

The Governance of Foundation-Owned Firms¹

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Abstract

The burgeoning literature on corporate governance, both in economics and in law, has focused heavily on the agency costs of delegated management. It is therefore striking to encounter a large number of well-established and highly successful companies that have long been under the complete control of a self-appointing board of directors whose compensation is divorced from the profitability of the company and who cannot be removed or replaced by anyone except themselves.

The companies in question are those controlled by “industrial foundations,” which are nonprofit entities that possess a controlling interest in an otherwise conventional business corporation. Although common throughout Northern Europe, industrial foundations are particularly numerous in Denmark, where they control a quarter of the country’s 100 largest corporations. We work with a data set of 110 foundation-owned Danish firms to explore whether, and how, the governance structure of industrial foundations helps explain the strong performance of the firms they control. Given the absence of substantial material incentives, we concentrate on governance structures. We find a strong and robust relationship between foundation governance and firm performance.

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I. Introduction

Recent decades have brought a burgeoning literature, both in economics and in law, devoted to corporate governance. That literature has focused heavily on the agency costs of delegated management. A common theme in this literature is that efficiency calls for mitigating those agency costs by aligning the material interests of corporate managers and directors with those of their shareholders through mechanisms such as incentive compensation, exposure to hostile takeovers, and strong shareholder voting rights.

It is therefore striking to encounter a large number of well-established and highly successful companies that have long been under the complete control of a self-appointing board of directors whose compensation is completely divorced from the profitability of the company and who cannot be removed or replaced by anyone except themselves.

The companies in question are those controlled by “industrial foundations,” which are nonprofit entities that possess a controlling interest in an otherwise conventional business corporation. An industrial foundation typically controls only a single company, and was created by the founder of that company at the end of his (or her) life to maintain control of the company in perpetuity. The directors of an industrial foundation generally receive no incentive pay and, more remarkably, are typically self-appointing and hence impervious to shareholder votes and hostile acquisitions.

Foundation-owned firms² are common in Northern Europe, where they include world-class companies such as Bertelsmann, Heineken, Ikea, and Robert Bosch. In Denmark, where they are particularly numerous, industrial foundations control a quarter of the country’s 100 largest corporations and 70% of its stock market capitalization. These companies operate in a broad range of industries and include such internationally prominent companies as A. P. Møller-Maersk (the world’s largest container shipping company), Carlsberg (the world’s fourth largest brewery group), Novo Nordisk (the world’s 16th largest pharmaceutical company, chosen by the Harvard Business Review as having the best-performing CEO in the world for 2015), and William Demant (one of the world’s foremost producers of hearing aids, and European Company of the Year for 2003).

Previous studies, summarized in Table 1, have indicated that, quite contrary to the predictions of conventional agency theory, companies controlled by industrial foundations are, on average, roughly as profitable as comparable companies with conventional patterns of investor ownership, whether widely held or family controlled. We offer here a first effort to analyze the role of foundation governance in this surprising performance, and the implications this might have for more conventional forms of ownership. We proceed, not by comparing foundation-owned firms (“FOFs”) with conventional investor-owned firms, but rather by focusing on differences among the industrial foundations themselves.³ More particularly, we take advantage of the substantial – and, it appears, largely exogenous -- variation among the foundations’ governance structures to illuminate the relationship between those structures and the economic success of the foundations’ industrial subsidiaries.

² We use the terms “company” and “firm” interchangeably throughout.

³ Well-controlled comparisons between FOFs and investor-owned firms is difficult with Danish data, particularly because the foundation-owned firms in a number of industries are much larger than the largest investor-owned firms.

Given the absence of substantial material incentives facing foundation directors (other than losing their jobs if the foundation is liquidated in bankruptcy), we concentrate our attention on behavioral factors. We focus in particular on a composite structural measure that we term a “Foundation Governance Index.” We propose this construct as a rough measure of the clarity, objectivity, and intensity with which a foundation’s directors are induced to focus on the performance of the foundation’s subsidiary company, and especially its profitability. More precisely, our Foundation Governance Index (“FG Index”) is intended to be an aggregate of corporate governance features that tend to put a foundation’s board of directors in the position of “virtual owners” of the foundation’s subsidiary company in the sense that, as the index increases, the decisions facing the foundation’s directors are increasingly framed for them in roughly the way those decisions would be perceived by true owners of the foundation’s subsidiary company, and in particular by the company’s founder if he or she were still in control of the company.

We emphasize that our FG Index is not offered as a comprehensive or extensively verified norm for evaluating FOFs, much less business corporations more generally. Rather, we offer the FG Index in essentially the same spirit that other scholars have offered corporate governance indices for corporations that are not foundation-owned, such as the “anti-director rights index” created by La Porta, Lopez-de-Salanes, Shleifer, and Vishny (1998), the “governance index” created by Gompers, Ishii, and Metrick (2003), and the “entrenchment index” created by Bebchuk, Cohen, and Ferrell (2009). That is, our FG Index is simply a multi-factor construct designed to facilitate testing of particular hypotheses concerning the relationship between firm governance structures and firm performance. Indeed, our index is complementary to these other indices, because it focuses exclusively on non-material incentives that those indices were not designed to explore.

We work with a data set comprising 110 foundation-owned Danish industrial companies and their parent foundations. Our empirical analysis shows a positive, significant, and robust association between our FG Index and company performance. We suggest two related interpretations for this result. The first is that, when a FOF has a high FG Index, the foundation’s board is more likely to avoid co-optation by the company’s own internal management and to make objective and effective decisions regarding the company. The second interpretation – consistent with recent work on “identity economics” (Akerlof and Kranton 2010; Benabou and Tirole 2011) – is that, when the FG Index is high, the foundation’s directors tend to identify more strongly with the role they have accepted as surrogates for the firm’s founder, charged by him, through the foundation’s charter, to perpetuate the success of the firm he built. We argue that only the second of these interpretations offers a promising explanation for the strong economic performance of FOFs. Our data does not, however, permit us to distinguish clearly between these two interpretations.

While these results need to be interpreted with caution, they appear to cast light, not just on FOFs, but also on the governance structures of more conventional business corporations. In particular, they offer perspective on the effectiveness of incentive-based compensation, independent directors, holding company structures, and commercial fiduciaries in general.

More broadly still, we seek to convey to a wider audience an awareness of the structure and performance of these idiosyncratic companies which, despite their large presence in modern economies, and despite the challenges they pose to conventional theories of the firm, have to date been much neglected.

