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## **PRIVATIZATION IN A NORDIC COUNTRY – THE CASE OF ICELAND**

**Summary.** A wave of privatization enclosed the eighties and nineties both in developed and undeveloped countries alike. Since the financial crisis of 2008, many governments have taken over private firms, either in full or partially, hence reactivating the discussion of the effects of privatization. In Iceland a whole banking system collapsed in autumn 2008 leading to an economic crisis where the majority of larger firms became technically bankrupt and state owned banks took over most of them. Whether to privatize all these firms or not has become a debated issue. Future decisions on privatization should rest on understanding past outcomes. This empirical research analyses the changes in operations of Icelandic firms privatized 1992 – 2005 where nearly all potentials for privatization were used. The result suggests that privatization did not lead to significant improvements of the divested state owned firms. Still their operation was efficient, both before and after privatization. On the other hand a control group of private firms improved their performance after privatization.

**Keywords:** Privatization, Ownership, Public Administration, Deregulation, Performance Management

## **PRYWATYZACJA W PAŃSTWIE NORDYCKIM – PRZYPADEK ISLANDII**

**Streszczenie.** Fala prywatyzacji przetoczyła się w latach osiemdziesiątych i dziewięćdziesiątych zarówno przez kraje rozwinięte, jak i państwa w niedostatecznej fazie rozwoju. Od czasu kryzysu finansowego z 2008 roku wiele rządów przejęło prywatne firmy zarówno częściowo, jak i całkowicie, stąd też ponownie podjęto dyskusje na temat efektów prywatyzacji. W Islandii cały system bankowy załamał się jesienią 2008 roku, prowadząc do kryzysu gospodarczego, w którym większość

dużych firm, technicznie rzecz ujmując, zbankrutowała, a w rzeczywistości została przejęta przez banki stanowiące własność państwa. Pytanie o to, czy prywatyzować te firmy czy też nie, stało się kwestią aktualnej debaty. Przyszłe decyzje prywatyzacyjne powinny opierać się na zrozumieniu przeszłych rezultatów. Przedstawione w niniejszym artykule badania empiryczne stanowią analizę zmian obserwowanych w zakresie działań firm sprywatyzowanych w latach 1992 – 2005, gdzie niemal wszystkie możliwości prywatyzacyjne zostały wykorzystane. Rezultaty wskazują, iż prywatyzacja nie prowadzi do znaczących usprawnień przekształcanych przedsiębiorstw państwowych. Ich praca była skuteczna zarówno przed, jak i po prywatyzacji. Z drugiej strony, grupa kontrolna firm prywatnych poprawiła swoją wydajność po prywatyzacji.

**Słowa kluczowe:** prywatyzacja, własność, administracja publiczna, deregulacja, zarządzanie wydajnością

## 1. Introduction

The collapse of the Icelandic economy in the autumn of 2008 led to the nationalization of many of the country's largest firms. Consequently, the government found itself in the position of having to decide whether or not to privatize, and having to consider the issue of whether private firms perform better than public firms do. With the goal of learning from past experience the research question becomes; *did the privatized Icelandic State Owned Enterprises (SOEs) of the 1992 – 2005 privatization era improve their operations after being privatized?*

Iceland carried out an extensive privatization program during the period from 1992 to 2005 during which the government privatized more or less every SOE (33) fit for divestment (The Icelandic National Audit Office, 2003). The same right wing pro-liberalization and privatization coalition governed for the entire period. Following the 2008 crisis, a new left wing government had to take over dozens of private firms, providing the government with a second opportunity to launch a privatization program. The issue for the government is whether or not to privatize, a decision that should not be made without analysing the results from the initial privatization program of 1992 to 2005. This paper presents the findings of the Icelandic privatization program.

Some of the literature describing the effects of privatization suggests positive improvements (Megginson, 2003; Shirley and Walsh, 2001). Within emerging economies the results of privatization have largely been successful, although the variance is great, but most success stories come from high or middle-income countries (Kikeri and Nellis, 2002). The Nordic countries (Norway, Sweden, Finland, Denmark and Iceland) have mostly been omitted from the literature on privatization. The Nordic counties have a well-established

legal and institutional framework (OECD, 2006), which is an important premise for successful privatization. On the other hand, the Nordic countries' SOEs are already efficient (Willner, 2003), which might reduce the gains to be expected from privatization.

This research provides an empirical estimate of the results from the privatization program in Iceland by analysing privatized firms and comparing them with a control group of private ones. The results provide support for policy makers, both in Iceland and in other countries that are faced with decisions about whether to privatize nationalized firms or not. The paper is organized such that section II discusses the empirical literature. Section III describes the methodology and the data. Section IV presents the basic empirical results and Section V provides a summary and conclusion.

