered from the official reports of the privatisation programme published by BNDES. For state companies, this information was obtained from the Secretaries of Treasury from each State.

For the counterfactual effect of privatisation on the pre-tax rates of return, our sample is drawn from the 118 contracts signed over the period 1991-2003. Table 2 presents the contracts and the number of firms present in the sample used in the panel data analysis.

⁹BNDES Privatização no Brasil (2003).

Table 2: Contracts and firms by industry present in the data base for panel data analysis.

Industry Classification	Number of contracts		Number of firms		Auction Results ^a (US\$ millions)	
	Not		Not		Not	
	Included	Included	Included	Included	Included	Included
Steel	7	1	7	5	8172.8	15.0
Petrochemical	21	6	21	8	3123.1	578.1
Fertilizers	3	2	3	2	464.3	29.2
Electricity	23	0	23	0	35268.1	-
Railways	0	8	0	8	-	1721.9
Mining	2	0	2	0	6863.5	-
Telecommunications	13	0	46	0	24875.56	-
Gas	2	1	2	1	1599	158
Ports and Container terminals	0	9	0	9	-	461
Others	6	1	6	7	902.1	403
Banking and Financial Industry	3	10	3	15	3604.3	1342.9
Total	80	38	113	55	84872.76	4709.1

^aIncludes debt transferred to the private sector

Source: Authors calculation

We were able to gather information on 80 of those contracts from the sources stated above. This corresponds to 113 firms. We exclude cases where the government sold only a minority participation in private or remaining SOEs. As we do not have information for the whole period for every company, our firms compose an unbalanced panel. We believe that the problem of selection bias is unlikely in our sample, since we collected pre and post privatisation data for small and large firms, as well as listed and unlisted firms in the stock exchange. Overall, the sample covers 95% of the auction results. Many of the firms not included were merged after privatisation and no longer kept separate financial statements. For railways and ports, they were split for privatisation purposes and it was impossible to have compatible financial statements for the pre and post privatisation period. Other firms were not included due to unavailable information.

The accounting procedures have remained the same for the whole period, which makes the figures comparable between the pre and post-privatisation period.

Table A.1 in the appendix describes all variables used to compute the results presented in the paper. It contains three parts, the first for section 4 and the other two based on section 5 of the paper.

4 Did the government collect full market valuation?: Degree of competition in the auctions and the value of the firm.

From section 2 and according to equation (6), one of the factors we need to consider to assess the long-term effect of privatisation on government finances is the difference between the amount received in the auction and the net present value of the company under privatisation ($B - V$). If the payment received is lower than the expected future value of the assets, the government is forgoing potential earnings.

According to the theory, the number of participating bidders in the auction influences the optimal decision of the bidder in terms of how much of his true valuation for the asset he is willing to pay. So our goal is to get a measure of the true value of the firm for the winning bidder through the estimation of how relevant competition is in determining observed bids.

We follow the same procedure used by Lopez-de-Silanes and Zamarripa (1995), which is based on that standard auction theory argument postulating that the observed bid (B_i) may differ from the true value of company i for the bidder (V_i). For that purpose, the bidders' behaviour is simplified by assuming that the observed bid B_i is a function $B_i = g(V_i, n_i, \dots)$ which depends directly on the true valuation of the asset for the bidder (V_i) and also positively on the number of bidders involved in the auction of asset i (n_i).

Vickrey (1961) showed that, for the case of first price auctions, under the assumption that all agents are risk neutral, the Nash or noncooperative equilibrium bid function would be:

$$B_i = V_i I\left(-\frac{1}{n_i}\right) \quad (7)$$

where all variables are defined as above. As $n_i \rightarrow \infty$, then $B_i \rightarrow V_i$. Therefore, the auction becomes less competitive, bidders will tend to bid lower and further down from their true valuation of the firm leaving the seller with a lower payment.

For the purpose of econometric estimation, the general form of $B_i = g(\cdot)$ can be linearized as:

$$B_i = V_i - f(n_i) \quad (8)$$

where $f(n_i)$ measures the surplus the bidder gets to keep due to the lack of competition in the auction.