The paper proceeds as follows: Section II describes the organization of industrial foundations and the puzzle presented by their strong performance. Section III discusses non-pecuniary motivations, describes the construction of our FG Index, and explains our research strategy. Section IV describes the data sample on which our empirical analysis is based. Section V presents the results of that analysis, while Section VI explores the robustness of those results and questions of endogeneity. Section VII offers a more general discussion and interpretation of the empirical results, including possible implications for practice, policy, and future research. Section VIII concludes.

II. The Industrial Foundation Enigma

An industrial foundation is, in effect, a nonprofit corporation⁴ organized and operated principally to administer a large ownership stake – generally controlling and often 100% – in a particular business company. (Shares not held by the foundation, if any, may be privately held or publicly-traded.) The foundation is usually created, and endowed with its ownership stake in the company, by the company’s founder at the end of his active life. Transfer of ownership to the foundation serves as an alternative to passing ownership to heirs or to outside investors. Under Danish foundation law and tax law, the transfer to the foundation must be irrevocable.⁵

The foundation is governed by its own board of directors. After the initial board is chosen by the founder, the foundation board is generally self-electing, though sometimes one or more of a foundation’s directors is required to be a descendant of the founder or is appointed by an independent outside organization. (As an extreme example, the entire board of the Carlsberg Foundation is appointed by the Royal Danish Academy of Sciences.) The foundation’s charter sets out the foundation’s purposes and the details of its organization. Many industrial foundations are long-lived; the Carlsberg Foundation, for example, has controlled the eponymous brewery since 1882.

Under Danish tax law and foundation law, industrial foundations can have both charitable and business purposes. There is, however, no legal requirement that a foundation serve a charitable purpose, much less that it distribute to charity some portion of the controlled company’s earnings rather than reinvesting those earnings in the controlled company or in other companies. Nonetheless, the charters of most industrial foundations make specific provision for supporting other worthy causes by donating excess revenue to outside charities, while generally leaving the amount of such distributions to the foundation board’s discretion. The following provision from the charter of The Hempel Foundation is typical:

⁴ In Denmark, as generally in continental Europe, the law provides separately for two basic types of nonprofit entities. The first type is the nonprofit foundation, which commonly has a self-perpetuating board of directors. The second type is the nonprofit association, which typically has members who elect the board. (In the United States, both types of organization are generally formed under a single nonprofit corporation statute.) Industrial (erhvervsdrivende) foundations are foundations that either own controlling shares in a business company or conduct a non-trivial amount of business activity in the foundation itself (sales > 250,000 DKK). We are concerned here only with the former kind – those that own business companies. Danish industrial foundations are subject to a special legal regime which requires them to publish annual reports and subjects them to government supervision. We address this regulation below.

⁵ Kronke (1988) surveys the legal status of industrial foundations in other countries.

The purpose of the foundation is to secure and support the economic foundations for the continuation and development of the companies run by and associated with Hempel Inc, on a sound business and economic basis In so far as this purpose is fulfilled the foundation shall of its profits support cultural, social, humanitarian, scientific, artistic, or other generally charitable purposes, primarily within the maritime area, trade or industry, but otherwise according to the decisions of the board.

An industrial foundation's charter commonly, but not always, requires the foundation to maintain majority ownership of the company. The founder's family continues to play a role on the boards of some industrial foundations, but many others (we estimate around half) no longer have any such ties. Although foundation ownership has often been used elsewhere – most conspicuously, in the Netherlands – as a means of entrenching managerial control, leveraging (pyramiding) family ownership, or avoiding taxes (de Jong, DeJong, Mertens, and Roosenboom 2007; Roosenboom and van der Goot 2003), Danish industrial foundations have generally been established via donations by private owners who are now long deceased, and not by managers who are seeking to maintain control at minimal cost.

Foundation directors receive fixed annual compensation, typically at levels somewhat below the compensation paid to directors of comparable investor-owned companies, which is also usually fixed. (See Table 2, discussed further below, which shows that directors of foundations controlling listed companies receive 1/3 of the compensation of listed company directors though the foundations are on average somewhat larger.) In particular, directors of an industrial foundation are not given stock options or other forms of variable pay tied to the success of the foundation's operating⁶ company, nor does it appear that they often, if ever, have any other form of ownership interest in the company. This conservative approach to director compensation is reinforced by the Danish Law on Industrial Foundations §19, which states that “*Remuneration of board members must not exceed what is considered normal regarding the nature and scope of work.*” Only on rare occasions have the foundation regulators intervened to lower board fees that they considered excessive.

Industrial foundations are found in several European countries beyond Denmark and The Netherlands, including Austria, France, Germany, Norway, Sweden, the UK, and Switzerland. The Tata group – the largest and most admired Indian business group – is now also controlled by charitable trusts that are in effect what we call industrial foundations.

Industrial foundations were common in the U.S. prior to controversial 1969 tax legislation that prevents private foundations from owning more than 20% of the voting shares in any business corporation (Fleishman 2001). A prominent example that, for idiosyncratic reasons, has survived despite that legislation is the Milton Hershey School Trust, which for nearly a century has owned a majority of the voting shares of the Hershey Company, the largest publicly-traded confectionary company in North America (Sitkoff and Klick 2008). Also unaffected by the private foundation legislation are the rapidly-spreading holding company structures for U.S. hospitals, in which a nonprofit foundation controls and effectively owns a separately incorporated hospital, and often as well a health insurance company and a company that markets and administers employer health plans.⁷ The subsidiaries entities effectively operate as commercial companies with no meaningful

⁶ We use the terms “operating company” and “subsidiary company” interchangeably in referring to an FOF.

⁷ For information on hospital reorganization we are indebted to communication by telephone and fax with attorney Douglas Mancino of Los Angeles, March 25, 2015.

income from charitable donations, making their structure look very much like the Danish industrial foundations that we focus on here.

A. Looking for Agency Costs

Because the board of directors of a typical industrial foundation is self-appointing, members of the board cannot be removed by anyone outside the board itself (other than government officials, whom we will discuss below). And, because the typical foundation owns a controlling block of stock in its associated operating company, control of the company cannot be acquired either by a shareholder vote or by a hostile acquisition of the company's shares or assets. In short, foundation directors are free from the market for corporate control. Moreover, in keeping with the nonprofit character of the foundation, members of the foundation's board receive only fixed compensation, and are not awarded company stock, stock options, or other incentive pay. (The Danish corporate governance code also advises against stock options for directors of conventional investor-owned business corporations.)

