# The Performance of Danish Foundation-Owned Companies[1][2][3]

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**Abstract**

We study the relative performance of Danish foundation-owned companies 2000-2012. We find that foundation-owned companies have lower sales growth and accounting returns than other companies, but higher factor productivity and similar rates of productivity growth. Size effects appear to be important in that large foundation-owned firms overperform, while small foundation-owned firms underperform. However, foundation-owned companies also have lower risk (volatility of earnings), and we find no differences in risk-adjusted accounting returns.

## 1. Introduction

Foundation ownership[8] implies an interesting combination of for-profit business firms with non-profit ownership. Quite a few world-class companies like the Tata Group, Robert Bosch, Hersheys or Maersk are owned in this way, and one wonders whether their unique ownership structure contributes to or detracts from their success.

Theoretically, foundation-owned companies might be expected to underperform. Their owners have no personal profit incentive. The companies may not be able to diversify risk and so should have higher costs of capital compared to companies with dispersed ownership. Furthermore the market for corporate control does not discipline foundation-owned companies.

The available evidence so far is that foundation-owned companies do as well or perhaps even slightly better than other companies (Thomsen, 1996, 1999, Herman and Franke 2002, Rose and Thomsen, 2004, Hansmann and Thomsen 2013). However, most of this research has been done on limited data sets covering only the largest foundation-owned companies.

In this paper we reexamine the performance of foundation-owned companies with improved data coverage and we use new alternative performance measures. The data is based on Danish population data from 2000-2012 and data from the comprehensive accounting database (Experian). We are able to track (almost) all of the Danish foundation-owned companies, which account for an estimated 5-10 % of economic activity, the bulk of Danish stock market capitalization and the bulk of Danish R&D investments.

The structure of our paper is as follows. We discuss theory development with cost and benefits of foundation-ownership in Section 2. In Section 3, we describe previous studies about foundation-ownership and in Section 4 we describe our data. We examine the performance of foundation-owned companies in Section 5. Section 6 concludes.

[8] For more information on industrial foundations see Thomsen (2012) on institutional structure and Thomsen (2013) on their economic importance in Denmark.

## 2. Theory development

Below we list some of the arguments for over- and underperformance in foundation-owned firms. We describe each argument in following section.

**Theoretical arguments on the Costs and Benefits of Foundation Ownership**

| Benefits (+) | Costs (-) |
|---|---|
| Long-term decisions | No personal profit incentives |
| Succession | Undiversified (concentrated) risk |
| Stakeholder relations | Capital rationing |
| Identification | Overinvestment |
| Financial conservatism | No market for corporate control |
| Social legitimacy | Multiple objectives |

### Benefits of foundation-ownership

On the positive side, foundations are by construction long-term owners, who value the survival of the company over short-term gains or dividends. Thus, they should be able to influence for the long term without being pressured to the same extent by stock market fluctuations, earnings expectations or pressure by hedge funds. Stein (1989) models how managers come to behave myopically when investors are unable to observe some of their investments and therefore focus on current earnings. The Kay report (Kay 2012) shows that these concerns are significant and real in modern equity markets. Foundation-owned companies should be able to make better long-term decisions than investor-owned companies subject to these pressures.

Foundation ownership also presents a solution to the challenges of succession in family-owned firms, including transition from founders to second or third generation family members, which are known to be costly (Bennedsen et al. 2007, Mehrota et al. 2012). Foundation ownership also involves safeguards against (equally costly) conflicts within the founding family (Bertand and Schoar 2012), who can negotiate a collective representation of their interests through membership of the foundation boards. In other cases[9], when the family

[9] Hansmann and Thomsen (2013a) find that the founding family is active in around half of the largest Danish industrial foundations.

does not sit on the foundation board, foundation ownership is an alternative to family ownership and control.

Foundation-owned firms should also be able to cultivate long-term relations with their stakeholders since they have less of a profit incentive to breach implicit contracts. This is the essence of the contract failure argument for non-profits advanced by Hansmann (1980): Under asymmetric information about product quality, consumers will find it more attractive to contract with non-profits who have less of an incentive to cut costs by lowering quality. It seems possible to generalize this argument to employees and other stakeholders as well. When contracting under asymmetric information they may prefer to contract with foundation-owned firms, which have less of an incentive not to deliver on implicit contracts. Thus, foundation-ownership may provide competitive advantages such as loyalty among customers and employees and greater mutual trust in cooperation with suppliers. They may be particularly likely to benefit from the partnership advocated by Porter and Kramer (2001).

