



ELSEVIER

Available online at www.sciencedirect.com

SCIENCE @ DIRECT®

Journal of Corporate Finance 11 (2005) 747–766

Journal of
CORPORATE
FINANCE

www.elsevier.com/locate/econbase

Effect of institutional and firm-specific characteristics on post-privatization performance: Evidence from developed countries

Juliet D'Souza^a, William Megginson^b, Robert Nash^{c,*}

^a*Department of Finance, Clayton State College and University, Morrow, GA 30260, United States*

^b*Price College of Business, University of Oklahoma, Norman, OK 73019, United States*

^c*Babcock Graduate School of Management, Wake Forest University, Winston-Salem, NC 27109, United States*

Received 1 January 2003; accepted 5 December 2004

Available online 19 February 2005

Abstract

This study adds to the empirical evidence that privatization improves the performance of divested firms and offers preliminary evidence as to *why* these performance improvements occur. Using a sample of 129 share-issue privatizations from 23 developed (OECD) countries, we first document significant increases in profitability, efficiency, output, and capital expenditure following privatization. Our data indicate that ownership (both private and foreign), degree of economic freedom, and level of capital market development significantly affect post-privatization performance. A comparison to the findings of Boubakri et al. (2005) [Boubakri, N., Cosset, J., Guedmani, O., 2005. Liberalization, corporate governance, and the performance of newly privatized firms. *Journal of Corporate Finance* (this issue)] suggests that several determinants of post-privatization performance improvements differ between developed and developing countries.

© 2005 Elsevier B.V. All rights reserved.

JEL classification: G32; G38

Keywords: Privatization; Corporate governance

* Corresponding author. Tel.: +1 336 758 4166; fax: +1 336 758 4514.

E-mail address: rob.nash@mba.wfu.edu (R. Nash).

1. Introduction

This study investigates performance improvements in newly privatized firms from developed countries. We collect accounting and market information for 129 companies in 23 developed countries that were privatized from 1961 to 1999. We follow Megginson et al. (1994) and categorize OECD members as developed countries. After privatization, these firms exhibit significant improvements in financial and operating efficiency. Our results highlight an interesting and important question: *why* do these changes occur? In this paper, we seek to address this question by identifying potential determinants of the performance improvements following privatization.

Numerous recent studies have empirically examined the financial and operating performance of newly privatized firms. This research is surveyed in Djankov and Murrell (2000, 2002), Megginson and Netter (2001), D'Souza and Megginson (1999), Havrylyshyn and McGettigan (1999). In total, these studies show that privatization generally improves profitability, productivity, and efficiency. Our study is an empirical attempt to examine *why* this occurs.

In a contemporaneous paper, Boubakri et al. (2005) conduct a similar search for potential determinants of performance improvements in a sample composed entirely of privatizations in developing countries. We compare our results to those of that study throughout our paper. Viewed together, the two studies provide interesting insights across a broad spectrum of countries and help identify how sources of post-privatization performance improvements may differ in developed and developing economies. Such evidence may provide valuable guidance to government officials, investors, managers, and financial economists.

Using our sample of 129 firms from 23 developed countries, this paper documents performance improvements following privatization. We find significant post-privatization increases in profitability, output, and efficiency, and no significant change in employment. Boubakri et al. (2005) present virtually identical results using data from developing countries.

Furthermore, while the two studies suggest that post-privatization performance consistently improves across both developed and developing economies, several potential sources of the performance changes appear to be different. In developed countries, firm-level factors (such as amount of government and foreign ownership) appear to have the most significant impact on post-privatization performance. Specifically, our data from developed countries indicate that changes in government and foreign ownership significantly affect employment and capital expenditure. Institutional factors (such as the level of trade openness and degree of financial liberalization) rarely impact the performance of firms in our sample. Conversely, in developing countries, Boubakri et al. (2005) identify that institutional factors are more frequently significant determinants of post-privatization performance improvements. For example, Boubakri et al. (2005) find that the amount of trade openness significantly affects the profitability, output, and capital spending of newly privatized firms in developing nations. Stock market liberalization is an important factor for efficiency improvement. Evidence that institutional factors are more influential in the developing nations is consistent with the World Bank (2002) report that emphasizes the importance of institution-building in emerging economies.

This paper is organized as follows. Section 2 identifies the potential sources of post-privatization performance improvements and defines our testable predictions. Section 3 describes our data and empirical methodology. Section 4 presents our findings. Section 5 provides a summary and conclusion.

2. Potential sources of post-privatization performance improvements

The finance and economics literatures suggest reasons why privatization might cause firms to operate more productively. Megginson and Netter (2001) provide an excellent summary. Potential determinants of post-privatization performance improvements may be either firm-specific or institutional (macro-economic factors). We first identify potential institutional or macro-factors that may affect the performance of newly privatized firms. We then discuss the potential impact of firm-level factors. For each potential determinant, we identify a specific, testable relation to post-privatization performance.

2.1. Institutional factors that may affect post-privatization performance

Cragg and Dyck (2003), Djankov and Murrell (2002), and World Bank (1995) argue that a country's institutional environment exerts a major influence on post-privatization performance. These studies note that privatization is inter-related with institutional factors such as development of a nation's financial system and its strength of product-market competition. Furthermore, World Bank (1995) contends that institutional reform must take place before privatization is even feasible (especially in developing countries).¹ For example, for privatization to succeed, World Bank (1995) contends that a country must ensure an institutional infrastructure that includes competition and effective financial markets. The following section identifies important institutional factors and describes how each may affect post-privatization performance.

2.1.1. Financial market development

Privatization subjects managers to the pressure of the financial markets and to the monitoring and discipline of profit-oriented investors. Anderson et al. (1997a,b) and Estrin and Perotin (1991) argue that state-owned firms are less efficient because they are immune from capital market scrutiny. As a result, managerial performance is inadequately monitored. Following privatization, the public trading of shares introduces monitoring by analysts and investors and provides the ability to link compensation to performance. As a result, when shares trade in the public equity markets, owners have enhanced capacity to spur greater managerial effort and accountability. We seek to further establish a linkage between the characteristics of the specific capital markets and performance of firms following privatization.