## 2. Literature

Keeping in mind the necessary premises for a successful privatization process, the initial privatization program in Iceland should have been a success. The premises are identified by, among others, Kikeri and Nellis (2002) and Megginson (2003). Political commitment is an important premise and one very much in evidence in Iceland during the entire privatization period. The same prime minister was at the helm throughout the program and his right wing cabinet established a strong coalition for change, providing both political and administrative commitment. Commitment from the public was secured by, in addition to other incentives, a considerable tax rebate on stock purchases of the privatized firms. This resulted in the public making up a large portion of the owners of the divested firms (Magnusson, 2007). In addition, personal income and corporate taxes were reduced (to 18% and 15% respectively), reaching among the lowest levels in Europe (IMF, 2007). Another important premise is to ensure competition within the industries that the privatized firms were to enter. In order to ensure competition, the government prevented mergers within industries that were influenced by privatization (Sigurjonsson, 2010). Financial sector reform is another premise, which occurred gradually, a major milestone of this being the joining the European Economic Area (EEA) in 1993. Hence, Iceland adapted most of the EU's legal and institutional frameworks. Deregulation goes hand in hand with successful privatization, which was a part of the government's program in Iceland from 1979 (Sigurjonsson and Mixa, 2011). The aim was to strengthen the stock market by allowing institutional investors (e.g. pension funds) to invest in a domestic stock and bond market. Transparency is a key premise to ensure trust and positivity of both the public and investors. The Icelandic National Audit Office in Iceland regularly published reports on the progress of privatization with the aim of monitoring and providing transparency to the public.

The privatization of the state owned banks was a somewhat different story. The banks were amongst the last SOEs to be privatized (in 2003) and the process was not a conventional one. The state privatization committee initially intended to offer the banks to a number of small institutional investors (where foreign ownership was to be a consideration), and individuals. However, the two ruling political parties focused on domestic political interests and therefore majority ownership was sold to domestic groups of investors who had no prior experience in commercial banking, but were closely tied to the political parties (Special Investigation Commission, 2010). The banks soon became the ruling parties' greatest sponsors (The Icelandic National Audit Office, 2009). Furthermore, the new owners were significant owners of Icelandic business, resulting in broad cross-ownership and therefore creating a large risk of extensive collapse if one link in the chain was to fail. Because of this process, the new shareholders of the banks, many of them being the banks' board members, also became the banks' largest debtors (Vaiman, Sigurjonsson and Davidsson, 2011). Within a few years, the banks' balance sheets grew to become nine times Iceland's GDP. A lack of transparency soon became evident but criticism petered out as the media did not act as a watchdog for stakeholders, possibly because the media outlets were owned by the same investors as the banks. The conduct of corporate governance within the Icelandic banks did not foster sustainability (Vaiman et al, 2011; Sigurjonsson, 2010), and within five years of privatization, the banks were all bankrupt.

Some of the literature on privatization suggests that privatization brings benefits to society but exceptions appear when the necessary premises for successful privatization are not in place. The benefits of privatization are traditionally measured as changes in operating and financial performance of the SOEs (Estrin, Hanousek, Kocenda and Svejnar 2009), such as, SOEs becoming more efficient, more profitable, financially healthier and increasing their capital investment spending, both in developed and developing countries (Megginson and Netter, 2001; Bishop and Key, 1988; Vining and Boardman, 1992).

The methodology of measuring the performance change of privatized firms has become classic; this methodology was introduced by Megginson and Netter, 2001; Megginson, Nash and Randeborgh, 1994; Boubakri and Cosset, 1998; and D'Souza, Nash and Megginson, 2000. They all use a similar methodology, using data from three years pre and post privatization and comparing financial and operational performance measures, in both developed and developing countries. The results of the above mentioned research show a statistically significant privatization improvement in the most common measures used (profitability, efficiency, output, leverage).

However, not all studies show improvements of the divested firms. Research by Choi and Silanes (2010), where the performance of privatized companies up to 10 years is taken

into account, claims that measured improvements from privatization is a mere reflection of the world business cycle. Campbell and Bhatia (1998) found that through new investments, the poorer countries experienced an increase of their capacity utilization, new technology was introduced and markets were expanded. Boubakri and Cossett (1998) came to similar conclusions, but profitability, efficiency, output and leverage did not change much. However, positive fiscal effects have consistently been found, no matter the type of country (Davis, Ossowski, Richardson and Barnett, 2000). When the privatized firms begin to pay taxes, budget deficits declined, net transfers to SOEs are reduced and start to become positive (Sheshinski and Lopez-Calva, 1999). Taxes paid by privatized firms tend to be considerably higher than pre-sale dividends (Kikeri and Nellis, 2002). The welfare consequence from privatization is a general increase in the total resources in the economy. However, it is rare for all stakeholders (sellers, buyers, consumers, employees and competitors) to gain welfare benefits out of privatization. This depends on how the transaction is organized, what the level of institutional development is, and the competence of the economy. An example of this is when a government prices an SOE lower than it might otherwise do. In this way, the government ensures that lower income, first time shareholders can participate in the issue, and the sale process itself should be swift and successful. Shareholders gain, but the seller collects less.

### **3. Methodology and data**

#### **Methodology**

Megginson, Nash and van Randerborgh (1994) first introduced a methodology for privatization studies. Change in any given indicator of performance is measured by comparing the three-year mean and median operating and financial performance of privatized firms to their own mean or median performance during their last three years as an SOE (Choi and Silanes, 2010). This study (using the above methodology) rested on six broad indicators of performance: (1) profitability, (2) operating efficiency, (3) output, (4) capital investment, (5) leverage and (6) employment.

Profitability was calculated using three ratios: operating profits to assets (ROA), net profit to total equity (ROE), and operating profit to sales (ROS). Using operating profits provided information on “pure” efficiency gains where net profit takes into consideration effects of changes in leverage, which often accompany privatization (Barber and Lyon, 1996). In order to capture changes in operating efficiency, three ratios were calculated: sales to number of employees, net profit to number of employees, and operating profit to number of employees. Operating efficiency ratios are interesting to use where SOE have been

criticized for lacking efficiency (Frydman, Gray, Hessel and Rapaczynski, 2000; Kornai, 1998; Berglof and Roland, 1998).