While foundation boards are not motivated by economic incentives they may identify with the foundation as suggested by Aklerlof and Kranton (2010). Moreover, managers and employees may find it easier to identify with foundation-owned firms knowing that dividends will be reinvested or be donated to charity. Holmén and Dijk (2012) finds from a experiment that participants are more likely to maximize profits by hard bargaining when the proceeds go to a charity.

Finally there may be benefits to financial conservatism, which aim for low leverage and stable earnings. Dutta and Radner (1999) predict that survival maximizing firms (such as foundation-owned firms) will be less leveraged. Both Hansmann and Thomsen (2013b) and Poulsen et al (2013) find that foundation-owned firms have lower leverage than firms with another ownership structure. Hansmann and Thomsen (2013) find that they have lower performance volatility (standard deviations of accounting and stockholder returns). In a volatile business environment this may give them strategic options such as the ability to buy competing companies at a discount.

**Costs of foundation ownership**

On the negative side, foundations may not monitor their companies carefully, since their boards have little or no financial incentive to do so (Fama and Jensen 1983). Agency problems could therefore proliferate including problems with managerialism, empire building, expenditure preference, managerial entrenchment and so on.

Since industrial foundations retain majority ownership there is a limit to diversification of ownership. This should theoretically make foundation-owned firms more risk adverse compared to investor owned-companies with dispersed ownership (Fama and Jensen 1985). In other words, foundations bear idiosyncratic risk, which could make them more risk adverse.

Foundation-owned companies may be capital rationed, when the foundation is short of funds but reluctant to give up control (Fama and Jensen 1985). Paradoxically, in crisis situations, this could make them more short-term than investor-owned companies. Hansmann and Thomsen (2013) find that they grow slower than listed companies.

In contrast, foundation-owned firms, which have positive cash flows seem more likely to reinvest it in the firm even when it may be economically more attractive to invest elsewhere. This could lead to overinvestment and reduced marginal efficiency of capital.

Foundation-owned companies are less likely to be sold than companies with dispersed ownership. In other words the market for corporate control (Manne 1965) is blocked or at least subdued. Foundation-owned companies therefore lack the stock market discipline, which pressure managers in other companies to better performance. A preference for autonomy and survival can also prevent them for taking part in industry consolidations by M&A. Relative to other companies this could mean a disadvantage that would lead to lower economic performance.

Finally, foundation-owned companies may have multiple objectives since their owners may have preferences concerning the welfare of the employees, location of production or other factors which may constrain bot short term and long term profitability (Jensen 2001).

## Hypothesis

It is impossible to decide theoretically whether the benefits identified above exceed the cost. But is it possible to say that the relative performance of foundation-owned companies will vary considerably with the business environment and other contingencies. Indeed in some cases, both costs and benefits relate to the same characteristics, which may be disadvantage in some situations but an advantage in other circumstances. We will therefore not propose a single hypothesis for empirical testing, but instead examine what the data has to say.

## 3. Literature review

Previous studies have found that foundation-owned companies on average perform no worse, or even slightly better, than companies with more conventional ownership structures.

Thomsen (1996) compares foundation-owned companies to investor-owned and family owned companies in a sample taken from the 300 largest non-financial Danish companies 1982-1992. He finds no significant differences in accounting returns (ROE, ROA) or sales growth. However, foundation owned-companies appear to be characterized by significantly higher profit margins and significantly lower asset turnover. Moreover, foundation-owned companies were found to have significantly high solvency (equity/assets) and lower earnings volatility (standard deviation of return on equity).

Thomsen (1999) explores possible explanations for the surprisingly good performance of foundation-owned companies. He rejects explanations based on market power (monopoly rents), tax advantages or monitoring by minority investors and creditors. There is some tendency for better performance in foundations with a founding family presence, but the effect is not strong enough to explain. However, Thomsen (1999) does find some indication that the performance advantage of foundation-owned firms deteriorates with company age.

Thomsen and Rose (2004) examine the stock-market performance of foundation-owned companies listed on Copenhagen Stock Exchange 1996-1999. In a sample of 171 companies, where 20 are majority-controlled by industrial foundations, they find these foundation-owned companies are at least as efficient as other listed companies in terms of risk adjusted stock returns, accounting returns and firm value (Tobin's Q)

Herrmann and Franke (2002) similarly find no significant performance disadvantage to foundation-ownership in Germany. On the contrary, profitability tends to be somewhat higher, but differences disappear when controlling for other relevant variables. Danzig (2011) finds no effect of foundation-ownership on firm value q and marginal q (firm value) in listed Swedish companies.

