Post-privatisation private ownership concentration: determinants and influence on firm efficiency

ABSTRACT

With this study we aim to contribute to the empirical literature on privatisation processes by analysing the determinants of post-divestment private ownership concentration and its possible link to corporate efficiency. For Spanish firms, we find that the method of privatisation, the type of industry, the company's size and its level of risk may help explain differences in private ownership concentration. We also find, after controlling for endogeneity, that ownership concentrated in the hands of private investors has a positive and significant effect on post-privatisation efficiency.

Key words: Corporate Governance, Privatisation; Private Ownership Concentration

1. INTRODUCTION

Privatisation became a priority on government agendas in the past few decades and remains of high importance despite the current global financial crisis. In fact, European countries such as Poland, Greece, Portugal and Spain are stepping up their divestment programs, in search of greater revenue to help reduce fiscal deficits. Some authors have suggested that the proliferation of these processes around the world may be a factor in the growing significance of corporate governance (Becht *et al*., 2002; Megginson and Netter, 2001). Privatisation involves selling ownership of State-Owned Enterprises (SOEs) to outside investors, providing an interesting context in which to understand governance mechanisms (Denis and McConnell, 2003). In addition, the ownership structure of a former SOE may change significantly when the company is transferred to outside investors who may place greater emphasis on profits and efficiency (Boycko *et al*., 1996; Shleifer and Vishny, 1997).

The relationship between ownership concentration and corporate performance has received considerable attention in the academic literature. From a theoretical point of view, ownership concentration can have either a positive or a negative effect on performance. Following Berle and Means (1932) - who contend that diffuse ownership puts significant power into the hands of managers whose interests may not match those of shareholders - a large body of literature reports that high ownership concentration improves monitoring and alleviates conflicts of interests between managers and shareholders. At the same time, it decreases agency costs and fosters better firm performance. However, other literature stresses the costs of a concentrated ownership structure. Large shareholdings may increase owner risk and reduce company liquidity; similarly, large stakeholders may obtain private benefits of control and expropriate wealth from minority shareholders, or their control may be too tight, curtailing managers' initiatives and incentives. Nevertheless, following Coase (1937) and Demsetz (1983), who state that ownership structure is the outcome of bargaining among economic agents, any argument that there is an association between a firm's ownership structure and its performance should be spurious. The results of Demsetz and Lehn (1985), Demsetz and Villalonga (2001) and Himmelberg *et al.* (1999) support this position.

Since the 1980s, privatisations have inspired extensive empirical literature that has analysed the improved efficiency and performance of divested companies (Bai *et al*., 2009; Brown *et al*., 2006; D'Souza *et al*., 2005, 2007; Megginson *et al*., 1994; Wei *et al*., 2003), but fewer studies have been undertaken to identify possible reasons for the improvements (Ausseneg and Jelic, 2007; Boubakri *et al*., 2005a and b; D'Souza *et al*., 2005, 2007).[1] Moreover, only a handful of studies have examined the relationship between ownership concentration and performance, and even fewer have considered concentration as endogenous when analysing this relationship. Studies that look at the relationship between divested firms' ownership structure and their performance without considering the ownership structure as endogenous include: Weiss and Nikitin (1998), who report for the Czech Republic a positive effect on performance when the ownership is held by non-investment funds; Earle and Teledge (2002) and Earle and Estrin (2003), who conclude for Romania and Russia, respectively, that private ownership has a positive influence on labour productivity; and Alexandre and Charreaux (2004), who for a sample of French privatisations state that performance is enhanced when the largest stakeholder has a high percentage of shares.

Interestingly, the results of most of the studies that do control for the endogeneity of divested firms' ownership concentration also seem to suggest there is a positive relationship between concentration and performance. For example, Claessens and Djankov (1999) for the Czech Republic, Pivovarsky (2001) for Ukraine, Boubakri *et al.* (2005a) for an international sample of privatised companies (both of developed and developing countries), and Omran (2009) for Egypt report ownership concentration has a positive influence on performance. Hanousek *et al.* (2007) for the Czech Republic show that the various types of private investors may influence post-privatisation performance in different ways (foreign owners seem to foster superior performance, but domestic owners seem to negatively affect employment).

This paper contributes to the literature on corporate governance and privatisation by analysing the main determinants of divested firms' private ownership concentration and exploring whether concentration is a

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[1] For a survey of privatisation literature, see Djankov and Murell (2002), Estrin *et al.* (2009), Megginson and Netter (2001) or Nellis (2005).

corporate governance mechanism that may help to explain post-privatisation efficiency. Although, as we have stated, the relationship between ownership concentration and performance has been extensively analysed in the financial literature, the empirical evidence varies according to institutional setting. For instance, even after taking endogeneity of ownership into account, while Demsetz and Villalonga (2001) report a non-significant relationship for the United States, De Miguel *et al.* (2004) report a positive significant relationship for Spain. Moreover, as suggested by Bolton and Van Thadden (1998), the issue may not be whether ownership concentration *per se* is desirable or not, but how often and at what point in a company's life ownership should be concentrated. This is reason to analyse the relationship between private ownership concentration and firm performance after divestment.

Our study focuses on Spain, a wealthy Western European economy, and includes firms divested through direct sales as well as by Share Issue Privatisations (SIPs). The country provides a good context in which to explore the relationship between private ownership concentration and post-divestment efficiency, for different reasons: its corporate governance setup and its large privatisation program.

Spain has a high concentration of control rights and a high diffusion of pyramid structures, it has a civil-law origin and it suffered a civil war in the 20th century. These are widely accepted signals of low investor protection (La Porta *et al.*, 1998; Roe, 2006) and high private benefits of control (Dyck and Zingales, 2004; Nenova, 2003). In addition, previous studies that consider endogeneity of ownership when examining the relationship between post-privatisation ownership concentration and firm performance are very scarce. These studies pertain to a different institutional setting, such as that of former socialist States or Eastern European countries including the Czech Republic (Claessens and Djankov, 1999; Hanousek *et al.*, 2007) and Ukraine (Pivovarsky, 2001); to international samples of both developed and developing countries (Boubakri *et al.*, 2005a); or to emerging countries such as Egypt (Omran, 2009). However, we are not aware of any study of this kind that pertains to a Western European economy, although

privatisations have been especially important in parts of Western Europe.[2] Moreover, in these studies the sample of firms divested by direct sales is absent or small. The sample used by Claessens and Djankov (1999), for instance, includes only privatisations by vouchers, and the samples used by Pivovarsky (2001) and Boubakri *et al.* (2005a) include direct sales but do not comprise a significant percentage of the firms that were divested.[3]

The Spanish privatisation program has been one of the largest among Organization for Economic Co-operation and Development (OECD) countries in terms of assets sold. The program raised US$ 53,749.87 million between 1986 and 2009 (US$ 41,679 million of that was generated between 1990 and 1998, the year the Maastricht Treaty came into force), thereby putting Spain fifth, after France, Italy, the United Kingdom and Germany, among EU-25 countries in terms of revenue from divestments (Privatisation Barometer, 2010). The year 1985 marked the beginning of the process, which has been conducted by both socialist (1985-1996; 2004-present) and conservative governments (1996-2003), and is still going on. In fact, in December of 2010 the government announced the possibility of more privatisations. Our sample comprises firms that were sold during socialist and conservative governments, which also allows us to test the influence of government ideology in the shaping of privatised firm non-state-ownership concentration.

We find Spanish companies that are privatised through direct sales, that are smaller and riskier, and that are in regulated industries show ownership highly concentrated in the hands of private investors. Thus, our results support that ownership concentration depends on which method the government chooses (a factor that is closely related to the size of the company, the need to reduce the public deficit and the type of industry), and on other firm characteristics (industry, size and risk). Our findings also suggest - but with just a 10 percent statistical significance - that the ideology of the government may influence private

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[2] Other studies that analyse the determinants of privatised firms' ownership concentration refer to the Egyptian case (Omran, 2009) and mainly to Eastern European countries: Boubakri *et al.* (2005a) and Grosfeld (2006) use, respectively, an international sample and a sample of firms privatised in Poland. Grosfeld and Hashi (2007) use a sample of firms privatised in Poland and the Czech Republic.

[3] It is necessary to note that direct sales are one of the main methods of privatisation in terms of the number of firms privatised. For example, for a sample of 1,992 privatisations in 92 countries, Megginson *et al.* (2004) show that 767 were divested using share offerings and 1,225 via direct sales.

ownership concentration. In addition, we report that even after considering endogeneity, private ownership concentration does significantly influence post-privatisation performance, confirming for a civil-law Western European country the results obtained by Claessens and Djankov (1999) and Pivovarsky (2001) for Eastern European countries, by Boubakri et *al*. (2005a) for an international sample and by Omran (2009) for Egyptian privatised firms. Other factors, such as the company's pre-divestment efficiency, also seem to play an important role in the success of privatisations.

The paper is organized as follows: Section 2 outlines the Spanish divestment process and its main characteristics. Section 3 refers to the potential determinants of post-divestment private ownership concentration and analyses, from a theoretical point of view, the possible relationship between private ownership concentration and firm performance after privatisation. Section 4 describes the sample selection, methodology and the variables we used. Our results are discussed in Section 5, and Section 6 presents our main conclusions.