The privatization literature mostly documents significant increases in output following privatization (Choi and Megginson, 2010). In this study, change in output was measured by two variables, and was defined as sales as a proportion of total assets and sales comparison between periods.

The impact that privatization has on investments was analysed by examining the stock of fixed assets in relation to sales and total assets. Large capital investment spending is required on some occasions in order to have well-functioning infrastructure. It was therefore of interest to see what results privatized firms achieved in this respect.

According to the literature, capital structure seems to change following privatization (Hansmann and Krakkman, 2000; Martin and Parker, 1997). SOEs may enjoy implicit or explicit loan guarantees enabling them to borrow more cheaply than private firms may. In addition, SOEs cannot usually issue stock. Therefore, it can be expected that they are more leveraged than private firms. Leverage was measured as the ratio of liabilities to assets.

The literature reports evidence of both layoffs and wage cuts because of privatization (e.g. La Porta and Silanes (1999) report a reduction in employment by half) and no evidence of employment reduction (Megginson, Nash and van Randerborgh, 1994). In this study, a simple measure of the number of employees before and after privatization was used for analysis. The study controlled for macroeconomic and industry factors by computing the same indicators used to describe the performance of privatized firms for the control sample of private firms. Table 1 shows the indicators of performance change that were used for analysis.

Table 1

Measures used in the research and predicted relationship

(This table presents the economic characteristics examined for changes resulting privatization. The predicted changes in the characteristics are detailed. The symbols “a” and “b” in the predicted relationship column stand for after and before, respectively)

Characteristics	Description	Predicted relationship
<i>Profitability</i>		
Return on assets (ROA)	Operating profits divided by total assets	$ROA_a > ROA_b$
Return on equity (ROE)	Net profit divided by total equity	$ROE_a > ROE_b$
Return on sales (ROS)	Operating profits divided by sales	$ROS_a > ROS_b$
<i>Operating efficiency</i>		
SALES/EMP	Sales divided by the number of employees	$SALES/EMP_a > SALES/EMP_b$
NP/EMP	Net profit divided by the number of employees	$NP/EMP_a > NP/EMP_b$
OP/EMP	Operating profits divided by the number of employees	$OP/EMP_a > OP/EMP_b$
<i>Output</i>		
Sales /Total Assets (Sales/TA)	Sales divided by total assets	$Sales/TA_a > Sales/TA_b$
Sales (SALES)	Sales comparison between periods	$SALES_a > SALES_b$

cont. tab. 1

<i>Investment</i>		
INV/Sales	Increase in fixed divided by sales	$INV_a > INV_b$
INV/Total Assets	Increase in fixed assets divided by total assets	$INV_a > INV_b$
<i>Leverage</i>		
Total leverage (LEV)	Liabilities divided by assets	$LEV_a < LEV_b$
<i>Employment</i>		
(EMP)	Number of employees	$EMP_a < EMP_b$

## Data

The sample used to investigate the relation between changes in ownership structure and firm performance consists of all Icelandic privatized companies for which there was at least three years' annual accounting data before and after privatization. The firms come from all types of industries and are of various sizes. Hence, the database is free of the bias that is present in much of the previous research on privatisation, namely the unavailability of data for mid-sized and smaller firms (Choi and Silanes, 2010). The database is also free of a "cream of the crop" selection bias, since it does not include only SOEs known to be a good fit to the market (Kikeri and Nellis, 2002). During the privatization era of 1992 to 2005, the Icelandic government privatized 33 companies, which was close to all the SOEs potentially fit for privatization (Sigurjonsson, 2010). Most of the privatization took place in the form of SIP (Share Issue Privatization). On four occasions an asset sale was used, leaving a sample of 29 firms (the method of asset sales led to the incorporation of the divested firms' assets into the books of the purchasers; hence data is not available for research). Table 2 provides an overview of all the privatized SOEs, the year of privatization and the form of the privatization method. Where accounting data was not publicly available, the firms were contacted and visited. This second approach applied to most of the firms. On occasion, data were not available where privatized firms merged with private ones within three years from privatization. Where the privatization had already begun in 1992, in some cases the data were not available. On a few occasions, the owners declined to hand over the data. Despite the compulsory delivery of annual reports to the Icelandic Directorate of Internal Revenue, not all firms follow that rule. The missing 13 firms are spread over both in terms of industry and size. The data finally encompassed that of 20 privatized firms.

Table 2

Overview of all privatized firms  
(This table provides an overview of all privatized SOEs during 1992 – 2005,  
year of privatization and method of privatization)

