

ABNORMAL FINANCIAL AND OPERATING PERFORMANCE OF PRIVATIZED STATE OWNED ENTERPRISES:

Empirical Evidence from IPO:s in Western Europe

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This study analyzes the effects of privatization on financial and operating performance of privatized state owned enterprises. The sample consists of 82 firms, representing 24 industries and 14 countries in Western Europe, that were privatized through a stock market listing during the period 1991 through 2003. In contrast to most previous research, this study attempts to isolate the effects of privatization using a two-digit SIC benchmark in the analysis. Our analysis points to significant increases in profitability and output following privatization and decreases in the level of capital expenditure and leverage. We document weak support for increases in efficiency and employment. These findings are for the most part in line with previous research. In a sub-sample analysis we find differences within our sample. Most notably, our results vary depending on firm size and the level of industry regulation.

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“In every great monarchy in Europe the sale of the crown lands would produce a very large sum of money which, if applied to the payments of the public debts, would deliver from mortgage a much greater revenue than any which those lands have ever afforded to the crown...When the crown lands had become private property, they would, in the course of a few years, become well improved and well cultivated”

- Adam Smith, 1776

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1. INTRODUCTION

In September of 2006 it was clear that the centre-right coalition had won the Swedish general election and would be forming a new government. They did so while advocating that several of the crown jewels in the portfolio of Swedish state owned enterprises would be privatized - a controversial issue in many parts of the world, not least in the Scandinavian countries.

Many prominent scholars have written voluminously on the topic of privatization of state owned enterprises (SOE:s), and great quantities of evidence have been brought forward supporting the claim that a shift in ownership regime from state to private ownership leads to improvements in corporate governance. The evidence also supports the claim that the change in corporate governance, ultimately, results in improved financial and operating performance.

There have been studies from virtually every corner of the globe, almost always reaching the same conclusion; the operating performance of state owned enterprises improves after privatization. However, after the fall of the Iron Curtain, much of the research has focused on the extensive privatization programs embarked upon by many former socialist countries. Very little focus has been on Western Europe. Moreover, the studies carried out on European data have not isolated the effect of the privatization from the overall change in economy and in industry performance.

This study of the financial and operating performance of privatized SOE:s contributes to the existing research by addressing two key issues. First, this study extends the rigorous framework developed by Megginson, Nash and van Randenbourgh (1994) by measuring abnormal performance, i.e. firm performance relative to the industry. The underlying assumption being that at least some of the change in company performance could be attributable to the general trend in the industry, something that has not previously been investigated. The need to control for industry performance has been pointed out notably by Megginson and Netter (2001). Second, we analyze firms privatized in Western Europe during the period 1991 through to 2003, a previously unexamined region for this period. To the best of our knowledge, this study is the first to focus on privatization in Western Europe on this side of the millennium. Moreover, we examine the effects of privatization in a business environment similar to the one under which Swedish SOE:s are currently operating. Subsequently, the purpose of this study is to perform an event study in order to evaluate the

change in abnormal financial and operating performance of SOE:s following privatization in Western Europe. In order to gain a deeper insight into our main findings we also perform four different sub-sample analyses based on legal origin, firm size, industry regulation and whether or not the government retains a controlling interest.

The main results of this study are that profitability and output increase following privatization. We document a decrease in the level of capital expenditure and leverage. Furthermore, we find weak support for improvements in efficiency and employment.¹ Performing sub-sample analyses reveals differences within our sample. Most notably, we find differences in our sample depending on firm size and the level of industry regulation.

This study proceeds with six parts. In part two we give an overview of the concept and history of privatization, this part of the study is more descriptive. In part three, we present the theoretical background and previous research on the topic of operating performance of privatized SOE:s. Part four presents our hypotheses and methodological framework. In part five we present the data. In part six the results and our analysis are presented. In this part we also introduce the sub-sample analysis. The study is concluded in part seven.

2. PRIVATIZATION – AN OVERVIEW

The privatization of SOE:s has long been a heavily debated and politically sensitive area of research. The privatization concept, as we know it today, was first discussed by Peter Drucker in 1969. Mr. Drucker was a well known management guru and it was in “The Age of Discontinuity” that he first envisioned that governments in Europe and the western world would have to return companies to the private market place. The label “privatization” was then made synonymous with the concept by Robert Pool who wrote and researched on the subject in the 1970:s (Reason Foundation, Annual Privatization Report (2006)). The term privatization has sometimes been applied so as to encompass phenomena as diverse as the divestment of SOE:s, deregulation of former state monopolies and private provision of state financed services. Throughout this thesis the term “privatization” refers to the divestment of SOE:s.

¹ The two proxies for efficiency in this study are sales efficiency and net income efficiency. Sales efficiency is defined as real sales divided by number of employees and net income efficiency as real net income divided by number of employees.

Although the concept of privatization was spawned with the sale of Volkswagen in 1961, it was in Britain during the 1980:s the first major wave of privatizations took place. During the British privatization program, there was fierce debate and opposition. The Prime Minister, Margaret Thatcher, pursued a program of government divestitures motivated by politics and the idea that in order to “create a genuine market in a state you have to take the state out of the market” (Margaret Thatcher (2006)). Later periods of extensive privatizations have been motivated partly by the same thoughts, but increasingly focus has shifted to creating profitable and efficient organizations as well as to giving the governments a sometimes much needed injection of cash. The privatization policies of governments’ now also have a more solid theoretical and empirical base as researchers around the world have investigated more aspects of the privatization phenomenon.

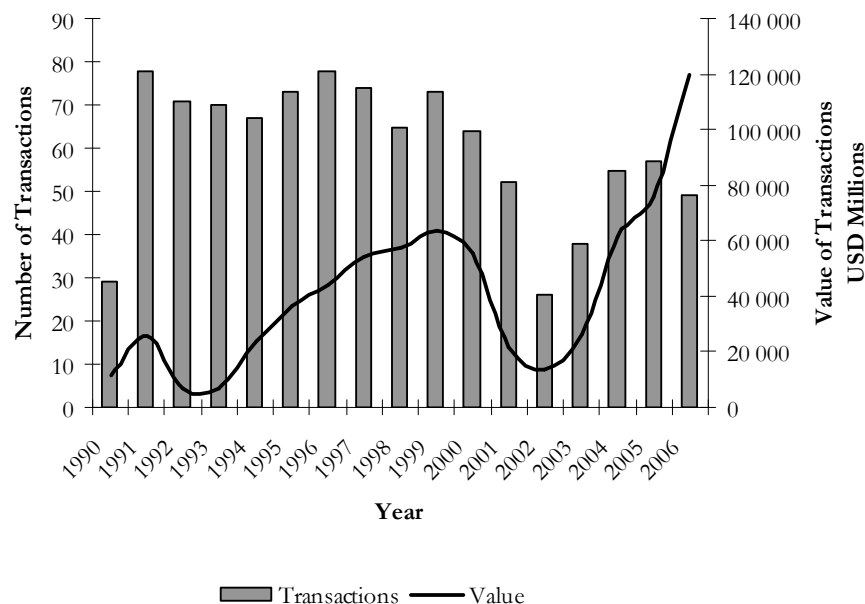
Since the first large wave of privatization in the UK, privatizations have become an important policy tool for many governments and the concept has today spread to virtually every corner of the world. Large privatizations have been carried out in places as diverse as South America, North America and Asia as well as Eastern and Western Europe. Most of the studies on these privatization programs have found that privatization improves financial and operating performance of former SOE:s. The nature of privatizations in developing countries is, however, different from that of developed regions since the reasons governments divest SOE:s are often more diverse than in developed economies.²

Another difference between privatization in developed and developing countries lies in the institutional setting of the countries. The institutional framework in developing countries is deficient compared to that in developed economies. This means that they have higher sovereign risk wherefore they will inevitably have to give a larger discount when pricing SOE:s (Bortolotti, Fantini and Siniscalco 2003). Moreover, isolating the effect of the privatization in an unstable environment poses a much greater challenge. Thus, one can safely conclude that there is a large conceptual difference between privatization in developing and developed countries. The objective of this thesis is to shed some light on the privatization phenomena in developed Western European countries. Therefore, we will focus on privatizations in developed countries and will not elaborate on privatizations in developing countries.

² See for example Omran (2002) who argues that the Egyptian government privatize SOE:s partly to increase the liquidity of the capital market.

The number of privatization transactions, and the average value of these transactions, in the countries included in our sample during the last 15 years are illustrated by Diagram I. Although several different methods of divestiture are utilized world wide, two are dominant in Western Europe.³ These two are public offerings where the SOE is sold to the general public, and public sales where the SOE is sold as a unit to a private company or investor. Diagram II shows the total value of transactions divided by public sales and public offers during the period studied.⁴ Public offerings include not only initial public offerings (IPO:s) but also additional divestment of firms previously partly privatized, i.e. companies with stocks already traded on a stock exchange. The focus of this paper is initial public offers (IPO:s). The significance of privatization IPO:s is presented in Megginson and Netter (2001) who report that 30 of the 34 largest initial public offerings in history have been privatizations. An interesting feature of the Diagram I and II is that the number of privatizations roughly follows the general market trends. A quick glance at Diagram I suggests that during periods of economic slowdown and low IPO activity only a limited number of SOE:s is offered to the public.

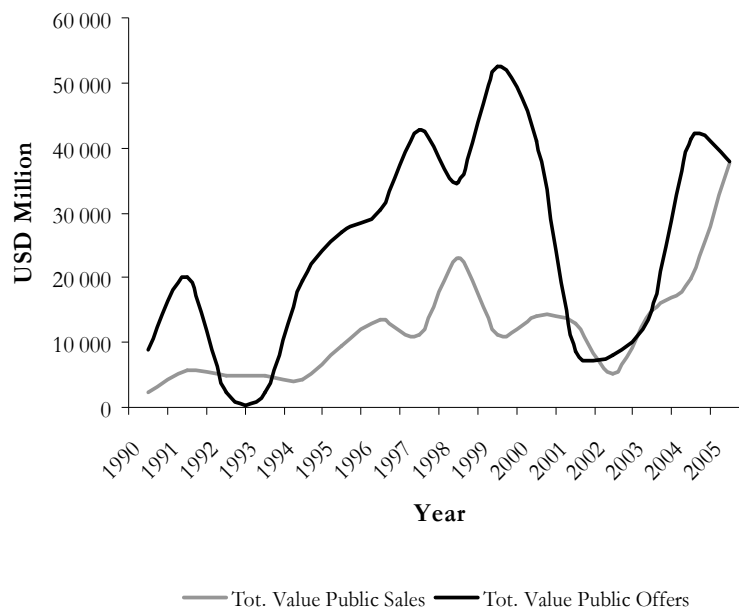
Diagram I. Volume and value of transactions involving privatized SOE:s



³ Outside Western Europe other method of divestment has been used. Many former East European states, have utilized so called “voucher privatizations”. In a voucher privatization the shares in the companies are more or less allotted to the people, thus handing back to the people what was, arguably, rightfully already theirs.

⁴ Data for diagrams I and II was collected from the Privatization Barometer’s website 2007-03-17. The Privatization Barometer is an Italian based privatization Internet portal funded by non-profit research institutes. The Privatization Barometer is also an official provider of privatization data to OECD and the World Bank.

Diagram II. Value of transactions by type



Source: Privatization Barometer

3. THEORETICAL AND EMPIRICAL BACKGROUND

Our aim is to perform an event study to analyze the difference between the pre and post privatization operating performance. In this section we will account for the theoretical foundation upon which we base our hypotheses. We will also present the most influential literature in this field of research. In addition, we will describe how we compute abnormal performance – our main methodological contribution. The section is concluded by a presentation of the statistical methods used to assess the significance of any change in abnormal performance.

3.1 THEORETICAL BACKGROUND

The concept of privatization can be analyzed from a wide variety of angles, each demanding a separate set of theories. Previous research and debate, however, have had two main foci. The first focus has been to assess, theoretically and empirically, if privatized firms operate more efficiently and profitably. The second focus has been the impact of privatization on socio-economic issues such as employment and exploitation of market power. SOE:s have traditionally been used by politicians and politically appointed managers to achieve political gains, not least increasing the rate of unemployment (See for example Boycko, Scheifer and Vishny (1996) and Megginson *et al.* (1994)). The issue of privatizations thus lies in the

intersection of theories such as those on corporate governance, property rights, agency theories, political economy, macroeconomics and finance. Hence, any prediction on the subject will in virtually every case be fraught by counteracting forces which lead to uncertainty. Perhaps because of the difficulty in efficiently accounting for the underlying theory, many empirical researchers quote previous studies in order to lay the foundation for their own.