Hansmann and Thomsen (2013) compare listed and unlisted Danish and Swedish foundation-owned companies to listed Nordic companies 2003-2009. They find that unlisted foundation-owned companies underperform listed companies matched by industry and size, while listed foundation-owned overperform in terms on accounting returns (ROA) and firm value. Regardless of control group foundation-owned companies have less volatile earnings and slower growth than other listed companies.

Altogether, previous studies have tended to concentrate on large listed companies which not be representative. For example Hansmann and Thomsen (2012) find markedly higher profitability among listed foundation-owned companies. Moreover, no studies have to our knowledge examined the impact of foundation ownership and productivity growth, which may be the important measure from a societal viewpoint.

## 4. Data

The data for this study comes from five different registers. They are all based on mandatory information reported by corporations to the Danish Business Authority. First, we use the Danish Business Authority's register of industrial foundation to identify the industrial foundations. The purpose of a foundation is not in the register, so in order to remove foundations without business activity outside the foundations and foundations with charitable and government-linked activities (registered as industrial foundations), we clean the list by hand. We then add data from the four other registers with information on firm ownership (who owns the firm and who does the firm own), firm characteristics (e.g. year of incorporation, exit, and industry), firm management (directors and executives), and firm financials (income statement and balance sheet), respectively. These four registers are maintained by the private data provider Experian.

First, we use the ownership data to identify all subsidiaries of the industrial foundations. We can track subsidiaries of subsidiaries but not beyond that, and we can only identify ownership

of firms incorporated in Denmark. Some foundations have a holding company in between the foundation and the subsidiary with the business activity. If a subsidiary is a holding company and a subsidiary of this company is also a holding company, it is removed from the data. We use the industrial classification DB07 by Statistics Denmark to identify holding companies. If a subsidiary is a holding company and the business activity is a subsidiary to that company, we drop the holding company but keep its subsidiary (the operating company). In this case, we calculate the foundation's ownership stake as the product of ownership stakes along the chain.[10] The links between foundations and subsidiaries are made irrespective of ownership stakes, i.e. as long as a foundation owns part of a company the company included as a subsidiary. This procedure is justified as the Business Authority only registers foundations with controlling influence as industrial foundations.

Second, having established the links between foundations and operating companies, we add firm characteristics to the latter, and start out by deleting all financial firms, since financial firms are regulated by their own (different) law, and their income statements as well as balance sheets are incomparable to those of non-financial firms.

Finally, we add financial data. The register contains both consolidated and unconsolidated data. First of all, it is important not to use both types of data in the same analysis, since subsidiaries are treated quite differently. In the unconsolidated numbers (for the parent), the subsidiary appears on the balance sheet as an asset. In the consolidated numbers, the subsidiary's balance sheet items would be added to the parent's corresponding balance sheet items one by one (eliminating internal transactions in the process). In terms of capital structure, for example, the difference is that the unconsolidated numbers distorts the ratio between debt and assets, as assets increase while debt is unaffected. In choosing between the two types of data, we choose consolidated data.

Besides mapping some of the firm characteristics in foundation-owned firms, it is also interesting to compare with non-foundation-owned firms. But many foundation-owned firms are unique, not least in terms of their size, making such a comparison less than straight forward. As a first attempt, we compare to all other firms in Experian for which we have

[10] We could also define a foundation's ownership stake in terms of control and use the weakest link along the control chain. Since a chain of ownership (with more than one link) only exist in firms owned by foundations through a holding company, this change in definition only applies to the (few) observations where this is the case. Our results are not sensitive to this.

consolidated financial data. It is therefore important to bear in mind that these firms are not necessarily equal to the foundation-owned firms in all their (sometimes unobserved) characteristics. We also compare the foundation-owned firms to propensity score matched firms.

Finally, we exclude missing values, i.e. we only count firm-years in which a company has registered firm assets.