¹ Boehmer et al. (2004) and Klapper and Love (2004) identify wide variation of institutional environments in developing countries. If these institutional factors affect post-privatization performance, the greater variation in emerging economies will increase the likelihood that these variables will have explanatory power in the developed countries.

Recent academic research has documented that the intensity of the capital market pressure depends upon the size and sophistication of the nation's financial system (La Porta et al., 1997, 1998; Levine, 1997; Levine and Zervos, 1998; Subrahmanyam and Titman, 1998). While many of the firms in our sample are from countries with large equity markets, others operate in financial markets which are more debt-oriented. Holmstrom and Tirole (1995) note that the monitoring benefits vary considerably with the level of equity market development. As a result, some privatized firms face greater market monitoring than others do.² Additionally, a well-developed and active financial market allows the newly privatized firm greater access to the capital frequently required for further restructuring and facilities modernization. Finally, a large and liquid equity market is more likely to be informationally efficient. Dow and Gorton (1997) and Vickers and Yarrow (1991) emphasize that stock prices must be informationally efficient to provide an accurate retrospective of managerial performance. If not, the information conveyed by the stock price has diminished value for monitoring and performance-based compensation plans. Accordingly, the level of capital market development may be an important determinant of post-privatization efficiency gains. Firms whose shares trade in more sophisticated and active equity markets should display the strongest performance improvements. We follow Megginson et al. (2004) and others measure equity market development with the market turnover ratio (annual equity value-traded to market capitalization).

For managers to feel the full disciplining pressure of the capital market, the rights of the individual shareholder must be enforced by the country's legal system. La Porta et al. (1997, 1998) note that the amount of protection of shareholders' legal rights varies significantly across countries. Specifically, shareholders in countries with an English common law tradition benefit from much stronger legal protection than those living in nations with French civil law or other legal systems. The authors find that markets affording greater shareholder protection are consistently larger and more efficient. Additionally, Pagano and Roell (1998) argue that greater legal protection of investor rights hinders collusion between the firm and potential monitors and promotes more effective managerial monitoring. Since La Porta et al. (1997, 1998) contend that nations with an English common law tradition provide stronger protection of shareholder rights, we predict that firm's privatized in common law countries should exhibit stronger performance improvements. Our empirical analysis includes an indicator variable to designate the English common law countries.

2.1.2. Competition

In addition to changing ownership, privatization may also expose the firm to the discipline of product market competition. Having to compete with other firms for customers and market share may provide the pressure required to stimulate greater efficiency and profitability. Djankov and Murrell (2002), Ramamurti (1997), Newbery and

² In fact, in countries with less active equity markets, privatization may offer little efficiency advantages over government ownership. Estrin and Perotin (1991) argue that, in nations with weak stock markets, government ownership may be advantageous because the state may have greater access to information and stronger powers to sanction managerial performance than private shareholders.

Pollitt (1997), World Bank (1995), and Vickers and Yarrow (1991) identify competition as a major determinant of post-privatization performance improvements. We assess each nation's competitive environment from the perspective of both domestic and international product-market competition.

To assess the amount of domestic product-market competition, we use the Economic Freedom Index (EFI) from Gwartney et al. (2001). The EFI measures the amount of freedom to compete in economic activities within each country. The major determinants of a nation's EFI are size of government, structure of the economy (i.e., market vs. central planning), and opportunities for the exercise of personal choice. Higher EFI ratings reflect institutions and policies providing greater freedom to engage in economic competition. The World Bank (1995) concludes that increased domestic competition (such as proxied by the EFI) is associated with more successful privatizations. Therefore, to control for the level of a nation's competitive environment, our empirical models include each nation's Economic Freedom Index (EFI).

We measure the intensity of foreign competition with the Trade Openness Index (TOI). Developed by Gwartney et al. (2001), the Trade Openness Index reflects the degree to which a government's policies restrict freedom to trade with foreigners. Components of the TOI include the prevalence of tariffs, quotas, exchange rate controls, and limitations on international movements of capital. Higher values of the index indicate greater freedom to trade with foreigners and more openness to multinational competition. Gwartney et al. (2001) and World Bank (1995) contend that a larger degree of trade openness leads to higher efficiency and productivity (due to incentives brought on by the international competition). World Bank (1995) further identifies that the most effective economic reforms involved international trade liberalization. Accordingly, we include the trade openness index in our empirical analysis to control for cross-country differences in the degree of international product-market competition.

2.1.3. Overall level of macroeconomic activity

A firm privatized during a period of overall economic growth (perhaps brought about by greater trade liberalization, advantageous capital market conditions, or some combination of factors other than privatization) may experience improved performance in the post-privatization years. However, the performance improvements may be mostly driven by the favorable macroeconomic environment and not by the change in ownership. As an attempt to control for macroeconomic effect, our regressions include a variable measuring the real change in each country's overall economic growth (real change in GDP).

2.2. Firm-level factors that may affect post-privatization performance

In addition to institutional or macro-factors, firm-specific factors may also influence post-privatization performance. The fundamental firm-level effect of privatization is a change in ownership. First, privatization reduces or eliminates share ownership by the state and correspondingly increases equity ownership by private investors. The new private shareholders may be domestic and/or foreign investors. Furthermore, the impact of ownership changes may also be affected by firm-specific characteristics such as the firm's

size and industry. The following section describes how these firm-specific factors may impact post-privatization performance.

2.2.1. Changes in ownership

With the change in ownership, privatization redefines the firm's objective function. Since state-owned enterprises (SOEs) may pursue objectives that conflict with profit-maximization, the level of post-privatization ownership retained by the government should affect the newly privatized firm's performance improvements. Boycko et al. (1996) predict efficiency gains from privatization only if control rights pass from the government to private investors. Also, Paudyal et al. (1998) argue that selling only a small stake increases the likelihood of continuing government interference and possible renationalization.³ In empirical studies of the effects of privatization, D'Souza and Megginson (1999), Boubakri and Cosset (1998), Eckel et al. (1997), and Megginson et al. (1994) report larger efficiency improvements following sales in which the government relinquished majority control. Accordingly, we expect that greater performance improvements will result from privatizations in which private owners control a larger portion of the firm. In our empirical analysis, we include a variable that measures the government's post-privatization percentage ownership.