	Company	Year of privatization completed	Method of privatization
1	Flugskóli Íslands hf. (aviation)	2005	Share issue privatization (SIP)
2	Landssími Íslands hf. (telecom)	2005	Mixed
3	Lánasjóður landbúnaðarins (finance)	2005	SIP
4	Barri hf. (manufacturing)	2004	SIP
5	Búnaðarbanki Íslands hf. (finance)	2003	Mixed
6	Íslenskir aðalverktakar hf. (construction)	2003	SIP
7	Landsbanki Íslands hf. (finance)	2003	Mixed
8	Sementsverksmiðjan hf. (manufacturing)	2003	SIP
9	Íslenska járnblendifélagið hf. (manufacturing)	2002	SIP
10	Steinullarverksmiðjan hf. (manufacturing)	2002	SIP
11	Kísiliðjan hf. (manufacturing)	2001	SIP
12	Stofnfiskur (fishing industry)	2001	SIP
13	Intís hf. (IT)	2000	SIP
14	Áburðarverksmiðjan hf. (manufacturing)	1999	SIP
15	FBA (finance)	1999	SIP
16	Hólalax hf. (fishing industry)	1999	SIP
17	Íslenska menntanetið hf. (IT)	1999	SIP
18	Skólavörubúð Námsgagnastofnunar (retail)	1999	Asset sale
19	Skýrr hf. (IT)	1998	SIP
20	Bifreiðaskoðun hf. (service)	1997	SIP
21	Jarðboranir hf. (research)	1995	SIP
22	Lyfjaverslun Íslands hf. (pharmaceutical)	1995	SIP
23	Þörungaverksmiðjan hf. (manufacturing)	1995	SIP
24	Þormóður rammi hf. (fish industry)	1994	SIP
25	Rýni hf. (research)	1993	SIP
26	SR-mjöl hf. (fish industry)	1993	SIP
27	Ferðaskrifstofa Íslands hf. (tourist industry)	1992	Direct sale to employees
28	Framleiðsludeild ÁTVR (manufacturing)	1992	Asset sale
29	Íslensk endurtrygging hf. (finance)	1992	SIP
30	Menningarsjóður (culture)	1992	Asset sale
31	Prentsmiðjan Gutenberg hf. (manufacturing)	1992	SIP
32	Ríkisskip (transportation)	1992	Asset sale
33	Þróunarfélag Íslands hf. (finance)	1992	SIP



A control group of privately owned firms, spanning a wide variety of sectors and firm sizes is included in the study. The ÍSAT2008 industry coding system was used in order to choose appropriate firms to create pairs of privatized SOEs and private firms. The ÍSAT2008 system is based on the European Union's NACE Rev. 2 industry indexation which applies to all member countries of the European Economic Area (including Iceland). The aim of the indexation is to secure parallelism in comparison between nations. A list of all private firms belonging to the same industry indexation as the privatized ones was obtained from the Directorate of Internal Revenue. Those private firms matching the industry indexation, being of similar size and operating during the same three years before and after privatization were chosen as the control group. The same rule applied for data collection of the private firms as for the privatized ones. When possible, public accounting data were gathered. Where this data was not available the firms themselves were contacted. Ultimately, 29 private companies were fit for comparison purposes.

All data used for the analysis was adjusted for inflation (applying the Consumer Price Index (CPI)), using the year of privatization (year 0) as a base year. Local currency data (Icelandic krona) was employed in all analysis and ratios were computed using nominal data in both the numerator and the denominator. Overall, the study used 20 privatized firms and 29 private firms, which totals 49 firms.

#### **4. Results**

When a comparison is done of the mean and median values for all privatized firms, a large difference between these two measures is revealed in some occasions. For example, this shows in changes in employment where the mean increases after privatization while the median declines. When concurrently examining the data for each industry, the financial industry stands out in its improvement, although an unsustainable one as earlier discussed. The financial industry is therefore excluded from the sample. The results show only two out of twelve measures change significantly. More often, a significant change in direction is seen, or in six cases out of twelve.

The performance of the privatized firms is presented in table 3.

Table 3

Results from test of predictions for the full sample excluding financial firms  
(This table presents the empirical results for the complete sample of available privatized firms excluding financial firms. For each performance measure, the table provides the mean and the median values for the three-year period before and after privatization. Change in mean and values of the performance indicators are provided after versus before privatization in column five. The sixth column provides the Wilcoxon Z statistics for the difference in median values. The two remaining columns provide the proportion of firms whose performance changed as predicted and the significance test of this change from 50%)

Variables	N	Mean before (median)	Mean after (median)	Mean change (median)	Z-Statistics for difference in medians (after-before)	Percentage of firms that changed as predicted	P-value for proportion Test
<b>Profitability</b>							
ROA	18	3.40 (3.91)	6.51 (6.72)	3.11 (2.81)	$z = -1.154$ ns	0.50	0.500
ROE	18	4.00 (4.22)	7.40 (8.96)	3.40 (4.74)	$z = -1.502$ ns	0.67	0.079*
ROS	18	-9.97 (3.95)	-0.42 (9.17)	15.13 (5.22)	$z = -0.4145$ ns	0.61	0.170
<b>Operating efficiency</b>							
Sales/EMP	18	12419 (10816)	22555 (12298)	10135 (1482)	$z = -2.069$ , $p < .05$ **	0.72	0.030**
NP/EMP	18	112 (176)	717 (748)	605 (572)	$z = -1.198$ ns	0.67	0.079*
OP/EMP	18	557 (425)	1279 (887)	721 (462)	$z = -1.677$ , $p < 0.1$ *	0.67	0.030**
<b>Output</b>							
Sales/Total Assets	18	0.92 (0.78)	1.08 (0.89)	0.16 (0.11)	$z = -1.372$ ns	0.67	0.079*
Real sales	18	2361000 (781267)	2700600 (764709)	339600 (-16558)	$z = -1.590$ ns	0.61	0.170
<b>Investments in fixed assets</b>							
Fixed assets/sales	18	-0.11 (1.11)	1.41 (-0.55)	1.52 (-1.66)	$z = -0.152$ ns	0.50	0.500
Fixed assets/total Assets	18	1.95 (0.55)	-1.70 (-1.35)	3.65 (-1.90)	$z = -0.762$ ns	0.44	0.680
<b>Leverage</b>							
Liabilities/ Assets	18	42.44 (43.78)	51.38 (51.99)	8.94 (8.21)	$z = -1.154$ ns	0.33	0.092*
<b>Employment</b>							
EMP	18	172 (74)	144 (52)	-28 (-22)	$z = -0.719$ ns	0.50	0.500

\*\*\*, \*\*, \* denote significance levels of 1.5 and 10 percent, respectively.