2. THE SPANISH PRIVATISATION PROGRAM (1985 to present)

Spain's privatisation program is one of the most far-reaching yet undertaken by a non-Eastern European country, putting the country fifth among OECD members in terms of assets sold. From the program's start in 1985 until 2009, 137 State-Owned Companies were divested, US\$ 53,749.87 million was raised and most regulated industries were liberalised. One result was that public-sector contribution to the gross domestic product declined sharply over the final decade of the last century, particularly from 1996 onward (whereas the public sector's share in GDP remained fairly stable at about 8.5 percent until 1992, it plummeted to 1.8 percent by 1996 and to 0.1 percent by 2001). The government's participation as a shareholder in the Spanish Stock Market also declined significantly; at the beginning of the 1990s the State held 16.64 percent of the market's shares, but just 0.3 percent by 2008.

The public sector's high participation in the GDP before the start of the privatisation process mainly stemmed from the political regime in place after the Spanish Civil War (1936-1939). General Francisco

Franco's victory in 1939 ushered in a period of economic and political isolation, which, when coupled with policies of self-sufficiency and interventionism, spawned a state-led economy.

In 1941, General Franco set up the *Instituto Nacional de Industria* (INI), a holding company for SOEs that were operating mainly in strategic sectors of the economy, i.e. oil, steel, mining and transportation. The INI was created during a time known as the autarky period (1940-1959), when the State nationalised the railway company (RENFE), the airline (Iberia), the telephone and telecommunications company (Telefónica) and several banks that were to form the public banking sector. This period was followed by a cycle of economic growth (1959-1974), during which the government reduced its interventionism in the economy but nonetheless continued to regulate it and subsidise certain industries and production activities. The State also acquired many ailing private companies. The economic crisis of the 1970s coincided with the end of the Franco regime (General Franco died in 1975) and the transition to democracy. It was a time of great social and political instability, with governments during the transition period (1974-1983) being loath to start any restructuring of the public sector, preferring, in fact, to use the INI to keep employment up and bolster social stability. Consequently, the public sector grew even larger. By the beginning of the 1980s, it was burdened by overcapacity and had severe financial problems.

The Spanish Socialist Party (PSOE) won the general election in 1982 and was to govern until 1996. Aiming to rationalise the public sector, reduce state presence in the economy and leave only profitable companies under state control, the government started in 1985[4] to privatise SOEs belonging to a range of public holdings, but mainly to the INI. Because Spain was joining the European Community in 1986, greater competition and a requirement to raise cash to reduce the fiscal deficit were the key forces driving this policy. It was accompanied by restructuring of the public sector and the introduction of profitability criteria for SOEs, which involved cutting labour and financial costs at companies within INI; major

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[4] The first privatisations that took place under the socialist government cannot formally be included in the Spanish privatisation process. They were instigated between 1982 and 1985 and involved the re-privatisations of banks, companies and assets that had been bailed out by the Deposit Guarantee Fund during the banking crisis of the 1970s, and the privatisation of a company that had been expropriated by the socialist government in 1983 (Cuervo, 1997).

investment in the public sector, along with the protection of state enterprises in the electricity, oil and gas, and telecommunications sector; and the formation of large SOEs by the merging of state companies operating in strategic sectors: electricity (Endesa, 1983), aluminium (Inespal, 1985), electronics (Inisel, 1985), oil and gas (Repsol, 1987), banking (Argentaria, 1991), and iron and steel (Corporación Siderúrgica Integral – Aceralia, 1991). These SOEs would later be privatised.

During this "early or first period" - 1985 to 1992 - of the socialists' divestment process in the 1980s and 1990s, privatisations were undertaken without following any specific program or systematic plan. As in other EU countries such as Germany, Italy, Holland, Portugal and Greece, privatisations were not founded upon political or ideological reasoning (Comín, 1995). The SOEs that were sold were unprofitable small and medium-sized firms that the public sector had rescued, companies that were no longer competitive as state enterprises because they were too small or had technological shortcomings, or firms that were of no strategic value to the public sector (De la Dehesa, 1992). Most were sold directly to a single buyer. Several profitable and strategic enterprises in the energy and petrochemical sectors (GESA, ENDESA and Repsol) were privatised only after 1988, although the State retained a significant number of shares in each.

The effort to sell off monopolies and profitable SOEs gained momentum after 1992, during the "late or second period" of the socialists' privatisations. In order to raise cash to meet the Maastricht criteria for membership in the EU, between 1992 and 1996 a considerable number of the largest, most important SOEs - the Crown Jewels of the public sector - began or continued to be sold through share issue privatisation (ENCE, ENDESA, Repsol, Argentaria and Telefónica) and in some cases via direct sales (CAMPSA or Indra Sistemas).[5] The State did not lose control of the companies privatised through SIPs, however, as it did not sell more than 50 percent of these firms' shares, with the exception of Repsol. Moreover, in 1995 a law was passed creating "golden shares" giving the government the right to decide whether a private investor could acquire more than a 10 percent holding in the firm being divested. The

new legislation also gave the State the prerogative to approve certain company decisions, such as mergers, asset sales or changes in activities.[6]

When the conservative party Partido Popular (PP) won the general elections in March of 1996, another phase of the privatisation process was ushered in. On 28 June, 1996, the new government implemented the Public Sector Modernisation Program, which established an explicit political policy based on a belief in the benefits of market competition, the greater efficiency of privatised firms and the development of capital markets. Moreover, following EU directives, privatisation was to become part of a larger liberalisation and deregulation program for the Spanish economy. Most regulated industries (electricity, oil and gas, telecommunications, water, the postal service, sea, air and road transportation, and the financial sector) were liberalised.

Under the conservatives (1996-2003), most of the large enterprises that the socialist government had started to divest were totally or almost fully privatised: ENCE, ENDESA, Repsol, Argentaria, Telefónica, Indra Sistemas and ENAGAS. Moreover, the conservative government also began the privatisation of other large SOEs: Gas Natural, Aldeasa, Aceralia - which was to become part of Arcelor - Tabacalera (now called Altadis) and Iberia. Companies were either auctioned off or sold by SIPs or directly to other stakeholders.[7]

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[5] Direct sales refer to the sale of shares (not through capital markets) or of certain assets that may be separated from the main firm, or to the sale of minority stakes of subsidiaries lacking a strategic justification for the SOE. Share issue privatisations refer to the sale of the State's whole stake in firm capital, or at least part of its stake, through capital markets.

[6] The year 1995 also saw the approval of another law, Royal Decree 5/1995, which disbanded the State holding company (*Instituto Nacional de Industria*) and divided it into two groups: the State Industrial Agency (*Agencia Industrial del Estado, or* AIE) and the State Corporation of Industrial Shares (*Sociedad Española de Participaciones Industriales, or* SEPI). The former was made up of the public shareholdings of established firms undergoing industrial restructuring, while the latter brought together the most profitable companies.

[7] A consultative privatisation committee (*Comité Consultivo de Privatizaciones*) similar to those created in other EU countries was set up to guarantee transparency. The committee's report was required as an ex-ante control for the sale of SOEs. It was also charged with informing on issues and questions posed by the government or by handling agents during the course of privatisations. Two additional control mechanisms were also set up as ex-post controls apart from this committee. These were a parliamentary sub-committee for the privatisation of SOEs (*Subcomisión de seguimiento de la privatización de empresas públicas*) and an audit that was to be carried out by the central administration (*Intervención General de la Administración del Estado*). The structure of the public sector was also simplified in 2001.

The socialist party won the general election of 2004, and in 2005 the new government continued the privatisation of three firms whose divestment had been started by the conservatives. It also privatised another three companies. From 2006 to 2009, two more firms were totally divested, one was partially privatised, and the assets of another were sold. The State also sold (in 2007) its Endesa shareholdings when the electrical company was taken over.

On the whole, 137 SOEs were divested between 1985 and 2009. Some of them (27 firms, or 18 percent) were privatised in stages: 44 percent of these companies were sold off in different phases during the socialist period of the 1980s and 1990s; 30 percent were partially divested during that same socialist period and continued to be privatised under the conservatives; 15 percent were sold in different phases between 1996 and 2004; and 11 percent that were partially privatised by the conservatives were totally divested between 2004 and 2009 by the socialists. Thus, while 137 SOEs were privatised from 1985 to 2009, the number of privatisation processes within that time frame stands at 180. Table 1 shows the characteristics of the Spanish privatisation process differentiating among its first and second periods under the socialist governments of the 1980s and 1990s, the period under the conservatives and the period under the recent socialist governments. As can be observed, more than half of the processes - 112, or 62.22 percent - took place under the socialist governments (1985-1995 and 2004-2009). Under the conservative governments there were 68 processes (37.78 percent), even though there was more privatisation activity per year in terms of revenue generated (71.59 percent of overall proceeds). The amount of cash raised in each period reflects the type of SOEs sold and the method of privatisation (under the conservatives, 23.52 percent of the privatisation processes - 16 out of 68 - were made through SIPs; under the socialists, just 15.18 percent - 17 out of 112 processes - were via SIPs). Moreover, 56 percent of processes - 24 out of 43 - that involved regulated and strategic industries such as telecommunications, energy, transport and banking corresponded to the conservative governments.

Overall, the chief method of divestment during the Spanish privatisation movement was direct sales (77 percent of cases), and 24 percent of the processes involved firms in regulated industries. Although not

shown, the years in which there were a higher number of processes were 1997 (12 percent of cases), 1986 (10 percent), and 1987 and 1989 (6.11 percent each).