The presence of foreign investors may also affect the degree of performance improvement in newly privatized firms. Foreign owners may provide managerial and technical expertise and allow for greater access to new markets and to new sources of capital. Frydman et al. (1999), Anderson et al. (1997a,b) and Smith et al. (1997) document a significant positive relation between foreign ownership and post-privatization efficiency and profitability improvements. Therefore, we expect that newly privatized firms with larger amounts of foreign ownership should experience stronger performance improvements. We measure the influence of foreign investors with the percentage ownership acquired by foreigners during the initial privatizing offering.

2.2.2. Firm-level effects of competition

As described earlier, the competitive environment in each country may affect the newly privatized firm's performance. However, within each country, the impact of competition may differ across industries and firms. For example, Vickers and Yarrow (1991) suggest that while privatization should stimulate efficiency gains in competitive environments, there is no advantage to private ownership when market power exists. Additionally, Boardman and Laurin (1998) contend that firms such as utilities, which are not subject to the discipline of competitive pressure, would be less likely to benefit from privatization. Several empirical studies—including Megginson et al. (1994) and La Porta and López-de-Silanes (1999)—report significant differences when comparing the post-privatization performance of firms in competitive and non-competitive (regulated) industries. These studies find that efficiency gains are significantly greater for firms in competitive markets. We extend this analysis by testing for post-privatization performance differences between

³ In their study of Malaysian privatizing IPOs, Paudyal et al. (1998) find a positive relation between the percentage of capital sold and the IPO's initial premium. They contend that the market reacts favorably since the larger percentage sold reduces the probability of government interference.

firms in competitive industries and those that are heavily regulated. We identify firms in regulated industries (telecoms and utilities) with an indicator variable.

2.2.3. Firm size

The size of the newly privatized firm is another variable which may affect its post-privatization performance. Aussenegg and Jelic (2002) and Villalonga (2000) argue that larger firms may be more difficult to turn around. Therefore, in larger firms, performance improvements might not fully materialize until many years following privatization. Also, due to their increased visibility and political importance, larger SOEs may have benefited from greater ongoing state support (through subsidies, tax breaks, forgiveness of debts, and other favorable treatment). For example, Djankov and Murrell (2002) and Megginson and Netter (2001) note that larger SOEs are more likely to receive soft financing and other support from the state. As a result, larger SOEs may have been in better condition as of the time of privatization. For these reasons, we expect larger firms to exhibit less substantial post-privatization performance improvements immediately following privatization. In our empirical analysis, we measure firm size with the log of total assets (at the time of privatization).

3. Data and methodology

Our sample of privatized firms is from the appendix of Megginson and Netter (2001) and the Privatization International and the World Bank privatization databases. Through mail requests, we directly solicit annual reports and prospectuses from the privatized firms. We collect these data by hand from the documents that we receive from the privatized companies.⁴ We also collect data from company websites.

To generate comparable post-issue financial and accounting data, we limit our analysis to share-issue privatizations. While governments may use other methods of privatization (e.g., direct sale to another company), share-issue privatizations (SIPs) represent the largest and most economically and politically important privatizations.

We compute proxies from the prospectuses and annual reports as well as from supplemental sources such as Disclosure databases, Infotrac, *The Wall Street Journal*, and *The Financial Times*. We use local currency data in our performance measurements. Whenever possible, we measure performance with ratios that include nominal data in both the numerator and denominator. We also emphasize ratios computed using current-year, “flow” measures, which are less sensitive to inflation and to accounting conventions.

Studies of operating and financial performance using accounting data are subject to numerous empirical hazards. Barber and Lyon (1996) describe many of these concerns. Megginson and Netter (2001) note that empirical problems involving accounting data are amplified when conducting multi-national studies of newly privatized firms. Accordingly, we recognize that multi-national studies of privatization may be plagued by potentially

⁴ We follow the procedure of Megginson et al. (1994) with respect to identifying privatized firms and classifying pre- and post-privatization performance information.

inconsistent, inaccurate, or missing accounting data. However, we feel that there are several reasons why our data may be less-adversely affected by these problems. First, unlike many studies of privatization, our sample is entirely from developed countries (where accounting and disclosure standards should be higher). Second, since our typical privatizing transaction is relatively large (average size of US\$1.9 billion), we expect higher quality and greater availability of accounting data. Third, a vast majority of our sample firms today have websites. Typically presenting detailed financial data, these websites now provide researchers with more complete and consistent accounting information. Finally, to maximize data availability, we follow Megginson et al. (1994) and focus on lowest-common-denominator accounting variables such as sales, net income, total assets, and total debt.

Our database includes privatizations of 129 firms (from 23 developed countries). These transactions take place from 1961 to 1999. Table 1 provides some descriptive information about our data. Our sample of privatizations raised US\$239 billion, or an average of US\$1.9 billion per transaction. While the data range over almost forty years, a majority of the privatizations occurred in the late 1980s and early 1990s.

Our initial tests follow the techniques of Megginson et al. (1994). To determine post-privatization performance changes, we use a matched pair methodology (i.e., compare pre- and post-privatization results). Megginson and Netter (2001) provide an excellent discussion of the strengths and weaknesses of applying this technique to the study of post-privatization performance.

We begin by calculating performance measurement proxies for every company over a seven-year period (covering the 3 years before to the 3 years after privatization). We next determine the mean value of each variable for every firm over the 3-year “before” and “after” periods. Since the year of privatization (year 0) includes phases of both state and private ownership, we exclude year 0 from our mean calculations, though we examine several variables that are normalized relative to that variable’s value in year 0 (value in year 0 equals 1.00). To test for differences in the pre- and post-privatization performance, we use the Wilcoxon signed-rank test. We additionally utilize a proportion test to determine whether the percentage (p) of firms experiencing changes in an expected direction is greater than 50%. Findings of a significant proportion of performance changes that occur as expected would help to reduce concerns that outliers are driving our results.

After assessing post-privatization performance, we begin our search for the factors that may explain why newly privatized firms experience changes in profitability and efficiency. We perform a multivariate OLS regression to examine how institutional and firm-specific factors may affect post-privatization performance. In each model, the dependent variable is the change in the value of the performance proxy (mean value after privatization/mean value before privatization). The independent variables are factors that the theoretical and empirical literature identifies as potential determinants of post-privatization efficiency gains.

