CHAPTER 9

The Privatization of Firms

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1 Introduction

Privatization reforms are one of the most controversial policies of the last century. Given the large amounts of money involved, the different interests of buyers and sellers, and the numerous ways in which the sales have been implemented, the controversies and focus of attention are easy to understand. Since at least the 1990s, a large literature in economics has devoted significant efforts to evaluate the effects that these reforms have had on firms. Early work focused mostly on how firm-level measures of productivity such as sales and employment changed after privatization (e.g. La Porta & Lopez-de-Silanes, 1999), but more recent research has expanded the areas of potential impacts and began to document how the sales themselves have been usually plagued by corruption and irregularities (e.g. Fisman & Wang, 2015). The sale of state-owned firms during the

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Pinochet regime in Chile (1973–1990) has also been the focus of significant attention for reasons that are similar to that of other countries. More than 30 years have transpired, but the process in Chile is still highly debated among political commentators, policymakers, and researchers.

This chapter summarizes what we know about the sales, their impacts, and provides new evidence that incorporates insights from the earlier and newer literatures. The sale of firms during the Pinochet years were part of a broader package of radical changes which aimed to reduce the role of the state in the economy, to promote the role of markets in the allocation of resources, and to improve efficiency by relying significantly more in the skills of the private sector. The first wave of sales began in the year after the 1973 coup and ended shortly before an economic crisis hit the country in 1982. The second wave of sales was led by a renewed economic team and took place between 1984 and 1989. Beyond efficiency arguments largely grounded on beliefs about the incentives of private ownership, privatizations also aimed at signalling Chile's economic model to decrease uncertainty and increase economic activity. Overall, almost four hundred state-owned firms were sold, and both waves were systematically accompanied by rapid economic growth.

We begin this chapter by describing the sales of state-owned firms during the dictatorship years together with the main goals and motivations that triggered the process. We then discuss previous (mostly short run) evaluations from the 1990s and emphasize the difficulties in aggregating the wide variety of outcomes that have been examined into a general evaluation of the reform. Our review of the literature reveals that privatization seems to be positively associated with firm performance in Chile. However, the methods used for these evaluations suffer from significant flaws that prevent solid conclusions. The most prevalent problem is that previous work cannot credibly isolate the impact of the privatization process from the impact of other reforms that were taking place at the same time. Beyond the positive impacts on firms, we also review a more recent literature that emphasizes how the sales contributed to the renovation of business elites and to, likely, misallocation of resources grounded on pervasive links between firms and politicians.

We then provide novel evidence of the effect that privatization had on firm-level investment and average returns. We measure investment and monetary returns for 141 firms over a period of eight years using annual reports independently collected. Investment rates measure the entrepreneurial activities of firms, while returns measure the average performance of all investment projects. Firms with many stockholders or listed in the stock market were mandated to annually report balance sheets and income statements to a regulatory agency. We collected these reports from the library of the agency and digitized information about investment, earnings, debt, and assets. We use firm-level information before and after the privatization of 21 firms in our data, two times the number of firms in early studies. In contrast to the majority of previous work, we study privatized firms using information from non-privatized firms as comparison group. Using a comparison group allows us to isolate the effect of the privatization reform from other changes taking place at the same time which likely affected firms. A prominent example was the trade liberalization process. We track the evolution of investment and average returns among privatized and non-privatized firms using a synthetic control method, which guarantees that we are comparing firms that were observationally similar before their privatization process began.

By comparing firms over a period of eight years, we offer two new results that speak to the economic effect of privatization on firms. First, after being privatized, firms increased their investment and their average returns decreased. We argue that marginal investments likely had lower returns than previous investments, pushing average returns downwards. Second, more competitive privatization processes drive the higher investment and pushed returns upwards. Motivated by the usual controversies around privatization, and using data from previous work for the Chilean case (González et al., 2020), we argue that the sale of firms at relatively low prices to buyers who collaborated with the dictatorship was the outcome of less competitive privatization processes. In fact, less competitive privatization had lower average returns than non-privatized firms. Overall, our findings suggest that introducing competition to the sale of state-owned firms increases both investment and returns. We conclude that privatization brought economic gains for firms, but gains could have been higher if the process would have been more competitive.

We contribute to the existing literature evaluating Pinochet's privatizations by bridging two sets of results, namely the lack of transparency in the sales and the positive impact of private ownership on firm-level productivity. By using a comparison group of firms affected by reforms different from privatization, we are able to credibly document the positive impact of private ownership on investment and add nuance to the impact on firm-level returns. Marginal projects are likely to have lower returns than existing ones and thus measures of average returns need to be interpreted accordingly. In addition, by using measures related to the different modes of privatization, we are able to show that reform had the largest positive impacts on firms when the sale was implemented through a relatively more competitive process. The latter result is consistent with part of the early literature which uses firm-level data with clear comparison groups, to show that privatization has different effects on performance depending on if the firm is sold to outsiders (insiders) or domestic (foreign) owners (Frydman et al., 1999; Estrin et al., 2009).

2 The Two Waves of Privatization

In the words of Hernan Büchi, Minister of Finance between 1985 and 1989, the sale of state-owned firms was part of a large package of reforms to introduce "radical transformation of the country's economy" (Büchi, 2006). At the time, privatization reforms were popular around the world and were being heavily promoted by major international institutions such as the World Bank and the International Monetary Fund (Marcel, 1989). Besides the privatization reform, the military regime also promoted trade openness by lowering tariffs, installed a market-oriented system in education, privatized the pension system, and implemented important reforms to the health system. Figure 9.1 represents a schematic view of the intensity of reforms and distortions in the economy during the Pinochet years, as viewed by the Minister of Finance in 1982–1983.