[Table 1]

3. PRIVATISED FIRMS' PRIVATE OWNERSHIP CONCENTRATION AND PERFORMANCE

3.1. Determinants of privatised firms' private ownership concentration

Corporate rules can shape choices about ownership structures. For instance, concentrated ownership might be discouraged by legal rules that make it more difficult or costly for financial institutions to accumulate and hold large blocks. It also could be discouraged in corporate systems that enable owners to extract large private benefits of control; "rent-protection" considerations might lead to concentrated ownership (Bebchuck and Roe, 1999).

The legal origin perspective (La Porta *et al.*, 1997, 1998) proposes "that legal rules protecting investors vary systematically among legal traditions or origins, with the laws of common law countries being more protective of outside investors than the laws of civil law, and particularly French civil law countries". Accordingly, La Porta *et al.* (1998) find that French civil-law countries have firms with higher ownership concentration. The legal origin perspective has been criticised by other authors who contend that legal origins are merely proxy for other factors (culture, history and politics) influencing legal rules and outcomes. According to the political perspective, legal rules are the product of legislative policy decisions, voter preferences and interest groups' power. Actually, Roe (2006) suggests that in continental social democracies the mechanisms that align managers with diffuse stockholders are weaker, public firms have higher managerial costs and large blockholdings have persisted as a means of controlling those costs.

Spain is a civil-law origin country that ranks 93rd among 183 economies in terms of investor protection (Doing Business, 2010), with an anti-director rights index of 4 over 6 (a higher score than the mean for French civil-law countries - 2.33) and a rule of law score of 7.8 over 10 (La Porta *et al.*, 1997).

Consequently, the development of capital markets in Spain traditionally has not been high, although the situation has changed over the past years. Spanish companies show a high ownership concentration. In fact, La Porta *et al.* (1999) report that the three largest shareholders hold 50 percent of firms' shares and Faccio and Lang (2002) document that widely held companies account for only 10 percent of listed firms when 10 percent is used as the threshold. Thus, Spanish privatised companies, including those divested through SIPs, should be expected to show high ownership concentration ratios.

Governments may choose which SOEs they want to privatise, when to do it, the percentage of shares to divest and how they will be sold. The privatisation method, timing and the government's ideology may have a significant influence on firm post-divestment ownership structure.

The State may privatise a company at a certain moment for various reasons: to increase the firm's revenues and improve its economic situation, to obtain cash with which to reduce the public deficit, or to boost the competitiveness of a particular industry. These issues, in combination with the size of the company, may determine the percentage of shares to be sold. Moreover, governments may choose to divest a firm in one tranche or stage, or in different stages. Staggered sales may come about because of an asymmetric information framework: in the privatisation process there is asymmetric information between the State and private investors about government intentions after divestment; investors do not know whether state policies will be committed (with no interference after privatisation) or populist (the government is unable to resist the temptation to interfere). Hence, the investors bear risks stemming from this uncertainty (Bel, 2003). In this environment, staggered sales may be a signal of the government's commitment, since postponing part of the sale indicates that the State is willing to bear the risk of policy reversal and, consequently, investors may think the government will not act in ways that may reduce the value of the firm (Perotti, 1995).[8] Moreover, early privatisations carry more political uncertainty than those that occur after the divestment program has been implemented to a certain degree. Once investor

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[8] Another factor that may reflect government's desire to build a good reputation as a seller is the underpricing of the firms privatised through SIPs. For Spain, Bel (2003) shows that the underpricing of privatised firms was larger for early SIPs.

confidence has grown and reversal of privatisation is difficult, governments will be able to sell larger fractions of stocks (Perotti, 1995). Accordingly, in the early phase of privatisation, governments will sell smaller percentages of shares and will more frequently divest the company in stages; and there will be higher ownership concentration ratios after the first stage (the State will remain a significant owner).[9] The results obtained by Omran (2009) for Egypt tend to confirm this prediction. Firms divested in later stages of privatisation waves show higher private ownership concentration ratios. Other studies, such as Boubakri *et al.* (2005a) and Grosfeld and Hashi (2007) document a negative coefficient for the variable representing later privatisations, although this coefficient is non-significant.

Biais and Perotti (2002) establish a link between government ideology and divested firm ownership concentration. Following their arguments, Megginson *et al.* (1994) find that right-wing governments will promote widely held ownership structures so that middle-class citizens afterward will oppose redistributive policies that would adversely affect their investment, making privatisations non-reversible. In order to do this, right-wing governments will be more likely to relinquish control[10] and will favour non-concentrated private ownership structures.

The method of privatisation (direct sales versus SIPs) is chosen by governments and has a bearing on what percentage of shares are to be sold. The method is determined according to the development and conditions of capital markets, political and legal factors such as the ideology of the government that initiates the privatisation, market regulation, or firm competitiveness and industry (Megginson and Netter, 2001). For instance, while smaller companies are often totally sold through private direct sales (Bortolotti *et al*., 2004; Megginson *et al*., 2004), larger companies are divested via SIPs and are expected to present lower ownership concentration ratios (Megginson *et al*., 2004). The empirical evidence tends to confirm

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[9] Investors could consider a partial privatisation to be the consequence of government reluctance to relinquish control because of social and political costs, for example, or fear of losing revenues (Boubakri *et al*., 2005a). The State therefore may be unwilling to sell larger stakes in the early stages of the privatisation (Bortolotti and Faccio, 2006). Governments might choose to give up control in the first phases if doing so is necessary to attract private investors; consequently, firms divested at that point will also show higher ownership concentration ratios (although concentration will not be in the hands of the State).

[10] Bortolotti and Faccio (2009), for a sample of companies privatised in OECD countries, find lower state voting rights for companies privatised by right-wing governments.

this prediction. Pivovarsky (2001) for Ukraine, and Boubakri *et al.* (2005a) for firms privatised in 39 countries, report that ownership concentration is lower when SIPs have been used.

But, in addition to government ideology, the timing of privatisation and the method employed, other factors that may determine ownership concentration should be considered in privatised firms. Demsetz (1983) states that "the ownership structure of firms is the endogenous result of competitive selection in which the advantages and disadvantages in costs are balanced to achieve a balanced organisation in the firm". Accordingly, Demsetz and Lehn (1985) and Demsetz and Villalonga (2001) show that ownership concentration is related to the characteristics of the company (i.e. the degree of industry regulation, the firm's size and risk).

Ownership concentration could be linked to industry regulation, which reduces investors' potential control but also monitors and disciplines managers. Regulatory constraints may therefore be a substitute for monitoring by shareholders and should reduce ownership concentration.[11] Moreover, regulated industries will face less uncertainty and are likely to present more dispersed ownership (Demsetz and Lehn, 1985). Other considerations are that in the case of regulated privatised companies, investor uncertainty about future political risks will be large and that States will have more interest in continuing to be shareholders in these firms (Sprenger, 2010). Thus, as State-Owned Utilities will be sold in small initial partial sales to signal government commitment and States will want to retain their holdings in them, privatised utilities will show lower private ownership concentration (Perotti, 1995).

Another determinant of ownership concentration is firm size. Wealth limitations and risk aversion may lead to lower degrees of ownership concentration (it is more costly and risky to acquire large portions of equity in larger companies), and also the larger the firm, the smaller the percentage of its stock is needed

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[11] However, as pointed out by Demsetz and Lehn (1985), there are problems of amenity consumption by management in regulated settings as the cost-plus price-setting regulation reduces the incentive to keep expenses down and dulls competition. If this is the case, regulated firms will be expected to need greater monitoring and thus will present higher ownership concentration ratios. The authors note, however, that the tendency of regulatory commissions to adjust prices toward levels that leave profit rates unchanged may reduce shareholders' desire to monitor management.

to obtain a certain degree of control. Consequently, widely held private ownership structures should be more common in larger privatised firms.[12]

Firm risk also influences ownership concentration: managers at companies that operate in less risky environments - characterised, for example, by stable prices and technology - may be monitored quite easily, while in noisier settings managerial behaviours figure more prominently in company fortunes and become more difficult to control. As a consequence, noisier environments should be associated with higher private ownership concentration (Demsetz and Lehn, 1985). However, it could also be argued that large shareholders may be more reluctant to invest in riskier firms, and therefore less risky firms would show higher private ownership concentration ratios.

3.2. Determinants of divested firms' post-privatisation performance changes

Privatisation theory extols the advantages of having the means of production in private hands, pointing to the inefficiency of State-Owned Enterprises and to the problems these companies face when defining their goals. SOEs may have objectives other than profit and shareholder wealth maximisation (Megginson and Netter, 2001). They may, for example, have a political agenda to maximize social welfare, which may be inconsistent with efficiency. Moreover, SOEs will tend to be more risk averse and less free to take decisions because managers will need to justify their strategies to the employees and to the State (Frydman *et al*., 2000).

Moreover, in SOEs there is a dual level of agency relations (citizens-government and government-management); citizens cannot sell the firms' shares, the State may have political objectives, and companies may rely on the State for funding (being unlikely to face bankruptcy). Given these characteristics and the lack of market discipline, the change from public to private ownership ought to enhance profitability and efficiency (Boycko *et al.*, 1993; Yarrow, 1986). This expected improvement in

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[12] Nevertheless, firm size may be considered as a proxy for managerial discretion (Himmelberg *et al*., 1999) and larger firms should present higher ownership concentration.

operating performance is supported by various empirical studies that find an increase in the ratios of return on assets, return over sales, operating efficiency or labour productivity for privatised firms (Antoncic and Hisrich, 2003; Bai *et al.,* 2009; Boubakri and Cosset, 1998; D' Souza *et al*., 2007; Megginson *et al*., 1994).