The most ambitious attempt to formalize a comprehensive theory to explain the performance of SOE:s, and the effect of privatization in particular, was brought forward by Boycko, Shleifer and Vishny (1996) in their paper “A Theory of Privatization”. The model developed by Boycko, Shleifer and Vishny (henceforth “the BSV model”) attempts to formally explain the effects from privatization. The fundamentals of the BSV model are that the goals of a private owner and those of a government are not aligned. In the BSV model it is assumed that both the government and the private owner are utility maximizing, and that for the private owner the monetary pay-off is equal to the utility. The state, on the other hand, should maximize social welfare and other non-monetary measures. In other words, a private owner is expected to be profit maximizing, whereas a government may have political ends – such as high employment. Based on these fundamentals Boycko *et al.* develop a model that predicts that privatization will lead, all else equal, to more efficient firms because the private owner will have stronger incentives to restructure the firm in order to improve profits. The model thus explains why a private owner would rationalize the operations – creating a more efficient and profitable firm – and the state would have a lower propensity to do so. This also implies that governments may maintain an inefficiently high level of output in SOE:s, in order to reduce unemployment.

In addition, the type of owner to whom an SOE is sold will have a significant impact on the expected outcome in terms of changes in the level of efficiency, profitability and employment. Boycko *et al.* (1996) argue that for privatizations in which the new owners are dispersed, the benefits of privatization will be smaller – since the new owners would to a lesser extent exercise their shareholder influence, thus rendering the manager capable of directing cash flow as he sees fit. Boycko *et al.* (1996) argue that, like politicians, managers are reluctant to lay off workers because of the personal inconvenience. Thus, for improvements in efficiency and profitability to be maximized, there should be a few large owners among

those to whom the SOE is sold. Investigating this effect, however, lies outside the scope of this study.

The BSV model also outlines that a prerequisite for firms to become more efficient is that the government relinquishes a large enough part of the control and cash-flow rights. The reason is that the cost for the politician to influence the decision making in the firm increases following privatization. Using internally generated funds to finance political ends is associated with lower political costs than using tax revenue. In other words, if the politician has no control over the cash flow, he or she has only the alternative to use subsidies or other government funds in order to influence the firm. Such a scheme would meet with much resistance because of its transparency and obvious impact on public finances.

3.2 LITERATURE REVIEW

Privatization was for a long time a more or less ignored area of research. The common belief was that certain market failures were inevitable and that the best remedy for these was to create state owned “natural monopolies” (Vickers and Yarrow (1991)). As interest has grown and privatization of state owned enterprises have become more commonplace, many prominent scholars have written on the topic. Most previous studies of the effect of privatization on firm financial and operating performance have generally taken one of three approaches. Firstly, studies have been carried out with a sample from one and the same country, but from a cross-section of industries. This method was commonly used in the earlier studies carried out, primarily, on data from Britain and developing countries. Secondly, researchers have chosen to focus on a specific industry, a relevant approach since governments during certain periods of time have chosen to privatize certain types of companies - such as utilities or airlines. Thirdly, there are studies that analyze numerous industries across several countries. Since these multidimensional studies are the ones upon which we build this thesis, we will outline the methods and main findings of these studies below. Moreover, the findings of the most important studies of this type will be contrasted to our result in section six.

Meggison, Nash and van Randenborgh (1994), is the most widely cited multidimensional privatization study to date. Meggison *et al.* (1994) develop a methodological framework to empirically analyze the effects of privatization predicted by the BSV model. The method developed by Meggison *et al.* (1994) (henceforth the MNR framework) has since been

extensively used also by other researchers and has had a large impact on the way in which gains from privatization are measured. Using a sample spanning over 18 countries, both developed and developing, and 32 industries, Megginson *et al.* (1994) find that, on average, firms improve their financial and operating performance as a result of privatization. D'Souza and Megginson (1999) confirm these results using a sample of firms privatized during the period of 1990-1996.

Dewenter and Malatesta (2001) perform a multidimensional study using a global sample of large firms. The study is carried out in three parts, where they in the first use regression analysis and establish that there is a difference in operating performance between private companies and SOE:s. In this regression analysis they attempt to correct for industry performance. In the second part Dewenter and Malatesta perform a study using the MNR framework, but use a larger sample and a longer event window. The main contribution of this analysis is that there is a large performance improvement prior to the seven year period studied in Megginson *et al.* (1994). In this part they do not correct for industry performance. In the third part they analyze the long run stock return of privatized firms and find that SOE:s have no abnormal stock performance following the IPO. This finding contradicts the findings of Jones, Megginson and Nash (1999), who find that privatized firms significantly outperform both regional and international stock indices.

Though the MNR framework has become influential it has also been criticized. Megginson and Netter (2001) criticize the framework for “ignoring (or, at best, imperfectly accounting for) changes in the macro-economy or industry over the seven-year event window during which they compute pre versus post privatization performance changes”. Although, our focus is not on developing countries our result will, in order to provide a more nuanced context, be contrasted to a major study by Boubakri and Cosset (1998). Boubakri and Cosset identify the need to adjust for the market condition at time of privatization. Their study includes 79 companies in 21 developing countries. The authors measure the same variables as MNR but adjust for the prevailing market condition. The authors intended to use industry averages but due to limited data availability for the included markets they had to settle for two market wide indices; one for financial and one for non-financial firms.

Other researchers that identify the need to account for time and industry specific effects are Okten and Arin (2003) who examine the privatization of the Turkish cement companies between 1989 and 1998. Their sample consists of 23 SOE:s which before the privatization held 40 percent of the Turkish cement market. The privatization of the cement industry offered a unique opportunity to study how privatization affects efficiency while controlling for firm and time specific effects. The results show that the efficiency, allocation efficiency and productivity of the cement companies improve significantly.

Omran (2002) is another researcher who tries to account for industry performance within the MNR framework. Omran corrects for business cycle variations, when analyzing Egyptian privatizations, by matching the privatized firms to firms that remain state owned. He finds that privatization leads to significant improvements in profitability, efficiency as well as a reduction in leverage.

The results of the studies above provide overwhelming evidence that the performance and efficiency of SOE:s improve with privatization. However, none of these studies successfully control for changes in industry performance. Thus, they cannot establish if the documented improvements are directly attributable to the privatization event, or if they can be explained by a general improvement in market conditions within the industry. Some studies have, indeed, attempted to investigate this possibility, but in those cases the samples have consisted of firms from developing nations. In light of the upcoming Swedish privatizations it is of special interest to analyze the recent privatizations of Western Europe, while controlling for industry performance.

4. HYPOTHESES AND METHODOLOGY

4.1 HYPOTHESES

Meggison *et al.* (1994) have identified a set of testable hypotheses based on the BSV model. We will use the same hypotheses as those used in the MNR framework. The primary reason for this is that our study is an extension of this framework. Hence, using the same hypotheses enables an evaluation of the impact of our methodological contribution. This does not mean, however, that we are in total agreement with the MNR framework regarding the *a priori* expectations. Our expectations are accounted for in the next section. Within the

MNR framework the tested hypotheses are: privatization increases profitability, increases operating efficiency, increases capital expenditure, increases output, decreases employment, decreases leverage and, finally, increases dividends paid. The same hypotheses are also examined in research by D’Souza and Megginson (1999), Dewenter and Malatesta (2001) and Boubakri and Cosset (1998) among others.

Our intention is to extend the MNR framework by adjusting for industry performance. However, in order to highlight the impact of this methodological extension we also perform the “pure” MNR analysis. In addition, to assert the robustness of our findings most hypotheses are measured by several different variables. Although we aim at testing the same hypotheses as MNR, we do not exclusively analyze the same variables as they do. In some cases we have identified shortcomings in the variables used by MNR and we address these issues when possible. A summary of the hypotheses, expected sign of change and the variables used to test the hypothesis are presented in Table I. The hypotheses presented are not mutually exclusive but are constructed to highlight different nuances of the effects of privatization. Our opinion is that the most important effects of privatization are changes in profitability and employment. We argue that the remaining variables are closely related to profitability. Employment is interesting to analyze due to its political aspects. Moreover, as a complement to the main analysis, we also perform a sub-sample analysis, where we divide our main sample into several sub-samples in an attempt to identify important firm, industry and country level properties that affect the outcome of privatization.

Table I. List of Hypotheses, proxy variables and testable predictions.

Hypotheses	Proxy variable	Prediction
H ₁ : Increased profitability	Return on Sales (ROS) = Net Income / Sales	$ROS_{PRE} < ROS_{POST}$
	Return on Assets (ROA) = Net Income / Assets	$ROA_{PRE} < ROA_{POST}$
	Return on Equity (ROE) = Net Income / Equity	$ROE_{PRE} < ROE_{POST}$
H ₂ : Increased operating efficiency	Sales Efficiency (SALEFF) = Sales / Number of Employees	$SALEFF_{PRE} < SALEFF_{POST}$
	Net Income Efficiency (NIEFF) = Net Income / Number of Employees	$NIEFF_{PRE} < NIEFF_{POST}$
H ₃ : Increased capital expenditure	Capital Expenditure to Sales (CESA) = Capital Expenditure / Sales	$CESA_{PRE} < CESA_{POST}$
	Capital Expenditure to Assets (CETA) = Capital Expenditure / Assets	$CESA_{PRE} < CESA_{POST}$
H ₄ : Increased output	Real Revenues (REVENUE) = Nominal Sales / Consumer Price Index	$REVENUE_{PRE} < REVENUE_{POST}$
H ₅ : Decrease in employment	Employment (EMPL) = Average number of employees for the year	$EMPL_{PRE} > EMPL_{POST}$
H ₆ : Decreased leverage	Debt to Assets (D / A) = Total Debt / Total Assets	$(D / A)_{PRE} > (D / A)_{POST}$
	Long Term Debt to Equity (l-t D / E) = Long Term Debt / Equity	$(l-t D / E)_{PRE} > (l-t D / E)_{POST}$
H ₇ : Higher pay-out ratios	Dividends to Sales (DIVSAL) = Dividendes / Sales	$DIVSAL_{PRE} < DIVSAL_{POST}$
	Dividends Payout Ratio (PAYOUT) = Dividendes / Net Income	$PAYOUT_{PRE} < PAYOUT_{POST}$

4.1.1 Privatization increases profitability [H₁]

One of the fundamentals of the BSV model is that private owners, as opposed to governments, are profit-maximizing. We want to test if the effect of privatization on profitability is that which is expected by governments and suggested by theory, i.e. that the profitability improves. The proxies used for measuring profitability are Return on Sales (ROS), Return on Equity (ROE) and Return on Assets (ROA), where net income is scaled by sales, equity and total assets. It should be noted that as Megginson *et al.* (1994) we use net income in all our return measures and also that we base all calculations on end of year values both in the numerator and denominator.⁵ Using end of year data overcomes the problem that would arise from any change in the composition of our benchmark since the same companies are included both in the numerator and denominator.

Although all three measures are recognized measures of profitability not all of them are well suited for the analysis of change in operating performance of privatized SOE:s. There are several shortcomings of ROE for such an analysis. From examining our data it is clear that the long-term financing (long-term debt and equity) of many companies in our sample changes substantially and irregularly over time. D'Souza and Megginson (1999) describe the long term financing of SOE:s as “mushy” since there is no real distinction between debt and equity. Another feature that leads to extreme changes in ROE is that equity often is close to zero. Also, if a company has negative equity and negative net income ROE would be positive which, of course, does not make economic sense.

Since total assets is a more stable measure and not influenced by the composition of the financing, ROA does not suffer from the first of the shortcomings of ROE. In addition, since total assets is always positive (and hopefully not close to zero), ROA also overcomes the second shortcoming of ROE, i.e. that associated with negative equity. ROA does, however, have a drawback in that total assets are reported at historical cost while net income is a current money measure. The denominator is thus to a greater extent affected by national differences in accounting standards and inflation induced valuation errors.