The rationale for pushing markets and privately owned firms was simple. State-ownership was thought to be associated with low productivity and inefficient processes that were corrupted by political incentives. The sale of state-owned firms would then ultimately help the country to grow faster, achieve full employment, and eliminate extreme poverty (Lüders, 1991). The privatization of state-owned firms was then implemented in two waves, one beginning in 1974 and another one after the 1982–1983 crisis. The rapid economic growth after both waves of sales has likely contributed to a widespread positive economic assessment of the sales. However, the privatization of firms was implemented at the same time that of other large reforms (e.g. trade openness) and has also been surrounded by controversies, particularly after the return to democracy. We first describe the two waves of privatizations to then briefly discuss the existing debates around the sales.

More than 700 firms were privatized by the Pinochet dictatorship. Approximately half of these firms were in the process of being nationalized and thus were simply returned to previous owners (Meller, 1993). The

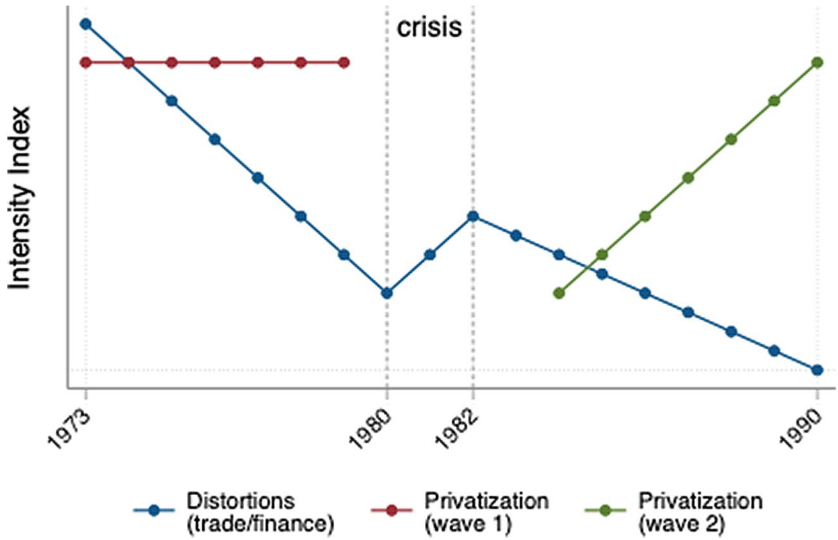


Fig. 9.1 Privatization reform and market distortions. Notes: Own construction based on a similar schematic figure in Lüders (1993, Chart 1). Higher values in the y-axis represent more distortions or higher intensity of the privatization reform

first wave of sales of the remaining firms began in 1974. This process was characterized by the privatization of companies that were nationalized during the previous socialist government of Salvador Allende (1970–1973). The main goal was to increase revenues to finance the public sector deficit (Lüders, 1991). More than 400 firms were sold (or returned to previous owners) between 1973 and 1979. Unprecedented economic growth took place almost at the same time that this first wave of privatization. The country grew at an average of 4.4% per year between 1975 and 1981. Yet many other reforms were implemented during this time period, most notably a reduction of tariffs to a flat 10%, which prevents us from concluding that these early privatizations were responsible for the higher economic growth. The first part of the process did not end well, as in response to a large economic crisis in 1982, the state returned to controlling many companies with the goal of managing the spread of the crisis. As a result of the crisis, tariffs also increased from 10 to 35%, exemplifying the coordination of reforms that complicates policy evaluations (see Fig. 9.1).

The second wave of privatizations began in the mid-1980s, and it was the largest and most controversial of both waves of sales. At the time, the economic conditions were poor, with high unemployment (16%) and inflation (13%). The process involved state-controlled firms in crucial sectors of the economy (e.g. energy), firms in the financial sector, firms controlled indirectly by the state, and traditional state-owned firms (Larroulet Vignau, 1994; Vergara, 1996). The renewed economic team of the Pinochet regime promoted a structural adjustment that included the sale of traditional public firms (e.g. CHILECTRA, ENDESA, LAN, CAP). Most of these firms emerged during the development strategy of import-substitution during the 1940s–1950s, were considered relatively productive, and had been promoted by governments of all political leanings in the preceding decades (Marcel, 1989).

For this second wave of sales, the new Minister of Finance (Hernan Büchi) had three goals: (i) return to balanced macroeconomic accounts by implementing a devaluation and a floating exchange rate, (ii) reduce economic uncertainty by being clear about the nature of the Chilean economy, i.e., a market-oriented economy open to international markets, and (iii) improve long-run determinants of economic growth such as savings with the use of a tax reform. To gather broad support for the sales of state-owned firms, the privatization reform was promoted as "popular capitalism" that aimed to transform everyday Chileans into owners of firms (Valenzuela, 1989).

When the sales were completed, the state had control of 12% of the gross domestic product, a significant decrease from the previous 26%. Once again, unprecedented economic growth took place almost at the same time that the wave of privatizations, with an annual average growth rate of 6% between 1985 and 1993. Moreover, unemployment decreased to 5% and inflation was controlled in single-digit levels. In contrast to the use of auctions during the first wave, the second was characterized by many divestiture modes (Lüders, 1991), including an active role for the new pension fund administrators (AFP), entities that participated in 25% of the sales (Hachette & Lüders, 1992).