None of the three profitability ratios show a significant increase, although ROE shows an improvement in profitability by 67% of firms. Two of the three variables for efficiency, namely sales efficiency (measured by real sales per employee) and operating income (measured by operating income per employee), change significantly according to the predicted relationship. All three show a significant improvement ( $p < 0.05$ ) in all measures for 72%, 67% and 67% of the firms, respectively. These results suggest that the Icelandic SOEs significantly improve their efficiency, an objective that governments launching privatization programs often emphasize.

The results show no significant increase in real sales, although 60% of firms show an increase of sales in relation to assets. It is difficult to state whether this finding would agree with the often-mentioned argument that SOEs tend to overproduce to satisfy political objectives (Boycko, Shleifer and Vishny, 1994). In real sales the mean increases while the median decreases and just more than half (61%) of the privatized firms change in the predicted direction, but not significantly. Changes in financing opportunities or incentives for increased output do not seem to apply here, contradicting an opposite argument by Megginson, Nash and van Randenborgh, 1994.

Neither measures of change in investments show a significant increase. Nonetheless, half of the firms show movement in the direction of an increase. The literature suggests such a trend (Megginson, Nash and van Randenborgh, 1994), but a significant change does not apply here. The results report no significant change in the level of leverage after privatization. It was predicted that leverage would decrease as private firms do not have the same access to “cheap” money as SOEs do in some instances and SOEs do not issue stocks. Less than half of the firms in fact moved in the direction of increased leverage (33%).

Studies on privatization report mixed results in changes in employment of divested firms. La Porta and Silanes (1999) reported a significant decline in the number of employees where Megginson, Nash and van Randenborgh (1994) found a non-significant decline in employment. The result for the Icelandic case is non-significant.

Research on privatization has been criticized for not controlling for the general level of economic activity before and after privatization (Choi and Silanes, 2010). The argument is that such studies are incapable of distinguishing between changes in firm attributes arising from change in ownership and from ordinary fluctuations in economic activity. Iceland enjoyed economic growth from the time of the first privatization in 1992 until its last one in 2005. Hence, there is a reason for analysing whether increases in profits, efficiency and sales growth of privatized firms are mere manifestations of economic and industry factors. Table 4 presents a control group of the private firms used for this comparison. The private firms are “twin firms” of the privatized ones in the sense that they come from the same industries, have the same industry indexation (see Section III, on data and methodology) and the data comes from the same privatization period (the same three years before and three years after).

Table 4

Results from test of predictions for the full control group sample excluding financial firms (This table presents the empirical results for the complete sample of available private firms excluding financial firms. For each performance measure, the table provides the mean and the median values for the three-year period before and after privatization. Change in mean and values of the performance indicators are provided after versus before privatization in column five. The sixth column provides the Wilcoxon Z statistics for the difference in median values. The two remaining columns provide the proportion of firms whose performance changed as predicted and the significance test of this change from 50%)

Variables	N	Mean before (median)	Mean after (median)	Mean change (median)	Z-Statistics for difference in medians (after-before)	Percentage of firms that changed as predicted	P-value for proportion Test
<b>Profitability</b>							
ROA	18	11.15 (9.16)	10.55 (10.95)	-0.60 (1.79)	$z = -0.109$ ns	0.56	0.319
ROE	18	9.46 (9.21)	8.77 (10.12)	-0.69 (0.91)	$z = -0.370$ ns	0.50	0.500
ROS	18	7.03 (11.03)	25.98 (26.21)	18.95 (15.18)	$z = -2.069$ , $p < .05$ **	0.61	0.173
<b>Operating efficiency</b>							
Sales/EMP	18	15689 (12977)	14784 (11612)	-905 (-1365)	$z = -0.457$ ns	0.50	0.500
NP/EMP	18	784 (383)	1507 (804)	723 (421)	$z = -1.590$ ns	0.61	0.173
OP/EMP	18	1401 (733)	1436 (1151)	35 (418)	$z = -0.457$ ns	0.56	0.389
<b>Output</b>							
Sales/Total Assets	18	1.45 (3.25)	1.21 (0.99)	-0.24 (-2.26)	$z = -2.504$ , $p < .05$ **	0.28	0.970
Real sales	18	1443826 (1297738)	2004309 (1356869)	560483 (59131)	$z = -2.417$ , $p < .05$ **	0.72	0.030**
<b>Investments in fixed assets</b>							
Fixed assets/sales	18	2.16 (2.94)	4.41 (3.64)	2.25 (0.70)	$z = -0.675$ ns	0.61	0.173
Fixed assets/total Assets	18	-3.21 (2.99)	4.60 (6.22)	7.81 (3.23)	$z = -1.032$ ns	0.68	0.079*
<b>Leverage</b>							
Liabilities/ Assets	18	60.67 (59.95)	52.02 (54.59)	-8.65 (-5.36)	$z = -1.807$ , $p < 0.1$ *	0.72	0.030**
<b>Employment</b>							
EMP	18	125 (73)	158 (129)	33 (56)	$z = -2.983$ , $p < .05$ **	0.78	0.009***

\*\*\*, \*\*, \* denote significance levels of 1.5 and 10 percent, respectively.