If we were to estimate the determinants of the value of the firm econometrically, we could use a simple linear approximation of the form:

$$B_i = \alpha + X_i\beta + \varepsilon_i \quad (9)$$

where X_i represents different characteristics which affect the bid. However, as we saw, this number is different from the true value (V_i). The origin of this difference is the surplus the bidder gets to keep due to the lack of competition in the auction $f(n_i)$ (equation 8).

Therefore, to make a correction for this difference, we estimate the value of the underpayment of the stock of firm i , including this factor in the equation above:

$$B_i = \alpha + X_i\beta + f(n_i)\gamma + \varepsilon_i \quad (10)$$

Normalizing the equation by the book value per share of firm i at privatisation date, we will be estimating the following equation:

$$\frac{B_i}{BV_i} = \alpha + X_i\beta + \frac{f(n_i)}{BV_i}\gamma + \varepsilon_i \quad (11)$$

where we approximate the value of $f(n_i)$ according to a Taylor expansion such that the estimated equation on the number of bidders becomes:

$$\frac{B_i}{BV_i} = \alpha + X_i\beta + \frac{n_i}{BV_i}\gamma_1 + \frac{n_i}{BV_i}\gamma_2 + \frac{n_i}{BV_i}\gamma_3 + \dots + \varepsilon_i$$

Therefore, this formulation permits us to look at the effect of competition among bidders in terms of extracting part of their potential surplus, allowing us to estimate the surplus they were able to keep and thus to obtain a measure of the true value for firm i (V_i). In order to achieve this, we evaluate the polynomial given by the Taylor expansion in the equation for each bid i and average these values for all bids in all companies (76 observations). The mean value of this polynomial across bids ($f(n)$) represents the average value, in terms of book value, that the bidders were able to keep.

Regression results are presented in Table 3.

Table 3: ESTIMATION OF THE PRICE BID

Independent Variables	Dependent Variable: Price / Book Value
N/BV	21262.8 (2.73)***
N ² /BV	-16650.0 (-2.72)***
N ³ /BV	3564.82 (2.73)***
Net Income/ Sales	2.09593 (2.60)**
Strikes	-0.580911 (-1.95)*
Size	0.280682 (1.78)*
Order of sale within the industry	0.0465784 (1.54)
Steel	1.80253 (1.45)
Petrochemical	-1.20751 (-1.39)
Fertilizers	-1.37239 (-1.40)
Mining	-1.52991 (-1.28)
Electricity	0.725833 (0.885)
Telecommunications	-0.216589 (-0.209)
Banking	1.55122 (0.891)
Observations	76
R-square	0.498477

*** 1% Significance Level,** 5% Significance Level;
*10% Significance Level. Ordinary least squares;
Dependent variable is defined as the price offered
by the bidder divided by the book value per share.
Definitions of the independent variables are in
appendix.

In the regression we control for observable characteristics of the firm such as the size, profitability in the four years before privatisation as well as the number of strikes in the five years leading up to the sale. We also include industry dummies and control for the order of sale within the industry.

As we calculate the average value of the polynomial for each of the regressions in Table 3, we obtain an average of value of 0,352744 which means that participants in the auction underbid an amount equivalent to 35% of the book value of the company. This number can be interpreted as money left on the table or money not extracted from bidders as a result of low bidder participation.

Using the simple linearization in equation (8), bidders underbid an equivalent of 14% of their true valuation. Therefore we have to take account of this fact when estimating the long-term effect of privatisation on the government's net worth.

5 Did Privatisation change the firm's discounted income stream?: Impact of privatisation on firms' earnings before taxes.

An analysis of the fiscal effects of privatisation need not be concerned with social or economic definitions of efficiency, but only with the narrower issue of the effect of privatisation on firm's profitability¹⁰.