The empirical evidence pertaining to the Spanish case is not conclusive, however. Bachiller (2009), Melle (1999), Romero (2005), Sanchís (1996) and Villalonga (2000) do not find significant improvements in firm performance after privatisation. Similar results have been reported by Cabeza and Gómez (2007) for the same temporal horizon after the possible influence of the industry effects has been considered. Villalonga (2000) also finds that firm size, the economic cycle and the presence of a foreign investor significantly influence post-privatisation performance, while Cabeza and Gómez (2007) report significant differences in performance changes depending on the company that was divested, the stage of privatisation - first versus last -, the temporal horizon and the measure used as a proxy of firm performance. These results, in line with those of other international studies (Megginson and Netter, 2001), suggest that the change from public to private ownership cannot be considered the only determinant of performance improvements. There may be other factors, such as the firms' ownership and corporate governance structures.

Ownership concentration has often been considered a key internal corporate governance mechanism. Berle and Means (1932) already suggested the importance of ownership concentration in alleviating agency problems between shareholders and managers. Dispersed ownership increases the principal-agent problem, consequently decreasing firm performance. On the other hand, large shareholders - whose wealth depends on the company's performance - may have more incentives to support the cost of monitoring managers and ensuring that shareholder resources are not diverted (Grossman and Hart, 1980).

Another body of literature states that high ownership concentration may impose tight control on managerial initiatives and incentives (Aghion and Tirole, 1997; Burkat *et al*., 1997), limit large

shareholders' wealth diversification, reduce their risk tolerance (Admati *et al*., 1994; Bolton and Von Thadden, 1998; Demsetz and Lehn, 1985; Heinrich, 2000), result in lower stock liquidity (Holmstrom and Tirole, 1993) and increase shareholders' private benefits of control (Shleifer and Vishny, 1997). For privatised companies, large shareholdings may also have a positive influence on firm performance. Privatisations that lead to diffused ownership structures may reduce political control over the firms divested and lower the agency costs that stem from political control (Boycko *et al*., 1996). Moreover, the effect of ownership concentration on divested firm performance may be completely different when, after partial privatisation, the State continues to be the largest shareholder (or a significant shareholder).[13] Following the political view of privatisations, when control rights pass from the State to private investors, the company objectives and managerial incentives are redefined and, consequently, firm performance should increase (Boycko *et al*., 1996). Accordingly, Claessens *et al.* (1997) contend that if the State keeps a majority ownership, a privatised company is more likely to delay restructuring and maintain high levels of employment. Shleifer and Vishny (1996) argue that divested firms controlled by the State may not have incentives to assume risks, given their lesser degree of wealth diversification, and could pursue non-value-maximising objectives. Shen and Lin (2009), for a sample of companies privatised in China, report that state ownership weakens corporate governance by making top managers less accountable for profitability. More specifically, they find that state ownership lowers top manager turnover when profitability is below the industry median. Boubakri *et al.* (2008), for an international sample of privatised firms in developed and developing countries, report that politically connected companies are generally highly leveraged and operate in regulated sectors, and that the likelihood of observing political connections in these firms is positively related to the government's residual stake. These companies exhibit a poor accounting performance.[14]

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[13] As mentioned in Section 2, this is the case in Spain because some firms were privatised in several stages and sometimes after the first stage of privatisation the State continued to be the largest shareholder.

[14] Several previous empirical studies analyse the effect government shareholdings have on firm performance after privatisation. These studies, which do not consider the endogeneity of ownership, suggest, for example, that increases in profitability and efficiency are significantly larger when the State surrenders voting control (Boubakri and Cosset, 1998; D' Souza and Megginson, 1999; Sun and Tong, 2003); that firms in which the State retains less than 50 percent of shares after privatisation show larger

In regard to the relationship between ownership concentration and firm performance, the empirical evidence is mixed. For example, studies that consider ownership structure to be the result of bargaining among economic agents (Coase, 1937; Demsetz, 1983) and therefore take into account the endogeneity of ownership suggest for the United States that ownership does not influence performance (Cho, 1998; Demsetz and Villalonga, 2001; Himmelberg *et al.*, 1999; Loderer and Martin, 1997; Palia, 2001; Pedersen and Thomsen, 1999). The empirical evidence concerning this issue is nevertheless different for other institutional settings, such as Spain, where companies have large shareholders who are active in corporate governance (Faccio and Lang, 2002) and where the main conflict of interest lies between large and minority shareholders. Alonso-Bonis and De Andrés-Alonso (2007), De Miguel *et al.* (2004), and Mínguez-Vera and Martín-Ugedo (2007) report a significant relationship between firm ownership and firm value, even after taking into account the endogeneity of the ownership.

The empirical evidence pertaining to privatised firms tends to indicate that ownership concentration has a positive effect on company performance. Without considering ownership concentration as endogenous, Weiss and Nikitin (1998) find, for privatisations that took place through vouchers in the Czech Republic, that concentration is associated with improved performance, but only if the concentration is in the hands of non-investment funds; Alexandre and Charreaux (2004), for a sample of 19 French SIPs, report that the size of the stake held by the largest shareholder after privatisation positively influences performance; Claessens and Djankov (1999), for a cross-section of Czech companies divested through vouchers, find that the higher the ownership concentration, the greater the firms' profitability and labour productivity, although once corrections for endogeneity have been considered, a positive and significant effect of ownership concentration is found only for labour productivity; Pivovarsky (2001) - for a sample of 376 medium-sized and large privatised companies in Ukraine in 1998 - reports that ownership concentration (especially when it is in the hands of foreign investors and banks) is positively associated with firm total

decreases in the ratio liabilities-to-assets (Sun and Tong, 2002) or have significant improvements in profitability, employment and sales efficiency (Wei *et al*., 2003); that state ownership leads to larger increases in output (D' Souza *et al*., 2007); and that the

factor productivity and labour productivity; Boubakri *et al.* (2005a) for the period 1980-2001 and for an international sample of companies privatised mainly through SIPs, report after controlling for the endogeneity of ownership that private post-divestment ownership concentration is positively related to performance. Hanousek *et al.* (2007), for a sample of Czech companies over the period 1996-1999, conclude that the larger the stake held by foreign industrial companies, the larger the growth in privatised firms' sales. In addition, Omran (2009) concludes that ownership concentration has a positive impact on Egyptian divested firm performance.[15]

Other factors that may influence post-privatisation performance are the competitive and economic environments, company size, and prior performance. The competitiveness of the product and factor markets may be crucial for the success of privatisations. When there is a lack of competition, efficiency will depend mostly on regulation, not on whether the firm is publicly or privately held (Vickers and Yarrow, 1988; Yarrow, 1986). Thus, the change from public to private ownership should have a greater impact on performance when market competitiveness also increases (Grosse and Yanes, 1998; Shirley and Nellis, 1991). Accordingly, the empirical evidence shows that, in the case of regulated or less competitive industries, there is a sharp increase in post-privatisation profitability and a soft growth in productivity, suggesting that firms operating in regulated markets may be exploiting, at least partially, their market power (Sheshinski and López-Calva, 2003). Moreover, as various authors report, even if the efficiency improvements from privatisation seem to take place in both competitive and regulated industries, the increases are significantly larger for firms that operate in competitive markets (La Porta and López de Silanes, 1999; Megginson *et al.*, 1994).

The economic environment at the time of privatisation may also be a factor in the company's success afterward. As restructurings are more feasible during expansive economic cycles, performance

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impact of privatisation on profitability is more pronounced when the State does not own most of the divested firm (Bai *et al.,* 2009).

[15] Harper (2002) for the Czech voucher privatisation, and without considering the endogeneity problem, finds that ownership concentration in private hands does not significantly affect privatised firms' performance changes.

improvements should be greater for companies when divestment occurs at those times. Alexandre and Charreaux (2004) and Villalonga (2000) confirm this prediction for France and Spain, respectively. Both authors report a positive relationship between the economic cycle and post-privatisation efficiency.

Company size may also play a role in performance. Larger firms can be more difficult to restructure after privatisation (Villalonga, 2000) and may have benefited from greater ongoing state support; for instance, they could have received soft financing (Megginson and Netter, 2001). As a result, larger SOEs may be in better economic and financial condition at the time of privatisation and, consequently, may exhibit less substantial performance improvements immediately afterward[16].

Finally, company performance prior to divestment may be strongly related to post-privatisation success. On one hand, firms that were restructured before privatisation could be expected to show lower performance improvements after divestment because they were already in better financial condition when the process occurred (Dewenter and Malatesta, 2001). On the other hand, we should also consider that firms with a higher performance before privatisation would continue that trend and experience larger increases in their performance afterward.

4. SAMPLE SELECTION, METHODOLOGY AND VARIABLES USED IN THE STUDY

4.1. Sample selection

The initial database used for the analysis comprised a sample of the first-stage privatisation processes for companies in Spain during the period 1985-2003 (131 firms).[17] We obtained the firms' economic and financial information for a period of up to seven years, covering the three years before and the three years after the year of privatisation (year 0 is considered as the first year of the - partial or total- privatisation).

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[16] It could also be argued, however, that the companies' better historical performance could add to the positive effect of privatisations and enhance post-divestment performance.

[17] The maximum period that we could have considered, taking into account the necessity to have data spanning the three years after the year of privatisation, would have been 1985-2006. Inclusion of the period 2004-2006 would have added just three possible firms to the database; thus our sample may be considered the largest one possible for which data could be obtained for studying the whole Spanish privatisation process.