We also acknowledge the econometric complexities involved in analyzing post-privatization performance. As mentioned above, there may be data problems. Additionally, Megginson and Netter (2001) note the possibility of sample selection bias. For example, to enhance the chances of financial success of privatization programs, governments may be

Table 1
Description of sample

Panel A: By country

Country	Number of transactions	Total US\$ value of transactions
Australia	5	15,432
Austria	5	1116
Canada	9	3107
Czech Republic	1	134
Denmark	2	2894
Finland	4	2314
France	18	41,078
Germany	7	15,595
Greece	1	398
Hungary	2	1413
Ireland	3	4956
Italy	11	29,948
Japan	6	49,697
Netherlands	3	4675
New Zealand	3	2739
Poland	4	502
Portugal	3	2867
Spain	7	7193
Sweden	4	1713
Switzerland	1	5600
Turkey	3	1044
UK	25	41,362
USA	2	3075

Panel B: By legal system

Origin of legal system	Number of transactions	Total US\$ value of transactions
English Common Law	47	70,671
French Civil Law	46	87,203
German Civil Law	19	72,008
Other	17	8970

Panel C: By date

Date of transaction	Number of transactions	Total US\$ value of transactions
1980 and before	3	1123
1981–1985	8	5834
1986–1990	46	69,340
1991–1995	39	32,744
1996 and after	33	129,811

Panel D: By industry

Industry	Number of transactions	Total US\$ value of transactions
Telecommunications	18	95,124
Manufacturing	49	29,160
Financial	21	37,860
Transportation	14	27,306

(continued on next page)

Table 1 (continued)

Panel D: By industry		
Industry	Number of transactions	Total US\$ value of transactions
Utility	24	48,814
Other	3	588

This table presents a description of our sample of newly privatized firms (organized by country, legal origin, date of privatization, and industry). Dollar amounts are in millions of US\$ as of the date of privatization.

more likely to first privatize profitable firms.⁵ There are also econometric issues stemming from potential endogeneity, omitted variables, and outliers. Where possible, we attempt to mitigate some of these concerns. Nevertheless, the reader should keep these methodological caveats in mind when interpreting the results of our empirical analysis.

4. Empirical results

Our first round of empirical analysis measures post-privatization financial and operating performance in our sample from developed countries. We then turn to our examination of possible causes of the performance changes.

4.1. Post-privatization changes in financial and operating performance

Our data indicate that, following privatization, firms experience significant increases in profitability, efficiency, and real output, compared to the average values from the 3-year pre-privatization period. Table 2 summarizes our specific results.

We measure profitability with return on sales (net income/sales). Following privatization, average (median) return on sales increases from 5.8% (4.8%) to 8.2% (6.6%). This increase is significant at the 1% level. We further note that a statistically significant 70% of our sample firms have positive changes in profitability. Confirming that such a large proportion of newly privatized firms experience increased profitability lessens concerns that outliers may be driving our results.

To test for post-privatization efficiency improvements, we use inflation-adjusted, sales per employee (SEFF). Deflated sales per employee is normalized to equal 1.00 in year 0 so that other year figures are expressed as a fraction of output in the year of divestment. We find that SEFF increases significantly after privatization. Average (median) SEFF rises from 0.87 (0.75) of year-0 values in the 3-year pre-privatization period to 1.89 (1.33) after divestiture. Our proportion test also reflects greater efficiency with 82% of our sample firms reporting higher values of SEFF in the years after privatization.

Output (real sales) also significantly increases following privatization. We compare average, inflation-adjusted sales for the pre-privatization period to the average post-

⁵ This concern is perhaps more relevant in earlier studies of privatization (where samples consisted primarily of each country's initial privatizing transactions). As Table 1 shows, our sample includes numerous privatizations from each country, a majority conducted years after the nation's first privatization.

Table 2

Results from tests of changes in performance of newly privatized firms from developed countries

Variable	N	Mean before (median)	Mean after (median)	Mean change (median)	Z-statistic for difference in medians (after–before)	Percentage of firms with expected performance	t-statistic for significance of % with expected performance
<i>Profitability</i>							
Return on Sales (%)	105	5.83 (4.78)	8.16 (6.61)	2.33 (1.83)	4.45*	70.40%	5.00*
<i>Output</i>							
Normalized Real Sales	118	0.83 (0.69)	2.06 (1.40)	1.23 (0.71)	8.06*	88.14%	12.81*
<i>Efficiency</i>							
Normalized Sales Efficiency (SEFF)	94	0.87 (0.75)	1.89 (1.33)	1.02 (0.58)	6.46*	81.91%	8.04*
<i>Employment</i>							
Employment	102	32,601 (12,209)	33,408 (10,843)	807 (–1,366)	–1.21	44.12%	–1.20
<i>Investment</i>							
Normalized Real Capital Expenditure	98	0.83 (0.66)	2.36 (1.50)	1.54 (0.84)	6.90*	83.84%	9.15*
<i>Leverage</i>							
Debt to Assets (%)	100	48.52 (45.14)	43.94 (37.56)	–4.59 (–7.59)	–3.75*	68.57%	4.10*

This table presents empirical results for our sample of privatized companies headquartered in developed countries (members of the Organization for Economic Cooperation and Development (OECD)). The table presents the number of useable observations, the mean and median values of the proxy for the three-year periods prior and subsequent to privatization, the mean and median change in the proxy's value after versus before privatization, and a test of significance of the median change. We employ the Wilcoxon signed rank test (with its z-statistic) as our test for significance for the change in median values. The final two columns detail the percentage of firms whose proxy values change as expected, as well as a test of significance of this change. Sales efficiency (SEFF) uses inflation-adjusted sales figures divided by the number of employees each year. This ratio is normalized to equal 1.00 in year 0 so other year figures are expressed relative to per capita output in the year of divestment. Real sales and real capital expenditure are computed similarly.

**Indicates significance at the five percent level.

***Indicates significance at the ten percent level.

* Indicates significance at the 1% level.

privatization level. The increase following privatization is significant at the 1% level. The proportion test further indicates that real output significantly rises in the years following privatization. Virtually all of our newly privatized sample generates higher real sales in the post-privatization period.