Potential differences in the firm's value due to privatisation have direct implications for the effects of the programme on the public finances. If, once in the private sector, a firm's earnings are higher than what they would have been otherwise, that implies that the government disposes of a more valuable asset. The difference in profitability should then affect the net gains from the sale, both in the short and in the long run. Potentially, the government can sell the company at a higher price, and it will obtain higher tax revenues in the future¹¹.

It is important that the desired actions that lead to improved performance be achieved through the change in ownership. Certain reforms that accompanied privatisation and that were consistent with continued government ownership need to be controlled to get the net effect of privatisation.

In what follows, we first determine whether privatisation has actually increased the profitability of the firms in the sample. We then examine some of the political and organisational factors that may have played a role in arriving at those results. After all, if the privatisation process is itself flawed, it is doubtful that the privatised firms will perform better than state owned enterprises.

¹⁰Profitability measures may not be a good indicator of efficiency, as a big proportion of the firms in our sample are not in a competitive environment (Boris and Boothman, 1985; Cuervo, 1995).

¹¹See equation (6) in Section 2.

Methodology

From equation (6), two of the elements needed to determine the effects of privatisation on public finances are the pre-tax public rate of return (r_i^{SOE}) and the pre-tax private rate of return (r_i^{PR}). While it is possible to observe private profits after the firm has been privatised, we are left to infer what public profits would have been in the post-privatisation period had the firm not been privatised. Likewise, we must infer what private profits would have been in the pre-privatisation period had the firm been private.

To make counterfactual inferences we use two procedures. First, we compute pre-tax rates of return for each company¹² for a seven-year period (from three years before to three years after privatisation). We then compute means for each variable for the preprivatisation (years -3 to -1) and postprivatisation (years +1 to +3) periods. However it is important to note that we included companies in our sample as long as we had observations from at least year -2 to year +2. Furthermore, the year of the privatisation, year 0, is excluded from the analysis because it includes both the public and private ownership phases of the firm. We then report the univariate mean-comparison test results for the sample of firms that have data for those years.

In the second approach, the actual and private pre-tax rates of return are observed when they are available for the period 1988 to 2003. We model the time series of the rates of return in the following way:

$$r_{it} = \alpha_i + \beta_1 Priv_{it} + \beta_2 Regul_{it} + \beta_3 Import_{it} + \beta_5 Size_{it-1} + \gamma Year_t + \varepsilon_{it} \quad (12)$$

where i denotes firm i and t denotes year t , r_{it} is the rate of return for company i at time t , $Priv_{it}$ is a dummy variable equal to one if year t is a post privatisation period for firm i and 0 otherwise. The intercept α is company i 's fixed effect, capturing any idiosyncratic, company-specific differences in profitability. $Year_t$ is a dummy which is equal to 1 in year t and 0 otherwise, controlling for time effects. Introducing these year dummies controls for contemporaneous macroeconomic shocks.

Control variables in this model refer to external factors not implied by privatisation that may affect firm profitability, and therefore, should be discounted in order to estimate the net effect of privatisation. In addition to the year effects, we include as a control the import penetration coefficient ($Import_{it}$) for each of the tradable industries over the sample period. The purpose of this control is to take account of the measures implemented by the Brazilian government aimed at gradually deregulating and liberalising trade by reducing tariff barriers. Their goal was to force greater competition in what was otherwise an economy dominated in many sectors by oligopolistic practices and therefore it might have affected the performance of the firms. Similarly we control for the regulation effect ($Regul_{it}$). Regulation was a byproduct of privatisation and it might have affected the performance of

¹²The use of net income measures to analyse the position of the government would be misleading due to the tax credits and carryforwards that do not relate to the current year and which are considerable in Brazilians firm's annual reports. If the increase in profitability was the result of a more favourable taxation policy to the companies, then the fiscal gain would be the result of a change in policy and not from privatisation itself.

the regulated firms. In addition, we control for size using lagged Total Assets measured in logarithms.