The following filters were applied to the initial database:

a) Firms for which we were unable to obtain data for a period of up to seven years, covering the three years before and the three years after the privatisation process: firms for which there was a lack of accounting data, firms that began their activity in the two years prior to the privatisation and firms that closed their business around the time of the privatisation.

b) Financial and insurance companies because of their differential characteristics.

c) Firms for which we were unable to obtain the mean industry ratio.

After these filters were applied, the database was reduced from 131 to 126 firms. For this sample, we tried to estimate all the dependent and independent variables of the analyses. In order to carry out the study, we needed no missing values for any of the dependent and independent variables. For some observations/years we were not able to find the required information to estimate all the variables, so the final sample amounted to 44 firms representing 35 percent of the database of the 126 processes (Table 2).[18]

[Table 2]

The information about the Spanish privatised firms was manually collected from various data sources: the State-owned holding company (*Sociedad Estatal de Participaciones Industriales - SEPI-*) and the reports of the Consultative Board of Privatisations (*Consejo Consultivo de Privatizaciones - CCP -*). Accounting information was obtained as follows: for the pre-privatisation years, it came from the annual reports of the former SOEs stored in the SEPI library and different ministries (Economy and Industry); for the post-privatisation years, information was supplied by the companies, by the Spanish Supervisory Agency

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[18] We considered the possibility of estimating a panel data analysis instead of a cross-sectional one in order to increase the number of observations. However, the fact that the majority of the firms were privatised through direct sales (the same owner held 100 percent of the firm capital along the time), made it difficult to employ a panel data methodology. We also considered building a non-privatised firms control sample, but were unable to find a database with which to create the sample for the whole period of the study (databases were not available for the 1980s and early 1990s).

(CNMV) and by the Madrid Stock Exchange. Additionally, we checked the SABI (*Sistema de Análisis de Balances Ibéricos*) and Informasa databases, and the financial reports of the Official Mercantile Registry. This information was completed with data from the Dicodi and the Dun's & Bradstreet directories. The aggregate data for the industries corresponds to information provided by the Spanish central bank (*Central de Balances del Banco de España*). GDP data were obtained from the National Institute of Statistics (*Instituto Nacional de Estadística*) databases. Annual reports and annual corporate governance reports were used, as well as information regarding ownership concentration that the firms provided directly.

Table 3 shows the industry and annual distribution of the firms in our sample, as well as the privatisation method employed in each case. The sample resembles the Spanish whole privatisation process. The firms belong mainly to the iron and steel industry (15.91 percent - SIC code 37); the transport equipment industry (13.64 percent - SIC code 33); and the water, electricity and gas industries (11.36 percent - SIC code 49) - Table 3, Panel A -. Thus, 20 percent of the processes refer to utilities (regulated firms represent 23.89 percent for the whole privatisation program 1985-2009 and 18 percent of the final database - 126 firms - for the period 1985-2003). The privatisation processes took place mainly in 1999 (13.64 percent), 1997 (11.36 percent), 1989 and 1995 (9.09 percent) and 1986 (6.81 percent) (Table 3, Panel B) (similarly, in the whole privatisation program 1985-2009 and in the final database for 1985-2003 among the most active years are 1997, 1986 and 1989). Compared with previous studies that do not include privatisations done by direct sales (Alexandre and Charreaux, 2004; Claessens and Djankov, 1999) or include just a small percentage of firms divested via this method (Boubakri *et al*., 2005a; Pivorasky, 2001), our sample, as is the case for the whole Spanish process, comprises a significant percentage of companies privatised by direct sales (77.27 percent, Table 3, Panel C, 76.66 percent for the whole privatisation program and 89 percent for the final database -126 firms - for the period 1985-2003).

[Table 3]

4.2. Methodology and variables

When analysing the relationship between a firm's ownership structure and its performance, a common approach is to conduct a regression analysis of company performance on selected variables representing the ownership structure. However, if a firm's ownership is endogenous, some of the unobserved determinants of performance may also explain the ownership variables, leading to a spurious relationship between ownership and performance. In order to correct for the endogeneity of the ownership structures - and specifically of ownership concentration - we employ a two-step estimation procedure that involves the use of instrumental variables. In the first step, we regress the endogenous variable private ownership concentration over the instrumental variables to obtain the fitted (estimated) value of private ownership concentration. In the second step, when regressing firm efficiency over private ownership concentration, we replace these values as an instrument for concentration to examine the relationship between private ownership concentration and firm performance. Table 4 shows the dependent and independent variables used in these analyses and the expected sign for the coefficients of the explanatory variables in each of the two-step regression models.

Instruments should comply with two conditions: they must be important determinants of the endogenous variables and be exogenous (that is, they cannot be correlated with the error term of the second regression). The timing and the method of privatisation, the firm's regulation, size and risk[19] have been used as instrumental variables of private ownership concentration.

Thus, we estimate the following equation as the first model of the two-step procedure:[20]

$$C1_i = a_0 + \beta_1 LATE + \beta_2 METHOD + \beta_3 SECTOR + \beta_4 SIZEPRE + \beta_5 RISKPRE + \varepsilon_i$$

where C1 denotes the ownership held by the largest private shareholder at the end of the first year after privatisation (Alexandre and Charreaux (2004), and Grosfeld and Hashi (2007), also employ this

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[19] The necessary conditions for identification were met as we included one exogenous variable that plausibly affects only ownership concentration, but not post-privatisation efficiency: risk.

[20] Robust models were estimated considering the heteroskedasticity problem.

measure),[21] LATE is a dummy variable that takes value 1 for sample firms privatised after 1996 and 0 otherwise;[22] METHOD is a dummy variable that equals 1 for firms privatised through direct sales and 0 for firms privatised via SIPs (see for example, Boubakri *et al.*, 2005a, and Omran, 2009, who also employ this variable); SECTOR is a dummy variable that equals 1 for firms that belong to regulated sectors (energy, electricity, transportation, telecommunications) and 0 otherwise;[23] SIZEPRE is defined as the natural logarithm of the firm's assets in the pre-privatisation period (the three years before) and RISKPRE is the mean firm leverage in the three years preceding the privatisation year (pre-privatisation period) (Grosfeld and Hashi, 2007, employ a similar variable to measure firm risk).[24] Similarly to Boubakri *et al.* (2005a) and Grosfeld and Hashi (2007), we use lagged variables for firm size and risk (three years before privatisation) in order to control for endogeneity.

Next, the determinants of firm operating performance are analysed. It is necessary to point out that, among the underlying reasons for privatisation, the economic motivations based on claims that private companies outperform their State-Owned counterparts suggest firm efficiency improves after privatisation, as this is the most frequently mentioned objective. For this reason it may be interesting and adequate to use

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[21] We opted not to include other proxies of ownership concentration because in economies with highly concentrated ownership structures the stake of the largest shareholder is the commonly used measure. Following Boubakri *et al.* (2005a), Demsetz and Lehn (1985), Himmelberg *et al.* (1999) and Omran (2009), we also applied a logistic transformation to C1, using the formula log [C1/ (100-C1)] to convert a bounded variable into an unbounded one (LC1). However, it must be noted that when the largest investor owns 100 percent of the firm's shares, the transformation LC1 is not possible and, therefore, when we used this proxy for ownership concentration the number of observations dropped significantly to 18. Because of the small number of observations, we decided not to show the results of the analyses for LC1.

[22] Initially, similarly to Boubakri *et al.* (2005a) and Omran (2009), we thought about including a dummy variable that took into account whether sample firms were divested before or after the median privatisation year, but considering the characteristics of the Spanish privatisation process, we made 1996 the cutoff. This year marks the beginning of the conservative government in Spain and its approval of an explicit privatisation program entitled Modernisation Program of the Public Sector. Thus, this measure takes into account both the timing of the privatisations and the ideology of the government. The median privatisation year - 1996.5 - nevertheless turned out to be very close to the year 1996. Alternatively, and following Bel (2003), which considers 1985-1989 to be a confidence-building period, we defined variable LATE as a dummy variable that takes value 1 for privatisations that occurred between 1985 and 1989 and 0 otherwise. The results did not vary significantly.

[23] Although other studies consider several dummies related to the firms' industries or a dummy variable for each regulated sector, in our case, because of the sample size and the fact that some sectors had a very small number of observations, it was better to use just a dummy variable that relates to whether a firm belongs or not to a regulated sector.

[24] As an alternative proxy of firm risk we used the deviation of annual return on equity ratio (Boubakri *et al.*, 2005a and Omran, 2009, employ this measure), but the estimation of this proxy led to a reduced number of observations. We also used the ratio of tangible to total assets as a proxy of the degree of uncertainty or risk in firm environment (Grosfeld and Hashi, 2003). This variable presented a positive, although non-significant, coefficient. So, although we are aware of the existence of other proxies for firm risk, we decided to use firm leverage as a proxy. Firm leverage may also be considered a complementary monitoring of corporate governance mechanism and in this sense may also influence the level of ownership concentration.

efficiency as a proxy for privatised firms' performance. Consequently, and similarly to the majority of previous studies, including Boubakri *et al*. (2005b), D'Souza and Megginson (1999), and Wei *et al*. (2003), we measure performance by company efficiency; that is, the real sales-to-employees ratio, during the post-privatisation period (EFFICPOST). Nevertheless, initially we also considered different proxies for firm efficiency (net profit-to-employees, operating profit-to-employees and added value-to-employees) and firm profitability (return on assets, return on equity and return on sales), but when we used these proxies the models or the explanatory variables turned out to be non-significant.[25] We consider firm efficiency after its adjustment to the corresponding industry, i.e. from the annual value shown by every firm, we subtract the firm industry mean for the same year as reported by the Spanish central bank.[26] For all companies, the year of privatisation is named year 0. It includes both the public and private ownership phases of the firm.