⁵ Barber and Lyon (1996) show that using end of year values in both the numerator and denominator of ROA when analysing abnormal performance yields the same results as using beginning or average values in the denominator. Moreover, deflating assets and sales by operating profit would have been preferable, but would have yielded less reliable results due to accounting differences and since our data set contains few observations of operating profit. Megginson *et al.* (1994) collected operating profit information for part of their sample and find that profitability measures based on net income yields virtually identical results as those based on operating income.

Since ROS is based purely on current money measures it is the most reliable measure for our analysis and conclusions (Megginson *et al.* (1994)). The main drawback of using ROS is, as we see it, that it does not adequately take into account the amount of capital required to generate the profit. Hence, a change in the asset base that would result in improved profitability (as measured by ROA or ROE) will not necessarily affect ROS. Correspondingly, a change in ROS does not give any information regarding the development of the asset base.

4.1.2 Privatization increases operating efficiency [H₂]

According to the BSV model, privatization will lead to an increased focus on profit maximization. Since SOEs are often used for political ends, such as maintaining high employment, theory predicts that, *ceteris paribus*, operating efficiency will increase after privatization. Our *a priori* expectation regarding the sales and net income efficiency has to be that they increase following privatization, since focus is then solely on profit maximization. Megginson *et al.* (1994) argue that the measures of efficiency are the least controversial of those included in the MNR framework. The reason for this is that all stakeholders in a firm would prefer more output for any given level of input. Operating efficiency is measured by sales efficiency (SALEFF) and net income efficiency (NIEFF) which are calculated as revenue and net income over average number of employees. We expect the change in efficiency to be highly correlated with the change in profitability and output. The interesting feature with these proxies for efficiency is that they capture the relationship between changes in output and net income on the one hand, and employment on the other.

To make the SALEFF and NIEFF variables comparable over time, the MNR framework uses the consumer price index (CPI) of each respective country to deflate revenue and net income. In addition, we extend the original MNR framework by deflating revenue and net income by, not only by CPI, but also the change in gross domestic product (GDP). The underlying reasoning is that we expect the company to grow as the economy grows. However, deflating by CPI and GDP is not necessary when we include the benchmark since it implicitly takes both measures into account. SALEFF and NIEFF are normalized by setting the variables to 1 for the year of privatization (year 0) and expressing the other years as fractions of this. Due to statistical considerations it is neither possible nor desirable to normalize the variables when comparing the firms to the benchmark.

Since governments might have other goals than profit maximization, we expect privatization to render a positive change in efficiency. We consider the SALEFF measures to be more reliable than the NIEFF measure. The reason is that net income often is also often close to zero and thus that any change in net income and number of employees that is registered may in absolute measures be small, but generate large fluctuations in NIEFF.

4.1.3 Privatization increases capital expenditure [H₃]

Predicting what will happen to capital expenditure is a difficult task. Theory offers no clear-cut guidance and there are several different forces at work. Based on the BSV model, Megginson *et al.* (1994) point out that the level of investment in SOE:s, in order to achieve political ends, could be higher than the level of investment in private firms. In other words, SOE:s are sometimes used as “vehicles of investment” for investments of high social, but economically doubtful, value. Moreover, we argue that the weaker corporate governance in state owned enterprises could lead to managers trying to reach personal goals – such as gaining reputation through “empire building” – by overinvestment. However, in well functioning democracies in Western Europe, we expect this last point to be of smaller importance. Both of the arguments above suggest that capital expenditure should decrease following privatization.

Megginson *et al.* (1994) also produce arguments that suggest that the level of capital expenditure will increase following privatization. They argue that as SOE:s gain access to capital markets, the level of capital expenditure should increase. According to Megginson *et al.* (1994) privatization can lead to a more entrepreneurial mindset which in combination with the demands of the private owner provides higher incentives to go after growth opportunities and therefore increase capital expenditure. Moreover since governments want to maintain a high rate of employment, Boycko *et al.* (1996) suggest that SOE:s sometimes maintain an inefficiently high level of output by raising the number of employees rather than capital spending.

Since there are arguments supporting both increases and decreases in capital expenditure forming an *a priori* prediction of the results is difficult. The hypothesis is stated as in the original MNR framework. We utilize two variables to assess the change in capital expenditure, capital expenditure scaled by sales (CESA) and by total assets (CETA). We

consider the CESA measure to be our main measure since it is based on current money flows. CETA on the other hand is based on historical values, wherefore it is subject to differences in national accounting standards.

4.1.4 Privatization increases output [H4]

Boycko *et al.* (1996) suggest that output should decrease after privatization as the government subsidies to the former SOE is lifted. The government has no means of persuading the privatized firm to keep output at the inefficiently high level it did as an SOE. Again, however, there are conflicting forces at work. Megginson *et al.* (1994) argue that the better incentives, new financing opportunities and greater scope of entrepreneurial initiative would lead to increased output. The shift towards a more entrepreneurial mindset following privatization is also documented by Wright, Hoskisson, Busenitz and Dial (2000). The reasoning that output should increase following privatization is also in line with theories on corporate valuation, according to which the market value of a firm is driven by return on equity and growth. Hence, in order to maximize long-term shareholder value, the firm should focus not only on profitability but also on growth. In addition, one can for example easily imagine that SOE:s, due to political considerations, sometimes focus too heavily on the domestic market even if they have the power to move outside of national borders. Thus, with privatization, it seems likely that the increased incentives and entrepreneurial possibilities lead to an expansion of the total market as new cross-border ventures are considered. Another consideration, more external in its nature, in connection with a privatization is that the privatization causes large amounts of publicity, which in itself has a value since it creates brand recognition. Although this effect may seem small and remote, it is not impossible that it has some marginal effect. In summation, the arguments above indicate that output should increase as a result of privatization, which motivates the expected positive sign in the expected outcome.

In the original MNR framework output is measured by real sales, calculated as nominal sales deflated by CPI.⁶ In order to as far as possible isolate the effect of privatization, we also deflate sales by GDP. In line with MNR and in order to avoid having relatively small changes in real sales for large companies too heavily influencing the results we have chosen to normalize real sales by giving the sales of the year of privatization (year 0) the value of 1 and

⁶ It would have been preferable to evaluate a measure based on output in number of units sold. This, however, is impossible due to restrictions in data availability. We note that Megginson *et al.* (1994) argue that a majority of privatized SOE:s operate non-regulated industries and do not have sufficient market power to, on average, raise output without it affecting the prices.

expressing all other figures as a fraction of this. Hence, the changes in means and medians reflect the difference in percentage change in real sales relative to year zero.

4.1.5 Privatization decreases employment [H₅]

According to the BSV model, the government as an owner has a second objective in lowering the rate of unemployment. The private owners do not share this objective and are thus expected to be prepared to lay off employees in their quest to maximize profit. It therefore seems reasonable to expect employment to, *ceteris paribus*, decrease following privatization. The tendency of SOE:s to be overstaffed is also noted by among others Boubakri and Cosset (1998). We therefore expect employment to decrease following a privatization. It should be noted that the effect of privatization on the level of employment is especially interesting to measure from a political perspective since the opponents of privatization often use employment as a counter argument.

We measure employment by two variables. First, as MNR, we measure the actual level of employment (EMPL_REAL). However, we realize that large companies might heavily influence our results and thus choose to also analyze a normalized variable. This variable is calculated by setting the employment level to 1 for the year of privatization and expressing the level of employment for the other years as a fraction of this level (EMPL). The normalized variable measures the percentage change in employment on a firm level. In performing this normalization we address one of the deficiencies we have identified in the MNR framework.

4.1.6 Privatization decreases leverage [H₆]

The logic behind how the average level of debt is affected by privatization is ambiguous. First, researchers have documented that the debt level of SOE:s is usually extraordinarily high (Megginson (1994)). In addition, one obvious effect is that the firms so called “soft budget constraints” are hardened as the implicit government guarantee is lifted.⁷ This should, theoretically, increase the firms’ average cost of debt, which, *ceteris paribus*, should lead to a decrease in the average level of indebtedness. However, we also argue that there is a counteracting force. As the SOE:s gain access to the capital market, and are exposed to the requirements of the market, also the cost of equity increases since the required rate of return increases. Furthermore, since both debt and equity are often supplied by the government the

⁷ This is documented by Boubakri and Cosset (1998), Megginson *et al.* (1994) and Boycko *et al.* (1996) among others.

distinction between the two is not as clear for SOE:s as it is for their privately owned counterparts.

It is, thus, not clear what effect privatization will have on the level of debt. However, given that the pre privatization debt levels are high we suspect that the firms' level of debt will go toward the industry average, i.e. decrease.

We employ two variables as measures of leverage, total debt to total assets (D/A) and long-term debt to equity ($l-t D/E$). Due to the irregularities in the long-term financing (equity and long-term debt) of the privatized firms we consider (D/A) to be a more reliable measure. (D/A) is to a lesser extent influenced by changes in the relative sizes of debt and equity.

4.1.7 Privatization leads to higher pay-out ratios [H₇]

The reason why we examine dividends is not directly given by the theory on privatization. However, profit maximizing shareholders should demand high dividends if they feel they can allocate funds to higher yielding projects. According to the BSV model politicians use internally generated funds to finance political ends. Hence, measuring any change in payout ratios may provide some insights into the extent to which private shareholders exercise their influence. Consequently, we argue that privatization should result in increased dividend payments; this is also supported by Megginson *et al.* (1994). To measure the level of dividends paid we use two ratios; dividends to sales (DIVSAL) and dividends to net income (PAYOUT). Due to data availability, our analysis includes only normal dividends. Hence, any other transfers between the company and its shareholders, such as share buy-back initiatives, will not be part of the analysis. Although that is theoretically off the mark, we argue that a share buy-back is a rather unlikely contingency soon after an IPO.

As mentioned above, we expect private owners to demand that funds not used efficiently should be distributed to shareholders, more so than would the government. Moreover, as these companies become private and listed, the dividend yield is also interesting since it is the least risky part of the total return on a stock. In other words, whereas the capital gain in a stock is, by definition, uncertain, a higher dividend yield should provide a relatively safer investment.⁸ This adds to our conviction that the payout ratio should increase following privatization.

⁸ See for example Bodie, Kane and Marcus "Investments" 6th International Edition, p. 144

4.2 EVENT WINDOW

We calculate the test variables over seven years, i.e. from three years before (-3) until three years after (+3) the privatization date. We then, for each firm, calculate the mean and median of the pre and post period where the pre-privatization period is defined as year -3 to -1, and the post privatization period as year +1 to +3. The year of privatization, i.e. year 0, is excluded since it includes both a period during which the companies were owned by the government and a period during which they were privately owned. We include a company in our analysis as long as it has at least one observation both in the pre and post period and thus constitutes a matched pair. Since the availability of information for the companies varies, this also means that the number of companies included in the analysis of the different variables differs. Using the three-year pre and post privatization periods is a method of minimizing the influence of outliers. Our judgment is that analyzing the difference between single years, be it close or distant from privatization, would yield less reliable results.

One of the main findings of Dewenter and Malatesta (2001) is, as discussed in section 3, that a large performance increase occurs earlier than three years before privatization. This could be the result of deregulations which, in itself, is also a sort of privatization. Deregulation in a previously closed market, to some extent, forces SOE:s to adapt to market requirements through competition on the product market. To account for these findings we perform an additional analysis in which the pre-privatization period is defined as year -5 to -2, and the post-privatization period as year +2 to +5. Thus, we do not only extend the pre- and post-period but also exclude two additional years around the year of privatization. The reason we exclude one additional year prior to privatization is that we avoid that any last minute “window-dressing” during this year affects our results. It, moreover, seems plausible that the year prior to the privatization is affected by preparation for the upcoming IPO. The reason we exclude one additional year posterior to the privatization is that we believe that it takes time before any changes implemented by the new owners affect the performance of the privatized firm. The analysis using a larger event window will also more closely examine a discrete jump from one steady-state to another.

4.3 CHOICE OF BENCHMARK

Barber and Lyon (1996) go to great lengths to evaluate the econometric implication of different methodological considerations for accounting based event studies of operating performance. Although their main focus is return measures such as ROS, ROA and ROE

their conclusions are general and their recommendations applicable also to the other variables included in this study. It is, according to Barber and Lyon (1996), of decisive importance to find a benchmark against which to measure the change in operating performance. Such a benchmark is, as earlier highlighted, absent in the MNR framework. One of the main contributions of this study is that the MNR framework is extended by including a benchmark to isolate the effect of privatization.