When the results for the control group are analysed, it becomes evident that there is a significant change in eight measures out of twelve. Table 4 shows these results. Significant changes are found in three of the variables where the privatized firms do not show significant changes, in output, investments in fixed assets and employment. On the other hand, improvements in operating efficiency measures are not seen. On the other hand the private firms still show significant changes in one of the profitability measures (ROS). These improvements by the private firms could likely be explained by the fact that they were faced with increased competition from their privatized “twin” firms.

The profitability of the median Icelandic SOE is not too different from that of its private sector peer although it is noticeable lower. Profitability grows after privatization, as the significant changes in performance of the SOEs indicate. Figures 1 to 3 illustrate this point by graphically showing the behaviour of the median profitability measures through time, for both the sample of SOEs and the control group of private firms, excluding financial firms. SOEs show ROE before privatization similar to private firms but overtake them after privatization. Regarding the ROA measure, SOEs are lagging behind private firms before privatization but improve greatly after privatization. In ROS privatized firms do well and improve greatly, although there is a decline during the last period of analysis. See figures 1 to 3.

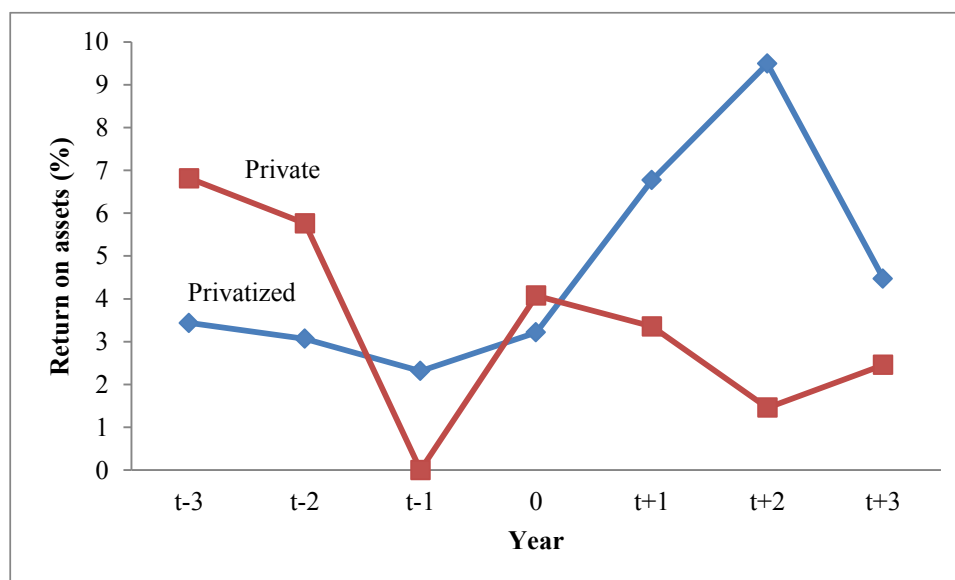


Fig. 1. Return on assets for privatized firms versus private firms

Rys. 1. Zwrot z aktywów dla prywatyzowanych firm w porównaniu do prywatnych firm

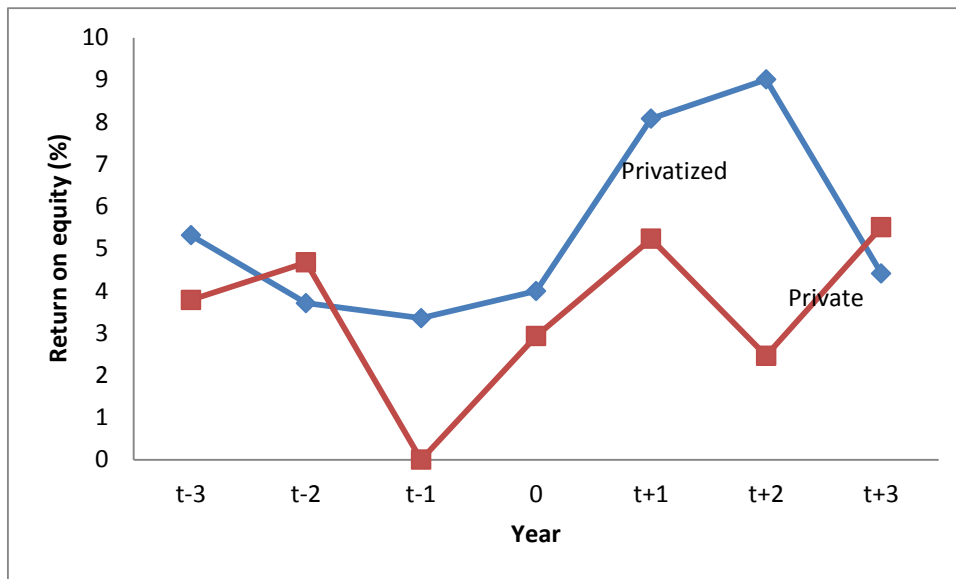


Fig. 2. Return on equity for privatized firms versus private firms

Rys. 2. Zwrot z kapitału dla prywatyzowanych firm w porównaniu do prywatnych firm