Danish industrial foundations are lightly regulated by the Commercial Foundations Regulatory Authority in the Ministry of Economy and Business. The foundation regulator is confined to policing the legality of a foundation's activities (e.g., adherence to the foundation's charter and foundation law) and cannot intervene in business decisions. The regulator is entitled to replace members of the foundation board, but only in extreme cases of gross violations, which do not include mere inefficient management and low profitability.⁸ Private parties generally lack legal standing to call foundation directors to account for mismanagement.

In sum, FOFs are ultimately subject to control by a group of persons – the foundation's directors – who are effectively free from removal by outsiders and face virtually no other material incentives to use their control to promote efficient management of the company.

Simple agency theory would therefore predict that FOFs would perform poorly compared to investor-owned companies. Such a prediction, however, is inconsistent with empirical studies of Danish companies, which have found the economic performance of FOFs – when compared in terms of return on equity, return on assets, or Tobin's Q – to be similar to average performance in companies with more conventional ownership structures (Thomsen 1996, 1999; Thomsen and Rose 2004; Thomsen and Hansmann 2016). Similar results have been reported for FOFs in Germany (Herrmann and Franke 2002) and Sweden (Dzansi 2011). Table 1 offers illustrative statistics for Danish companies between 1982 and 2008. As shown there, average return on equity for FOFs is similar to the comparable figures for either family-owned companies or companies with dispersed ownership, while at the same time volatility of net earnings is markedly lower for FOFs (as one would expect for companies with undiversified owners and limited ability to raise additional equity capital).⁹

⁸ We know of only one recent case, which involved creation of a foundation for evasion of creditors. The case was so unusual that it was debated in the Danish parliament. For details (in Danish) see http://webarkiv.ft.dk/?/Samling/20001/udvbjerg/ERU/Almdel_bilag288.htm.

⁹ Table 1 reports return on equity rather than return on assets because return on assets – which is our preferred measure of performance here – is not reported in the sources for the years 1982 – 2002. The results for 2003-2008 are similar when using return on assets rather than return on equity (Thomsen and Hansmann 2016).

// Insert Table 1 around here //

The comparisons in Table 1 are, to be sure, subject to at least three important qualifications (Thomsen and Hansmann 2016). First, highly profitable Danish companies that are not foundation-owned are frequently purchased by larger foreign companies, after which they are no longer listed on the Danish stock exchange, and hence are omitted from the comparisons reported in Table 1. The Danish industrial foundations, in contrast, generally can and do refuse to sell their operating companies. This unbalanced out-selection of non-FOFs may bias the results in Table 1, which compares FOFs only with those conventional investor-owned companies that have stock listed on the Danish stock exchange, and hence have not attracted a foreign purchaser.

Second, the relatively high return on equity for FOFs shown in Table 1 may in part reflect, not efficiency, but rather externally or internally imposed capital constraints that limit FOFs to investing in only the most profitable of the opportunities facing them, requiring that they pass up other investment opportunities that, though potentially less profitable, still promise returns above the market cost of capital. That is, a high average rate of return on investments does not necessarily mean that a company is maximizing total profits.

Third, more recent research by Børsting et al. (2014) finds that company size is an important moderating factor. Smaller FOFs tend to underperform compared to other companies in terms of accounting profitability, while larger (above average) FOFs over-perform.

Yet, despite these qualifications, the fact remains that the profitability of FOFs in Denmark is roughly comparable to that of other Danish companies, while the Danish economy, in turn, is among the most prosperous and productive in the world.¹⁰

In contrast to these results for Denmark, the only empirical study of an industrial foundation using U.S. data (Sitkoff and Klick 2008) purports to find strong evidence of inefficiency, consistent with the authors' hypothesis that foundation ownership necessarily results in large managerial agency costs. That analysis, however, involves an event study of a single incident involving a single company – the Hershey Company. And, though the authors do not address the fact, their own charts show clearly that, if one considers the entire four-year period surrounding the brief event interval on which they focus, the foundation-controlled Hershey Company – whose minority shares trade publicly – strongly outperformed both the industry average and the overall Dow Jones Industrial Average, as indeed it has done consistently over at least the last 35 years (Lex 2012).

We turn, therefore, to potential explanations for the seemingly anomalous profitability of Danish FOFs.

B. Unconvincing Explanations for Success

Some obvious potential explanations for the success of the Danish FOFs do not appear to work (Thomsen 1999; Thomsen and Hansmann 2016).

¹⁰ For example, Denmark was recently reelected at the happiest country in the World according to the World Happiness Report (<http://worldhappiness.report/wp-content/uploads/sites/2/2015/04/WHR15.pdf>) and comes out 7th highest on GDP per capita - ahead of the US - according to The World Bank Economic Tables 2014 (<http://data.worldbank.org>).

Taxation. Danish tax law clearly helps to explain the creation of foundations since, prior to 1987, Danish law permitted the founder's initial gift of stock to escape inheritance, wealth, and capital gains taxes. But this exemption should not affect the subsequent relative performance of FOFs, which are taxed like their proprietary counterparts.¹¹

Selection Effects. While we have no systematic data regarding the profitability of existing FOFs as of the time their founder passed control to the foundation, it seems reasonable to assume that those companies were, at the time, more profitable than average. Entrepreneurs presumably do not want to create perpetual monuments to their failures. Might it be, then, that the current profitability of the FOFs is simply the echo of that original selection effect?

However, given that the Danish FOFs in our sample have been under that form of ownership for an average of roughly four decades, and a median of more than five decades (see Table 3), this is an implausible explanation. If foundation ownership were significantly less effective than investor ownership, it seems quite unlikely that some form of momentum in other aspects of the company (e.g., specially qualified managers in the company) or its markets (e.g., brand reputation) would suffice to keep the company's profitability from falling below that of more conventionally owned companies half a century after the founder had transferred control to a foundation.

Monopoly. Market power seems an implausible explanation, since the FOFs are spread across a broad range of industries and, overall, market more of their products internationally than do other Danish companies (hence generally facing more competition than the small Danish economy itself can offer).

Creditor monitoring. Monitoring of managers by creditors as a substitute for monitoring by equity investors cannot be the reason, since FOFs commonly have significantly lower debt/equity ratios than their investor-owned counterparts (Thomsen and Hansmann 2016).