One of the most commonly used measures against which the change in performance is measured in corporate finance research is industry averages as defined by two-digit Standard Industry Classification code (SIC). The underlying assumption of industry matching is that some of the cross-sectional variations can be explained by an industry benchmark (Barber and Lyon (1996)). For this reason we have identified the industry, on a two-digit SIC level, for each firm. This enables us to compare each firm's operating performance to that of the industry average. In doing so we isolate the privatization effect from the general trend in the industry.

Our method of matching firms to industry average based on two-digit SIC differs from the method advocated by Barber and Lyon. The authors have, based on a sample that allows for almost laboratory like precision, concluded that the best possible match is achieved by matching firms on two-digit SIC and on firm performance.⁹ This, however, would have required more data than is, firstly, available to us and, secondly, within this scope of our budget. Moreover, such a comparison – in order to be as precise as intended - would require a benchmark consisting of SOE:s matched on both SIC and profitability. This is not only expensive, but impossible since data is not available. Our opinion is that matching our sample on a two-digit SIC level provides the closest match practically possible.

4.4 CALCULATION OF ABNORMAL PERFORMANCE

In the calculation of abnormal performance, we create a new variable by simply deducting the benchmark measure from that of the firm. If the firm outperforms the benchmark the new variable will be positive and vice versa. We then test if there is a statistically significant difference between the medians of the pre and post period abnormal performance measures.

⁹ To test the power of different models for expected performance Barber Lyon first rank all firms on the New York Stock Exchange and American Stock Exchange. They then introduce a systematic abnormal performance in part of this sample. Random samples of 50 firms are then drawn and the performance of these firms is analyzed using the different benchmarks.

However, the nature of the benchmark makes it inappropriate to calculate abnormal performance for the variables that measure output and employment. The problem originates in the fact that the composition of the benchmark changes over time. Hence, any change in, for example, real sales for the benchmark could be the result of a change in the composition of the benchmark, rather than a change in output. We argue that we partly overcome this issue by deflating real sales and net income not only by CPI but also by GDP.

4.5 STATISTICAL TESTS

To assess the significance of the difference between the pre and post privatization performance we use the non-parametric Wilcoxon signed-rank test first developed by Wilcoxon (1945). The Wilcoxon signed-rank test tests the null hypothesis of no change in abnormal performance and is consistently more powerful than the alternative t-statistic when it comes to analyzing operating measures (Barber Lyon (1996)). Having said this we still performed t-tests of the difference. However, when we tested for normality, the null that our pre and post privatization medians were normally distributed was rejected. Therefore we chose not to report the results of the t-tests and also not to base our analysis on these results. It should especially be noted that the Wilcoxon signed-rank test is relatively insensitive to any extreme values in the sample. The use of the Wilcoxon signed-rank test thus limits the need to adjust the outliers of the data.¹⁰ We therefore only exclude outliers in the rare case that the extreme values cannot be economically justified.¹¹ To further limit the influence of extreme values we base our test on change in median as opposed to mean operating performance for the pre and post period of each firm.¹² In the sub-sample analysis the Wilcoxon signed-rank test only measures the effect of privatization on each sub-sample. In order to assess the significance of the differences between our sub-samples we employ the Kruskal-Wallis test developed by Kruskal and Wallis (1952). The Kruskal-Wallis test is a non-parametric test applicable to detect differences in population means Kruskal and Wallis (1952).

¹⁰ The t-test is sensitive to outlier mainly due to the normality assumption. However if the data is winsorized the result of the t-test align with that of the Wilcoxon signed-rank test (Barber and Lyon (1996)).

¹¹ An observation cannot be economically justified if it is not consistent with (i) industry, (ii) information contained in financial statements and prospectuses or (iii) surrounding years.

¹² We use the STATA command SIGNRANK to test if the difference between the matched pairs in our sample.

5. DATA DESCRIPTION

In order to obtain a comprehensive list of firms partially or fully privatized by initial public offering in Western Europe during the time period studied we contacted institutions such as the European Union, the Swedish Ministry of Finance, the OECD, the IMF, the World Bank and a number of national and international think tanks, none of which could supply us with such a list. Instead we had to use several information sources to identify privatizations that potentially could be part of our sample. Our main source in this quest was a list of privatization generously supplied to us by Professor William L. Megginson of the University of Oklahoma. This list comprised of 385 privatizations by IPO worldwide during the period 1961 through to August 2003. Of these firms 119 were privatized in the European region during the period 1991 through 2003. Our main data source, Compustat International Database, had accounting information for 86 of these firms – but not necessarily for the entire period needed. We would like to clarify that Compustat International Database was the only available source that could supply us with accounting information prior to privatization and that had data going back far enough. Other sources available to us failed to meet at least one of these criteria.

In cases where Compustat International was not able to supply us with data, we have utilized data found in annual reports and IPO prospectuses. These were sent to us by the firms themselves or downloaded from the firms' websites. Since many of the privatizations took place more than ten years ago documents were often too old to be kept on file or were only available in a language we do not master. We solicited all firms for which we did not have a complete data set, but were only able to add data to eleven cases. Regrettably, some firms, in spite of repeated attempts, refused to accommodate our requests. In some cases we sensed a reluctance to acknowledge the fact that the firms had a past under state ownership. It can be summarized that due to limitations with regards to data availability the final number of firms included in our sample is 82 for which we have enough information for including the firm in the analysis of at least one hypothesis. The 82 firms represent 24 industries, as defined by two-digit SIC codes. In addition to the company data Compustat International has also supplied us with industry averages for these industries. An overview of the distribution of transactions over industries, countries and time is found in Appendices I-III.

Since no comprehensive information regarding privatization transaction in Western Europe is available we cannot say with certainty how large a portion of the total privatization pool we have captured in our sample. However, in order to provide a glance at the scope of privatizations that have taken place in Western Europe during this period we have collected data from the Privatization Barometer, some of which has been presented diagrammatically above. The total value of all privatization transactions during the 16 year period studied amounts to an astounding 657 billion US dollars. This includes public offers of already privatized SOE:s, IPO:s of SOE:s and transactions in which a state owned enterprise is sold to a private company or investor. The value of public offerings (of which IPO:s constitute only a sub-sample) was roughly 227 billion USD during the same period. Regrettably, we do not have information regarding the values of the initial public offerings for the companies in our sample. However, the average size of a public offer amounts to some 1.35 billion dollars, according to data from the Privatization Barometer.

In order to illustrate the properties of the firms included in our sample we have translated the revenues and net incomes for the firms into 2006 values. These values reveal that the firms included in our sample are, on average, very large. During the three year period before the privatization, the median revenue for our sample was 2.56 billion Euros (in 2006 values). On average the revenues rose by 14.5% after the privatization, which translates into 372 million Euros. The median increase in net income during the same period was roughly 100 million Euros.

All data is analyzed in local currency in order to avoid interference from changes in exchange rates. The period we study does, however, coincide with the introduction of the Euro as accounting currency for many companies in the sample. This means that the accounting data for these companies are reported in different currency before and after the introduction of the Euro. We therefore convert all figures before the introduction to Euros using the conversion rate at the time of transition from national currency to Euro. It should be noted that this should have no effect on our results since we always use end of year data in our calculations and thus both numerator and denominator are affected equally by the conversion.¹³

¹³ This method of converting pre Euro accounting data is recommended by the National Euro Changeover Committee. <http://www.mfin.gov.mt/image.aspx?site=NECC&ref=Euro%20Conversion%20Guidelines>

For our analysis a set of CPI inflation rates, one for each country, was obtained from Thomson DataStream Database. According to Megginson *et al.* (1994) inflation reported as CPI is higher than other inflation indicators such as the producer price index. As a result the use of CPI imposes a conservative bias in our variables. In addition we also need the year on year change in real GDP for each country, this data is obtained from the same source. Both the CPI and GDP data were originally reported by Eurostat, the statistical branch of the European Commission. Correcting the data for inflation and general growth in the economy is essential since some European countries experience relatively high inflation and growth during the period studied.

There are some shortcomings in the data set. Though we have gone to great lengths to ensure the best possible quality there are some issues that we cannot control for. Most of the data is collected from the Compustat International Database, owned by Standard and Poor's. Reporting errors occur, but we do not believe this will significantly influence our results. We have performed a number of random checks to see if the numbers provided by the data base correspond to those reported in annual reports and IPO prospectuses and have found that they do, wherefore we feel confident that the database data is accurate.

However, according to Megginson and Netter (2001), the use of a sample consisting exclusively of IPO:s may lead to selection bias for two main reasons. Firstly, firms that are sold through a stock market listing are likely to be “the cream of the crop” and are therefore not perfectly representative of the universe of privatized SOE:s. Secondly, firms that are privatized in IPO:s are usually the largest firms to be privatized in a country's privatization program. Megginson and Netter (2001) argue, however, that these two issues are also advantages, in that firms included in the sample are of economically significant size and of political importance.

In cases where we have identified outliers, we have included these in the analysis if the extra-normal magnitude has non-extraordinary explanation. In a few cases where we have not, using information contained in IPO prospectuses and annual reports, been able to explain why a measure is suspiciously small or large we have excluded it. This is an additional reason why the number of observations varies across variables.

6. RESULTS AND ANALYSIS

In this section we present the results from the statistical analysis. Each hypothesis will be presented separately and in the same order as they were presented in the methodological section. For each hypothesis the results from two methods will be presented; one analysis uses the “pure” MNR framework and one analysis includes the benchmark. As outlined in the section 4.4 we are not able to apply the benchmark to all variables. We will also, where appropriate, offer comparisons to other studies in order to provide a more nuanced analysis. After the main analysis we will present two further analyses. First, the results of the analysis using an extended event window are presented and lastly we will present the sub-sample analysis in which we attempt to highlight differences within the sample.

6.1 FULL SAMPLE

6.1.1 Privatization increases profitability [H₁]

For reasons outlined above we consider ROS to be the most reliable of the three profitability measures. In our analysis based on the “pure” MNR framework we find that the changes in all profitability variables are of the expected sign. However, only the change in ROS is statistically significant. The mean (median) change in ROS is 0.017 (0.023); this change in median is significant at the 1% level and 65% of the companies change in the expected direction.

When we measure the change in abnormal performance, i.e. include the benchmark in our calculation, we still find the change in our main measure, ROS, to be of the expected sign and significant. The mean (median) change in ROS is now greater at 0.025 (0.025) and significant at the 5% level. With the benchmark also the change in ROA is significant, at the 1% level, with a mean (median) change of 0.013 (0.012). Again the change in ROE is of the expected sign but not significant.

Our results thus indicate that profitability increases as a result of privatization. Our *a priori* expectation is thus confirmed. Interestingly, the results are stronger when we adjust for industry performance. This finding suggests that the results presented in earlier studies, where industry correction has not been made, may have misstated the magnitude of the effects of privatization on financial performance. Hence, the importance of including a benchmark in the MNR analysis is highlighted.

Table II. Results from the “Pure” MNR framework

The table presents the results of the statistical analysis of the hypotheses and proxy variables. For each variable the number of observation that meet the requirements of the Wilcoxon signed-rank test, i.e. for which we have at least one observation in both the pre- (-3 to -1) and post- (1 to 3) privatization period, is presented. The table also includes the mean and median of the proxy variable before and after privatization and, in addition, the changes in mean and median are reported. Furthermore, the table presents the percentage of firms that change in accordance with the hypothesis as well as the results of the Wilcoxon signed-rank test. When more than one variable is used to assess a hypothesis the one on which we place the highest emphasise is listed first. NIEFF, SALEFF and REVENUE are adjusted by CPI, the suffix GDP indicates that also GDP adjustments are made. REVENUE, SALEFF, NIEFF and EMPL are normalized by setting the value of the year of privatization to 1 and relating all other years to the value of this year. EMPL thus measures the relative change in employment whereas EMPL_REAL measures the actual change in employment.