3 Previous Evaluations

In this section, we discuss previous evaluations of the privatizations of the Pinochet regime. We begin by reviewing studies that focus on the implementation of the sales. The methods used for privatization, who the buyers were, and the prices paid for the state-owned firms are the focus of that work. Then, we discuss some of the classic studies documenting the effect that privatization had on firms and the Chilean economy. Overall, the evidence shows that the sales lacked transparency and had both positive and negative effects on firms and the economy.[1]

3.1 The Implementation of the Sales

Beyond the fact that the privatization reform was decided and implemented by a dictatorial regime, there have been persistent allegations about the institutional rules that regulated the sales of public firms and the methods of privatization. A special commission called by the Congress of Chile produced an influential report after the return to democracy in 1990 which concluded that the privatizations of the Pinochet regime were plagued by irregularities (Congress Report, 2004). In a nutshell, the sales were regulated by inconsistent rules, and information about the sales was consistently lacking, which likely led to some firms being sold under-priced to specific buyers. The under-pricing implies that the sales were a transfer of wealth from the state to the private sector.

The implementation of the sales can be divided in three parts: (1) the method used for the privatization, (2) who the potential buyers were, and (3) the price paid for public firms. The price is an equilibrium outcome that depends on the method used for the sale and the number of potential buyers. The controversy around the methods used for privatization is fairly simple. In practice, state-owned firms were sold using a wide variety of methods without clear rules regulating how the method was actually chosen. Sometimes firms were sold by offering packages of shares, sometimes there was one package that included all the shares, some sales used open auctions, others allowed bids only from pre-qualified buyers, and some buyers were sometimes allowed to use debt equity swaps. Hachette et al. (1993) provides details about the methods used in the sale of five state-owned companies, showing the many types of sales. Importantly, both information at the time of the sales and documentation of the process (e.g. bids) have been consistently lacking. Simply put, the process

[1] Hachette and Lüders (1992) provide a relatively positive review of the privatization reform during the Pinochet regime, Huneeus (2006) a more critical review of the process with a focus on Pension Fund Administrators and the case of the electricity industry, and Hachette (2000) provides a summary of the early studies evaluating the reform.

lacked transparency, as discussed by Hachette (2000, p. 139) and succinctly mentioned by Hachette and Lüders (1992, p. 241): "A notable negative aspect was the lack of transparency in the majority of the privatizations."

Who the buyers were has also sparked significant controversy. There were three types of potential buyers. First, the newly created Public Fund Administrators (AFP), who had acquired 25% of shares by the time of the transition to democracy in 1990. Second, workers of the same company were allowed to buy shares and received a number of financial incentives (with limited risk) to buy between 5% and 10% of the company where they worked. And third, domestic and foreign investors, including the general public. Foreign investors acquired shares through open auctions (e.g. CTC, IANSA, LAN). The fact that some collaborators of the Pinochet regime, including his son-in-law, were able to buy large shares of strategic companies, and became millionaires in the process, has certainly fuelled some of the controversies (Mönckeberg, 2001).

And last, many of the existing researches have expressed concern about the prices paid for the public firms. Although estimating if prices indeed reflected the market value of firms at the time of the sale is difficult, different methods and investigations have systematically pointed in that direction. Popular methods include analysis of book values, stock exchange valuations, and estimations using the present value of cash flows. The details and case-by-case studies can be found in the Congress Report (2004). Early studies attempted to calculate the implicit subsidies in the sales, which ranged from 30% among reprivatized banks and firms to 50–60% among the 12 largest public firms (Foxley, 1982; Marcel, 1989). Why were some firms sold at a relatively low price? Sale prices are likely the result of the method used for privatization, which affects both who the potential buyers of the firm and how much competition there is among potential buyers. There is evidence that buyers who previously worked for the Pinochet regime bought firms at relatively lower prices than other buyers (González et al., 2020).

3.2 The Effects of Private Ownership

An evaluation of the privatization of firms under Pinochet requires at least a clear objective and a method.[2] Given that the main goal was to increase the efficiency of firms, it seems reasonable to study changes in measures of productivity of newly privatized firms.[3] The main problem with most existing evaluations is that firm-level outcomes are likely to be affected by other reforms that were implemented at the same time that the privatization of firms. Simply put, if we observe that the productivity of a firm increases after privatization, we cannot be sure if that increase was caused by the change in ownership or by some other policy that took place at the same time. The most prominent of these other policies is the trade liberalization, which co-moved with both waves of privatization (Ffrench-Davis, 2018).

The challenges associated to evaluating the privatization of firms have not prevented researchers from studying numerous potential impacts. We distinguish between two types of evaluations. A first group of studies emphasizes the positive effects of the reform. The productivity of firms is consistently found to have increased after the change in ownership across numerous industries. For example, Hachette and Lüders (1992) and Meller (1993) study 10–12 recently privatized firms from the second wave and conclude that privatization led to higher economic returns and more employment. Similarly, Larroulet Vignau (1994) shows an increase in investment among telephone companies after their privatization. In terms of state revenues, researchers have shown that the sales increased revenues by approximately 10% (Cifuentes, 1993). Most of these early studies were conducted shortly after the dictatorship and thus represent relatively short-run effects. Long-run estimates of privatization on the productivity of firms are surprisingly limited. In an evaluation of privatization of public services, Fischer and Serra (2004) found that the change of ownership is associated with higher productivity, investment, and coverage of services.

[2] We only consider work evaluating the effect of the privatization reform. That is, we do not review works that reflect on the sales being the foundation for the permanent installation of a market-based society that seeks to move away from the entrepreneurial state that dominated the Chilean economy in previous decades.

[3] Economists refer to productivity as an input in the production process that is different from physical (machines) or human (workers) capital. If firms *A* and *B* produce the same good or service, have the same number of workers and machines, and firm *A* produces more output than *B*, then economists say that firm *A* has higher productivity.