Accounting Biases. FOFs with listed (minority) shares tend to have the same Q-values and market rates of return as other companies, even after adjusting for the conventional risk measures, reinforcing the credibility of purely accounting-based measures of profitability.

Self-Dealing. While data on the issue is understandably scarce, it does not appear that foundation board members benefit indirectly from the profitability of the foundation's captive industrial company by arranging self-dealing ("tunneling") transactions between that company and other companies in which the board members have a financial stake. Very few such cases have surfaced, perhaps in part because the foundations are obliged to submit, to the Danish Business Authority, audited financial reports in which all conflicted transactions must be disclosed, increasing the difficulty and hazards of hiding such transactions.

Career Concerns. Finally, one might hypothesize that directors on the foundation board are motivated by indirect pecuniary incentives along the lines of the career concerns literature (Holmström 1999). In particular, membership on the board of an industrial foundation might be a means by which aspiring young managers signal their capacity to undertake more highly remunerated positions in the future. This hypothesis seems directly contradicted, however, by a comparison (shown in Table 2) of the demographic profile of foundation board members with that of the directors of investor-owned companies. In particular, the average age of foundation board members is 64, which is nearly 10 years older than the average age for board members in investor-

¹¹ On taxation of industrial foundations, see Nørgaard (2014, 2015).

owned companies and clearly too late in life to be signaling one's capabilities to future employers. Evidently foundation board membership is, in most cases, an end-of-career rather than a mid-career position.

III. Non-Pecuniary Incentives

From the preceding, it appears that we must turn to non-pecuniary incentives to explain the apparent effectiveness with which the directors of industrial foundations oversee the companies that their foundations control. The economics literature on non-pecuniary motivation in organizations is not extensive. There are, however, at least four related strands in the current literature that are relevant.

A. Distorting Effects of Incentive Pay

To begin with, there is the literature, epitomized by Holmström and Milgrom (1991, 1994), on the design of compensation for agents who have multiple tasks. A basic theme in this literature is that, if performance of only some of the tasks is measurable, the optimal incentive contract may involve paying a fixed wage that is independent of observed performance on any of the tasks. This logic requires the assumption that agents have an intrinsic motivation to perform their assigned tasks at some adequate level even without pecuniary reward. It is the distortion of this intrinsic motivation by over-incentivizing certain tasks, and thereby inducing neglect of other important tasks, that renders incentive compensation inefficient in these models.

Directors of industrial foundations are at an extreme in freedom from the distorting effects of incentive compensation, since they do not realistically even face removal from office as a sanction. Thus foundation ownership makes a credible commitment to the foundation directors that they are at maximum liberty to take guidance from their own best judgment. That of course leaves the question of how good their judgment will be, and what other aspects of the governance structure might affect their exercise of control over the foundation's company.

B. Nonprofit Enterprise

The multi-task literature focuses on designing compensation for individual agents. But a similar theory has long been employed to explain the economic role of nonprofit organizations.

The dominant theory of nonprofit enterprise is that it serves as a crude form of consumer protection in situations in which consumers (or suppliers) are severely handicapped in assessing, with any accuracy, either the quantity or the quality of the goods or services that the company sells them (Hansmann 1980, 1996; Fama and Jensen 1983b; Glaeser and Shleifer 2001). By virtue of the "nondistribution constraint," which bars the persons who control a nonprofit organization from appropriating the organization's net earnings or assets, the managers of a nonprofit organization do not have a strong incentive to maximize the company's profits. Consequently, the managers are left to be guided by intrinsic motivations – such as personal integrity, pride in their work, identification with the company and its services, and the approbation of others – that are less likely than the profit motive to induce the managers to exploit the company's informational advantage over its patrons. And consumers, appreciating this difference in incentives, might rationally choose to patronize a nonprofit company rather than a for-profit company.

This theory of nonprofit organizations implies a trade-off in organizing a company on a nonprofit rather than a for-profit basis. A nonprofit company is less likely to exploit its informational advantage over its patrons, but it is also less likely to minimize the costs of what it produces.

The theory applies easily to industrial foundations. To be sure, the goods and services that Danish FOFs typically produce – such as beer, container shipping, and hearing aids – are not characterized by unusual degrees of asymmetric information between the company and its customers. Consequently, reassurance to consumers can have little to do with the motives for putting these companies under the control of nonprofit foundations. Rather, in industrial foundations the nonprofit form is evidently chosen as protection for the company’s one largest patron – its founder. An entrepreneur who passes control of his company, at the end of his life, to a specially-created industrial foundation is evidently seeking a degree of immortality. He wishes to assure, as far as possible, that the company he built will live on in perpetuity as a form of monument – commonly with his name on it. In short, he wants to perpetuate his control over the company beyond the grave.

One familiar approach that entrepreneurs take to this end is to pass ownership of their company to their descendants. But even if an entrepreneur has children he trusts to fulfill his wishes, leaving ownership of his company to the family involves placing much faith in generations yet unborn. And there is good evidence that such faith is often unjustified (Bertrand and Schoar 2006). It is therefore unsurprising that many entrepreneurs, given the opportunity, instead pass control of their company to a specially-created foundation controlled by trustworthy persons pledged to maintain the company as the entrepreneur would have maintained it, and pledged as well to pass their control on to succeeding directors who can be trusted to do the same. The foundation’s nonprofit form largely removes pecuniary incentives to betray that trust.

The conventional theory of the nonprofit company assumes, however, that this enhanced trustworthiness is accompanied by increased managerial agency costs. Otherwise, we might expect all firms to be nonprofit. What is most striking about FOFs is that they do not appear to face these increased agency costs.

C. Influence Activities and Cognitive Bias

Fama and Jensen (1983a) have posited that managerial agency problems – in nonprofit corporations as well as in widely held business corporations – can be mitigated by separating “decision management” (initiation and implementation of decisions) from “decision control” (ratification of proposed initiatives and monitoring the consequences of decisions after they are implemented). The latter function, they suggest, is the role and rationale for a board of directors that is formally distinct from a corporation’s management. While this proposition is intuitively appealing, Fama and Jensen are not explicit about the behavioral mechanisms that underlie it. Subsequently, however, two strands of the literature on non-pecuniary incentives have suggested possible mechanisms.