The coefficient of interest is β_1 from the equation (12), that is, the average measure of the impact of privatisation on each firm's earnings. If it is statistically significant, we can use the estimated value β_1 to approximate the difference in companies' performance between the pre and post privatisation periods:

$$\begin{aligned} \sum_{j=0}^{\infty} \frac{(r_{i,t+j}^{PR} - r_{i,t+j}^{SOE})W_i}{(1+\delta)^j} &= \sum_{j=0}^{\infty} \left(\frac{1}{1+\delta}\right)^j (r_{i,t+j}^{PR} - r_{i,t+j}^{SOE})W_i = \\ &= \sum_{j=0}^{\infty} \left(\frac{1}{1+\delta}\right)^j \beta_1 W_i = \beta_1 W_i \left(\frac{1}{1 - \frac{1}{1+\delta}}\right) = \beta_1 W_i \left(\frac{1+\delta}{\delta}\right) \end{aligned} \quad (13)$$

That gives the present value (at time t) of the difference between future stream of pre-tax profitability under private and state-ownership.

In the previous regressions we control for all external factors not implied by privatisation. It is however clear that the privatisation process has also implications, different from the ownership factor that may offset the efficiency gains that should have followed from privatisation and therefore affect the relationship between privatisation and profitability. To examine those factors that may have played a role in arriving at those results we use a different model. We regress different political and organisational factors on the observed changes in the rates of return calculated for the univariate analysis. We include the following factors in the regression. As political factors:

- (1) The privatisation year at which the company was privatised, which captures the government's decision of when exactly to privatise the firm;
- (2) The foreignness of the buyer, which is common to be an issue of political concern in many countries;
- (3) If the buyer is an outsider to the industry, to evaluate whether the qualifications in the business are important.
- (4) Debt absorption, to evaluate the effect of government restructuring option prior to the sale on the outcomes.
- (5) The percentage of shares sold, to test whether the amount of shares decided and sold by the government has an effect on the privatisation outcome. This can also control for the fact that in some cases the government sold only a minority control.

As organisational factors, we consider:

- (1) If the firm is described as a monopoly or oligopoly by the prospect, to capture the role of the industry structure at the time of privatisation. According to the literature, in competitive sectors private companies are generally more efficient than SOEs. In oligopolised sectors, however, there appears to be no significant differences (Vickers and Yarrow (1991) and Vining and Boardman (1998)). Hemming and Mansoor (1988) argue that significant

efficiency gains are more likely to result from measures to increase competition than from changes in ownership and that the latter are neither necessary nor sufficient for such gains.

(2) The size of the organisation at the time of its privatisation, which is assumed to be proportional to any possible resistance to change encountered;

(3) The company's starting performance level as a private firm, which is assumed to be reflecting the difficulty of running or turning around a low-performing privatised firm;

As control variables, the only factors considered as external are industry dummies for all industries which are represented by more than one firm in the sample: steel, mining, petrochemical, telecommunications and the electric industries.

Results and Discussion

To make the inferences we use the computed pre-tax rates of return as explained in the data section. The values of the t-statistics of the first approach are reported in Table 4. The key question is whether there is evidence that private profits are any different than what profits would have been had the firm remained public.

As the table shows, none of the statistics are significant at the conventional levels. Therefore the null hypotheses that the mean levels of profitability for each firm are the same before and after privatisation cannot be rejected.

Table 4: Test for changes in the Pre-Tax Rates of Return after privatisation

Profitability Measure ^a	N	Sample statistic	Pre-Priv. mean	Post-priv mean	Means of differences	t-stat for differences
$\frac{Pre-taxProfit}{TotAssets}$	81	Means	0.005	0.015	0.010	0.857
$\frac{Pre-taxProfit}{Sales}$	79	Means	-0.005	0.010	0.015	0.477
$\frac{Pre-taxProfit}{Equity}$	80	Means	-0.018	0.005	0.023	0.932

^aPre-tax Profit is total profits (losses) at the end of the fiscal year.

These tests do not control for several factors that are external to privatisation and that may systematically affect profitability. They are, for instance, incapable of distinguishing between changes in firm attributes arising from ordinary fluctuations in economic activity and those due to changes in ownership. There are also other reforms happening at the same time of privatisation, like regulation of some industries and liberalisation reforms that may also affect the performance of the firm.