In terms of methods, all of these studies compare firm-level measures before and after the change in ownership without the use of comparison group. Notable exceptions include Fischer et al. (2005), which compares 37 privatized firms with other firms in the same sector and found privatized firms increased their efficiency as much as other firms but did enjoy higher profitability, and Maquieira and Zurita (1996), who use data for other firms to account for market conditions and found attenuated positive impacts of the reform.

The generally positive assessments of the reform are far from the only evaluation of the process. As previously mentioned, some investigations have pointed to the lack of competition in the sales, which likely shaped the impacts of the reform. In that sense, the privatization reform could have led to even higher productivity gains, collected more revenues, and created more positive expectations if the sales would have been implemented with more transparency and more competitive methods. The next section provides evidence that supports this interpretation.

A second line of research goes beyond firm-level measures of productivity to provide another view of how privatized firms impacted the Chilean economy. One of these studies shows that the combination of sales in the 1980s and a large economic crisis in 1982 allowed existing businesspeople to acquire important firms in strategic industries, facilitating the formation of powerful business groups managing clusters of companies (Aldunate et al., 2020). This relatively more recent work uses firm-level data to show that the second wave of privatization enabled the creation of new business groups that nowadays remain the most relevant actors in the country's economy. Crucially, previously leading business groups had been crashed by the 1982 economic crisis, facilitating the process of replacement of economic elites (Yotopoulos, 1989; Islas-Rojas, 2015). Recent work has also shown how Pinochet's privatizations helped to create pervasive links between firms and politicians (González et al., 2020). Firms involved in the privatization reform of the Pinochet regime disproportionally participated in the campaign finance of aspiring politicians, and routinely hired recent incumbent politicians to work in their boards. These public-private interactions represent an active revolving door between politicians and privatized firms that has been shown to lead to inefficient allocation of resources in the economy (e.g. Bertrand et al., 2018). Moreover, the board members of these firms were also found to be engaging in tax avoidance as revealed by the recent Panama Papers. Given the distortions associated to links between firms and politicians, and the lower state revenues due to tax avoidance, those results point towards a negative impact of privatizations on the functioning of Chilean democracy after 1990.

3.3 Discussion of Other Effects

The privatizations of the Pinochet regime have also been associated with developments in the capital markets, savings, economic growth, and expectations about the economy. Hachette and Lüders (1992, Chapter IV) provide a great summary of the discussion around capital markets and savings. The direction of causality is two-way, as the sales can be useful to fuel capital markets and economic growth, at the same time capital markets can facilitate or hinder the process of privatization. Savings can also be affected by the large amounts of money involved in the transactions, potentially leading to higher investment and subsequent economic growth, as some have hypothesized happened during the second wave. The privatization reform has also been argued to have contributed to improve economic expectations by "clarifying the economic rules of the game" to attract foreign investment, to activate the financial sector, and to strengthen capital markets (Larroulet Vignau, 1994). Unfortunately, given the difficulties in firmly connecting microeconomic changes with macroeconomic aggregates, the evidence regarding these relationships is mostly discursive, and rigorous empirical analyses are notably absent.

There are also many conjectures regarding other, potentially hidden, objectives behind the sale of state-owned firms. Perhaps the most recurrent one is the extent to which the Pinochet dictatorship saw the transfer of property from the state to the private sector as a strategy to gather political support on the eve of the 1988 referendum (Huneeus, 2006). Dictators usually aim to build strong political support by making transfers to certain groups in society with the goal of staying in power a prolonged period of time (Bueno de Mesquita et al., 2003). Political support for the upcoming election was something that the dictatorship certainly sought through many channels. Examples include support from women enrolled in female organizations and people affiliated to religious groups (Esberg, 2020; González et al., 2024). Yet the extent to which the privatization of firms served this purpose remains to be evaluated rigorously.

Overall, the sale of state-owned firms was plagued by controversies related to its implementation, and the existing evidence suggests that the change in ownership increased the productivity of firms, incentivized the replacement of business elites, increased government revenues in the short run, created a revolving door between politicians and firms, and clarified the rules that were to govern the Chilean economy. Some of these effects likely had a positive effect in the functioning of the newly created market economy, while others probably introduced distortions that hindered economic growth. A comprehensive empirical evaluation of the reform is still missing to firmly conclude if the sales had a net positive or negative effect in the economy.

4 Tracking Privatized Firms

We track firms before and after privatization using official annual reports submitted to a regulatory agency. These reports provide us with valuable information about firms that we can use to later study the effect of privatization on investment and returns. We first describe the data and then offer a methodology that compares different types of firms to learn about the impact of privatization.

4.1 Data from Firm Reports

We collected annual data for 141 firms that operated during the Pinochet dictatorship. At the time, a firm was mandated to produce an annual report with its balance sheet and income statement if listed in the stock market or had more than five hundred stockholders. A regulatory agency was in charge of collecting these annual reports, which we gathered directly from their library and digitized to analyse with quantitative and qualitative methods. These reports allow us to measure key characteristics of firms, such as their assets and debt. We also observe the name of owners, board members, and managers. In previous research, we showed that we can successfully classified firms as being politically connected if board members had worked for the Pinochet dictatorship (González & Prem, 2018, 2020; González et al., 2020; Aldunate et al., 2020). Crucially for the purpose of our analysis in this chapter, after comparing the list of firms in our data with the official list of firms privatized by Pinochet, we found that 21 of them were privatized during the dictatorship.[4]

To characterize the 21 privatization processes that we can track with our data, we rely on our previous work. In González et al. (2020), we use a two-dimensional quantitative analysis to distinguish between different

[4] For this chapter, we restrict attention to all firms which submitted reports to the regulatory agency for at least three years before and five years after their corresponding privatization to analyze the effect of the reform on firms.

types of privatization processes. Based on the literature that studies privatization, we decided to characterize these reforms by studying the relative price paid for the state-owned firm and the identity of the buyer. The former compares the price paid per share with book values, although the measure is similar when using alternative benchmarks such as present values of projected cash flows or existing estimates of firm values conducted by international auditors. The latter studies whether the buyer worked for the Pinochet regime before the corresponding privatization process. That is, for each privatization we constructed a measure of under-pricing and buyer identity. Additional analysis reveals a group of state-owned firms that were sold relatively under-priced to Pinochet's collaborators. We label these processes as relatively less competitive. We observe 8 less competitive privatizations, leaving us with 13 more competitive ones.