The main explanatory variables of firm post-divestment operating efficiency include the predicted value for private post-privatisation ownership concentration that was estimated in the regression of the first stage (P_C1). In addition, considering that several authors provide evidence of non-linearities in the ownership-performance relationship - also for Spanish firms - (De Miguel *et al*., 2004; Himmelberg *et al*., 1999; McConnell and Servaes, 1990; Mork *et al*., 1988; Thomsen and Pedersen, 2000) we extend our specification to include the variable P_C1 and its squared variable $(P\_C1)^2$. Other factors may also influence privatised performance; as proxy of competitiveness we employ a dummy variable that adopts value 1 for the firms that belong to a regulated industry and 0 otherwise (D' Souza *et al*., 2005 and 2007; Harper, 2002; Sun and Tong, 2003 and 2005); as a proxy of the economic environment we include variable CYCLE defined as the variation between the average GDP in the post- privatisation period (years

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[25] A possible reason why we did not obtain significant results when employing these proxies of firm performance may relate to the reduction in the number of observations because of data constraints. The ratio real sales to employees is the one for which we were able to have the higher number of observations.

[26] We are aware that company efficiency may also be a product of the firm's make or buy decisions. They are determined by many factors that are not included in the paper's model, such as asset specificity, uncertainty and frequency of transaction (Williamson, 1979). However, at least some of these factors may be captured by adjusting for the industry mean. In this sense, it is worth noting that privatised firms' efficiency and mean industry efficiency follow the same trend.

1+ to +3) related to the mean GDP in the pre-privatisation period (from year -3 to -1) (Alexandre and Charreaux, 2004; Boubakri *et al.*, 2005b; D' Souza *et al.*, 2007); the proxy for firm size is variable SIZE defined as the logarithm of the firm's total assets in the three years after privatisation (post-privatisation period)[27] (D' Souza *et al.*, 2005), and finally the prior performance of privatised firms measured by variable EFFICPRE defined as the mean firm efficiency in the pre-privatisation period (Harper, 2002, also considers the pre-privatisation performance as an explanatory variable) (Table 3, Panel B). Thus, as the second-step regression model we estimate the following:

$$EFFICPOST = a_0 + \beta_1 P\_C1 + \beta_2 (P\_C1)^2 + \beta_3 SECTOR + \beta_4 CYCLE + \\ \beta_5 SIZE + \beta_6 EFFICPRE + \theta \lambda_i$$

[Table 4]

Table 5 presents the summary statistics (mean, median, maximum, minimum and standard deviation) of the variables included in the study.[28] The mean ownership stake held by the largest private shareholder at the year after privatisation (C1) is, as expected, quite high, at 67.293 percent.[29] The mean leverage ratio in the pre-privatisation period (RISKPRE) amounts to 76.071 percent. Fifty-seven percent of the firms (24 firms) were privatised after 1996 (Table 5, Panel A). The mean value of firm efficiency in the post-privatisation period is 1.91-04. The CYCLE variable reveals that firms were mainly divested during periods of economic growth (the mean value of the variation in GDP is 0.326). The mean firm size in the three years after privatisation in terms of total assets (SIZE) amounts to €2,078.143 million although the

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[27] Alternatively, we considered the firm's total real sales as a proxy of the firms' size. The results did not change significantly.

[28] We did not have information about variable C1 for two of the firms in the study. For this reason, the summary statistics and the correlation matrix were calculated for a sample of 42 firms. Nevertheless, in the first-stage model it was possible to estimate the predicted values of the different proxies of ownership concentration for all sample firms, and consequently the sample for the second-stage model amounts to 44 observations.

[29] This figure is larger than the mean ratio of shares held by the largest investor for the whole sample of Spanish listed companies (29 percent for Aguiar and Santana, 2006; 39.86 percent for Alonso-Bonis and De Andres-Alonso, 2007; 38.27 percent for Crespí and García-Cestona, 1998; 25.8 percent for Mínguez-Vera and Martín-Ugedo, 2007). Considering the ownership held by the largest private shareholder, or by the State, this figure is even larger. It stands at 79.15 percent (in firms privatised through SIPs, the State as largest shareholder for six firms holds a median 57.53 percent of the shares at the end of the year after privatisation).

sample is very asymmetric (with a maximum value of €32,688.7 million and a minimum value of €2.083 million). Nineteen percent of the privatised firms belong to a regulated industry (Table 5, Panel B).

[Table 5]

The variable bivariate correlations are presented in Table 6. Firm ownership concentration (the stake held by the first private shareholder in a company's capital) (C1) is positively related with METHOD, indicating that in firms privatised through direct sales, private ownership concentration tends to be higher. Variable SIZEPRE is negatively correlated to post-privatisation private ownership concentration. The largest firms are usually divested through SIPs and in different stages; because the State retains a percentage of the firm's shares (57.530 percent as a median), private ownership tends to be less concentrated than in companies privatised through direct sales. Variable LATE is not significantly correlated to variable C1 (private ownership concentration). METHOD is negatively and significantly correlated to variables SECTOR and SIZEPRE. Therefore, firms privatised through direct sales tend to belong to non-regulated industries and are smaller. Moreover, as firms belonging to regulated industries are larger, the correlation between SECTOR and SIZEPRE variables is also positive and significant (Table 6, Panel A).

Firm efficiency in the post-privatisation period is positively correlated with efficiency in the pre-privatisation period; that is, firms that present higher efficiency levels in the years before divestment tend to maintain that trend, showing higher post-privatisation efficiency (Table 6, Panel B). However, it is worth mentioning that although some variables show statistically significant correlations, after applying variance inflation factors (VIFs) we find no evidence of multicollinearity problems both in the first and the second stage models as no VIF is above 10 (Kleinbaum *et al*., 1998).

[Table 6]

5. RESULTS

5.1. Determinants of private ownership concentration

Table 7 shows the results of the first-step regression models. The method of privatisation (METHOD) is positively and significantly related to ownership concentration; that is, the percentage of shares in the hands of the largest private shareholder (at a 1 percent level of significance). Similar to Boubakri *et al.* (2005a), Megginson *et al.* (2004) and Omran (2009), our findings suggest that direct sales privatisations result more frequently than share issue privatisations in private concentrated ownership structures.[30] Variable SECTOR influences post-privatisation private ownership concentration positively and significantly (with a 5 percent level of significance). Thus, contrary to Boubakri *et al.* (2005a) and Omran (2009),[31] whose results suggest that utilities and telecommunications sectors show lower levels of private ownership concentration and that the government might be reluctant to relinquish control in sectors believed to be economically or politically strategic, we find that privatised utilities firms show higher levels of private ownership concentration. Apparently these results contradict the correlations found between variable SECTOR and C1 (negative and statistically significant at a 1 percent level). The negative correlation between variable METHOD and SECTOR could explain the apparently different results. Without including in the model the variable METHOD, variable SECTOR presents a positive but non-statistically significant coefficient. Actually, in our sample, from the 10 firms privatised through SIPs, seven are utilities, while from the 34 firms divested through private sales, two are utilities. Among the companies divested through private sales, utilities show a private ownership concentration of 100 percent and non-utilities show a private ownership concentration of 86 percent.

In addition, similar to Boubakri *et al.* (2005a) and Grosfeld and Hashi (2007), and as suggested by Demsetz and Lehn (1985), firm size (SIZEPRE) presents a negative and statistically significant

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[30] Grosfeld (2006), for a sample of privatised firms in Poland, also reports that the initial ownership concentration in the early years of listing is strongly determined by the divestment method (private sales, employee and managerial buyouts, mass privatisation schemes and initial public offerings).

[31] Other authors, such as Sprenger (2010) for Russia, do not find any evidence that regulation reduces divested firms' private ownership concentration.

coefficient.[32] The level of risk before privatisation (RISKPRE) is positively associated with the stake held by the first private shareholder, with a 5 percent significance level (C1). This positive relationship between firm risk and ownership concentration is similar to the relationship reported by Demsetz and Lehn (1985).[33] Finally, variable LATE presents a positive coefficient, although its significance is just 10 percent. So, contrary to Boubakri *et al.* (2005a) and Grosfeld and Hashi (2007), but similarly to Omran (2009), we find some evidence that suggests the timing of divestment may influence post-privatisation ownership concentration: firms sold in later stages of privatisation waves would show higher private ownership concentration ratios. In our case, the values of variable LATE also coincide with the periods of the left-wing and right-wing governments in Spain. Because of the low level of significance of the coefficient of variable LATE, these results should be taken with caution, but they are in line with the empirical evidence reported for OECD countries by Bortolotti and Faccio (2009). These authors find that state control over privatised firms is greater in countries with left-wing governments.[34] The non-high significance of variable LATE can have different causes. For instance, Bel (2002) reports that the switch from left-wing to right-wing governments in Spain did not lead to significant changes in the underpricing of SIPs, although greater underpricing leads to higher ownership concentration. Ideological differences between the governing parties may be less relevant. But also, the institutional setting with high ownership concentration ratios might explain why Spanish conservative governments, like those in France, also chose to keep ownership concentration levels high. Actually, for firms privatised by SIPs, hard-core shareholder techniques were frequently used. This could explain why our results are not in line with the theoretical arguments proposed by Biais and Perotti (2002) that right-wing governments implement privatisations that may promote widely held private ownership.