Variable	N	Mean Before (Median)	Mean After (Median)	Change in Mean (Median)	Percentage of firms that changed as predicted	Z-statistic for Change in Median	Significance
PROFITABILITY							
ROS	69	0.060 (0.040)	0.077 (0.063)	0.017 (0.023)	65%	2.807	0.005 ***
ROA	69	0.033 (0.024)	0.037 (0.032)	0.005 (0.008)	54%	1.259	0.208 no
ROE	69	0.047 (0.092)	0.119 (0.113)	0.072 (0.020)	58%	1.109	0.267 no
EFFICIENCY							
SALEFF	67	1.001 (0.954)	1.075 (1.041)	0.073 (0.087)	69%	2.848	0.004 ***
NIEFF	66	0.898 (0.703)	1.481 (1.051)	0.583 (0.348)	73%	3.683	0.000 ***
SALEFF_GDP	67	1.044 (0.998)	1.022 (0.991)	-0.022 (-0.007)	46%	-0.131	0.896 no
NIEFF_GDP	66	0.941 (0.768)	1.419 (1.014)	0.478 (0.246)	71%	3.095	0.002 ***
OUTPUT							
REVENUE	70	0.914 (0.923)	1.135 (1.101)	0.222 (0.179)	81%	5.059	0.000 ***
REVENUE_GDP	70	0.951 (0.947)	1.080 (1.053)	0.129 (0.106)	69%	3.438	0.001 ***
CAPITAL EXPENDITURE							
CESA	41	0.151 (0.093)	0.133 (0.078)	-0.018 (-0.015)	37%	-2.248	0.025 **
CETA	41	0.079 (0.069)	0.063 (0.057)	-0.016 (-0.012)	32%	-2.482	0.013 **
EMPLOYMENT							
EMPL	67	0.951 (0.963)	1.106 (1.042)	0.155 (0.079)	60%	2.736	0.006 ***
EMPL_REAL	69	33239 (12904)	33837 (14951)	598 (2047)	58%	1.016	0.309 no
LEVERAGE							
D / A	65	0.268 (0.273)	0.234 (0.230)	-0.034 (-0.042)	43%	-1.483	0.138 no
E / 1-t D	69	1.776 (0.692)	0.803 (0.465)	-0.973 (-0.227)	42%	-2.326	0.020 **
PAY-OUT							
DIVSAL	13	0.040 (0.016)	0.027 (0.020)	-0.013 (0.004)	77%	1.293	0.196 no
PAYOUT	12	0.542 (0.239)	0.449 (0.308)	-0.093 (0.069)	58%	0.706	0.480 no

***, ** and * indicates that the result is significant on the 1, 5 and 10% level respectively. “no” indicates that the result is not significant

Table III. Results from the MNR framework with Benchmark

The table presents the results of the statistical analysis of each hypothesis and proxy variable. For each variable the number of observation that meet the requirements of the Wilcoxon signed-rank test, i.e. for which we have at least one observation in both the pre- (-3 to -1) and post- (1 to 3) privatization period, is presented. The table also includes the mean and median of the proxy variable before and after privatization and, in addition, the changes in mean and median are reported. Furthermore, the table presents the percentage of firms that change in accordance with the hypothesis as well as the results of the Wilcoxon signed-rank test. When more than one variable is used to assess a hypothesis the one on which we place the highest emphasise is listed first.

Variable	N	Mean Before (Median)	Mean After (Median)	Change in Mean (Median)	Percentage of firms that changed as predicted	Z-statistic for Change in Median	Significance
PROFITABILITY							
ROS	69	0.022 (0.001)	0.047 (0.025)	0.025 (0.025)	62%	2.329	0.020 **
ROA	69	0.010 (-0.000)	0.023 (0.012)	0.013 (0.012)	64%	2.771	0.006 ***
ROE	69	-0.045 (-0.002)	0.048 (0.018)	0.092 (0.020)	55%	1.522	0.128 no
EFFICIENCY							
SALEFF	66	0.247 (0.014)	0.500 (0.037)	0.253 (0.024)	59%	1.549	0.121 no
NIEFF	65	0.017 (0.003)	0.043 (0.005)	0.027 (0.002)	57%	2.362	0.018 **
CAPITAL EXPENDITURE							
CESA	41	0.058 (0.020)	0.026 (0.003)	-0.032 (-0.017)	39%	-2.041	0.041 **
CETA	41	0.012 (0.002)	0.000 (-0.004)	-0.012 (-0.006)	41%	-1.613	0.107 no
LEVERAGE							
D / A	65	0.001 (-0.000)	-0.040 (-0.034)	-0.041 (-0.034)	42%	-2.029	0.042 **
E / I-t D	69	0.538 (-0.098)	-0.443 (-0.323)	-0.981 (-0.224)	33%	-2.813	0.005 ***
PAY-OUT							
DIVSAL	13	0.024 (0.002)	0.003 (0.003)	-0.020 (0.001)	54%	-0.734	0.463 no
PAYOUT	11	0.181 (-0.080)	-2.485 (-0.025)	-2.666 (0.055)	55%	-0.622	0.534 no

***, ** and * indicates that the result is significant on the 1, 5 and 10% level respectively. “no” indicates that the result is not significant

Our result from studying IPO:ed SOE:s in Western Europe, that profitability improves with privatization, confirms the findings of, among other, Megginson *et al.* (1994), Boubakri and Cosset (1998), D'Souza and Megginson (1999) as well as Dewenter and Malatesta (2001), which represent a global sample of privatizations. Moreover, the result still stands and is strengthened when we add our benchmark to the analysis.

6.1.2 Privatization increases operating efficiency [H₂]

Operating efficiency is measured by SALEFF and NIEFF, for reasons previously outlined we focus our analysis on the SALEFF measure. The result from the “pure” MNR method shows a mean (median) change in SALEFF of 0.073 (0.087). The change in median is significant at the 1% level. NIEFF shows extraordinarily large improvements after the privatization with a mean (median) change of 0.583 (0.348) which is significant on the 1% level. When we extend the MNR framework to account for the growth in GDP, however, we find that the change in our main measure SALEFF is negative but not significant. The change in NIEFF is positive and significant at the 1% level with a mean (median) change of 0.478 (0.246).

Comparing the company efficiency to the industry average, i.e. employing our benchmark analysis, yields similar results. The change in the SALEFF measure is not significant although the change is positive. The mean (median) change in NIEFF is 0.027 (0.002) and significant at the 5% level. Since the improvement in SALEFF is erased when the data is deflated by GDP or compared to the industry average our results do not firmly support the hypothesis that privatization leads to increased efficiency. Since the change in NIEFF is significant and of the expected sign we cannot, however, with certainty reject the hypothesis of increased operating efficiency.

A possible explanation of the differing result between SALEFF and NIEFF is that the marginal profitability of increased revenues following privatization is high. Thus, any increase in revenues will result in a more than proportional change in net income. Such a relationship would result in, as documented, a relatively larger change in NIEFF.

The model developed by Boycko, *et al.* (1996) predicts that privatization will lead to increased efficiency as the government can no longer exercise its power to reach political ends. This is also strongly confirmed in previous research as well as our data when we use the original

MNR method in which we do not deflate by GDP or control for industry performance. However, the results from the extended analysis are considerably weaker. Our results with respect to the change in efficiency are, as has been demonstrated, mixed. Taking all results into consideration our judgment is that we cannot reject the null hypothesis that privatization leads to improved efficiency. Our result indicates that the improvements in efficiency that have previously been documented by studies, not accounting for economic growth or industry performance, may have been overstated.

6.1.3 Privatization increases capital expenditure [H₃]

The changes in both CESA and CETA are negative and highly significant. The mean (median) change in CESA is -0.018 (-0.015), significant at the 5% level, thus indicating that the level of capital expenditure decreases. CETA follows a pattern very similar to that of CESA with a mean (median) change of -0.016 (-0.012), significant at the 5% level and with 68% of firms report decreased capital spending to total assets. The evidence from CESA and CETA when analyzed within the “pure” MNR framework, thus, suggests that firms reduce the level of capital expenditure after privatization.

We believe that firms in which unusually large investments were made during the years prior to privatization drive our results. Noteworthy among these are firms in the telecom industry and infrastructure firms, such as companies constructing toll-roads. For the telecom industry the period analyzed and the privatizations coincide with the bidding process for 3G licenses and the initial development of the 3G networks. Thus, capital expenditure is to a large extent likely to be influenced by industry specific trends. Considering these industry specific trends we expect the results to be weaker when we include the benchmark in our calculations. The results found only partially support this prediction. The mean (median) change in CESA is -0.032 (-0.017) and still significant at the 5% level. We do, however, document that a smaller proportion of companies show a negative change. The change in CETA, on the other hand, is not significant and therefore shows weaker results than in the “pure” MNR case. Since CESA, the measure which we consider more important, is still significant we document that privatization does have a significant negative effect on the level of capital expenditure.

Our result that the level of capital expenditure decreases significantly following privatization deviates from previous research. Megginson *et al.* (1994) and Boubakri and Cosset (1998) document significant increases in capital expenditure during the seven-year event window

studied. D'Souza and Megginson (1999), on the other hand, find no significant change in the level of capital expenditure.

6.1.4 Privatization increases output [H₄]

As a proxy for output we evaluate the changes in real revenues. Using this measure of output, our results according to the “pure” MNR framework show that the mean (median) change is 0.222 (0.179). This change in median is highly significant at the 1% level and shows the expected sign. Moreover, 81% of firms in the sample show an increase in real sales posterior to privatization. In comparison to other measures this is a very large proportion.

As outlined in the methodology section, real sales also reflect the growth rate in the general economy. Hence, we have chosen to expand the MNR framework by adjusting for GDP. When performing this analysis we find a mean (median) change of 0.129 (0.106), which is significant at the 1% level. As would be expected, the changes is smaller than in the first analysis, where the data were deflated by CPI only, but still highly significant. Again, due to the changing composition of our benchmark we are not able to compute abnormal changes in output.

The results documented, that output increases following privatization, confirm our *a priori* expectation as well as the findings of Megginson *et al.* (1994) and Boubakri and Cosset (1998) as well as D'Souza and Megginson (1999). This indicates that the better incentives, new financing opportunities and greater scope of entrepreneurial initiative should entice the SOE to focus not only on profitability but also on growth – which would ultimately satisfy the private owners' goal of profit and value maximization.

6.1.5 Privatization decreases employment [H₅]

As outlined earlier we measure the change in employment both by the actual number of employees and by a normalized variable. We do not find any significant changes in the absolute number of employees after privatization. However, when we measure the percentage change in the number of employees using the normalized measure the mean (median) change is 0.115 (0.079). This increase is highly significant at the 1% level, and thus runs contrary to our hypothesis. The difference between the real and normalized variables seems to point towards a difference in results depending on whether you focus on a firm level analysis or if you take a socio-economic perspective. In the latter, privatization has no

significant effect on employment, whereas in the former we document a significant increase in employment.

What happens to employment is of particular interest since it answers a question of great political importance and of much controversy. Not only can we reject the hypothesis of the original MNR framework, if anything the results offer support for an increase in employment following privatization. The results of previous studies are mixed. The two studies performed by Megginson *et al.* (1994) and D'Souza and Megginson (1999) reach opposite conclusions regarding the development of employment following a privatization. Boubakri and Cosset (1998) find that, for a sample of privatizations from developing countries, there is no significant change in employment. In summation, however, we can reject the hypothesis that privatization leads to decreased employment, since neither of our proxies support this.

6.1.6 Privatization decreases leverage [H₆]

To assess the change in leverage we use two different variables defined as total debt to total assets (D/A) and long-term debt to equity (l-t D/E). As mentioned above, the most important proxy of the two is (D/A). The “pure” MNR analysis yields changes of the expected sign, indicating that the level of debt decreases following privatization. The mean (median) change in (D/A) is -0.034 (-0.042), but the change in median is not statistically significant. Then mean (median) change in (l-t D/E) is -0.975 (-0.227) and significant at the 5% level. It is, however, difficult to draw any firm conclusions based on these results. Not only is the change in (D/A) not significant, but the results from the (l-t D/E) measure is unreliable since it is based on two highly volatile variables. As we have mentioned previously, it is almost impossible to draw any conclusions from long term financing because of its “mushiness”. Moreover, many companies have equity and long term debt figures that are negative and/or very close to zero, which yields very large percentage increases for economically insignificant changes.