Table 9.1 provides descriptive statistics for firms in our final dataset. We first focus on privatized firms in columns 1–3 and leave the discussion of non-privatized ones in column 4 for the next section. We present the average and standard deviation (in parenthesis) for firms during the Pinochet dictatorship. In columns 1 to 3, the statistics are computed the year before the corresponding privatization process. Column 1 uses all 21 privatized firms in our data while columns 2–3 split the sample of privatized firms into less and more competitive processes. The average privatized firm had a return over assets of 2% before being privatized, invested 1% of their total assets in physical capital, had a 43% of leverage (measure of indebtness), was established almost 50 years before the second wave of privatization, and operated mostly in the manufacturing (secondary) sector. When comparing privatized firms across types of processes, we mainly observed that less competitive privatizations had higher returns, were larger, relied less on debt, were established more recently, and operated relatively more in services (tertiary) and extractive (primary) sectors and less in manufacturing.

4.2 Construction of a Counterfactual

We estimate the effect of privatization on firm-level returns and investment using a control group of companies which also operated under dictatorship but were never privatized by Pinochet. The use of a comparison group is nowadays a standard practice when evaluating the impact of reforms. Having a comparison group is a powerful tool to account for contextual factors that take place at the same time that the reform of interest. A leading example in the case of Chile is the trade liberalization, which

Table 9.1 Descriptive statistics of firms

Privatization type	*Privatized firms before their privatization process*			
	All	*Less competitive*	*More competitive*	*Non-privatized firms (always private)*
	(1)	*(2)*	*(3)*	*(4)*
Return over assets (ROA)	0.02	0.04	0.01	0.01
	(0.05)	(0.04)	(0.05)	(0.07)
Investment in physical capital	0.01	0.06	−0.02	−0.01
	(0.29)	(0.10)	(0.38)	(0.30)
Log total assets	18.60	19.59	17.91	15.34
	(1.55)	(1.00)	(1.48)	(2.30)
Liquidity	0.28	0.31	0.25	0.30
	(0.20)	(0.22)	(0.18)	(0.26)
Leverage	0.43	0.39	0.46	0.46
	(0.24)	(0.18)	(0.27)	(0.56)
Year of foundation	1937	1951	1927	1941
	(34)	(19)	(39)	(28)
Indicator primary sector	0.10	0.13	0.09	0.24
	(0.31)	(0.34)	(0.28)	(0.43)
Indicator secondary sector	0.74	0.63	0.83	0.41
	(0.44)	(0.49)	(0.38)	(0.49)
Indicator tertiary sector	0.15	0.25	0.09	0.32
	(0.36)	(0.44)	(0.28)	(0.47)
Firms	21	8	13	120

Notes: This table presents the average and standard deviation (in parenthesis) for firms during the Pinochet dictatorship. In columns 1 to 3, the statistics are computed the year before the corresponding privatization year. In column 4, we compute statistics in the 1979–1988 period. Column 1 uses all privatized firms that meet the inclusion criteria. Columns 2–3 split the sample of privatized firms into less and more competitive privatization processes. We define a privatization process as being less competitive if the firm was sold relatively under-priced to a collaborator of the Pinochet dictatorship. We classify all remaining processes as more competitive. Column 4 presents descriptive statistics for firms that were private throughout the period of analysis happened simultaneously to the privatization process. Most previous evaluations of Pinochet's privatization reform simply compare outcomes of interest before and after the reform without having a comparison group. If the outcome improved after the reform, then those evaluations concluded that the reform had positive impacts. The problem with this conclusion is that the privatization reform happened at the same time that other reforms such as lower trade tariffs, and it is thus hard to disentangle the effect of privatization from other policies such as the trade liberalization, a difficulty exposed early on by Yotopoulos (1989). By having a comparison group of firms that were also affected by the trade liberalization but not by the privatization wave, we can isolate the impact of the reform of interest.

We propose to use non-privatized firms as the comparison group to evaluate the direct impact of privatization on firms. We observe 121 of such firms in our dataset. The availability of this comparison group is a significant step forward from previous research, but it still has some limitations. Ideally, we would like to compare newly privatized firms with state-owned firms that could have been privatized but were not. Unfortunately, we do not observe such firms in our dataset. The construction of a dataset with such characteristics would be improvement over existing research. Thus, we are left with firms that were private throughout the period of analysis. Given that our interest is on *changes* in firm-level outcomes, the comparison is still informative about what would have happened to state-owned firms had these not been privatized by the Pinochet dictatorship. Column 4 in Table 9.1 offers descriptive statistics for this comparison group of firms. In this case, we compute the mean and standard deviation for the 1979–1988 period. In all, when compared to privatized firms, we observe that non-privatized firms had similar returns, were slightly smaller, and were more likely to operate in the manufacturing (primary) and services (tertiary) sectors.