Our data also confirm the findings of Megginson et al. (1994) and Boubakri and Cosset (1998) that employment does not significantly decline following privatization. We find no measurable change in employment. In fact, our average firm's employment increases from

32,601 before to 33,408 after privatization. Therefore, the strong post-privatization performance improvements are achieved, on average, without sacrificing employment security.

Additionally, we examine changes in the privatized firms' capital spending and leverage. Capital expenditure increases significantly following privatization. We compare average, inflation-adjusted capital expenditure for the pre-privatization period to the average for the post-privatization period. The increase following privatization is significant at the 1% level. The proportion test also indicates that capital spending significantly rises in the years following privatization. Almost 84% of our sample increased the amount of real capital expenditure in the post-privatization period. Finally, our results show that leverage decreases significantly. The decrease following privatization is significant at the 1% level. The proportion test shows that over 68% of our firms reduce leverage after privatization.

In summary, we identify increases in the profitability, efficiency, and output of newly privatized firms from developed countries. In a contemporaneous study, Boubakri et al. (2005) focus entirely on developing nations and conduct a parallel empirical analysis that uses identical methodology and a comparable time period. We compare our findings to those of Boubakri et al. (2005). Overall, our results are very similar. Both studies document post-privatization performance improvements. Therefore, as noted in summaries of the earlier empirical literature (e.g., Megginson and Netter, 2001; Djankov and Murrell, 2002), firms privatized in both developed and developing countries typically exhibit significant post-privatization performance improvements.

4.2. Regression results: potential determinants of post-privatization performance changes

The following sections present evidence of potential sources of the performance changes in our sample of privatizations from developed countries. Wherever possible, we compare our results to those of Boubakri et al. (2005). This allows us to identify how factors affecting post-privatization performance may differ between developed and developing countries.

In our regression models, the dependent variables represent percentage changes after privatization in return on sales (ROS), level of real sales (RSALE), sales efficiency (SEFF), employment (EMP), real capital expenditure (CAPEX), and leverage (LEV), respectively. To potentially explain these changes in post-privatization performance, we employ the independent variables: state ownership, foreign ownership, size of firm, regulated firms, the degree of protection of shareholder's rights, growth in GNP per capita, equity market development, the trade openness index, and the index of economic freedom. We list and define these variables in Table 3. Table 4 presents the results of our regressions.

4.2.1. Profitability

Our primary measure of profitability is the return on sales ratio (ROS). Since it is formed by two "flow" values, the ROS ratio should be less affected by any accounting inconsistencies. This is especially important given our earlier described concerns about the quality of accounting data used in studies of privatization.

Table 3
Definitions of explanatory variables used in regressions

Variable	Proxy for	Empirical definition
State Ownership	Residual State Ownership in Privatized Firm	Percent of shares owned by the government after the privatization.
Foreign Ownership	Presence of Foreign Ownership in Privatized Firm	Percent of shares allocated to foreign investors at the time of privatization.
Regulated Firms	Industry Effects (Regulated vs. Competitive)	Indicator variable with value=1 if firm is from a regulated industry. We consider a firm as regulated if it is in the utilities or telecommunications industries.
Firm Size	Size of Firm as of Privatization Date	Natural log of total assets as of year of privatization.
Common Law	Degree of Protection of Shareholder Rights	Indicator variable with value=1 if firm is from a common law nation.
Market Development	Equity Market Development	Annual Value of Shares Traded to Total Market Capitalization (in US\$).
Economic Freedom Index (EFI)	Degree of Domestic Product-Market Competition	EFI measures amount of freedom to compete in economic activities within a country. Higher values=greater economic freedom (greater domestic competition).
Trade Openness Index (TOI)	Degree of International Product-Market Competition	TOI measures amount of freedom to trade with foreigners. Higher values=greater trade openness (greater international competition).
Real GDP Growth	Overall Level of Economic Activity During Post-Privatization Period	Percentage growth in Real GDP for three year post-privatization period over the three year pre-privatization period.

The following table defines the empirical variables used in our regression models (Table 4). We use these variables to identify potential determinants of post-privatization performance improvements in our sample of privatizations from developed countries.

Our analysis identifies differences in the factors affecting profitability improvements when comparing developed and developing countries. Specifically, our regression isolates no specific variable that is statistically related to the profitability changes in the developed economies. Conversely, in their analysis of developing nations, Boubakri et al. (2005) identify several institutional or macro-economic variables that significantly affect post-privatization profitability. For example, Boubakri et al. (2005) find that the country's degree of trade liberalization positively affects the magnitude of profitability increases. Since Gwartney et al. (2001) present evidence that trade openness has a larger impact in developing economies, it is not surprising that this variable has a significantly positive relationship with profitability in Boubakri et al. (2005) but not in our sample of privatizations in developed countries. Further, in developing countries, the overall level of macroeconomic activity (changes in GDP) significantly impacts post-privatization profitability. This macro-factor was not significant in our sample of developed countries.

4.2.2. Output

Our regression also attempts to identify determinants of the increased output of newly privatized firms. As expected, Table 4 reveals that post-privatization output improvements are stronger in nations with more developed equity markets. Such performance

Table 4

Regression results to identify potential sources of performance improvements in newly privatized firms in developed countries