The extent to which companies choose to finance their operations using debt is likely to vary across business cycles. As interest rates and investor appetite for risk change, firms' decisions with respect to means of financing may be affected. For this reason it is interesting from an economic perspective to compare the change in debt financing with the privatized SOE:s to the change in debt financing in each respective industry. Our benchmark analysis enables such a comparison and produces interesting results.

When the benchmark is added to the analysis the mean (median) change in (D/A) is -0.041 (-0.034), and significant at the 5% level. Hence, once again our results indicate that correcting for industry performance is important when analyzing the effects of privatization. Again, we do not wish to rely on the (1-t D/E) measure, but note that it too is showing a change with the expected sign, which is significant at the 1% level.

The results that long-term financing decreases significantly following privatization confirms our *ex ante* prediction. This result is in line with the findings of previous research by Megginson *et al.* (1994), Boubakri and Cosset (1998) and D'Souza and Megginson (1999). Furthermore, our analysis shows that the change in leverage is larger than it is for the industry during the same period. In passing we also note that we, from a visual analysis of our data, find signs of more disciplined financing after privatization, it becomes less “mushy”. Quantifying this effect, however, is outside the scope of this study.

6.1.7 Privatization leads to higher pay-out ratios [H₇]

The level of dividends paid is measured by DIVSAL and PAYOUT. Since the number of observations (13 and 11 respectively) is extremely low we refrain from drawing any conclusions from these measures, we will, however, report the results. The change in median is of the expected sign for both variables. The changes in the means are of the opposite sign. We attribute the difference between the mean and median to outliers that, due to the small sample, heavily influence our results. The mean (median) change in DIVSAL is -0.013 (0.004) and in PAYOUT -0.093 (0.069). None of the median changes are significant. Including the benchmark in our calculations does not alter this result, the mean (median) change in DIVSAL and PAYOUT is -0.020 (0.001) and -2.666 (0.055) respectively and still not significant.

6.2 EXTENDED EVENT WINDOW

Research by Dewenter and Malatesta (2001) indicates that a larger event window will incorporate performance improvements that take place before the seven-year period examined in the MNR framework. Although our main measures have already provided relatively clear results, we find it interesting to perform an additional analysis in which we extend the event window. In this analysis we also exclude a larger period of time around the privatization. This allows us to examine a “jump” from one steady-state to another. The period analyzed runs from five years before to five years after the privatization and excludes

the years -1, 0 and 1. In this section we will present the results of this method in those cases where they deviate significantly from the results presented above.

From the analysis of the extended event window, one result in particular stands out. The change in mean (median) for ROE is 0.286 (0.045), where the change in median is significant at the 1% level. ROS and ROA are also highly significant at the 1 % level. It can, therefore, be argued that the general result for profitability is strengthened when we extend the event window.

When we employ the extended event window the median change in the (D/A) measure is no longer significant, but it still has a negative sign. Furthermore, we document several smaller changes in other variables. None of these, however, influenced the results significantly. In summation, the results from extending the event window do not significantly alter our conclusions regarding the effect of privatization on operating performance. However, since we observe a change in the profitability measures, we note that the findings of Dewenter and Malatesta (2001) appear to have some bearing on our results. The results from the extended event window analysis in its entirety can be found in Table IV, below.

Table IV. Results from the MNR framework with extended event window

The analysis is based on the MNR framework and when applicable the benchmark is included. The table presents the results of the statistical analysis of the hypotheses and proxy variables. For each variable the number of observation that meet the requirements of the Wilcoxon signed-rank test, i.e. for which we have at least one observation in both the pre- (-5 to -2) and post- (2 to 5) privatization period, is presented. The table also includes the mean and median of the proxy variable before and privatization and, in addition, the changes in mean and median are reported. Furthermore, the table presents the percentage of firms that change in accordance with the hypothesis as well as the results of the Wilcoxon signed-rank test. When more than one variable is used to assess a hypothesis the one on which we place the highest emphasise is listed first. Due to the composition of the benchmark no benchmark adjustments are made to REVENUE and EMPL. REVENUE is deflated both by CPI and GDP. REVENUE and EMPL are normalized by setting the value of the year of privatization to 1 and relating the values of all other years to the value of this year. EMPL thus measures the relative change in employment whereas EMPL_REAL measures the actual change in employment.

Variable	N	Mean Before (Median)	Mean After (Median)	Change in Mean (Median)	Percentage of firms that changed as predicted	Z-statistic for Change in Median	Significance
PROFITABILITY							
ROS	55	0.010 (-0.009)	0.035 (0.022)	0.025 (0.030)	65%	2.807	0.005 ***
ROA	55	0.003 (-0.002)	0.016 (0.008)	0.013 (0.011)	64%	2.849	0.004 ***
ROE	55	-0.258 (-0.024)	0.028 (0.020)	0.286 (0.045)	67%	2.622	0.009 ***
EFFICIENCY							
SALEFF	50	0.245 (0.009)	0.469 (0.035)	0.224 (0.026)	54%	1.163	0.245 no
NIEFF	50	0.012 (-0.000)	0.046 (0.003)	0.035 (0.003)	64%	2.650	0.008 ***
OUTPUT							
REVENUE_GDP	55	0.930 (0.930)	1.109 (1.094)	0.179 (0.164)	71%	3.268	0.001 ***
CAPITAL EXPENDITURE							
CESA	28	0.041 (0.051)	0.023 (0.004)	-0.018 (-0.047)	36%	-2.163	0.031 **
CETA	27	0.023 (0.009)	0.009 (0.005)	-0.014 (-0.004)	37%	-1.225	0.221 no
EMPLOYMENT							
EMPL	53	0.956 (0.952)	1.149 (1.089)	0.193 (0.137)	64%	2.899	0.004 ***
EMPL_REAL	54	41180 (19454)	42532 (22662)	1352 (3208)	63%	1.193	0.233 no
LEVERAGE							
D / A	51	0.022 (0.048)	-0.017 (-0.013)	-0.039 (-0.061)	43%	-1.219	0.223 no
E / 1-t D	53	1.422 (-0.000)	-0.374 (-0.172)	-1.796 (-0.172)	45%	-1.704	0.088 *
PAY-OUT							
DIVSAL	9	0.029 (0.004)	0.000 (-0.002)	-0.030 (-0.006)	56%	-0.296	0.767 no
PAYOUT	8	-0.069 (-0.082)	-0.210 (-0.021)	-0.140 (0.062)	63%	0.000	1.000 no

***, ** and * indicates that the result is significant on the 1, 5 and 10% level respectively. “no” indicates that the result is not significant

6.3 SUB-SAMPLE ANALYSIS

In addition to examining the full sample of SOE:s we use company characteristics to split our original sample into several sub-samples. The sub-sample analysis is an attempt to shed light on why some of our results are inconsistent with theory and to get a deeper understanding of the conditions under which privatization improves operating performance. D'Souza, Megginson and Nash (2005) find that there are significant differences in sub-sample performance when examining a sample based on several factors such as institutional quality, firm size and competition. Similar results are also found by Boubakri, Cosset and Fisher (2005).

We analyze the sub-samples using essentially the same methodology used for the full sample. As a complement to measuring the change in operating performance for each sub-sample we also use the Kruskal-Wallis test in order to establish whether the sub-samples are statistically different from each other. Although we have performed this analysis on all variables we will here only report and analyze the variables we consider most important and reliable. These variables are ROS, SALEFF, real revenues and the two employment variables. In order to capture as many observations as possible we analyze the sub-sample using the small event window. It should further be noted that we when applicable employ the two-digit SIC benchmark in our calculations.¹⁴ The results of the sub-sample analysis are summarized in Table V-VIII, below.

6.3.1 Legal Origin

Research has shown that there is a connection between institutional and legal quality on the one hand, and firm performance and valuation on the other. This has been documented by La Porta, Lopez de Silanes, Shleifer and Vishny (1998) who closely examine the differences between Common and Civil law countries with respect to investor protection and ownership concentration and the effect the legal origin has on corporate valuation. The study finds that investor protection is the weakest in French Civil law countries and the strongest in British Common law countries, with the Scandinavian and Germanic Civil law countries falling somewhere in between. Moreover, they show that Scandinavian and Germanic legal systems have the strongest enforcement of rules.

¹⁴ For reasons clarified later, performing the analysis using the benchmark is not appropriate for some of the sub-samples.

Table V. Results from sub-sample analysis based on legal origin

The analysis is based on the MNR framework and when applicable the benchmark is included. As outlined in section 6.3 the sub-sample analysis is only performed on 4 of the hypotheses. The table only presents the results for the main variables of these hypotheses. For each variable the number of observation that meet the requirements of the Wilcoxon signed-rank test, i.e. for which we have at least one observation in both the pre- (-3 to -1) and post- (1 to 3) privatization period, is presented. The table also includes the mean and median of the proxy variable before and privatization and, in addition, the changes in mean and median are reported. Furthermore, the table presents the percentage of firms that change in accordance with the hypothesis as well as the results of the Wilcoxon signed-rank test. In addition the test statistic and significance of the Kruskal-Wallis test for equality of population is reported. Due to the composition of the benchmark no benchmark adjustment is made to REVENUE, EMPL and EMPL_REAL. REVENUE is deflated both by CPI and GDP. REVENUE and EMPL are normalized by setting the value of the year of privatization to 1 and relating the values of all other years to the value of this year. EMPL thus measures the relative change in employment whereas EMPL_REAL measures the actual change in employment.

Variable	N	Mean Before (Median)	Mean After (Median)	Change in Mean (Median)	Percentage of firms that changed as predicted	Z-statistic for Change in Median	Kruskal-Wallis statistic
PROFITABILITY (ROS)							
Civil	50	0.027 (0.008)	0.039 (0.025)	0.012 (0.017)	58%	1.115 no	3.289 *
Common	19	0.010 (-0.007)	0.068 (0.026)	0.058 (0.034)	74%	2.495 **	
Civil (No Benchmark)	50	0.062 (0.039)	0.077 (0.064)	0.015 (0.025)	64%	2.225 **	0.349 no
Common (No Benchmark)	19	0.056 (0.047)	0.079 (0.063)	0.022 (0.016)	68%	1.690 *	
EFFICIENCY (SALEFF)							
Civil	48	0.074 (0.005)	0.072 (0.028)	-0.002 (0.023)	58%	0.903 no	0.561 no
Common	18	0.709 (0.127)	1.643 (0.104)	0.934 (-0.023)	61%	1.415 no	
Civil (No Benchmark)	48	1.044 (1.001)	0.985 (0.986)	-0.059 (-0.015)	44%	-0.687 no	0.921 no
Common (No Benchmark)	19	1.043 (0.981)	1.117 (1.135)	0.074 (0.154)	53%	0.765 no	
OUTPUT (REVENUE)							
Civil	50	0.974 (0.969)	1.081 (1.068)	0.107 (0.099)	70%	2.727 ***	0.692 no
Common	20	0.894 (0.885)	1.076 (1.037)	0.182 (0.152)	65%	1.904 *	
EMPLOYMENT (EMPL)							
Civil	48	0.981 (1.001)	1.144 (1.057)	0.164 (0.055)	60%	2.574 **	0.094 no
Common	19	0.876 (0.938)	1.008 (1.011)	0.132 (0.073)	58%	1.167 no	
EMPLOYMENT (EMPL_REAL)							
Civil	50	31167 (13807)	30301 (16380)	-867 (2573)	58%	0.849 no	0.052 no
Common	19	38691 (12904)	43144 (13648)	4453 (744)	58%	0.483 no	

***, ** and * indicates that the result is significant on the 1, 5 and 10% level respectively. “no” indicates that the result is not significant

Table VI. Results from sub-sample analysis based on firm size

The analysis is based on the MNR framework and when applicable the benchmark is included. As outlined in section 6.3 the sub-sample analysis is only performed on 4 of the hypotheses. The table only presents the results for the main variables of these hypotheses. For each variable the number of observation that meet the requirements of the Wilcoxon signed-rank test, i.e. for which we have at least one observation in both the pre- (-3 to -1) and post- (1 to 3) privatization period, is presented. The table also includes the mean and median of the proxy variable before and privatization and, in addition, the changes in mean and median are reported. Furthermore, the table presents the percentage of firms that change in accordance with the hypothesis as well as the results of the Wilcoxon signed-rank test. In addition the test statistic and significance of the Kruskal-Wallis test for equality of population is reported. Due to the composition of the benchmark no benchmark adjustment is made to REVENUE, EMPL and EMPL_REAL. REVENUE is deflated both by CPI and GDP. REVENUE and EMPL are normalized by setting the value of the year of privatization to 1 and relating the values of all other years to the value of this year. EMPL thus measures the relative change in employment whereas EMPL_REAL measures the actual change in employment.