To take account of these external factors not implied by privatisation, we use the second approach. Table 5 presents the results of our regressions. To adjust for the fact that firms are observed for differing number of years, the standard errors are calculated using White's robust estimator.

Table 5: Impact of Privatisation on Firms' Profitability (Fixed Effects)

Dependent Variable	Explanatory variables				Year	R-square	N
	Priv _{<i>i,t</i>}	Regul _{<i>i,t</i>}	Import _{<i>i,t</i>}	Size _{<i>i,t-1</i>}	Dummies		
$\frac{Pre-taxProfit}{TotAssets}$	-0.02153 (-0.625)	-0.00765 (-0.391)	0.01882 (0.128)	-0.00179 (-0.204)	Yes	0.075	1155
$\frac{Pre-taxProfit}{Equity}$	-0.02815 (-0.653)	0.01622 (0.241)	-0.21478 (-0.457)	-0.01097 (-0.475)	Yes	0.061	1131
$\frac{Pre-taxProfit}{Sales}$	-0.00360 (-0.072)	0.05511 (1.15)	-0.52055 (-1.52)	-0.00687 (-0.280)	Yes	0.073	1111

This table reports results from firm-level fixed effects (within) regressions that estimate the impact of privatisation for the period 1988-2003. t-statistics are below the coefficient estimates. Definitions of the variables are in appendix.

From the results, again we do not have evidence that privatisation had significantly changed the profitability of the firms. The negative sign in all the coefficients is striking and together with the evidence reported in other studies that private ownership is significantly associated with higher levels of performance, it may indicate that others factors implied by privatisation may have played a role in the relationship between privatisation and profitability.

To examine those factors that may explain the discrepancy with other studies, we use a different model. The dependent variables are the changes observed in the rates of return between the two periods, before and after the sale. Results of the estimations appear in Table 6.

Table 6 Regression of the Change on the Pre-tax Rate of Return on political and organisational factors.

Independent Variables	Dependent Variable		
	Δ Pre-Tax Prof / TotAss	Δ Pre-Tax Prof / Equity	Δ Pre-Tax Prof / Sales
Constant	0.45683 (2.90)***	0.34609 (1.01)	1.09097 (2.57)**
Political factors			
Privatisation Year	-0.02797 (-2.71)***	-0.03484 (-1.94)*	-0.09630 (-2.95)***
Percentage of Shares Sold	0.11735 (2.00)**	0.36051 (2.55)**	0.13187 (0.755)
Foreign Buyer	0.05298 (1.82)*	0.07665 (1.20)	0.06743 (0.860)
Outsider	-0.01543 (-0.637)	-0.01418 (-0.239)	-0.01673 (-0.233)
Debt absorption	-0.08372 (-1.88)*	-0.19068 (-1.77)*	-0.17597 (-1.29)
Organizational factors			
Monopoly/Oligopoly	-0.08843 (-3.32)***	-0.12468 (-1.94)*	-0.20364 (-2.41)**
Initial performance level	0.15550 (2.02)**	0.18616 (3.47)***	0.09273 (1.03)
Size	-0.01027 (-1.28)	-0.01732 (-0.888)	-0.01508 (-0.632)
Controls			
Steel	-0.117121 (-1.72)*	0.121480 (0.735)	-0.272088 (-1.24)
Mining	0.138392 (1.98)*	0.500334 (2.95)***	0.0360192 (0.155)
Petrochemical	-0.128532 (-1.92)*	0.0348975 (0.214)	-0.372479 (-1.69)*
Telecommunications	-0.0602213 (-1.09)	0.128896 (0.964)	-0.142923 (-0.745)
Electric Sector	0.0173052 (0.323)	0.252692 (1.98)*	0.165844 (0.897)
R-square	0.60602	0.477381	0.547971
N	81	80	79

Definition of the variables are in appendix.