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[32] Sprenger (2010), for Russia, also finds that firm size influences private ownership concentration, which is greater for small and large companies than for medium-sized ones.

[33] Alternatively, considering leverage as a corporate governance mechanism, this result may suggest that firm private ownership concentration and leverage may be complementary devices.

[34] Nevertheless, other authors, such as Boubakri *et al*. (2010) for emerging markets report that the ideology of the government is not related to privatised firms' state ownership.

[Table 7]

In a nutshell, our results reveal that private ownership concentration is strongly determined by the method of privatisation and to a lesser extent by the type of industry, company size and risk. Other factors such as the timing of divestment and the ideology of the government that initiates it may also play a role.

5.2. Determinants of post-privatisation efficiency

First, although it is not shown, to analyse the effect of privatisation on firm performance we compare the industry-adjusted sales efficiency in the pre- versus post-privatisation period (the three years after and before the change in ownership) and the results suggest an increase in the median value (although the difference is not statistically significant). Thus, these findings make it necessary to take other factors into account (i.e. post-privatisation private ownership concentration) in addition to the privatisation *per se* in order to explain the performance improvement.

In this sense, after correcting for the endogeneity of ownership concentration, we relate post-privatisation efficiency to the firms' private ownership concentration after privatisation and to a set of control variables (the companies' economic and regulatory environments, their size and prior performance). The results are reported in Table 8.[35]

The findings suggest that private ownership concentration is positively and significantly related to corporate efficiency (model 1, Table 8). This evidence indicates that the higher the ownership concentration, the greater the increase in post-privatisation efficiency. Boubakri *et al.* (2005a) report similar results for a sample of international privatised firms, as do Claessens and Djankov (1999) for Czech privatisations, and De Miguel *et al.* (2004) for Spanish listed companies. When we consider the possible non-linearity of ownership concentration reported by previous studies for the Spanish market, we

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[35] The estimations were repeated using exactly the same sample of firms of the first-model steps and the results did not vary. We also repeated the estimations related to the determinants of post-privatisation efficiency without considering the endogeneity problem and the results were similar: post-privatisation ownership concentration has a positive and significant influence, but other

find that although variable P_C1 continues influencing firm efficiency positively and significantly (but only at 10 percent), the square term $(P\_C1)^2$ presents a positive non-significant coefficient (model 2, Table 8). Therefore, contrary to De Miguel *et al.* (2004), who find a non-linear relationship between ownership concentration and firm value for Spanish listed firms, we do not support the existence of such a non-linear relationship for Spanish privatised firms.

With regard to the control variables, only firm efficiency previous to privatisation processes (EFFICPRE) seems to significantly influence post-privatisation efficiency (models 1 and 2). Companies that present higher levels of efficiency in the pre-privatisation period maintain that trend, showing higher efficiency after divestment. Moreover, firms in regulated industries seem to experience lower increases in efficiency after privatisation, denoted by the negative and significant coefficient of SECTOR (10 percent level) (model 1). Finally, and contrary to Boubakri *et al.* (2005a), we do not find that the economic cycle has a significant influence on firm performance.[36]

In summary, our results show that private ownership concentration seems to have a positive influence on the efficiency of divested companies, but that other factors such as pre-privatisation performance may also help explain performance improvements after privatisation.

[Table 8]

5.3. Additional analysis

As private ownership concentration seems to influence post-privatisation efficiency, we tried to find a link between performance and the typology of the largest private shareholders of divested firms. For that purpose, we classified the largest shareholders as financial companies, non-financial companies and individuals or families. Before privatisation, the largest shareholder is the State, but post-privatisation the

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factors such as prior performance should be taken into account.

[36] We repeated the estimations using as dependent variable the change in firms' efficiency in the post-privatisation period versus the pre-privatisation period. The results were similar.

largest shareholder in 78.50 percent of cases (in 33 of 44 firms) is a private investor (a non-financial company in 87.87 percent of firms; families or individuals, 6.06 percent). However, in 21.42 percent of the firms the State continues being the largest shareholder and in 2.38 percent of the companies the largest shareholder is the State along with a non-financial firm.

We performed a multivariate regression analysis in which we used the shares held by the different types of private investors, controlling for market competitiveness, economic cycle, firm size and prior performance. To estimate the system equations, we instrumented each type of private owner using the same set of instruments as before. The idea was that the percentage held by certain types of private owners could be endogenously determined by public information released via the privatisation process (Boubakri *et al*., 2005a). Nevertheless, for nearly 70 percent of the firms the largest shareholder in the year following privatisation is a non-financial company and that fact may explain why we were not able to run the models using all these independent variables. Moreover, because a large body of literature proposes (e.g. Aghion and Blanchard, 1996) that foreign strategic investors may play a crucial role in privatisation, we estimated the models using the ownership held by foreign investors as a proxy of private ownership concentration. Although it is not shown, the variable presents a positive - although non-significant - coefficient. Thus, contrary to Claessens and Djankov (1999), Omran (2009), and Pivovarsky (2001), we do not find that foreign private ownership concentration significantly influences post-divestment performance. We are not able to conclude, at least for our sample of Spanish privatised firms, that the presence of foreign investors implies better governance and higher corporate performance.

It is also worth mentioning that the typology of the largest private shareholder does change depending on the method of privatisation. While non-financial companies are the largest shareholders in 90.32 percent of firms privatised through direct sales, the figure drops to just 50 percent for firms divested through SIPs. Moreover, none of the firms privatised through direct sales has a financial company as the largest shareholder.

6. CONCLUSIONS

Privatisation processes were an important phenomenon in many countries before the current economic crisis. They were seen as a way to modernise the economy and to reduce political and governmental interference in economic activity. In a significant number of these countries (e.g. Spain and other EU members) privatisation processes made a large contribution to public deficit reduction. In fact, the financial crisis has spurred some countries, including Spain, to announce important privatisations in order to further reduce their deficits.

Our study deepens the understanding of privatisation by focusing on the Spanish divestment program, one of the largest undertaken in the last decade in a Western European economy. We examine the cross-firm differences in private ownership concentration after divestment. As expected, we find that privatisations via direct sales result more frequently in concentrated private ownership structures than do SIPs. We also find that industry sector, firm size and risk explain post-divestment private ownership concentration, and the timing of privatisation as well as the ideology of the government are other factors that should be taken into account. Right-wing governments were less reluctant to reduce state ownership in privatised firms, but they also chose high private ownership concentration levels, as hard-core shareholder techniques were frequently used.

Employing a methodology that controls for the endogeneity of ownership, we find that firm post-privatisation private ownership concentration is positively related to company efficiency. In this sense, our results suggest the importance of the post privatisation firm ownership structures for the success of the privatisation processes. Our findings are in accord with those of previous studies that report a positive relationship between firm ownership concentration and value for listed Spanish companies (Alonso-Bonis and De Andrés-Alonso, 2007; De Miguel *et al*., 2004; Mínguez-Vera and Martín-Ugedo, 2007); for former socialist countries (Claessens and Djankov, 1999); and for international samples of privatised firms in developed and developing economies (Boubakri *et al*., 2005a). Therefore, in the case of a Western

European economy, our results reinforce previous findings that private ownership concentration enhances efficiency in privatised companies.

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Table 1: Characteristics of the total Spanish privatisation process (1985-2009)

	1985-1995	1996-2004	2005-2009	Total
Number of processes	103	68	9	180
Methods				
SIPs [a]	15	16	2 [b]	33
Direct sales	86	47 [c]	5	138
Auction	2	5	1	8
Takeover			1	1
Regulated processes	18	24	1	43
Total proceedings (M$)	12,784.86	38,288.19	1,676.82	53,479.87
SIPs	9,033.938	26,454.49	741.95	36,230.38
Direct sales	3,750.924	11,383.70	1934.87	17,519.49

[a] SIP denotes Share Issue Privatisation
[b] Two Bought Deals are included (Tabacalera and REE)
[c] Including CASA that was integrated in EADS

Source: Own Elaboration and Privatization Barometer for information related to the privatisation proceedings

Table 2: Sample

Privatisation Year	Privatised Firm	Activity [1]	Method of Privatisation [2]
1986	Amper	Electronics	SIP
1986	Gesa	Energy	SIP
1986	Seat	Car industry	Direct Sale
1987	Alumalsa	Aluminium	Direct Sale
1987	Gas Madrid	Energy	SIP
1988	Ence	Paper	SIP
1988	Endesa	Energy	SIP
1989	Astican	Shipbuilding	Direct Sale
1989	Ateinsa	Capital goods	Direct Sale
1989	MTM	Capital goods	Direct Sale
1989	Repsol	Energy	SIP
1991	Geasa	Porcelain	Direct Sale
1992	Icuatro	Health	Direct Sale
1993	Palco	Aluminium	Direct Sale
1994	Artespaña	Craftsmanship	Direct Sale
1994	CTE	Shipping	Direct Sale
1995	Lesa	Food	Direct Sale
1995	Refinalsa	Aluminium	Direct Sale
1995	Telefónica	Telecommunications	SIP
1995	Indra	High technology	Direct Sale
1996	Gas Natural	Gas	SIP
1996	Sefanitro	Fertilizers	Direct Sale
1997	Aldeasa	Wholesale	Direct Sale
1997	CSI-Aceralia	Iron and steel	Direct Sale
1997	Ferroperfil	Aluminium	Direct Sale
1997	H.J. Barreras	Shipbuilding	Direct Sale
1997	Iongraf	Aluminium	Direct Sale
1998	Inespal	Aluminium	Direct Sale
1998	Productos tubulares	Iron and steel	Direct Sale
1998	Tabacalera	Food (tobacco)	SIP
1999	Astander	Shipbuilding	Direct Sale
1999	Aya	Aerospace	Direct Sale
1999	Enatcar	Road transport	Direct Sale
1999	Icsa	Aerospace	Direct Sale
1999	LM Composites	Capital goods	Direct Sale
1999	REE	Energy	SIP
2000	Casa	Aerospace	Direct Sale
2001	Babcok & Wilcox	Capital goods	Direct Sale
2001	Conversión Aluminio	Aluminium	Direct Sale
2001	Santa Barbara	Defence	Direct Sale
2002	Coosur	Food	Direct Sale
2002	Olcesa	Food	Direct Sale
2002	Química del Estroncio	Chemical	Direct Sale
2003	Ebro Puleva	Food	Direct Sale

[1] The industry classification corresponds to the one denoted by the SEPI reports (not SIC codes)

[2] SIP denotes Share Issue Privatisation

Source: Own elaboration

Table 3: Sample industry and annual distribution, classification according to privatisation method

The sample consists of 44 companies privatised in Spain during the period 1985-2003.