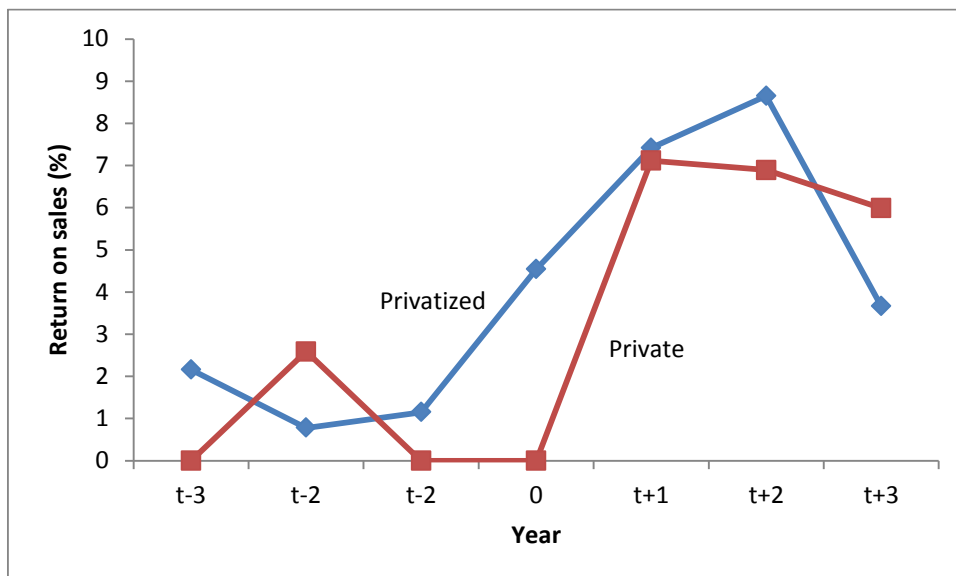


Fig. 3. Return on sales for privatized firms versus private firms

Rys. 3. Rentowność sprzedaży dla prywatyzowanych firm w porównaniu do prywatnych firm

Operating efficiency measures are reported in the same descriptive way in figures 4 and 5 (by sales to employees and net profit to employees). Operating efficiency increases after divestiture, supporting the idea that privatization can have a significant anticipation effect. This result would be consistent with Martin and Parker (1995) and Dewenter and Malatesta (2001). In all the measures for operating efficiency, SOEs show significant improvements. See figures 4 and 5.

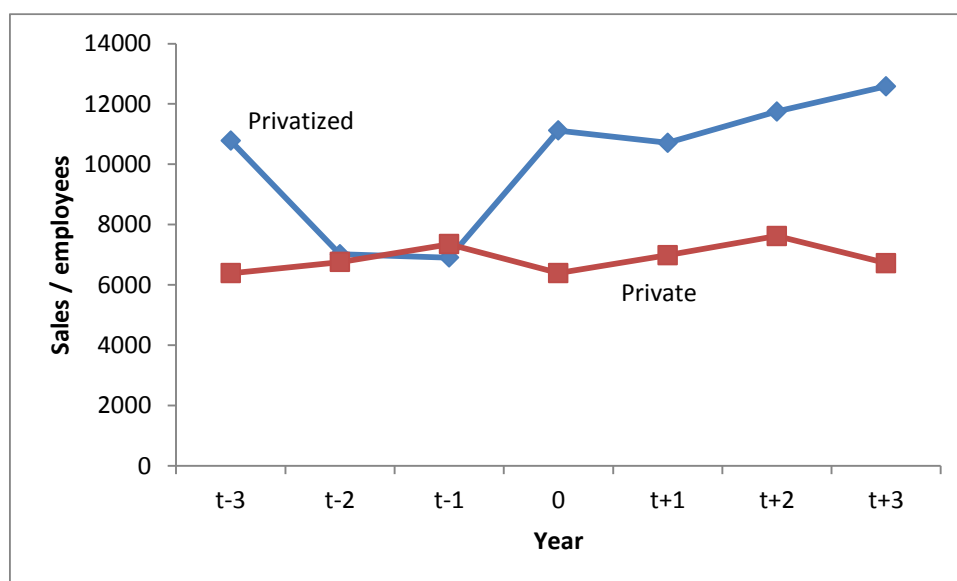


Fig. 4. Median ratio of sales over employees for privatized firms versus private firms  
Rys. 4. Średni wskaźnik sprzedaży przez pracowników dla prywatyzowanych firm w porównaniu do prywatnych firm