*** 1% Significance Level; ** 5% Significance Level; * 10% Significance Level

The results indicate that there were different factors unrelated to ownership that have

significantly intervened and that the manner in which privatisation is carried out matters.

Among the political factors, the significant negative effect found for the privatisation year at which the company was privatised suggests that the government may have sold some of the firms at a period of economic recession. As predicted, this is a potential negative factor to the net effect of a firm's privatisation on profitability.

The percentage of shares sold has a positive and significant effect. That is probably not surprising, since in some firms the government was part of the control group but owned only a minority participation in the pre-privatisation phase. In those cases, the presence of private partners in the control group may have induced SOEs to a management similar to the private firm, and therefore the performance between the two periods to be more similar.

The foreign buyer dummy's is positive in all regressions but only weakly significant in the first column. Foreign participation had been noticeably scarce up until 1994 due to, among other reasons, the fact that foreign ownership was limited to no more than 40 per cent of the voting share. This is a trade-off most governments face between the efficiency objective and responding to popular and political concerns about 'selling the country away'.

The coefficient on the dummy of whether the buyer was an outsider to the business is negative although not significant in any column. Firms that went through restructuring in the form of debt absorption seem to not perform much better afterwards. The coefficient is negative in all three columns and weakly significant in the first two.

Among the organisational factors, the fact that the industry has restricted competition at the time of privatisation seems to have a negative effect on the change observed. This means that firms in competitive environment at the time of privatisation perform better after it than firms in noncompetitive ones. This result is interesting, given that in Brazil the enhancement of competition was not a top priority. For example, due to the shortage of interested buyers, there were no restrictions as to the purchase of SOEs by their main competitors, customers or suppliers, to whom the companies have special value, since purchase permits them to obtain additional monopoly yields (Pinheiro e Giambigi, 1994). In sectors like steel, fertilizers, and petrochemicals, firms were allowed to increase their market power and in some cases they were able to further vertical and horizontal integration as a result of the privatisation programme (de Souza 1999). On the other hand, although regulatory frameworks had been created for the electric sector and telecommunications, many questions about the capacity of such agencies to regulate effectively persist (International Telecommunications Union (2001) , Landau (2002)).

The firm's initial performance level turns out to be significant, so the difficulty of running or turning around a low-performing firm may have played a role in arriving at the observed effects of privatisation on profitability. The size of the firm is statistically insignificant and therefore does not seem to have an effect on the changes observed.

The main conclusion of this part is that even though private ownership may be associated with higher efficiency that is not sufficient for privatisation to increase firms' profits. The manner in which privatisation is carried out matters, given that there are factors implied by the process and different from the change in ownership, that may intervene in the observed relationship between privatisation and profitability. Probably the most interest-

ing result we obtained was the fact that oligopolies or monopolies do not perform better than competitive firms after privatisation. The Brazilian programme put little emphasis on enhancing competition through privatisation and in some sectors firms were allowed to increase their market power. Oligopolies and Monopolies have less incentive to restructure after the sale. This seems to confirm the argument that the degree of market competition has more important effects on performance than does change of ownership (Vickers and Yarrow, 1991).

6 The Net effect of Privatisation on the Public Budget.

The analysis in the previous section establishes that there is no empirical evidence of a statistically significant effect of privatisation on the average profitability of the companies in the sample.

Therefore, in what follows we will assume that the value of each company did not change because of its privatisation: the expected stream of profits under the alternative scenario (the company remaining state-owned) would have been the same as the expected future profitability under private ownership:

$$\sum_{j=0}^{\infty} \frac{(r_{i,t+j}^{PR} - r_{i,t+j}^{SOE})W_i}{(1 + \delta)^j} = 0$$

According to equation (6), and because of the equality above, the change in the Government's net worth due to sale i is:

$$\Delta GNW_{i,t} = [(B_{i,t} - V_{i,t}) - C_{i,t}] \tag{14}$$

The Brazilian Government received revenues from selling company i (B_i), paid transaction costs (C_i), and, in selling the assets to the private sector, it gave up a stream of future net profits (V_i).