First, increasing the separation between a company’s managers and its board of directors may reduce the costs of influence activities (Milgrom and Roberts 1988), both by limiting the access of company personnel to the board and by providing the board with more objective information with which to counter efforts at influence. This is the interpretation offered by Carlin, Charlton, and Mayer (2010), who focus on multinational corporations to explore the efficiency

with which parent corporations allocate capital to their various corporate subsidiaries. They examine, among other considerations, two factors – which they call measures of “proximity” – that are related to some components of our FG Index: (1) the geographic distance between the parent and the subsidiary, and (2) the fraction of the shares of the subsidiary that is not held by the parent. They find that the return on subsidiaries’ investments is positively related to both measures.

Second, familiar forms of cognitive bias that are likely to affect corporate managers – including overconfidence, over-commitment, confirmation bias, and groupthink (Benabou 2013; Langevoort 1997, 2001) – may cause less distortion in overall company decision-making if the company’s board of directors is kept aloof from day-to-day management of the company. Our FG Index seeks to capture this psychological distance.

D. Short-Termism

Directors of industrial foundations and managers of FOFs often claim that foundation ownership has the important advantage of freeing an industrial company from short-term stock market pressures, thereby allowing the directors to focus on long-run profitability (e.g., Jack 2011). That is, a preference for investing for the long term may be among the intrinsic motivations that, in more conventional investor-controlled firms, are overwhelmed by material incentives. Our data is limited to FOFs, and thus does not permit a direct test of this supposition. Our FG Index does, however, reflect whether, and how much of, those firms’ shares are exchange-listed, and hence whether listing -- and thus the salient presence of a market price for the firms’ shares -- reduces the firms’ profitability, even though listing has no direct material consequences for the foundations’ directors

E. Charity

The theories of non-pecuniary incentives just surveyed effectively assume that agents’ non-pecuniary motivations for effective performance are fixed. Hence these theories focus primarily on organizational factors that *interfere* with that intrinsic motivation, and not on factors that might *strengthen* that motivation. We now turn to theories of the latter type (while keeping in mind that the difference between the two sources of motivation is not sharp, but rather a matter of degree and interpretation¹²).

In this regard, Dijk and Holmén (2012) report an experiment in which agents exhibited less moral hazard if the principal they work for contributes its income to charity as opposed to using it for personal consumption. Since the charters of most industrial foundations commit the foundation to serve charity to some degree, the same phenomenon may serve to boost the productivity of FOFs. One can, in fact, imagine such a productivity effect not (only) on the foundation’s directors, but at any or all levels of a firm’s personnel, including managers or production workers. As with short-termism, our data permit only an indirect test of this hypothesis, comparing the performance of firms whose parent foundations have a strong charter commitment to charity to the performance of other FOFs.

¹² For example, investor-owned firms can also make contributions to charity. Foundation ownership may just facilitate larger contributions and a more credible commitment to continue those contributions.

F. Identity Economics

A more far-reaching theory of the relationship between organizational structure and individual preferences has begun to develop within the nascent field of “identity economics” (Akerlof and Kranton 2000, 2005, 2008, 2010; Benabou and Tirole 2011). That work builds, in turn, on the “organizational identification” literature in psychology (Ashforth, Harrison, and Corely 2008).

Identity economics treats non-pecuniary motivations as malleable. As formulated by Akerlof and Kranton, in particular, identity economics assumes that participants in an organization can, through appropriate experiences and framing, be induced to identify their personal goals more closely with those of the organization, and hence to serve the organization more effectively.

In this regard, we have been struck that directors of industrial foundations frequently describe their understanding of their role as that which the founder set out in the foundation’s charter. That is, the directors seem to identify with the founder and the founder’s strong desire to maintain the industrial company’s economic success. Presiding over that conspicuous heritage is, in itself, plausibly an important source of motivation for the foundation’s directors.

This conjecture is reinforced by Denmark’s experience with foundation-owned financial institutions. Principally for accounting reasons, we have restricted our data sample to non-financial companies. This means, in particular, that we have excluded Danish foundation-owned banks, of which there were roughly 10 during the 2003-2008 period. In contrast to the foundation-owned industrial companies on which we focus, these banks did not, in general, begin foundation ownership as the conspicuously successful creations of entrepreneurs whose name and fame remain associated with the firm. Rather, the banking foundations are the creation of national legislation that in 1988 allowed the conversion of cooperative savings and loan associations to listed companies.¹³ Stock listing was accomplished by donating the cooperative’s assets to a foundation, which created a limited liability company to manage the bank and take it public, while maintaining foundation control by selling only a minority of the bank’s shares to outside investors.

In general, the resulting foundation-owned banks have not been conspicuously successful. Of the 17 savings associations that were converted to stock corporations after 1988, only 6 survived to 2009. In fact, a public scandal developed when some of the banks failed during the 2008 financial crisis because of excessive risk-taking (Fode 2010), which was partly attributed to bad governance and particularly to inefficient monitoring by the foundations’ directors.

We suggested above that simple momentum effects, without regard to ownership structure, are not convincing as an explanation of the contemporary success of FOFs. But perhaps there is a more subtle selection effect that helps explain why industrial foundations created by the entrepreneur who built the foundation-controlled company have been successful, in comparison to the foundation-owned banks, which were converted to foundation ownership by the action of a non-charismatic outside force – the state – after a long period of mediocre performance.

In particular, a plausible hypothesis is that foundation directors identify their own personal objectives with those of the company’s founder most strongly when the directors’ appointment to

¹³ For the law on conversion of savings associations to companies 1988, see <https://www.retsinformation.dk/Forms/R0710.aspx?id=66422>.

the board puts them in a direct line of succession from the company's founder himself. In that case, the directors may come to see themselves as, in a sense, heirs of the founder. Further, it seems intuitive that the foundation charter's injunction to maintain the company's economic success has more force in motivating foundation board members if the founder and his company had achieved renown for the company's success while the founder was still alive and active. In turn, we conjecture that the degree to which a foundation's directors identify with the founder's charge – that is, see themselves as, and act as, “virtual owners” of the company – will be determined in meaningful part by the extent to which the governance structures of the foundation and its subsidiary business company frame the directors' view of the company as if the directors were its true owners in the conventional sense of the term. It is this last conjecture that our data permits us to test.

G. Our Overall Strategy

As we have noted, we cannot measure directly the non-pecuniary motivation of a foundation director, or the degree to which that motivation is diminished or enhanced by the foundation's governance structure. We can, however, observe elements of a foundation's governance structure that seem likely to diminish or distort a director's non-pecuniary motivation for effective performance, or to reinforce that motivation. Consequently, our basic empirical strategy is to seek correlation – and, to the extent possible, causation – between these elements of a foundation's governance structure and the performance of the company controlled by the foundation. The general absence of pecuniary incentives for the foundation directors should, of course, make the effects of non-pecuniary motivations and influences easier to discern and interpret than they would be otherwise.