Once the comparison group is defined, we need to choose a methodology that uses the information from privatized and non-privatized firms efficiently to estimate the effect of privatization. A naïve estimation would simply take the average of an outcome of interest (e.g. investment rate) across privatized firms after privatization and compare it to the average of the same outcome across non-privatized firms. We can, however, perform better comparisons across firms by using what is known as *synthetic control method* (Abadie, 2021). This methodology constructs a counterfactual outcome for each of the 21 privatized firms in our data by efficiently selecting a combination of firms in the control group. This selection is done by an algorithm which essentially finds a linear combination of firms in the control group that is identical to the privatized firm in the pre-privatization period. For example, the algorithm could determine that privatized firm *A* has identical investment rate *before* privatization that a combination of 50% of non-privatized firm *j*, 25% of non-privatized firm *k*, and 25% of non-privatized firm *l*. Then, to estimate how would investment had been in firm *A* in the absence of privatization, we simply calculate the counterfactual investment rate using the weights calculated by the algorithm (50, 25, and 25%) among firms *j*, *k*, *l* but now in the period *after* firm A was privatized.

We apply the synthetic control methodology twice to each of the 21 privatized firms in our data, for a total of 42 estimation procedures. The first time, we use the method to study how privatization changed the investment rate of a firm. We define the *investment rate* as the ratio of the change in physical capital across quarters over assets, both in standardized monetary units. Prominent examples of physical capital include land and buildings. The second time, we estimate the effect of privatization on the average monetary returns of firms. We define *average returns* as total earnings (before interests, depreciation, and amortization) over assets. Investment rates measure the entrepreneurial activities of the firm and average returns measure the performance of all investment projects. We calculate average outcomes across privatized firms and their corresponding comparison 12 quarters before and 20 quarters after privatization. The difference in outcomes between the two groups after privatization can be interpreted as the impact of privatization. Therefore, we provide estimates for the impact of privatization for up to five years after the sale was completed.[5]

5 The Effect of Privatization on Firms

We begin by showing that the privatization reform triggered higher investment with lower average returns among firms sold to the private sector. We then show that these average changes among firms participating in the process mask significant differences depending on who bought the firm.

[5] To facilitate the reading of the chapter, we leave formal statistical details about the performance of the synthetic control algorithm, the inference procedures, and further robustness checks as available upon request.

5.1 Investment and Returns

We find that investment *increased*, and returns *decreased* after firms were privatized by the Pinochet regime. The higher investment is notoriously large and persistent, while the lower returns are more volatile. While the former is relatively aligned with previous evaluations, the latter is perhaps a more surprising result. Allow us to first discuss each of these results in more detail to then clarify the limitations and offer a simple economic interpretation that rationalizes these findings.

Panel (a) in Fig. 9.2 shows that investment in physical capital increased markedly after privatization. All firms in our data had an average investment of 5% per quarter before privatization. One year after the sale, previously state-owned firms began to increase their investment significantly. Three years after, privatized firms were investing three times more (15%), while investment in other firms was slowly decaying. The decoupling of investment trends across firms remains large even five years after privatization. Panel (c) in Fig. 9.2 presents the same result but now subtracting both trends to show the simple difference in investment across firms. Privatized and non-privatized firms were investing similarly in the quarters before privatization, as the synthetic control method guarantees by construction, which implies that the new ownership structure is the most likely driver of the higher investment after privatization. Quantitatively, we estimate that recently privatized firms invest 7 percentage points more than other firms.

While investment thrived after a firm was privatized, average returns seem to have slightly decreased. Panel (a) in Fig. 9.2 shows that, after the sale, returns were higher in firms that were *not* privatized. Before privatization, all firms had an average return over assets of 3%. One year after privatization, these firm-level returns increased for all firms but increased by more in the set of firms that were *not* privatized. While returns were approximately 4% among privatized firms, the same number was closer to 6% in other firms in the period after privatization. These trends represent the textbook example of why having a comparison group is important. Without the comparison firms, we would observe that state-owned firms increased their average returns from 3% to 4% after being sold to the private sector. The inclusion of the comparison firms, which experience an increase in their returns from 3% to 6%, clarifies that factors different from the privatization reform are likely the main explanation for the higher

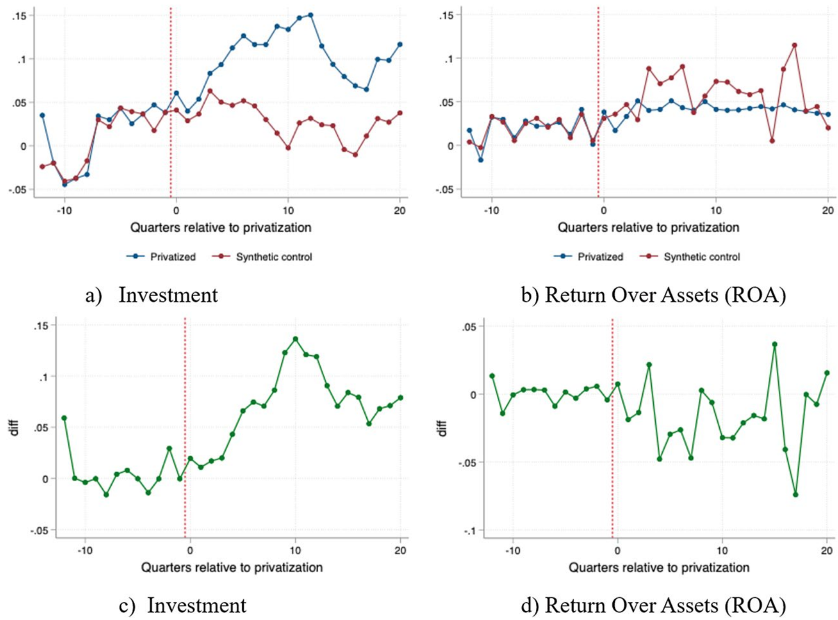


Fig. 9.2 Privatizations, ROA, and Investment. (**a**) Investment, (**b**) Return Over Assets (ROA), (**c**) Investment, and (**d**) Return Over Assets (ROA). Notes: This figure presents the synthetic control estimates for investment and ROA for privatized firms as compared to always-private firms. Panels (**a**) and (**b**) present the series for both treated and synthetic controls, while panels (**c**) and (**d**) present the difference between the two series. The synthetic control was constructed using the outcome variable in the 6 quarters before the time of privatization. The average difference in the post period is 0.074 in panel (**c**), while −0.017 in panel (**d**). Investment is defined as the one-year change in fixed capital and ROA as EBITDA over total assets

returns. A leading example is the changing trade policy and the transition to democracy, both of which likely increased the returns of all firms.