Variable	N	Mean Before (Median)	Mean After (Median)	Change in Mean (Median)	Percentage of firms that changed as predicted	Z-statistic for Change in Median	Kruskal-Wallis statistic
PROFITABILITY (ROS)							
Small	33	0.043 (0.026)	0.068 (0.046)	0.025 (0.020)	58%	1.135 no	0.346 no
Large	36	0.003 (-0.007)	0.029 (0.006)	0.025 (0.013)	67%	2.247 **	
Small (No Benchmark)	33	0.075 (0.067)	0.093 (0.072)	0.018 (0.005)	67%	1.635 no	0.629 no
Large (No Benchmark)	36	0.047 (0.036)	0.062 (0.046)	0.016 (0.011)	64%	2.184 **	
EFFICIENCY (SALEFF)							
Small	31	0.153 (0.026)	0.137 (0.041)	-0.016 (0.015)	55%	0.666 no	0.565 no
Large	35	0.330 (0.012)	0.822 (0.034)	0.492 (0.022)	63%	1.507 no	
Small (No Benchmark)	32	1.045 (0.983)	0.966 (0.955)	-0.079 (-0.028)	44%	-0.711 no	0.548 no
Large (No Benchmark)	35	1.043 (1.007)	1.074 (1.046)	0.031 (0.039)	49%	0.459 no	
OUTPUT (REVENUE)							
Small	33	0.876 (0.901)	1.134 (1.101)	0.257 (0.200)	88%	4.637 ***	15.488 ***
Large	37	1.018 (0.992)	1.032 (1.019)	0.014 (0.026)	51%	0.083 no	
EMPLOYMENT (EMPL)							
Small	32	0.888 (0.938)	1.243 (1.172)	0.356 (0.234)	81%	4.170 ***	18.214 ***
Large	35	1.009 (1.020)	0.980 (0.972)	-0.029 (-0.048)	40%	-1.048 no	
EMPLOYMENT (EMPL_REAL)							
Small	32	7465 (4708)	9557 (6424)	2091 (1716)	81%	3.852 ***	6.693 ***
Large	37	55530 (31320)	54836 (30132)	-693 (-1188)	38%	-1.177 no	

***, ** and * indicates that the result is significant on the 1, 5 and 10% level respectively. “no” indicates that the result is not significant

Table VII. Results from sub-sample analysis based on industry regulation

The analysis is based on the MNR framework and when applicable the benchmark is included. As outlined in section 6.3 the sub-sample analysis is only performed on 4 of the hypotheses. The table only presents the results for the main variables of these hypotheses. For each variable the number of observation that meet the requirements of the Wilcoxon signed-rank test, i.e. for which we have at least one observation in both the pre- (-3 to -1) and post- (1 to 3) privatization period, is presented. The table also includes the mean and median of the proxy variable before and privatization and, in addition, the changes in mean and median are reported. Furthermore, the table presents the percentage of firms that change in accordance with the hypothesis as well as the results of the Wilcoxon signed-rank test. In addition the test statistic and significance of the Kruskal-Wallis test for equality of population is reported. Due to the composition of the benchmark no benchmark adjustment is made to REVENUE, EMPL and EMPL_REAL. REVENUE is deflated both by CPI and GDP. REVENUE and EMPL are normalized by setting the value of the year of privatization to 1 and relating the values of all other years to the value of this year. EMPL thus measures the relative change in employment whereas EMPL_REAL measures the actual change in employment.

Variable	N	Mean Before (Median)	Mean After (Median)	Change in Mean (Median)	Percentage of firms that changed as predicted	Z-statistic for Change in Median	Kruskal-Wallis statistic
PROFITABILITY (ROS)							
Regulated	20	0.029 (0.005)	0.082 (0.056)	0.053 (0.052)	80%	2.315 **	2.911 *
Non-Regulated	49	0.020 (0.001)	0.033 (0.016)	0.013 (0.015)	55%	1.209 no	
EFFICIENCY (SALEFF)							
Regulated	20	0.258 (0.020)	0.349 (0.088)	0.090 (0.068)	70%	2.128 **	3.140 *
Non-Regulated	46	0.242 (0.013)	0.566 (0.034)	0.324 (0.021)	54%	0.475 no	
OUTPUT (REVENUE)							
Regulated	20	0.976 (0.992)	1.113 (1.055)	0.137 (0.063)	65%	1.755 *	0.207 no
Non-Regulated	50	0.941 (0.942)	1.066 (1.053)	0.125 (0.112)	70%	2.882 ***	
EMPLOYMENT (EMPL)							
Regulated	20	0.980 (1.029)	1.053 (0.947)	0.073 (-0.082)	35%	-0.448 no	4.510 **
Non-Regulated	47	0.939 (0.941)	1.128 (1.057)	0.190 (0.116)	70%	3.153 ***	
EMPLOYMENT							
Regulated	20	40675 (16448)	37607 (14417)	-3067 (-2031)	35%	-1.419 no	5.987 **
Non-Regulated	49	30204 (12436)	32298 (16045)	2094 (3609)	67%	2.009 **	

***, ** and * indicates that the result is significant on the 1, 5 and 10% level respectively. “no” indicates that the result is not significant

Table VIII. Results from sub-sample analysis based on divestment of controlling interest

The analysis is based on the MNR framework and when applicable the benchmark is included. As outlined in section 6.3 the sub-sample analysis is only performed on 4 of the hypotheses. The table only presents the results for the main variables of these hypotheses. For each variable the number of observation that meet the requirements of the Wilcoxon signed-rank test, i.e. for which we have at least one observation in both the pre- (-3 to -1) and post- (1 to 3) privatization period, is presented. The table also includes the mean and median of the proxy variable before and privatization and, in addition, the changes in mean and median are reported. Furthermore, the table presents the percentage of firms that change in accordance with the hypothesis as well as the results of the Wilcoxon signed-rank test. In addition the test statistic and significance of the Kruskal-Wallis test for equality of population is reported. Due to the composition of the benchmark no benchmark adjustment is made to REVENUE, EMPL and EMPL_REAL. REVENUE is deflated both by CPI and GDP. REVENUE and EMPL are normalized by setting the value of the year of privatization to 1 and relating the values of all other years to the value of this year. EMPL thus measures the relative change in employment whereas EMPL_REAL measures the actual change in employment.

Variable	N	Mean Before (Median)	Mean After (Median)	Change in Mean (Median)	Percentage of firms that changed as predicted	Z-statistic for Change in Median	Kruskal-Wallis statistic
PROFITABILITY (ROS)							
Control	28	0.029 (0.009)	0.065 (0.036)	0.036 (0.027)	68%	2.118 **	0.196 no
No control	28	0.018 (0.004)	0.042 (0.014)	0.024 (0.010)	61%	1.457 no	
EFFICIENCY (SALEFF)							
Control	28	0.507 (0.027)	1.088 (0.042)	0.580 (0.015)	64%	1.890 *	0.508 no
No control	25	0.063 (0.012)	0.083 (0.035)	0.020 (0.023)	64%	0.874 no	
OUTPUT (REVENUE)							
Control	29	0.899 (0.944)	1.104 (1.049)	0.205 (0.105)	69%	3.038 ***	4.175 **
No control	28	1.015 (0.965)	1.015 (1.019)	-0.001 (0.054)	57%	0.182 no	
EMPLOYMENT (EMPL)							
Control	28	0.918 (0.958)	1.094 (1.036)	0.177 (0.079)	54%	1.457 no	0.524 no
No control	27	0.993 (1.002)	1.027 (1.012)	0.034 (0.010)	56%	0.697 no	
EMPLOYMENT							
Control	28	46829 (17473)	48941 (15052)	2112 (-2421)	54%	0.342 no	0.017 no
No control	28	26144 (11999)	24918 (13353)	-1226 (1354)	54%	0.125 no	

***, ** and * indicates that the result is significant on the 1, 5 and 10% level respectively. “no” indicates that the result is not significant

Furthermore, Boycko *et al.* (1996) argue that after privatization politicians can no longer divert internally generated funds of SOE:s towards political ends – such as high employment. Thus, the only means available for politicians to influence SOE:s are through government subsidies or corruption. Such a scheme of subsidies is politically costly since the alternative costs of the state’s resources are highly transparent. For this reason it is plausible that firms from countries with better investor protection, where rules are enforced and any unfair actions are more likely to be detected, would benefit more from privatization. This reasoning is further strengthened by Pagano and Röell (1998) who document that stronger investor rights and legal enforcement diminish collusion between firms and government officials. In other words, where the legal framework is strong politicians cannot as easily influence managers to divert cash flows towards non-profit maximizing ends.

Baring this argument in mind we created a dichotomous sample by legal origin. The British common law countries together with the Scandinavian and Germanic law countries form one sub-sample (Common) French Civil law countries the other (Civil).¹⁵ The division between Civil and Common legal origin also, incidentally, corresponds to a division between high and low corruption scores.¹⁶ We expect the improvement in operating performance following privatization to be greater for firms from countries of British, Scandinavian and Germanic legal origin since politicians will to a lesser extent have influence over the privatized SOE.

The results for both sub-samples are generally consistent with the findings of the main analysis. There is one notable difference between the sub-samples; with the benchmark, only firms in Common, Germanic and Scandinavian law countries have a significant median change in ROS. Firms from Civil law countries show no measurable change in profitability. The Kruskal-Wallis test also indicates that there is a difference in the change in profitability between Civil and Common law countries. An issue with these results is that our Europe-wide benchmark is, by definition, mismatched when we split the sample into these categories. Because of this we also report the results without the benchmark. In this case the mean (median) change in ROS is 0.022 (0.016) for common law countries. Civil law countries show a mean (median) change of 0.015 (0.025). The change is significant for both Common and Civil law countries. It should be noted that although only firms from Civil law

¹⁵ For a complete list of the countries and their legal system, please see Appendix IV.

¹⁶ See Appendix VI for a list of scores according to the Corruption Perception Index compiled by “Transparency International” 2006. We see corruption as a proxy for relative frequency of collusion between government officials and managers. Hence, the dummy for legal origin also captures this aspect.

countries show a significant change in employment, the Kruskal-Wallis test fails to reject the null hypothesis. Hence we cannot firmly establish that there is a significant difference between Civil and Common law countries with respect to employment.

Considering that the benchmark is mismatched, we cannot safely draw any conclusions based on these results. Thus, these findings indicate small, if any, differences in gains from privatization between Common and Civil law countries.

6.3.2 Firm Size

Ausenegg and Jelic (2002) argue that large firms take longer to turn around and that it therefore would take longer for any improvement following privatization to materialize. In addition, in an overview of previous literature Djankov and Murrell (2002) conclude that large SOE:s to a greater extent receive different forms of government subsidies, which leads to a “soft budget constraint”. The underlying reason is that these firms are politically important and “too large to fail”. According to Megginson, Netter and Nash (2006), this implies that large SOE:s, are in better condition before the privatization and, thus, have less to gain. However, we see an alternative interpretation, more in line with the theoretical model of Boycko *et al.* (1996). The soft budget constraint in large SOE:s may lead to a more inefficient organization since managers have fewer incentives for stringent management. Thus, we expect large firms to gain more in terms of operating performance than smaller firms. Moreover, due to the soft budget constraint the larger firms are also more likely to maintain a higher level of employment before privatization. We therefore suspect that large firms will show a smaller increase in employment than smaller firms.

Size is measured by assets in Euro at the time of privatization (in 2006 values). Large firms are firms with assets above the median value and small firms are firms with smaller than median assets. Examining the difference between small and large firms may also provide guidance regarding a possible selection bias since SOE:s privatized through IPO:s tend to be large. Unfortunately, the size sub-sample analysis suffers from the same benchmark mismatch as does the Civil-Common law analysis, above – namely that splitting the main sample this way renders a comparison with our benchmark considerably less relevant.