IV. Data

Our data consists of governance and performance variables for 110 Danish FOFs and their respective foundation owners, collected for each of the five years 2003-2008. These foundations were selected from a gross list of some 1100 industrial foundations provided by the Danish Foundation Office at the Ministry of Business. From this list we selected the foundations that controlled the largest companies. Specifically, we selected foundations whose companies met at least one of the following (relatively arbitrary) conditions in 2006:

- Minimum of 50 employees
- Minimum assets of 30 million DKK (roughly 4.5 million USD)
- Minimum sales of 40 million DKK (roughly 6 million USD)

We also restricted the sample to companies in which the foundation has more than 50% of the voting rights of its operating company, so that the foundation has unquestioned control.¹⁴

We hand-collected governance and accounting measures over a 5-year period for both the companies and the foundations that own them, but have an uneven panel because of missing values. There was no attrition in the sample during the observation period, though in one case a

¹⁴ There were an additional 9 companies that met our size criteria, but in which the parent foundation's ownership share, while perhaps carrying control, represented less than a majority of the operating company's total shareholder votes. Including those 9 companies in our sample does not meaningfully change the results reported below.

foundation divested its ownership share.¹⁵ However, because of differences in the accounting year, for some foundations we track the 5-year period 2003-2007, rather than 2004-2008 as for the rest of the sample. Not all companies were consistent in reporting variables, but in most regressions, we have a sample of approximately 106 to 110 companies.

A. Background on Foundation Boards

Industrial foundations are distinct legal entities, which are governed by foundation boards, possibly in cooperation with a chief executive officer for the foundation. The foundations have a controlling influence on their industrial subsidiaries, which have boards and executives of their own. According to Danish law, operating company employees are entitled to representation on both boards.

To provide some background for the discussion that follows, we begin with a comparison of Danish industrial foundation boards to the boards of non-foundation-owned Danish company boards. The principal facts are displayed in Table 2. We compare a subset (96) of the industrial foundations that we examine in this paper to the listed non-FOFs for which we could get sufficient information. Note that, for the FOFs, we examine the boards of the foundations rather than the boards of their controlled companies.

//Insert Table 2 around here //

We see from Table 2 that, in comparison to the boards of non-foundation-owned companies, industrial foundation boards are on average slightly smaller, much more exclusively Danish in composition, and less male-dominated. Foundation board members are also significantly older and serve longer¹⁶ than their counterparts on non-foundation-owned company boards. Only 7% of foundation board members are younger than 50. We note that all of these differences are arguably consistent with a greater emphasis in foundation boards on maintaining strong mutually-shared norms regarding a director's role. We do not, however, focus on these board characteristics in the empirical study that follows.

Although non-managerial company employees have, by law, the right to elect 1/3 of a foundation's board members, they do so in only 21% of the foundations that we studied; on average, only about 7% of the foundation board members are employee representatives (see Table 3). Some foundation board members are current or former executives or directors in the foundation-controlled companies, and around 10% are members of the founding family. Professors are particularly numerous (around 5%), probably as a consequence of the foundations' charitable contributions, roughly half of which go to basic research.

Finally, as shown in Table 2, average foundation director compensation in our sample is a little more than \$13,000 per year – which is about one third of the level for directors of listed

¹⁵ The company was kept in the sample for the years before it was divested by the foundation, and dropped for subsequent years.

¹⁶ Although other factors are likely involved, we note that foundation directors are not subject to the corporate governance code for listed companies, according to which board members automatically lose their status as independent directors if they serve for more than 12 years.

companies – despite the greater average size of the foundations. (Size is measured by equity in Table 2.) Indeed, some foundation directors (10%) receive no compensation at all.

As shown in the last lines of Table 2, the same pattern emerges if we simply compare the 14 FOFs that have listed shares to the 14 largest non-foundation-owned listed companies. Although the listed FOFs are on average almost twice as large as the non-FOFs, average compensation for directors is roughly equal between the two. The size difference reflects the fact that the largest, second largest and third largest Danish companies in terms of market value – Novo Nordisk, A. P. Moeller – Maersk and Carlsberg – are foundation-owned.

B. Performance Measures

Since we are interested in examining the effect of governance structure on company performance, we collected three sets of variables: performance variables, governance variables, and control variables. In Table 3 we provide descriptive statistics for the variables that we use. In Table 4 we present correlation matrices for the variables. The text that follows describes the construction of each of our variables, beginning with the performance measures.

//Insert Table 3 around here //

//Insert Table 4 around here //

The principal performance measure that we use as the dependent variable in our statistical tests is:

Return on Assets (ROA): Gross profits, before interest and taxes, as a percent of total company assets.

While we display return on equity in Table 1 for the sake of consistency with earlier studies, we do not employ that measure of performance as a dependent variable in the tests we report below, principally because it is sensitive to a company’s choice of debt-equity ratio, and that choice seems correlated to foundation ownership, as we discuss further below.

As shown in Table 3, the FOFs earn, on average, roughly a 5% return on assets, which is respectable in a period with low interest rates. We winsorize these performance variables at the 1% level to avoid extreme reliance on outliers such as small companies with denominators close to zero. The balance sheets of the companies are financially conservative, with equity-to-assets ratios of 50%. The average company in the sample has assets of 3 billion DKK (a little more than US \$500 million at August 2012 exchange rates). However, as usual, the standard deviation is high given a large number of smaller companies.

C. Governance Measures: The “FG Index”

In developing an empirical assessment of non-pecuniary incentives, we focus on a composite “FG Index.”

Industrial foundations vary substantially in their governance structures. At one extreme, the foundation and its controlled company are essentially a single organization. The board of directors of the foundation is comprised of precisely the same individuals who serve on the company's board of directors, and the foundation has no officers or staff of its own, much less its own office space. The only distinction between the operating company and the industrial foundation that controls it is that sometimes the individuals comprising the board(s) of directors declare themselves to be acting in the name of the operating company, and sometimes in the name of the foundation. In substance, the arrangement would be no different if there were no separate foundation and the operating company itself were simply formed as a nonprofit corporation.¹⁷

At the other extreme, both the foundation and the operating company have their own distinct board of directors, with no overlap in membership between them. The foundation has its own staff, and occupies offices of its own that are well removed from the operating company's facilities. The stock in the operating company is only partially held by the foundation, with the remainder listed and traded on the stock exchange. And the foundation, in turn, also controls other operating companies. In short, the foundation is effectively a nonprofit holding company that is quite distinct from any of the operating companies in which it holds a controlling share.