A simple economic framework can explain the higher investment with lower average returns among privatized firms. We focus on *average* returns, which means that we observe one performance metric for many investments. If firms invest in projects with higher returns first, then the higher investment that we observe after privatization is likely to be materialized in projects that have relatively low returns when compared to others the firm has already invested in. That is, our results suggest that marginal investments triggered by a privatization have relatively lower returns.

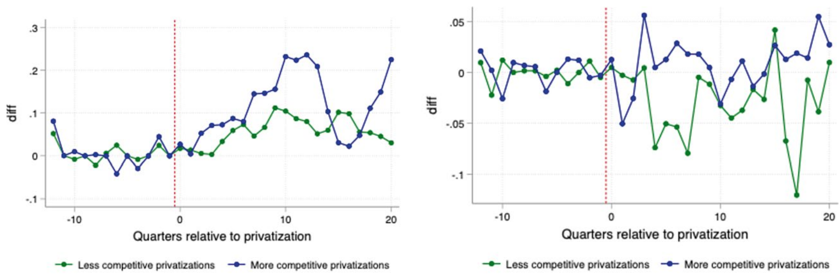
5.2 *Different Types of Privatizations*

The sale of state-owned firms has been plagued by controversies in privatization processes around the world. In theory, if the state is maximizing revenues, state-owned firms should be sold to whoever is willing to pay the most. To identify who is willing to pay the most, a process with clear rules should be put in place with the goal of making potential buyers compete to acquire the firms being sold by the state. A leading example of a process with clear rules is a competitive auction. To incentivize competition, information about the sale should be provided to all potential buyers for each one of them decides to participate and make a bid for the corresponding company.

In practice, privatization reforms can differ from the ideal theoretical benchmark for several reasons. Let us distinguish between the *process* and the *outcomes*. The process involves both the rules that regulate the sale, and the amount of information provided to potential buyers. We consider the outcomes of the sale to be largely determined by the process. The most common outcomes that researchers have studied to analyse these sales are two: (1) a standardized measure of the price paid for the state-owned company, and (2) the identity of the buyers. These metrics reveal meaningful information about the goals of the seller. In the case of Chile, an investigation conducted by the Congress in the 1990s found irregularities in the process through which firms were sold (Congress Report, 2004). Moreover, in previous work we show that a group of firms was sold relatively under-priced to buyers who previously worked for the Pinochet dictatorship (González et al., 2020). We now examine how previous results differ among these firms.

Operationally, we repeat our previous analysis using the synthetic control method but now performing two comparisons instead of one. The first compares investment and returns across non-privatized firms and eight firms sold under-priced to buyers who worked for the Pinochet dictatorship. The second compares the same outcomes across non-privatized firms and the remaining 22 firms privatized by Pinochet. The latter comparison reveals the effect of relatively competitive privatization on firms. The latter reveals the same effect but in the case of relatively less competitive sales. The results in the previous section were an average of these two comparisons.

We find that all privatized firms increased their investment when compared to other non-privatized firms during the same period. Panel (a) in Fig. 9.3 presents the relevant comparisons. However, we observe remarkable differences in terms of magnitude. Previously, we showed that privatized firms tripled their investment from 5% to 15%. Panel (a) in Fig. 9.3 shows that most of the increase is driven by competitive privatizations, which exhibit an investment rate that is double the size of less competitive privatizations: 12 versus 6 percentage points on average in the period after the sale. That is, the patterns in the data suggest that introducing competition to privatization reforms leads to higher investment. We also observe that competitive privatizations display significantly higher returns than less competitive ones. Panel (b) in Fig. 9.3 presents these results. Firms privatized in competitive processes outperform non-privatized firms by 1 percentage point, effectively increasing *average* returns from 4% to 5%. That is, the marginal investments made by these firms had higher returns than previous ones. In contrast, firms privatized in less competitive processes



a) Investment b) Return Over Assets (ROA)

Fig. 9.3 Different types of privatizations. (**a**) Investment and (**b**) Return Over Assets (ROA). Notes: This figure presents the synthetic control estimates for investment and ROA for corruptly and non-corruptly privatized firms as compared to always-private firms. Both panels present the difference between the treated and the synthetic controls for both types of firms. The synthetic control was constructed using the outcome variable in the 6 quarters before the time of privatization. The average difference in the post period is 0.058 for corrupt privatizations and 0.120 for the non-corrupt ones in panel (**a**), while −0.031 for corrupt privatizations and 0.009 for the non-corrupt ones in panel (**b**). Investment is defined as the one-year change in fixed capital and ROA as EBITDA over total assets had average returns that were 3 percentage points lower than non-privatize firms.

Overall, the patterns in investment and returns over assets across firms in Fig. 9.3 suggest that introducing competition in privatization reforms increases investment and improves returns. Therefore, even if the privatization reform was economically positive for firms, the lack of competition and irregularities in the process likely led to lower investment rates and lower returns.