	Percentage change in ROS	Percentage change in RSALE	Percentage change in EMP	Percentage change in SEFF	Percentage change in CAPEX	Percentage change in LEV
Constant	−303.24 (−0.37)	−147.80 (−0.34)	−191.02 (−0.90)	219.15 (0.63)	−621.86 (−0.47)	−196.05 (−1.48)
State Ownership	−1.27 (−1.34)	0.08 (0.18)	−0.41 (−1.68)***	0.40 (1.01)	2.23 (1.70)***	−0.18 (−1.28)
Foreign Ownership	1.32 (1.01)	−0.93 (−1.36)	−1.06 (−2.90)*	0.60 (0.99)	−5.14 (−2.71)*	0.04 (0.21)
Regulated Firms	29.47 (0.42)	12.02 (0.33)	9.07 (0.43)	52.33 (1.55)	112.69 (1.22)	−20.15 (−1.72)***
Firm Size	8.85 (0.6)	4.25 (0.58)	5.13 (1.38)	1.20 (0.18)	−18.05 (−0.84)	4.49 (2.07)**
Common Law	−90.84 (−0.83)	40.75 (0.69)	−36.69 (−1.11)	20.28 (0.37)	−53.17 (−0.29)	9.66 (0.57)
Market Development	−183.8 (−1.62)	88.78 (1.82)**	5.08 (0.17)	11.08 (0.23)	584.11 (3.82)*	12.09 (0.86)
Economic Freedom Index	108.41 (1.23)	57.74 (1.26)	39.02 (1.68)***	−9.94 (−0.26)	145.26 (0.88)	12.98 (0.87)
Trade Openness Index	−61.99 (−1.2)	−49.84 (−1.79)**	−14.19 (−1.07)	−29.81 (−1.38)	−82.20 (−1.19)	5.04 (0.64)
Real GDP Growth	0.21 (1.41)	1.08 (14.12)*	−0.04 (−0.83)	1.21 (16.84)*	1.85 (9.61)*	−0.01 (−0.23)
Adjusted R-Squared	−0.0042	0.8480	0.1464	0.8919	0.7389	0.0293
F-Value	0.97	40.66	1.99	47.74	17.35	1.18
Observations	64	65	53	52	53	56

This table presents regression results to identify potential sources of performance improvements in newly privatized firms in developed countries. The dependent variables in the six models are percentage changes in return on sales (ROS), real sales (RSALE), employment (EMP), sales efficiency (SEFF), real capital expenditure (CAPEX), and leverage (LEV), respectively. See Table 3 for a description of the explanatory variables. *t*-statistics are in parentheses.

* Indicates significance at the 1% level.

** Indicates significance at the 5% level.

*** Indicates significance at the 10% level.

improvements would be consistent with a large and liquid capital market providing more efficient financing opportunities and more effective managerial monitoring. The data also indicate the expected positive relation between firm output and overall changes in economic activity. Finally, our output regression in Table 4 identifies a negative relation between output and the level of trade openness. This result is opposite the findings of Boubakri et al. (2005) for firms in developing countries. Boubakri et al. (2005) identify a significant positive relation between trade openness and output. That is consistent with the literature arguing that greater trade liberalization leads to stronger economic performance (predominantly in developing countries).

There are other broad differences in factors affecting changes in post-privatization output when comparing developed and developing countries. Boubakri et al. (2005) find that the legal environment and degree of economic freedom significantly impact the newly privatized firm's productivity in developing countries. Neither of these factors is significant in our analysis of firms from developed economies. Therefore, institutional factors again appear more likely to be significant determinants of post-privatization performance improvements in developing countries.

4.2.3. Efficiency

While Table 2 indicates that newly privatized firms from developed countries exhibit strong efficiency improvements, our regression does not isolate any specific determinants. This is in contrast to the findings of Boubakri et al. (2005) which show that firms with majority of private ownership have significantly better efficiency improvements. In addition, Boubakri et al. (2005) find that several institutional factors are significantly associated with post-privatization efficiency improvements. It is informative to note that the institutional infrastructure significantly affects post-privatization efficiency only in the developing nations. This is consistent with the World Bank (1995) conclusion that institutional development is key to successful economic transition and development.⁶

4.2.4. Employment

Given the politically charged environment in which many privatizations occur, the effect on employment is a very important and closely monitored implication of privatization. As noted earlier, in our sample of transactions from developed countries, we find that average employment does not decline following privatization. Our regression in Table 4 attempts to identify factors affecting changes in post-privatization employment. There is a significant, negative relation between foreign ownership and post-privatization employment levels. Foreign owners, who are probably less affected by local political and social concerns, should be more likely to reduce jobs if the divested firms are truly overstaffed. This is also consistent with the conclusion of Djankov and Murrell (2002) that foreign owners are more likely to restructure newly privatized firms. Additionally, our analysis yields the somewhat surprising result that higher state ownership leads to lower

⁶ This finding may also be affected by a lack of variation in the institutional environment among the developed countries.

post-privatization employment. This is unexpected since overemployment was considered common in state-owned firms. As with foreign owners, we expected larger amounts of private ownership would stimulate deeper cuts in job rolls. However, our results suggest that the state is also not hesitant to eliminate jobs, especially if such reductions are offset by increased profitability (e.g., see change in ROS in Table 2). This finding is additionally consistent with the proposition that partial privatizations give the state greater incentives to streamline operations in order to maximize the future sale price of the government's remaining stake.⁷ Finally, the data indicate a significant positive relation between the country's level of economic freedom and the amount of post-privatization employment. It could be that, in an environment of greater economic freedom, newly privatized firms are more likely to expand to take advantage of the market opportunities and therefore add new employees.

4.2.5. Capital expenditures

Ownership variables also significantly impact the level of post-privatization capital spending in developed countries. The data indicate a significantly negative relation between foreign ownership and post-privatization capital expenditures. Since foreign owners are more likely to reduce the number of employees (see section B.4), newly privatized firms with substantial foreign ownership may have less need for additional capital equipment. Foreign owners may also limit capital investment because of concerns of expropriation.

Our regression further suggests that a larger amount of residual government ownership is associated with greater post-privatization capital spending. This is consistent with the notion of a government preparing its remaining stake in the SOE for subsequent privatization. Our finding is supported by Djankov and Murrell (2002) who determine that partially privatized firms with larger state shareholdings are more likely to restructure and are more productive than firms with diffuse private owners.

Financial market characteristics also affect the changes in capital spending of newly privatized firms. The data indicate a significant positive relation between equity market development and the level of post-privatization capital expenditures. This is as expected since a larger and more liquid capital market would provide the newly privatized firm with greater access to the financing often needed to refurbish and expand. Our result also suggests that the closer monitoring of analysts and sophisticated investors in the more developed markets may drive the newly privatized firms to seek efficiency improvements (such as through modernizing fixed assets and updating technology).