**Table 1: Descriptive statistics**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Foundation ownership | 14773 | 0.068 | 0.252 | 0.000 | 1.000 |
| ROA (netincome/total assets) | 14772 | 0.025 | 0.701 | -67.304 | 39.010 |
| ROA (EBIDTA/total assets) | 14656 | 0.104 | 0.121 | -0.422 | 0.474 |
| Firm size (log assets) | 14773 | 12.171 | 1.567 | 6.370 | 20.203 |
| Debt-to-equity ratio | 12289 | 2.826 | 2.604 | 0.332 | 10.317 |
| Growth (sales) | 7669 | 0.065 | 0.183 | -0.275 | 0.482 |
| Productivity (solow) | 13864 | 0.003 | 0.581 | -2.020 | 1.209 |
| Productivity growth | 8846 | 0.011 | 0.982 | -3.108 | 3.331 |

In Table 1 we observe that we have some 14773 firm year observations of which 6.8% belong to foundation-owned companies. The average firm has a ROA of 2.5% if ROA is measured as (net income/total assets), but 10.4% if ROA is measured as (EBITDA/total assets). The debt equity ratio is 2.8 on average, and the sales growth rate is 6.5%. The Solow residuals indicates the average firm generates slightly more value added than can be attributed to labour and capital and productivity growth is positive. We have winsorized most variables to prevent undue influence from extreme values.

## 5. Results

We observe in Table 2 that foundation ownership is negatively correlated with ROA, leverage (debt/equity) and sales growth. However, foundation-ownership is positively correlated with productivity (Solow residuals) and (insignificantly) with productivity growth. Moreover foundation-owned firms tend to be somewhat larger.

**Table 2: Correlation between foundation ownership and Profitability, Productivity and Growth**

| | Foundation ownership | ROA | Firm size | (D/E) ratio | Prod. | Growth | Prod. growth |
|---|---|---|---|---|---|---|---|
| Foundation ownership | 1.000 | | | | | | |
| Performance (roa) | -0.0221* | 1.000 | | | | | |
| Firm size (log assets) | 0.2143* | 0.0601* | 1.000 | | | | |
| Debt-to-equity ratio | -0.1198* | -0.2457* | -0.0882 | 1.000 | | | |
| Productivity (solow) | 0.0218* | 0.3326* | -0.0040 | -0.0617* | 1.000 | | |
| Growth (sales) | -0.0323* | 0.1869* | 0.0844* | 0.0566* | 0.0986* | 1.000 | |
| Productivity growth | 0.0094 | 0.0323* | -0.0008 | -0.0065 | -0.0352* | -0.0071 | 1.000 |

*p<0.01

Profitability (ROA) is positively correlated with growth, productivity and company size. ROA is negatively correlated with leverage (d/e), which is a surprise if we expect a positive trade off between (financial) risk and return. Apparently, well performing profitable firms build reserves and equity over time, while underperformers draw on their reserves, which therefor decrease over time.

In table 3A and table 3B we compare foundation-owned companies to the residual group of other firms in a series of t-tests (taking into consideration differences in variance which are theoretically to be expected for example because differences in risk aversion).

**Table 3A: Differences in means (t-tests)**

Differences in means (t-tests)

**Return on assets (ROA)**

| | Mean | Std. Dev. | Obs. |
|---|---|---|---|
| Non Foundation owned | 0.030 | 0.120 | 13762 |
| Foundation owned | 0.019*** | 0.108 | 1010 |
| Total | 0.029 | 0.119 | 14772 |

*** p<0.01, ** p<0.05, *p<0.1

**Productivity**

| | Mean | Std. Dev. | Obs. |
|---|---|---|---|
| Non Foundation owned | 0.000 | 0.581 | 13002 |
| Foundation owned | 0.053*** | 0.577 | 862 |
| Total | 0.003 | 0.581 | 13864 |

*** p<0.01, ** p<0.05, *p<0.1

**Productivity growth**

| | Mean | Std. Dev. | Obs. |
|---|---|---|---|
| Non Foundation owned | 0.009 | 0.991 | 8284 |
| Foundation owned | 0.047 | 0.845 | 562 |
| Total | 0.011 | 0.982 | 8846 |

*** p<0.01, ** p<0.05, *p<0.1

First, we observe that foundation-owned firms have significantly lower ROA. The average firm makes 3% (net income/assets), but foundation-owned firms make only 1.9%. This is contrary to a range of previous studies, which find foundation-owned firms to have higher or equivalent ROA.

Secondly, we observe the foundation-owned firms have higher factor productivity (solow residuals). However, there is no difference in productivity growth, although foundation-owned firms grow their productivity numerically faster.