5.3 Economic Policy Uncertainty

Is the higher firm-level investment among newly privatized firms explained by more certainty about the rules of the game in the country? If the privatization reform helped to "clarify the rules of the game" as some researchers have suggested (Larroulet Vignau, 1994), then the higher investment could have followed naturally and explain some of the previous findings. We propose to investigate this possibility by studying trends in an index of economic policy uncertainty, country-level data originally constructed by Ahir et al. (2022). In particular, we focus on their World Uncertainty Index (WUI), a measure based on counts of uncertainty-related words in Economist Intelligence Unit (EIU) country reports. These data cover 143 countries across the world from the 1950s until 2020. The WUI is normalized by the total number of words in the corresponding report and rescaled in such a way that a higher number means higher uncertainty.

We used yearly data from 1980 until 1994, dropped countries with at least one missing observation, and obtained a balanced dataset of uncertainty measures for 122 countries (N = 1830). To the extent that the WUI measure is correlated with perceptions about the rules of the game, the following analysis sheds light on the question whether privatizations provided information about the institutional framework. We interpret lower values in the uncertainty index as clearer rules of the game. We compare the trends in Chile with a weighted average of countries (synthetic control) that had similar levels of uncertainty in the early 1980s. To construct the synthetic control, we consider the first treatment year to be 1988, the year of the election that revealed the transition to democracy. This is, we construct the synthetic control using values of the WUI in all years before the election year, i.e. 1980–1987. Our interest is on changes in uncertainty in the election year (1988) and after the transition to democracy (1989–1994).

Figure 9.4 presents results. We observe three clear patterns. First, economic policy uncertainty in Chile increased during most of the second wave of privatizations (1984–1989). That is, the rules of the game did not seem to become clearer during the years of the sales, at the least to the eyers of economic experts. If anything, there was increasingly more uncertainty about economic policy during those years. Second, there is a larger increase in uncertainty in the year of the plebiscite (1988), which we interpret as key because the electoral result would reveal the type of future policies that would be implemented. And third, there is an immediate decrease in uncertainty after the plebiscite revealed that there would be a transition to democracy (1989–1994). These aggregate patterns cannot be explained by international events, because the synthetic control reveals that economic policy uncertainty *increased* in other countries from 1988 onwards. Overall, Fig. 9.4 strongly suggests that it was the transition to democracy

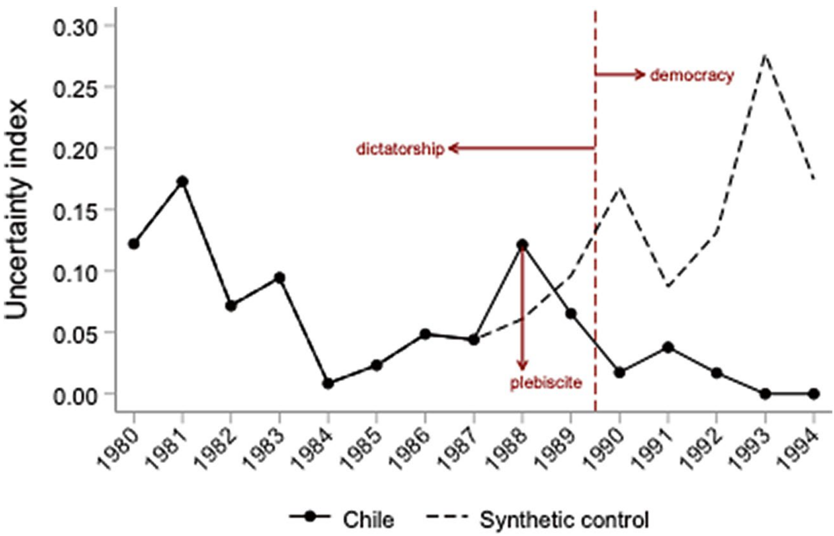


Fig. 9.4 Economic policy uncertainty. Notes: Synthetic control estimates for the impact of the 1988 plebiscite—the election which triggered the democratization in Chile—on economic policy uncertainty as measured by country expert reports. The estimation uses an annual balanced panel of 122 countries observed in the period 1980–1994. Higher values of the uncertainty index in the y-axis imply higher uncertainty. Sources: Uncertainty country-level data from Ahir et al. (2022) based on reports produced by the Economist Intelligence Unit

what triggered a decrease in economic policy uncertainty. The second wave of the privatization reform seems to be associated, if anything, to higher uncertainty.

6 Conclusion

As long as state-owned firms exist, privatizations reforms will likely remain controversial. The case of the Pinochet regime in Chile exemplifies many of the traditional concerns regarding the sales of state-owned firms in terms of sale prices, methods of sale, and the identity of buyers. As we have shown empirically in this chapter, these issues of implementation are an important constraint for the benefits of private ownership and thus should be regulated accordingly. Yet a full evaluation of these reforms will remain hard for many other reasons beyond how these reforms are implemented. Firms (especially large ones) have widespread influence in the economy and the political world, and thus the potential roles that newly privatized firms can play in the market can be many and increasingly hard to track. In the case of Chile, the privatizations under dictatorship seem to have increased firm-level measures of efficiency, but the sales also created a pervasive revolving door between the private and the public world, recurrently related to misallocation of resources (e.g. state contracts) and private incentives (e.g. electoral incentives) that are detrimental for the healthy development of any economy. Even with a consensus on the potentially large number of areas that privatizations could impact, there is also scarce evidence on the long-run effects of privatization reforms on firms and elsewhere, and how all these dimensions could be aggregated into a general equilibrium model that is able to quantify changes in welfare. Privatizations remain hard to evaluate, but recent research has opened many new questions that can help us to understand these reforms better to hopefully improve their design in the future.

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