Using the “pure” MNR framework, we document that profitability, as measured by our main measure, ROS, is only significant for the large companies in the sample. These firms show a

mean (median) increase in ROS of 0.016 (0.011) that is significant at the 5% level. In line with our expectation, the change for the small firms is positive but not significant. However, the Kruskal-Wallis does not support that there is a difference between small and large firms with respect to profitability.

Our results also show that only the smaller firms raise the level of output. The sub-sample containing small firms displays a mean (median) change in real revenues of 0.257 (0.200), significant on the 1% level. A possible explanation for this is that the smaller firms are strategically more nimble and adapt more quickly to changing conditions. In line with the pattern previously documented, the increase in output corresponds to an increase in employment. We see highly significant increases in both variables measuring employment for the small firms. We do not see any significant changes in neither output nor employment for our sub-sample containing larger firms. In addition, the Kruskal-Wallis tests strongly indicate that there is a difference between the two sub-samples with respect to both employment and output.

Our result regarding employment confirms our *ex ante* expectation. However, we only find weak support for a difference in other operating performance measures. Hence, we cannot conclude that larger firms have more to gain from privatization. Adding the mismatched benchmark to the analysis does not alter our results.

The results also raise the suspicion that our results are influenced by a selection bias, with respect to output and employment, since our IPO:ed SOE:s are likely to be larger than the average privatized firm. This is, of course, an issue that prohibits us from quantifying the effects from privatization in general. The sub-sample analysis does, however, fill its purpose and provides better insight into which firm characteristics affect the outcome of privatization.

6.3.3 Industry Regulation

The model developed by Boycko *et al.* (1996) predicts that; the greater the decrease in influence of politicians after the privatization, the greater the gains. Hence, a firm operating in a regulated industry would be expected to gain more from privatization – given that there is no government involvement in the industry after privatization. However, industries that are highly regulated before privatization (and in particular where SOE:s operate in natural

monopolies), are often regulated after the privatization as well - so that private owners cannot abuse the market power. Hence, a company operating in a regulated industry would be expected to benefit less, if at all, from privatization, since the government involvement would continue to be significant (Vickers and Yarrow (1991)). This is also our *ex ante* prediction. The privatization of companies operating in non-regulated industries is a less complicated issue since these privatizations do not require any particular monitoring following privatization.

As D'Souza and Megginson (1999), we define non-regulated firms as firms that are subject to international competition and regulated firms as firms that are relatively free from such competition. In line with this study, the regulated sub-sample is comprised of firms from the communication and utility industries (SIC codes 48 and 49) and the non-regulated sub-sample of all other firms. The same definitions were used by Vickers and Yarrow (1991).

We find several differences between the two sub-samples consisting of regulated and non-regulated firms. Our results show that regulated firms significantly outperform the benchmark and increase both profitability and sales efficiency. Conversely, non-regulated firms show no significant change in these two measures. Moreover, only non-regulated firms show a significant increase in employment – as measured by both real employment and using the normalized variable. The differences between the sub-samples are supported by the Kruskal-Wallis test. Output increases significantly for both sub-samples.

In line with the BSV model, but contrary previous research and our expectation, we only document significant improvements in profitability for firm operating in regulated industries. We offer three possible *ex post* analyses of this. First, that the continued government involvement in the regulated industries is not sufficient to counteract the impact of the competitive market requirements. Second, government run state-owned monopolies can, for political reasons, not be too profitable since it would be interpreted as an indirect tax. When such firms after privatization operate under free market requirements the implicit profitability limits will be lifted wherefore the potential gain from privatization should be greater. Such an explanation would be in line with the BSV model since the model hinges on the assumption that the SOE maximizes a weighted average of economic profit and political ends. The third reason for the unanticipated result found could be that the non-regulated

firms had already internalized some of the performance gains from privatization since were forced to operate on the same conditions as the private players in their respective industries.

Conclusively, our results show that the improvements from privatization are greater for firms operating in regulated industries. This contradicts our *ex ante* prediction but is in line with the BSV model. However, the BSV model assumes that the government will not continue to regulate the industry following privatization, which governments in practice often do. We see this as a sign that when the regulated firms face some form of competition – be it on the product, input or financial markets – are forced to improve profitability following privatization.

6.3.4 Divestment of Controlling Interest

The BSV model is based on the assumption that as SOEs are sold, it becomes considerably more difficult for politicians to influence the managers. Since this occurs at the same time as private owners start demanding a profit-maximizing strategy, the model predicts that financial and operating performance should improve. For this reason it is interesting to examine whether there is any difference in the case where the governments have relinquished a controlling interest in the SOE in the privatization, as opposed to when they retain a majority stake. The BSV model indicates that the smaller the influence of the politicians, the better the outcome of the privatization. Hence, the model suggests that the *a priori* expectation regarding divestment of controlling interest should be that it has a positive effect on the change in financial and operating performance of the privatized SOE.

Since “in theory there is no difference between theory and practice, but in practice there is”, we see a number of additional factors that may affect the expected outcome of the privatization with respect to the retention of controlling interest following privatization.¹⁷ Three factors that could potentially counteract the prediction in the BSV model are, firstly, that minority investor protection in well developed democracies is high. Hence, even if only a smaller stake is sold, it is reasonable to expect that the demands of the private owners would have to be adhered to. Thus, as long as some stake is sold to private owners – the marginal effect of selling more would be low. Secondly, it is possible that the larger the stake sold, the greater the dispersion of new owners. Since larger dispersion will contribute to poorer corporate governance, it is likely that this will have a negative impact on post

¹⁷ Quote attributed to the US baseball player Yogi Berra.

privatization operating performance. Thirdly, we have noticed a substantial overlap between the firms for which control is retained and those that, prior to privatization, operate in highly regulated industries. Since the BSV model predicts that firms operating in regulated industries will have more to gain from privatization, we have to expect that this will influence our results with respect to the divestment of controlling interest as well. In summation, it is not clear which differences to expect between the sub-samples - but we believe that firms in which governments divest their controlling interest have more to gain from privatization.

We have divided our sample into two groups, one in which the government retains more than 50% and one where the government has sold its controlling interest. In the analysis of these sub-samples we find, contrary to our *a priori* belief, that the improvement in profitability and sales efficiency are significant only for the sub-sample containing firms where the government retains a controlling stake. However, the Kruskal-Wallis test indicates that there is no difference between the sub-samples with respect to profitability and efficiency.

In additions, we find strong support for a difference between the sub-samples with regards to the change in output. Again, against our expectation we find that only the firms in which the government retain controlling interest shows a significant increase in output. This is also supported by the Kruskal-Wallis test. We are not able to firmly establish the cause of this result, but reiterate the overlap with firms from regulated industries.

On an ending note, there is a possibility that this sub-sample is influenced by a selection bias. Governments may retain control rights (and therefore also cash flow rights) in firms which they believe are well run and will continue to be a sound investment of public funds. Such a selection bias would lead to greater than expected gains for firms where a controlling stake is retained. Although we cannot control for this effect, it would constitute a selection bias in this variable.

7. CONCLUSION

This study analyzes the effect of privatization on operating and financial performance of privatized state owned enterprises. The sample consists of 82 state owned enterprises representing 24 industries and 14 countries in Western Europe privatized through a stock market listing during the period 1991 to 2003. In contrast to previous research this study attempts to isolate the effect of privatization by employing a two-digit SIC benchmark in the analysis.

For the full sample we document significant increases in profitability and output following privatization. We also find weak results supporting improvements in efficiency. Furthermore, the study also documents a decrease in leverage. These findings are for the most part in line with previous research. However, contrary to previous research we find a decrease in capital expenditure. In addition, previous studies have provided mixed evidence regarding the development of employment following privatization. Our results provide partial support to those who claim that privatization on average increases the level of employment.

A sub-sample analysis based on the legal origin of the privatized firm reveals no clear difference between firms from Common and Civil-law countries. A second sub-sample analysis, in which the differences between small and large firms are analyzed, does not confirm our *ex ante* belief that large firms gain more in terms of profitability. Significant increases in both output and employment suggest that small firms benefit from improved growth opportunities; for large firms we find no significant change in these two measures. A third sub-sample analysis, of the difference between firms operating in non-regulated and regulated industries, shows that privatization improves profitability and efficiency only for firms operating in regulated industries. This improved performance, however, does not translate into an increase in employment. Firms in non-regulated industries, on the other hand, show a reverse pattern with increased employment and no change in efficiency and profitability. Lastly, our sub-sample analysis, based on whether or not the government retains a controlling interest in the divested SOE, reveals small difference between the two groups.

In summary, this study extends previous research by controlling for industry performance. We find that privatization has a positive impact on abnormal financial and operating performance of state owned enterprises while at least maintaining the level of employment.

8. FURTHER RESEARCH

Privatizations constitute a topic of research that can not nearly be exhaustively treated in a single study. Throughout our work with this thesis we have identified two extensions of our work that could be of interest. First, due to data limitations we were not able carry out industry adjustments for all variables and sub-samples. An exhaustive set of benchmarks would enable a more profound understanding of the privatization phenomena. Second, baring the impact of our industry correction in mind, a similar analysis on data from other geographical regions is of interest.

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Transparency International

<http://www.transparency.org>

APPENDICES

Appendix I – Description of SIC codes and the number of firms in each industry

SIC Code	SIC Name	N
15	Building Construction - General Contractors	1
20	Food and Kindred Products	3
21	Tobacco Products	1
26	Paper and Allied Products	3
27	Printing, Publishing and Allied Industries	1
28	Chemical and Allied Products	2
29	Petroleum Refining and Related Products	4
32	Stone, Clay, Glass and Concrete Products	1
33	Primary Metals Industries	5
36	Electronic and Other Electrical Equipment and Components, Except Computer Equipment	1
37	Transportation Equipment	3
41	Local Suburban Transit and Interurban Highway	1
42	Motor Freight Transportation and Warehousing	1
44	Water Transportation	1
45	Transportation by Air	7
47	Transportation Services	2
48	Communications	12
49	Electric, Gas and Sanitary Services	12
51	Wholesale Trade - Non Durable Goods	1
60	Depository Institutions	10
63	Insurance Carriers	2
73	Business Services	6
79	Amusement and Recreation Services	1
87	Engineering, Accounting, Research, Management and Related Services	1
Sum		82

Appendix II – List countries and number of firms from each country

Code	Country	N
1	Austria	4
2	Finland	5
3	France	18
4	Germany	5
5	Greece	9
6	Ireland	1
7	Italy	18
8	Netherlands	1
9	Norway	2
10	Portugal	5
11	Spain	8
12	Sweden	3
13	Switzerland	1
14	UK	2
Sum		82

Appendix III – List of privatizations by year

Year	N
1991	2
1992	3
1993	4
1994	5
1995	6
1996	8
1997	6
1998	9
1999	13
2000	8
2001	10
2002	5
2003	3
Sum	82

Appendix IV – Classification of countries by legal origin

SYSTEM	Germanic	Scandinavian	Common-Law	French civil-Law
COUNTRY	Austria	Finland	Ireland	France
	Germany	Norway	United Kingdom	Greece
	Switzerland	Sweden		Italy
				Netherlands
				Portugal
				Spain
DUMMY	0	0	0	1

Source: La Porta, López de Silanes, Shleifer and Vishny (1998)

Appendix V – Compustat item definitions

Input	Compustat Item
Total Assets	G107
Total Debt - Sum of:	
<i>Long Term Debt</i>	G135
<i>Debt in Current Liabilities</i>	G132
Long Term Debt	G135
Total Shareholders' Equity	G193
Total Revenues	G321
Operating Profit	G617
Dividends	G675
Net Income	G378
Capital Expenditure	G676
Employees	G740

Appendix VI – Corruption scores

Civil/Common	Country	Corruption Index
Common	Finland	9.6
Common	Sweden	9.5
Common	Switzerland	9.2
Common	Norway	9.1
Civil	Netherlands	8.8
Common	Austria	8.7
Common	United Kingdom	8.6
Common	Germany	8.0
Civil	France	7.4
Civil	Ireland	7.4
Civil	Spain	6.8
Civil	Portugal	6.6
Civil	Italy	4.9
Civil	Greece	4.4

Source: Transparency International – Transparency International Corruption Perceptions Index 2006