From section 4, we have evidence of money left on the table as a result of low bidder participation in the auction, therefore $B_i - V_i < 0$. According to our results, the lack of more competition in the auction is estimated to account for close to 14% of the calculated true value of the firm.

The other factor we need to consider to get the overall change in the net worth of the Brazilian Government is the transaction costs in each sale (C_i). Transaction costs reflect any administrative expenses, costs of sale and enterprise restructuring.

Administrative costs are the costs of the bureaucracy responsible for the privatisation programme. At the federal level, the task of managing the programme was given to the National Bank for Economic and Social Development (BNDES) and at the state level was done by the local governments. State privatisations were in many cases an exchange for special federal loans disbursed by BNDES to help the depleted finances of the most important states.

The costs of sale are the costs of advertising, legal and other fees associated with valuation. The BNDES and the state governments selected via tender different consultancy firms to conduct the necessary studies for valuation and sale-strategy recommendations.

Finally, the government may undertake preliminary restructuring to prepare the enterprise for privatisation. Two main costs are usually present in the restructuring process. The first cost is the compensation paid to retrenched labour. A particular cost of labour retrenchment is the one associated with voluntary severance programmes (Programas de Demissões Voluntárias - PDVs), which have been instituted at the federal and state firms to encourage voluntary job separations. This was particularly common at some public utilities and state banks. Second, the government may write off outstanding loans or assume responsibility for repayment of loans to the enterprise from private creditors. The costs of loan restructuring vary. They were particularly high in the steel industry and state banks.

Table 7 shows expenses in US dollars and as a percentage of proceeds for each industry. These costs are difficult to estimate precisely and therefore for some industries the figures may be below the real value.

Table 7: Government Proceeds and Costs of Sale per industry, Brazilian Privatisations.

Sector	Total Proceeds ^a (US\$ Millions)	Expenses (US\$ Millions)	Expenses as % of Proceeds
Steel	8187.8	2775.6	33.9
Petrochemical	3701.2	56.9	1.54
Fertilizers	493.5	4.3	0.87
Minning	6863.5	118.0	1.72
Others	1305.1	69.1	5.3
Electricity	35268.1	1078.6	3.1
Telecommunications	24875.56	20.7 ^b	
Banking	7377.2	5229.7	71.3

Sources: BNDES, State Governments Accounts and authors calculations.

^aIncludes debt transferred to the private sector.

^bDoes not include the restructuring costs

The figures above clearly show that transaction costs were particularly high in the steel and banking sectors. They represent mainly financial restructuring costs associated with reducing the firms' total indebtedness (for example, by forgiving claims owed to the government itself, and/or transferring important financial obligations such as unfunded pension liabilities from the firm to the government).

It should be noted also that there are some indirect costs associated with the process. For example, since in some cases the buyers of the state enterprises have borrowed money from a government bank, this could have been done at a rate below the market rate.

We can now therefore conclude that the overall change in the net worth of the Brazilian Government, ΔGNW , was negative. First, the bidders' surplus of 14% from the lack of competition in the auctions is a clear sign of money left on the table. Bidders paid less for

the privatised assets than their net present value under privatisation. Transaction costs, although difficult to estimate precisely, add to the level of underpayment. Given that in section 5 we have shown that the average financial performance of the privatised companies did not change because of privatisation (which implies that the expected government's future tax revenues did not change as well), we have evidence that "selling the state" generated losses for the Brazilian government.

7 Summary and Conclusions

Like in many other developing countries, Brazilian privatisation policy was a response to the fiscal crises affecting the country in the 80s. Privatisation was perceived as part of the fiscal solution since it provides lump sum revenue and it frees the government from the burden of subsidising loss-making state enterprises and investing in the companies sold.

Indeed, in the short run the financial proceeds from the sales were considerable and the liquidity of public sector increased substantially. However, privatisation has long-term implications and the receipts from the programme do not of themselves indicate that the government is better off. In this paper we have analysed this question, assessing the impact of privatisation on the government net worth.