We interpret these two polar arrangements as reflecting substantially different degrees to which a foundation's board of directors (1) is detached from direct involvement in the affairs of the operating company; (2) is placed in a position where directors' distinct role as "virtual owners," pursuing the founder's vision for the industrial company, is highly salient, and (3) finds the operating company's performance framed in a fashion that encourages objective assessment. We conjecture that the profitability of the operating company will generally be a positive function of the foundation board's score on the FG Index.

D. Components of the FG Index

Our FG Index comprises six variables. Each of these variables reflects a different aspect of an industrial foundation's relationship to its operating company. All of the variables, as we define them, are dichotomous, taking a value of either 0 or 1. We follow the definition of each variable with a brief discussion of its potential relationship to effective foundation governance.

Board Separation:

= 1 if no more than two members of the foundation board are also on the company board;

= 0 if there are three or more company board members on the foundation board.

If the foundation and company boards overlap completely, the same group of directors is faced with the awkward task of monitoring itself. Conversely, if members of the foundation board are largely distinct from the members of the company board, the foundation board is effectively put in the position of the company's owner, with the authority and responsibility of choosing the directors of the company. We therefore conjecture that, as the degree of board overlap declines, the foundation's directors will be increasingly inclined to identify with the role of company owner, and hence view the performance of the directors and managers of the operating company

¹⁷ In fact, some Danish industrial foundations are comprised of just a single legal entity, the foundation, which produces and markets commercial goods and services by itself rather than through a subsidiary business corporation. None of the industrial foundations in our sample take this form, however.

objectively and critically, and with an eye to its economic success. Low board overlap should therefore correspond with high company profitability, subject to the proviso that some minimal level of board overlap might have the offsetting benefit of helping the foundation board remain informed about the affairs of the company.

Private Ownership:

- = 1 if the foundation owns < 100% of the company's share capital (cash flow rights) and the non-foundation-owned shares are privately held;
- = 0 if the foundation owns 100% of the company's share capital or if non-foundation-owned shares trade publicly (on the Danish stock exchange).

Although we are concerned here with companies in which a foundation has a controlling interest, that leaves room for minority outside ownership of the operating company, and in fact a number of the companies in our sample have minority shareholders. The presence of these minority shareholders could plausibly result in improved performance of the operating company. Most obviously, if the company performs poorly, the minority shareholders might complain. And, even if the minority shareholders do not complain, the foundation directors may feel more responsible if they have minority shareholders who are dependent on them. With this and the following variable, we allow for different effects depending on whether the non-foundation-owned shares are publicly-traded.

Listed Shares:

- = 1 if the company's minority shares (if any) are publicly-traded;
- = 0 if the company's shares do not trade publicly.

Seventeen of the operating companies in our sample not only have (non-controlling) outside shareholders, but have shares that trade publicly on the Danish stock exchange. The share price quoted on the stock market confronts the foundation board with an unavoidable objective evaluation of the company's performance. That evaluation is, moreover, conspicuous to the general business community, and hence is likely to have a particularly strong effect on the reputation of the company's managers, and particularly the foundation's board of directors.

Multiple Companies:

- = 1 if the foundation owns more than one company;
- = 0 if the foundation owns only the company in question.

Most industrial foundations exercise control over just one operating company. Some foundations, however, control two or more operating companies. Control over two or more companies, we conjecture, attenuates the foundation board members' sense of personal identification with the management of any particular operating company, and also constantly confronts the foundation board members with a comparison of the performance of its different companies, in effect making each a "yardstick" for the other (see Shleifer 1985). Holding multiple companies may also improve foundation governance by giving the foundation a credible option to sell one of them, hence both decreasing the foundation board's identification with the companies and increasing pressure on the companies' managers.

Physical Separation:

- = 1 if the foundation office has a different address from the company;
- = 0 if the foundation and the company have the same address.

Some industrial foundations conduct their activities in office space provided by their operating company. Other foundations have offices of their own, located away from the facilities of the operating company. We conjecture that, in the latter case, physical separation will enhance directorial perspective and objectivity, and company performance will be stronger.

Charitable Purpose:

- = 1 if the foundation charter expresses a general charitable purpose;
- = 0 if the foundation charter expresses only a limited, or no, charitable purpose.

As we have described, it is common for the charter of an industrial foundation to set forth as its purpose, not just the continued successful management of the founder’s company, but also – to the extent consistent with the first purpose – to make contributions to charity out of the company’s profits. The charters of some industrial foundations, however, do not mention support of charity as a purpose, while others limit the foundation’s support of charity to particular fields, such as biomedical research. We conjecture that foundations with a charter commitment to support charity will seek more strongly than foundations without a charitable purpose to maximize the profits of their operating company, since those profits will be framed for the foundation’s directors as means to another end. In effect, such foundations have a profit motive.

FG Index:

- = the sum of the preceding 6 variables.

Because all of the six constituent index variables take a value of either 0 or 1, the FG Index takes integer values between 0 and 5 (6 possible levels). (The component variables “private ownership” and “listed shares” are mutually inconsistent, which limits the maximum index value to 5 rather than 6.) This simple summation is of course a somewhat arbitrary method for constructing an index. We have, however, no strong *a priori* reason for a different weighting of the elements of the index. Moreover, as we report below, the various components of the index are generally positively correlated, providing some evidence that they are all pointing toward different aspects of a common phenomenon. At the same time, we find that the FG Index is not dominated by one or two of its components.¹⁸

From the correlation coefficients in Table 4b, we see that our index components are positively correlated with each other in most cases, and are always positively correlated with the aggregate FG Index, lending additional support to the idea of a composite FG Index.

E. Control Variables

We employ the following, relatively standard, set of variables to control for factors other than our FG Index that might affect company performance:

¹⁸ As an alternative to our evenly weighted FG Index, we employed a weighting derived from multiple component analysis (equivalent to factor analysis). The results were qualitatively similar to those reported here, though generally with lower levels of significance.

Company Size: The logged book value of the company's assets. We have reason to assume that the value of the FG Index will increase with company size and we want to avoid confounding the effects of the governance structure with possible positive performance effects of size due to, for example, economies of scale.