As with most other performance metrics, the factors affecting post-privatization capital spending are different in developed and developing countries. Boubakri et al. (2005) find that none of the factors significantly affecting post-privatization capital spending in developed countries are important determinants of capital spending in developing economies. Instead, Boubakri et al. (2005) find that institutional factors (such as the

⁷ World Bank (1995) also contends that governments may be better able to address unfavorable social consequences associated with the reduction in jobs. Therefore, governments may initiate terminations to help diffuse worker opposition to subsequent rounds of privatization.

level of trade openness) significantly affect the level of capital spending in developing countries. This factor is not significant in our sample.

4.2.6. *Leverage*

The final regression in [Table 4](#) searches for potential determinants of changes in the leverage of newly privatized firms. Consistent with [Megginson et al. \(1994\)](#), we find that leverage significantly decreases following privatization. [Megginson et al. \(1994\)](#) contend that a reduction in leverage may occur because the newly privatized firm has greater access to equity financing (that would not generally be available to SOEs). This would suggest that firms privatized in countries with more active and developed stock markets should be more likely to raise additional capital through equity and therefore further lower leverage ratios. Our regression analysis, however, suggests no significant relation between financial market development and change in leverage. Our model reveals that only firm-specific characteristics are important determinants of changes in leverage following privatization. Specifically, the factors that significantly affect post-privatization leverage are firm size and industry type (i.e., regulated vs. non-regulated). The corporate finance literature also identifies these factors as important determinants of capital structure in private firms.

4.2.7. *Robustness tests*

We conducted the following robustness tests to lessen some of the methodological concerns associated with our empirical analysis (see Section 3). First, since our tests involve ratios, outliers may be affecting our results. We identified outliers (i.e., dependent variables more than three standard deviations from the mean) and dropped them from our regressions. Typically, there were only 2–3 such observations per regression. After eliminating these outliers, we obtain results that are qualitatively similar to those presented in [Table 4](#).

Second, data quality may be a concern. Fortunately, as we noted earlier, quality of accounting data may be less of an issue since our sample consists of relatively large firms from developed countries. To ascertain accounting quality, we gather the accounting standards variable for each country from [La Porta et al. \(1997, 1998\)](#). These data confirm that our sample firms are generally from countries with relatively high accounting standards. In fact, approximately 40% of our sample firms are from accounting environments considered by [La Porta et al. \(1997, 1998\)](#) to be more thorough and rigorous than that of the US. Detailed examination of the accounting standards variables reveals that Portugal is by far the country with the lowest rated accounting system in our sample. Dropping the three sample firms from Portugal does not change our results.

Third, we verify the robustness of our findings to alternative measures of the institutional environment. In recent years, extensive international studies in economics and finance (especially since the seminal works of [La Porta et al., 1997, 1998](#)) have considered how financial decisions are affected by institutional factors. Since many proxies for these factors have been proposed, we examine the impact of using alternative measures of the institutional environment in our empirical analysis. Specifically, we draw from other current studies (such as [Dyck and Zingales, 2004](#); [Megginson et al., 2004](#); [Denis and McConnell, 2003](#); [Stulz and Williamson, 2004](#)) to identify alternative proxies for development of capital markets, competitiveness of the economy, and legal

protection of shareholder rights and private benefits of control. Using this extended set of alternative institutional variables does not alter our findings. Overall, these additional tests indicate that our results are relatively robust to alternative models and variable selection.

5. Summary and conclusions

Many recent empirical studies (summarized in [Djankov and Murrell, 2002](#); [Megginson and Netter, 2001](#)) document improvements in the financial and operating performance of newly privatized firms. This paper adds to the empirical evidence that, after privatization, firms become more profitable and efficient. Specifically, we use a sample of 130 firms (in 23 developed countries) to examine the effects of privatization. Following privatization, firms significantly increase profitability, output per employee, and real sales. The newly privatized firms also achieve these performance improvements without reducing average total employment.

This study seeks to further provide some insights regarding the sources of these performance improvements. Our multi-national, multi-industry sample offers unique opportunities to identify potential determinants of efficiency improvements following privatizations in developed countries. The data indicate that ownership significantly affects post-privatization performance. We find a significant negative relation between ownership (government and foreign) and employment. We also identify a significant positive relation between government ownership and capital spending and a significant negative relation between foreign ownership and capital spending. Finally, we compare our findings to those of the [Boubakri et al. \(2005\)](#) study of post-privatization performance improvements in developing countries. It appears that several factors affecting post-privatization performance differ between developed and developing economies. Most evident is that institutional factors (such as the degree of trade or financial liberalization) are more often significant in the developing countries.

Acknowledgements

We gratefully acknowledge the financial support of the University of Oklahoma's Michael F. Price College of Business, the University of Georgia Research Foundation, the New York Stock Exchange, and the Paris Bourse in acquiring the data used in this study. We are also grateful for comments received on this paper—or on a survey paper detailing these findings—from participants at the NYSE/Paris Bourse Global Equity Markets conference (Paris, December 1998), the 2000 Harvard Institute for International Development Privatization Workshop, three Federation of International Stock Exchanges (FIBV) conferences (Istanbul, Brisbane, and Stockholm), four World Bank and/or International Finance Corporation meetings, two OECD conferences (Paris and Beijing), the 1999 and 2001 American Finance Association meetings, the 1999 European Finance Association annual meetings, the 1999 Conference on Privatization and the Kuwaiti Economy in the Next Century, the 2000 European Financial Management Association

conference, the 1998 and 2000 Financial Management Association meetings, the Swiss Banking Institute and Credit Suisse, the City University Business School (London), London Guildhall University, and the University of Oklahoma. Finally, we thank Bernardo Bortolotti, Narjess Boubakri, Maria Boutchkova, Jean-Claude Cosset, Michael DeWally, Enrico Perotti, Han Kim, Tom Krantz, Florencio Lopez-de-Silanes, Kojo Menyah, Elena Miteva, Todd Mitlon, John Nellis, Jeff Netter, Nemat Shafik, and Mary Shirley for their specific comments and recommendations.