Third, we observe in table 3B that foundation-owned firms grow slower. While other firms experience sales growth of 6.7% throughout the period. Foundation-owned firms grow only 4.8% or two percentage points less. This is consistent with Hansmann and Thomen (2013), which attribute lower growth in foundation-owned companies to risk aversion and less M&A.

**Table 3B: Differences in means (t-tests)**

Differences in means (t-tests)

**Sales growth**

| | Mean | Std. Dev. | Obs. |
|---|---|---|---|
| Non Foundation owned | 0.067 | 0.187 | 6892 |
| Foundation owned | 0.048*** | 0.149 | 777 |
| Total | 0.065 | 0.183 | 7669 |

*** p<0.01, ** p<0.05, *p<0.1

**Firm size (Total assets)**

| | Mean | Std. Dev. | Obs. |
|---|---|---|---|
| Non Foundation owned | 1023217 | 5656217 | 13763 |
| Foundation owned | 6801526*** | 3.66e+07 | 1010 |
| Total | 1418268 | 1.11e+07 | 14773 |

*** p<0.01, ** p<0.05, *p<0.1

**Leverage (Debt-to-Equity Ratio)**

| | Mean | Std. Dev. | Obs. |
|---|---|---|---|
| Non Foundation owned | 2.915 | 2.640 | 11360 |
| Foundation owned | 1.735*** | 1.750 | 929 |
| Total | 0.011 | 2.604 | 12289 |

*** p<0.01, ** p<0.05, *p<0.1

Fourth, as already mentioned we find that the foundation-owned firms are much larger than other firms in terms of total assets. In fact they are 6 times larger, on average, in terms of total assets. This casts some doubt on direct performance comparison between the two groups.

Finally, foundation-owned firms have significantly lower leverage. Their average debt/equity ratio is 1.7 compared to 2.9 for non-foundation owned firms.

In table 4 we subdivide our sample in large and small firms defined as larger or smaller than mean total assets (1.4 bill DKK). This is partly to check for consistency with previous studies, which mainly studied large foundation-owned firms to large firms. But it is also relevant given the large size differences between foundation owned firms and non-foundation owned firms.

We observe that large foundation owned companies have average ROA of almost 5% while large non-foundation owned firms have average ROA of 3.6%. In other words foundation-ownership is associated with overperformance among large firms. In contrast, among small firms foundation owned firms have average ROA of 0.6% compared to 2.9% for non-foundation owned firms. So small non-foundation-owned firms tend to underperform.

In terms of productivity we see the same pattern. Large foundation-owned firms are much more productive than non-foundation owned firms, while there is little difference among small firms. The pattern in terms of productivity growth is more blurred. Large foundation owned firms have smaller mean productivity growth. Small foundation owned firms have higher mean and median productivity growth.

However in terms of sales growth, foundation-owned firms underperform both among large and small firms.

**Table 4: size effects**

| Size | | Non foundation owned | Foundation owned | Total |
|---|---|---|---|---|
| | | ROA | | |
| Large | Mean | .036 | .050 | .039 |
| | Median | .033 | .042 | .036 |
| | Std. Dev. | .0856 | .064 | .082 |
| | Obs. | 1,308 | 310 | 1,618 |
| Small | Mean | .029 | .006 | .028 |
| | Median | .035 | .024 | .034 |
| | Std. Dev. | .123 | .120 | .123 |
| | Obs. | 12,454 | 700 | 13,154 |
| | | Productivity (solow) | | |
| Large | Mean | 0.028 | 0.184 | 0.055 |
| | Median | 0.099 | 0.241 | 0.131 |
| | Std. Dev. | .615 | .566 | .609 |
| | Obs. | 1,155 | 249 | 1,404 |
| Small | Mean | -0.003 | -0.001 | -0.002 |
| | Median | 0.085 | 0.066 | 0.085 |
| | Std. Dev. | .577 | .573 | .577 |
| | Obs. | 11,847 | 613 | 12,46 |
| | | Productivity growth | | |
| Large | Mean | 0.038 | 0.028 | 0.037 |
| | Median | 0.020 | -0.002 | 0.009 |
| | Std. Dev. | .988 | .861 | .965 |
| | Obs. | 767 | 171 | 938 |
| Small | Mean | 0.006 | 0.055 | 0.008 |
| | Median | -0.003 | 0.009 | -0.003 |
| | Std. Dev. | .991 | .839 | .984 |
| | Obs. | 7,517 | 391 | 7,908 |
| | | Sales growth | | |
| Large | Mean | 0.092 | 0.071 | 0.088 |
| | Median | 0.071 | 0.057 | 0.068 |
| | Std. Dev. | .190 | .139 | .181 |
| | Obs. | 1,104 | 282 | 1,386 |
| Small | Mean | 0.063 | 0.034 | 0.060 |
| | Median | 0.048 | 0.032 | 0.047 |
| | Std. Dev. | .186 | .154 | .183 |
| | Obs. | 5,788 | 495 | 6,283 |