Because of the reduced number of market participants in the privatisation auctions, the government was unable to extract full market valuation from the bidders. Therefore the assets were sold at a discount, which combined with the transaction costs, indicate that the Brazilian Government's net worth was reduced by the privatisation policy. These losses could have been recovered if the private sector was able to obtain a stream of net returns higher than the government would have obtained from the privatised companies. In that case, the government could capture part of the higher returns either through a higher sale price or through increased future tax revenues from the newly-privatised firms. Results on the chapter show, however, that the average financial performance of the privatised companies did not change because of privatisation, and therefore the expected government's future tax revenues did not change as well.

Clearly one of the downsides of the Brazilian programme was the fact that the first two administrations put little emphasis on enhancing competition through privatisation. In some sectors, firms increased their market power through the acquisition of their competitors in privatisation auctions. It is argued that in competitive sectors private companies are generally more efficient than SOEs. In oligopolised sectors, however, there appear to be no significant differences. Therefore, this could be an explanation for the insignificant changes in the rates of return. Oligopolies have less incentive to restructure after the sale than firms in competitive environments. Results on the paper seem to point in this direction. On the other hand, some authors argue that a large proportion of all productive sectors in the country remain dependent on the state for investment financing and all of the important public utilities are subject to substantial regulation whose regulated prices are set by the state (Amman and Baer, 2005). Therefore, privatised firms have not become fully exposed to market forces as one might have expected.

In conclusion, the privatisation policy represented a net loss to the Brazilian government, and therefore to the taxpayers in general since they are the ultimate owners of the state-‘owned’ enterprises. Greater importance should be given to designing a privatisation programme to promote competition and maximize efficiency.

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Appendix 1.

Table A.1: Description of variables

Variables	Description
A. Section 4, Table 3:	
Price/Book Value	Price bid per share divided by the book value per share
Net Income/Sales	The four-year average of net income over total sales.
Strikes	The number of strikes experienced by the SOE in the five years before privatisation.
Size	Logarithm of the number of employees of the company
N/BV ; N^2/BV ; N^3/BV	The terms of the third degree polynomial approximation. N is the number of different groups of bidders in the auction. BV is the book value per share.
Order of Sale within the Industry	The number of companies privatised before the company in the same industry.
B. Section 5, Table 5:	
Pre-tax Profit/TotAssets	Total profits (losses) divided by total assets with both variables measured at the end of the fiscal year.
Pre-tax Profit/Sales	Total profits (losses) divided by net sales with both variables measured at the end of the fiscal year.
Pre-tax Profit/Equity	Total profits (losses) divided by stockholders' equity at the end of the fiscal year.
Regul	A dummy variable that assumes a value of 1 for regulated industries after the year the regulation agency was created

Import	Import penetration coefficient in specific tradable industry.
Size	Total assets measured in US dollars in logarithms.
C. Section 5, Table 6:	
Δ Pre-tax Prof/TotAss	The change observed in the means of total profits (losses) divided by total assets after privatisation.
Δ Pre-tax Prof/ Equity	The change observed in the means of total profits (losses) divided by stockholders' equity after privatisation.
Δ Pre-tax Prof/ Sales	The change observed in the means of total profits (losses) divided by net sales after privatisation.
Privatisation year	The year that the state owned firm was sold to the private sector.
Percentage of Shares sold	The percentage share of the firm that is sold to the private sector.
Foreign Buyer	Dummy variable equal to 1 if the main buyer was foreign.
Outsider	Dummy variable equal to 1 if the buyer is an outsider to the industry.
Debt absorption	Dummy variable equal to 1 if there was debt absorption by the government before the sale.
Monopoly/Oligopoly	Dummy variable equal to 1 if the privatisation prospectus describes the industry as either monopolistic or oligopolistic.
Initial performance level	Firm's total profits (losses) divided by total the assets, net sales or equity (depending on regression) with the variables measured at privatisation date.
Size	Logarithm of Total assets measured in US dollars.