References

- Anderson, C., Makhija, A., Spiro, M., 1997a. Foreign ownership in the privatization process: empirical evidence from Czech privatization. University of Missouri and University of Pittsburgh, Working Paper.
- Anderson, S., de Palma, A., Thisse, J., 1997b. Privatization and efficiency in a differentiated industry. *European Economic Review* 41, 1635–1654.
- Aussenegg, W., Jelic, R., 2002. Operating performance of privatized companies in transition economies: the case of Poland, Hungary, and the Czech Republic. University of Birmingham, Working Paper.
- Barber, B., Lyon, J., 1996. Detecting abnormal operating performance: the empirical power and specification of test statistics. *Journal of Financial Economics* 30, 359–399.
- Boardman, A., Laurin, C., 1998. The long-run performance of privatized firms: an empirical investigation. University of British Columbia, Working Paper.
- Boehmer, E., Nash, R., Netter, J., 2004. Bank privatization in developing and developed countries: cross-sectional evidence on the impact of economic and political factors. Texas A&M University. *Journal of Banking and Finance* (Forthcoming).
- Boubakri, N., Cosset, J., 1998. The financial and operating performance of newly privatized firms: evidence from developing countries. *Journal of Finance* 53, 1081–1110.
- Boubakri, N., Cosset, J., Guedmani, O., 2005. Liberalization, corporate governance, and the performance of newly privatized firms. *Journal of Corporate Finance* 11, 767–790. (this issue).
- Boycko, M., Shleifer, A., Vishny, R., 1996. A theory of privatization. *Economic Journal* 106, 309–319.
- Cragg, M., Dyck, A., 2003. Privatization, compensation and management incentives: evidence from the United Kingdom. *Journal of Law, Economics, and Organization* 19, 176–217.
- Denis, D., McConnell, J., 2003. International corporate governance. *Journal of Financial and Quantitative Analysis* 38, 1–36.
- Djankov, S., Murrell, P., 2000. The determinants of enterprise restructuring in transition: an assessment of the evidence. World Bank, Working Paper.
- Djankov, S., Murrell, P., 2002. Enterprise restructuring in transition: a quantitative survey. *Journal of Economic Literature* 40, 739–792.
- Dow, J., Gorton, G., 1997. Stock market efficiency and economic efficiency: is there a connection? *Journal of Finance* 52, 1087–1129.
- D'Souza, J., Megginson, W., 1999. The financial and operating performance of privatized firms during the 1990s. *Journal of Finance* 54, 1397–1438.
- Dyck, A., Zingales, L., 2004. Private benefits of control: an international comparison. *Journal of Finance* 59, 537–600.
- Eckel, C., Eckel, D., Singal, V., 1997. Privatization and efficiency: industry effects of the sale of British Airways. *Journal of Financial Economics* 43, 275–298.
- Estrin, S., Perotin, V., 1991. Does ownership always matter? *International Journal of Industrial Organization* 9, 55–72.
- Frydman, R., Gray, C., Hessel, M., Rapaczynski, A., 1999. When does privatization work? The impact of private ownership on corporate performance in transition economies. *Quarterly Journal of Economics* 114, 1153–1191.
- Gwartney, J., Lawson, R., Skipton, C., 2001. *Economic Freedom of the World: 2001 Annual Report* (Fraser Institute, Vancouver).

- Havrylyshyn, O., McGettigan, D., 1999. Privatization in transition countries: a sampling of the literature. IMF, Working Paper.
- Holmstrom, B., Tirole, J., 1995. Market liquidity and performance monitoring. *Journal of Political Economy* 101, 678–709.
- Klapper, L., Love, I., 2004. Corporate governance, investor protection, and performance in emerging markets. *Journal of Corporate Finance* 10, 703–728.
- La Porta, R., López-de-Silanes, F., 1999. Benefits of privatization-Evidence from Mexico. *Quarterly Journal of Economics* 114, 1193–1242.
- La Porta, R., López-de-Silanes, F., Shleifer, A., Vishny, R., 1997. Legal determinants of external finance. *Journal of Finance* 52, 1131–1150.
- La Porta, R., López-de-Silanes, F., Shleifer, A., Vishny, R., 1998. Law and finance. *Journal of Political Economy* 106, 1113–1150.
- Levine, R., 1997. Financial development and economic growth: views and agenda. *Journal of Economic Literature* 35, 688–726.
- Levine, R., Zervos, S., 1998. Stock markets, banks, and economic growth. *American Economic Review* 88, 537–558.
- Meggison, W., Netter, J., 2001. From state to market: a survey of empirical studies on privatization. *Journal of Economic Literature* 39, 321–389.
- Meggison, W., Nash, R., Randenborgh, M., 1994. The financial and operating performance of newly privatized firms: an international empirical analysis. *Journal of Finance* 49, 403–452.
- Meggison, W., Nash, R., Netter, J., Poulsen, A., 2004. The choice of private versus public capital markets: evidence from privatizations. *Journal of Finance* 59, 2835–2870.
- Newbery, D., Pollitt, M., 1997. The restructuring and privatization of Britain's CEBG: was it worth it? *Journal of Industrial Economics* 45, 269–303.
- Pagano, M., Roell, A., 1998. The choice of stock ownership structure: agency costs, monitoring, and the decision to go public. *Quarterly Journal of Economics* 113, 187–225.
- Paudyal, K., Saadouni, B., Briston, R., 1998. Privatisation initial public offerings in Malaysia: initial premium and long-term performance. *Pacific-Basin Finance Journal* 6, 1–25.
- Ramamurti, R., 1997. Testing the limits of privatization: Argentine railroads. *World Development* 25, 1973–1993.
- Smith, S., Cin, B., Vodopivec, M., 1997. Privatization incidence, ownership forms and firm performance: evidence from Slovenia. *Journal of Comparative Economics* 25, 158–179.
- Stulz, R., Williamson, R., 2004. Culture, openness and finance. *Journal of Financial Economics* 70, 313–349.
- Subrahmanyam, A., Titman, S., 1998. The going public decision and the development of financial markets. *Journal of Finance* 54, 1045–1082.
- Vickers, J., Yarrow, G., 1991. Economic perspectives on privatization. *Journal of Economic Perspectives* 5, 111–132.
- Villalonga, B., 2000. Privatization and efficiency: differentiating ownership effects from political, organizational, and dynamic effects. *Journal of Economic Behavior and Organization* 42, 43–74.
- World Bank, 1995. *Bureaucrats in business: the economics and politics of government ownership*. Oxford University Press, New York.
- World Bank, 2002. *Building institutions for markets*. Oxford University Press, New York.