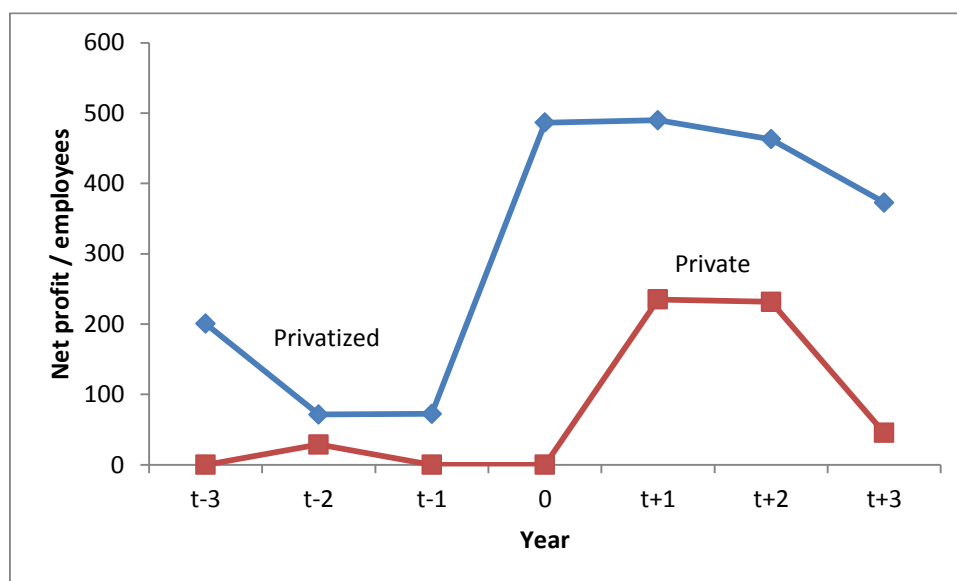


Fig. 5. Median ratio of net profit over employees for privatized firms versus private firms  
Rys. 5. Średni wskaźnik zysku netto w ciągu pracowników dla prywatyzowanych firm w porównaniu prywatnych firm

On the other hand, the number of employees initially decrease somewhat prior to privatization (years -3 to 0), and moderately after that. The private firms keep a stable number of employees for the comparison period. See figure 6.

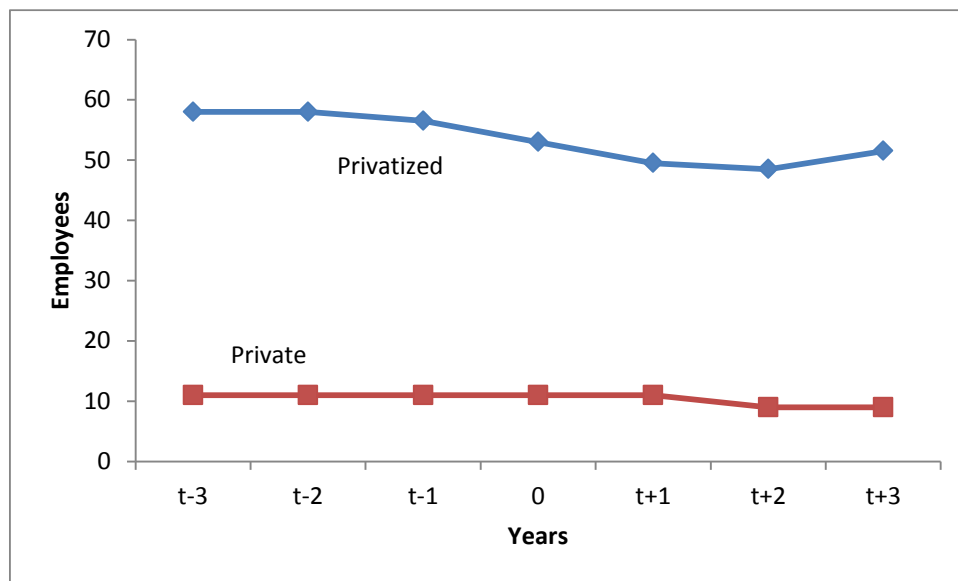


Fig. 6. Number of employees for privatized firms versus private firms

Rys. 6. Liczba zatrudnionych w prywatyzowanych firmach w porównaniu do prywatnych firm

## 5. Concluding remarks

The findings support the argument that Icelandic SOEs are efficient before privatization and continue to be so after divestment. Although there is little significant change in their operations after privatization, the general direction is towards improvement. Significant changes are only found in two measures out of twelve (when financial firms are excluded), or in sales to employees, and operating profit to employees. These two significant changes might be driven by the reduction in numbers of employees especially during the three years leading up to the privatization year (figure 6 shows this trend).

Controlling for potential market changes, privatized firms are equal to their private counterparts in many measures. On the other hand, when faced with new competition, private firms show significant improvements in more measures than privatized firms do. Hence, the privatization effect on industry's efficiency is positive. Private firms show significant improvements in a variety of measures (profitability, output, leverage and employees), where privatized firms show only significant improvements where decrease in number of employees is the denominator. This could indicate that privatization does not lead to significant improvements unless reduction of employees is prior to privatization. Private firms, on the other hand, prepare themselves for increased competition and potential expansion into new markets by searching for efficiency and effectiveness. They improve on most categories



of measures, although not on operating efficiency, the potential reason being that they don't reduce numbers of employees.

The fiscal effects of privatization are very positive, decreasing public debt to GDP in Iceland from 33.7% to 7.4%. State subsidies are also greatly affected as almost all SOEs are privatized. There seems to be an announcement effect of declaring forthcoming privatization which a decrease of employment at SOEs prior to privatization indicates. However, the efficiency gains take a few years to materialize as figures one to five imply.

The research question asks whether privatized SOEs improve significantly their operations after privatization. The short answer is no. Nevertheless, the research shows the positive direct and side effects of privatization. Privatized SOEs continue to be efficient and move in positive directions. Private firms improve their operation on a variety of measures, although in running the chi-square test it shows that on two measures (leverage and employment) the private firms move significantly in the opposite direction to privatized ones. Private firms are 5.26 times more likely to move in the direction of decreasing their leverage than privatized ones and 3.57 times more likely to increase their number of employees than privatized ones. On the other hand, privatized firms are 5.26 times more likely to increase the Sales/Total assets ratio than private ones. On other measures, there is no significant difference in the direction privatized and private firms move.

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