Panel A: Sample industry classification		
Industry (SIC Codes)	Number of observations	Percentage of observations
20	3	6.82%
21	2	4.54%
26	1	2.27%
28	2	4.54%
29	1	2.27%
30	1	2.27%
32	1	2.27%
33	6	13.64%
34	3	6.82%
35	3	6.82%
36	1	2.27%
37	7	15.91%
41	1	2.27%
44	2	4.54%
48	1	2.27%
49	5	11.36%
50	2	2.54%
55	1	2.27%
73	1	2.27%
Total	44	100%
Panel B: Sample annual distribution		
Year	Number of observations	Percentage of observations
1986	3	6.81%
1987	2	4.54%
1988	2	4.54%
1989	4	9.09%
1991	1	2.27%
1992	1	2.27%
1993	1	2.27%
1994	2	4.54%
1995	4	9.09%
1996	2	4.54%
1997	5	11.36%
1998	3	6.81%
1999	6	13.64%
2000	1	2.27%
2001	3	6.81%
2002	3	6.81%
2003	1	2.27%
Total	44	100%
Panel C: Classification by the method of privatisation		
Number of share issue privatisations	10	22.73%
Number of direct sales	34	77.27%
Privatisation processes	44	100%

Table 4: Variables of the study

Panel A: Determinants of post privatisation private ownership concentration		
Variables	Description	Predicted relationship
Dependent variable (Ownership concentration)		
C1	The percentage of shares held by the largest private-shareholder	
Explanatory variables		
LATE	Dummy variable that takes on value 1 for privatisations during 1996-2003 and 0 otherwise	+ / -
METHOD	Dummy variable that takes on value 1 if the firm was privatised through a direct sale and 0 otherwise	+
SECTOR	Dummy variable that takes on value 1 if company belongs to utilities sector and 0 otherwise	--
SIZEPRE	Logarithm of the firm total assets in the pre-privatisation period	-/-
RISKPRE	Firm leverage in the pre-privatisation period	+ / -
Panel B: Ownership concentration and post privatisation efficiency		
Dependent variable		
EFFICPOST	The mean firm efficiency (real sales to the number of employees) in the post-privatisation period	
Explanatory variables		
P_ C1	Estimated ownership concentration	+
$(P\_C1)^2$	Estimated squared ownership concentration	-
SECTOR	Dummy variable that takes on value 1 if company belongs to utilities sector and 0 otherwise	-
CYCLE	Variation of Spain GDP in the post privatisation period related to the pre privatisation period	+
SIZE	Logarithm of the firm total assets in the post-privatisation period	-/+
EFFICPRE	The mean firm efficiency (real sales to the number of employees) in the pre-privatisation period	- / +

Table 5: Summary Statistics

The sample consists of 42 privatised firms in Spain during the period of 1985-2003. C1 denotes the first private shareholder stakes in firms' capital (percent). LATE takes on value 1 for privatisations during 1996-2003. METHOD denotes if a firm was privatised through direct sales. SECTOR denotes if it is a utilities sector or not. SIZEPRE denotes the total assets in the pre-privatisation period (million Euros). RISKPRE is the firm total leverage in the pre- privatisation period (percent). EFFICPOST denotes the firm post privatisation efficiency. CYCLE denotes the variation in the gross domestic product in the post versus pre privatisation period. SIZE denotes the total assets in the post-privatisation period (million Euros). EFFICPRE is the mean firm efficiency in the pre-privatisation period.

Variables	Mean	Median	Maximum	Minimum	Stand. Dev.
Panel A: First stage model					
Dependent variable					
C1	67.293	93.35	100	0	42.243
Explanatory variables					
SIZEPRE	1,292.955	72.147	25,564.91	2.123	4,058.109
RISKPRE	76.071	73.125	136.423	20.98	23.995
Other explanatory variables		Percentage/(number) or observations			
LATE		57.14%			
		(24)			
METHOD		80.95%			
		(34)			
SECTOR		19.05%			
		(8)			
Panel B: Second stage model					
Dependent variable					
EFFICPOST	1.91-04	-0.004	0.080	-0.092	0.043
Explanatory variables					
CYCLE	0.326	0.331	0.644	0.047	0.160
SIZE	2,078.143	100.987	32,668.7	2.083	6,373.199
EFFICPRE	3.67-04	-0.007	0.143	-0.086	0.040
Other explanatory variables		Percentage/(number) or observations			
SECTOR		19.05%			
		(8)			

Table 6: Correlation matrix for the dependent and explanatory variables

The sample consists of 42 privatised firms in Spain during the period of 1985-2003. C1 denotes the first private shareholder stakes in firms' capital (percent). LATE takes on value 1 for privatisations during 1996-2003. METHOD denotes if a firm was privatised through direct sales. SECTOR denotes if it is a utilities sector or not. SIZEPRE denotes the total assets in the pre-privatisation period (million Euros). RISKPRE is the firm total leverage in the pre- privatisation period (percent). EFFICPOST denotes the firm post privatisation efficiency. CYCLE denotes the variation in the gross domestic product in the post versus pre privatisation period. SIZE denotes the total assets in the post-privatisation period (million Euros). EFFICPRE is the mean firm efficiency in the pre-privatisation period.

Panel A: First stage model					
Variables	C1	LATE	METHOD	SECTOR	SIZEPRE
LATE	0.218				
	(0.164)				
METHOD	0.704***	0.192			
	(0.000)	(0.221)			
SECTOR	-0.425***	-0.192	-0.691***		
	(0.004)	(0.221)	(0.000)		
SIZEPRE	-0.635***	0.039	-0.608***	0.490***	
	(0.000)	(0.803)	(0.000)	(0.001)	
RISKPRE	0.316**	-0.188	0.265*	-0.240	-0.093
	(0.041)	(0.231)	(0.088)	(0.125)	(0.557)

Panel B: Second stage model					
Variables	EFFICPOST	C1	SECTOR	CYCLE	SIZE
C1	0.051				
	(0.745)				
SECTOR	-0.034	-0.425***			
	(0.827)	(0.004)			
CYCLE	-0.112	-0.106	0.031		
	(0.479)	(0.502)	(0.845)		
SIZE	0.078	-0.631***	0.464***	0.267*	
	(0.620)	(0.000)	(0.002)	(0.087)	
EFFICPRE	0.790***	-0.196	-0.012	-0.065	0.258*
	(0.000)	(0.213)	(0.935)	(0.681)	(0.098)

(P-value)

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 7: Determinants of post-privatisation private ownership concentration

The sample consists of 42 privatised firms in Spain during the period of 1985-2003. The dependent variable is C1, that is, the first private shareholder stakes in firms' capital (percent). LATE takes on value 1 for privatisations during 1996-2003. METHOD denotes if a firm was privatised through direct sales. SECTOR denotes if it is a utilities sector or not. SIZEPRE denotes the total assets in the pre-privatisation (million Euros). RISKPRE is the firm leverage in the pre- privatisation period (percent). Corrected standard errors were taken into account in the estimations.

Variable	Model 1
LATE	15.979*
	(0.056)
METHOD	54.439***
	(0.001)
SECTOR	23.099**
	(0.016)
SIZEPRE	-7.206**
	(0.020)
RISKPRE	0.406**
	(0.041)
N	42
R^2	0.637
F	57.91***

(p-value)

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 8: Determinants of post privatisation efficiency

The sample consists of 44 privatised firms in Spain during the period of 1985-2003. P_C1 is the estimated ownership concentration. $(P\_C1)^2$ is the squared estimated ownership concentration. SECTOR is a dummy variable that takes on value 1 if company belongs to utilities sector. CYCLE denotes the variation in the gross domestic product in the post versus pre privatisation period. SIZE denotes the logarithm of firm assets in the post-privatisation period. EFFICPRE is the mean firm efficiency in the pre-privatisation period. Corrected standard errors were taken into account in the estimations.

Variable	Model 1	Model 2
P_C1	5.34-04**	2.93-04*
	(0.012)	(0.069)
$(P\_C1)^2$		2.17-06
		(0.557)
SECTOR	-0.020*	-0.018
	(0.066)	(0.178)
CYCLE	0.007	0.006
	(0.776)	(0.808)
SIZE	0.001	0.001
	(0.641)	(0.609)
EFFICPRE	0.969***	0.960***
	(0.000)	(0.000)
N	44	44
R^2	0.711	0.713
F	28.24***	21.55***

(p-value)

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$