Table 5 presents some size-weighted regressions of foundation ownership on alternative measures of firm performance. Here, large firms count for proportionally more than small firms so we are interested in the overall performance of foundation owned firms versus non-foundation owned firms.

**Table 5: Size weighted regressions**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| VARIABLES | ROA | Productivity (solow) | Productivity growth | Sales growth |
| Foundation owned | 0.022*** | -0.033*** | -0.001*** | -0.000*** |
| | [19,901.815] | [-2,797.067] | [-45.211] | [-166.741] |
| Constant | 0.034*** | 0.074*** | -0.011*** | 0.092*** |
| | [54,204.630] | [12,819.342] | [-955.188] | [57,465.078] |
| Observations | 20951993259 | 16259125044 | 10642033087 | 17349136499 |
| R-squared | 0.019 | 0.000 | 0.000 | 0.000 |

t-statistics in brackets

*** p<0.01, ** p<0.05, * p<0.1

In these size-weighted regressions we observe that foundation owned firms have 2.2% higher ROA, but lower productivity growth, lower base productivity and lower sales growth.

In table 6 we report results for the overall sample and examine the special effects among large firms. We control for firm size, capital structure, industry effects and year effects.

In model 1, we see that foundation ownership is negatively associated with ROA in the overall sample, but model 2 indicates that it is positively associated with ROA among large firms (significant at the 10% level).

Model 3 finds no significant foundation effect on productivity (Solow residuals) in the overall sample, while large foundation owned companies have higher productivity (model 4).

Models 5 and 6 find no differences in productivity growth regardless of company size.

Models 7 and 8 find that foundation-owned firms grow slower, regardless of company size.

**Table 6: Profitability, Productivity and Growth**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| VARIABLES | ROA | ROA | Productivity | Productivity | Productivity growth | Productivity growth | Sales Growth | Sales Growth |
| Foundation ownership | -0.021*** | | 0.048 | | 0.058** | | -0.032*** | |
| | [-4.006] | | [0.936] | | [2.070] | | [-4.898] | |
| Firm size (Log assets) | 0.002** | 0.000 | 0.006 | -0.013 | -0.012* | -0.020** | 0.011*** | 0.010*** |
| | [2.094] | [0.077] | [0.756] | [-1.233] | [-1.927] | [-2.258] | [6.190] | [4.176] |
| Debt-to-equity ratio | -0.010*** | -0.010*** | -0.013*** | -0.013*** | -0.001 | -0.002 | 0.005*** | 0.005*** |
| | [-19.925] | [-19.781] | [-3.194] | [-3.355] | [-0.306] | [-0.452] | [4.281] | [4.695] |
| Large Foundation-owned firm | | 0.009* | | 0.139*** | | 0.069 | | -0.003 |
| | | [1.741] | | [2.765] | | [1.614] | | [-0.296] |
| Constant | 0.159** | 0.181*** | -2.030*** | -1.833*** | -0.853*** | -0.771*** | -0.209*** | -0.201*** |
| | [2.313] | [2.623] | [-17.265] | [-14.078] | [-10.035] | [-7.280] | [-6.644] | [-5.235] |
| Industry effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time (year) effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 12,289 | 12,289 | 11,593 | 11,593 | 7,435 | 7,435 | 6,522 | 6,522 |
| R-squared | 0.167 | 0.165 | 0.076 | 0.079 | 0.006 | 0.006 | 0.108 | 0.106 |

Robust t-statistics in brackets
*** p<0.01, ** p<0.05, * p<0.1

In table 7 we compare different risk measures in order to examine whether foundation-owned companies take less risk as we would hypothesize.

**Table 7: Risk measures**

Differences in means (t-tests)

**Comparison of (winsorized) standard deviation of ROA**

| | Mean | Std. Dev. | Obs. |
|---|---|---|---|
| Non Foundation owned | 0.076 | 0.099 | 13356 |
| Foundation owned | 0.059** | 0.073 | 1001 |
| Total | 0.075 | 0.079 | 14357 |

*** p<0.01, ** p<0.05, *p<0.1

**Comparison of standard deviation of ROA (first differences)**

| | Mean | Std. Dev. | Obs. |
|---|---|---|---|
| Non Foundation owned | -0.004 | 0.097 | 10919 |
| Foundation owned | -0.004 | 0.079*** | 869 |
| Total | -0.004 | 0.096 | 11788 |

*** p<0.01, ** p<0.05, *p<0.1

**Comparison of Sharp measure of risk adjusted return, Adj. ROA**

| | Mean | Std. Dev. | Obs. |
|---|---|---|---|
| Non Foundation owned | 0.813 | 24.762 | 13356 |
| Foundation owned | 0.399 | 2.822 | 1178 |
| Total | 0.779 | 23.752 | 14534 |

*** p<0.01, ** p<0.05, *p<0.1

**Comparison of Sharp measures of risk adjusted return, Adj. ROA 2**

| | Mean | Std. Dev. | Obs. |
|---|---|---|---|
| Non Foundation owned | 0.377 | 23.481 | 13356 |
| Foundation owned | 0.097 | 2.642 | 1178 |
| Total | 0.354 | 22.522 | 14534 |

*** p<0.01, ** p<0.05, *p<0.1

First, we compare the (winsorized) standard deviation of ROA in foundation owned firms and non-foundation owned firms, which we have calculated by firm. We find that foundation owned firms have a ROA standard deviation of 5.9%, which is significantly lower than the average of 7.6% in non-foundation owned firms. In other words, the accounting profitability of ROA fluctuates more over time in foundation owned firms

Second, as an additional check we take first differences of ROA and calculate the standard deviations of this variable in foundation owned firms and non-foundation owned firms. Again we find that the standard deviation among foundation owned firms is significantly lower (7.9%) than in non-foundation owned firms (9.7%).

Third we compare two Sharpe measures of risk adjusted returns as

1. Adj ROA = (ROA-MEAN ROA)/Standard deviation of ROA

2. Adj ROA 2 = (ROA-MEDIAN ROA)/standard deviation of ROA

In both cases we find no significant differences between foundation owned firms and non-foundation owned firms.

In table 8 we include regressions on the same two risk adjusted returns with control for firm size, capital structure, industry effects and year effects. Again, we find no differences between foundation owned firms and non-foundation owned firms.

**Table 8: Regressions on risk measures**

| | (1) | (2) |
|---|---|---|
| VARIABLES | Adj. ROA | Adj. ROA 2 |
| Foundation owned | -0.608 | -0.329 |
| | [-1.521] | [-0.805] |
| Firm size (log assets) | -0.008 | -0.195 |
| | [-0.071] | [-0.795] |
| Debt-to-equity ratio | -0.228*** | -0.308*** |
| | [-4.175] | [-2.831] |
| Constant | 1.304 | 3.456 |
| | [0.829] | [1.223] |
| Industry effects | Yes | Yes |
| Time (year) effect | Yes | Yes |
| Observations | 11,994 | 11,994 |
| R-squared | 0.004 | 0.006 |

Robust t-statistics in brackets

*** p<0.01, ** p<0.05, * p<0.1

## 6. Conclusion

In this paper we have reexamined the performance of foundation-owned firms and made several contributions to the literature.

First, we show that the positive performance of foundation-owned firms does not necessarily generalize to smaller firms. We find that smaller firms underperform in terms of ROA.

Secondly, as new contribution to this literature, we calculate total factor productivity (solow residuals). We show that foundation owned firms do well in terms of productivity and productivity growth. They either overperform or perform similar to non-foundation owned firms depending on statistical mode.

Third, we find that foundation owned firms and in particular smaller foundation owned firms grow slower than non-foundation owned firms. This may reflect risk aversion, capital constraints and unwillingness not loose control in M&A transactions.

Fourth, as a new contribution to the literature, we calculate risk-adjusted returns. We show that though foundation owned firms have lower absolute returns, they take less risk and their risk-adjusted returns are no different from those of non-foundation owned firms.

A promising avenue for future research is to examine the nature of the firm size effect, which appears to be so important. Why do large foundation owned firms perform so well? Is it because of governance, for example stockmarket listing and board structure, as indicated by Hansmann and Thomsen (2013)? What, more precisely is the critical size limit?

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