Company Age: A FOF's performance may increase or decrease with age, especially after the death of the founder. For one thing, company profitability might decrease with time as the effects of the founder's management wear off. For another, the foundation board and the company board might specialize over time, with the foundation board devoting increasing attention to the foundation's charitable projects, and leaving the company board increasingly free to manage the company on its own. We use this variable to control for any such correlation between age and profitability.

Company Leverage and Profit Variation: We would like to control for financial risk since risk and return should theoretically be inversely correlated and we would like to avoid attributing high performance to companies that just take on more risk. We use the debt/equity ratio and profit volatility (standard deviation of ROA) to capture such risk. As it turns out, these variables are generally negatively rather than positively correlated with risk and thus do not serve the intended function. We therefore omit them in our base case models.

Year Dummies: Dummy variables for each of the six accounting years covered by our sample, to capture macroeconomic effects (such as the financial crisis in 2008).

Industry Dummies: Dummy variables for each of 21 industry groups – which we constructed by merging 8-digit NACE industries into broader categories – to capture industry-specific factors affecting company performance.

V. Statistical Results

Preliminary to presenting our results, we address identification – a topic we will return to below.

A. Identification

For our data to demonstrate correlation between our FG Index and company performance, much less causation, there must be some randomness in the values of the index exhibited by the companies in our sample. If each company had chosen the optimal foundation governance structure given its industry, size, and other attributes, statistical analysis of our data would reveal little. It appears, however, that the various degrees of conformity with our FG Index that are exhibited by the industrial foundations in our sample were, to a substantial degree, arrived at fortuitously. This randomness is central to our identification strategy.

Our conversations with foundation directors and officers suggest that, prior to our research, there was little focus, and no consensus, on the possible impact of foundation governance on company performance. Historically, most FOFs were owner-managed and governance variables like the composition of the foundation board appear to a large extent to have reflected specific conditions like family structure and the founder's social networks. After the foundation's creation, both this historical legacy and the foundation charter appear to have shaped ownership

and board structure. The result seems to have been a degree of randomness among foundations in their governance structures.

This conclusion is reinforced by the large variance across firms in the value of the FG Index. For example, as shown in Table 6, 60% of the companies in our sample have a majority of overlapping board members, and 39% have completely overlapping boards, while 40% have an overlap of half or less, and 7% have no overlapping board members at all. Moreover, the bulk of this variation is between companies, with little change over time within companies. As these figures indicate, prevailing practice during our sample period – in which a majority of companies exhibit a board overlap of greater than 50% – has in fact tended to be somewhat contrary to that which we hypothesize to be most conducive to profitability.

At the same time, there is strong evidence that there has been no clear logic or experience supporting the common choice of low-index governance structures. When we have spoken with foundation directors and officers about the potential advantages of adopting a foundation governance structure more closely aligned with our index, they have generally been receptive to the idea and have even suggested that, upon reflection, it would be consistent with their experience.

Further evidence that the conventional wisdom during our sample period was not in line with our hypothesis is offered by the experience with foundation-owned banks discussed above. Initially, the legislation governing these banks required that more than half of the foundation's board members also sit on the bank's board (and moreover that the chairman of the bank board be a member of the foundation board),¹⁹ thus mandating a foundation governance structure just the opposite of that called for by an important element of our index. In response to the bank failures following the 2008 financial crisis, and upon acquaintance with the preliminary results of the research reported here, in 2011 the Danish legislature removed the requirement that banking foundation boards overlap heavily with the boards of their affiliated banks. A similar reversal in prevailing attitudes toward foundation board membership is reflected in a 2012 report by a government committee on industrial foundation law, which led to the adoption of a comply-or-explain rule discouraging majority board overlap.²⁰

These considerations support the inference that, at least to a substantial degree, differences among foundations in their governance structures, and particularly as reflected in our FG Index, are exogenous for our purposes. At the same time, the recent developments we describe here also suggest that the apparent randomness in choice of foundation governance structure that we depend upon in interpreting our statistical results may no longer exist for years that follow our sample period.

¹⁹ See Law on Financial Companies (Lov om finansiel virksomhed, valid until 2011) §209.2 (a majority of the board of a foundation owning stock in a converted savings bank or mutual bank is to be appointed by the savings bank board from among its board members) and §209.2 (the chairman of the savings bank board must always be a member of the foundation board). On June 14, 2011 §209.2 was revised to provide that a savings bank board must not appoint or constitute a majority of the controlling foundation, and that the same applies to members of the boards of a bank's subsidiaries, while §209.3 was revised to provide that the chairman of the savings bank board must not be chairman of the foundation board.

²⁰ See Erhvervsfundsudvalget rapport (Report by the Committee on Industrial Foundations) (2012, in Danish) p. 565.

B. Differences in Means

Tables 4a and 4b display correlations among, respectively, operating company characteristics and FG Index components. From Table 4a we see that the FG Index is positively correlated with company performance (as we would predict), but also (as expected) with the age and size of the company. Company performance is positively correlated with company size (so that it seems necessary to control for company size to clarify the pure index effect), whereas there is no correlation between age and profitability. Table 4b shows that the components of the FG Index are in general, but not entirely, positively correlated. In particular, private ownership and general charity appear to be only loosely coupled with the other variables. By construction, the components of the FG Index are highly correlated with the index itself, but none of the correlation coefficients are so high that they can be said to effectively drive the index.

In Table 5 we present simple means of company performance for both values of each of our discrete, binary foundation governance measures.

// Insert Table 5 around here //

Table 5 shows more clearly the typical characteristics of our sample. We see that 58% of the companies (company-years) are owned by foundations whose boards overlap with that of the companies by more than two persons. In fact, the average share of the foundation board made up by the company's directors is 55%. Moreover, 42% of the companies are not 100% foundation-owned, 13% of the companies have publicly-listed shares, 27% of the foundations own more than one company, and 24% of the foundations have moved their office away from the company headquarters.

More importantly, Table 5 shows stronger performance in companies characterized by higher ratings on the FG Index. All these associations are positive, and all but one are statistically significant.

As an example of these relationships, companies whose directors occupy no more than two places on the foundation's board earn 2.6% more on their assets than companies with less board separation (6.4% against 3.8%). In other words, the evidence is highly consistent with our hypothesis that an independent foundation board is more likely to exercise effective supervision of the foundation's business subsidiaries. The absolute differences in returns seem, in fact, too large to reflect only a direct causal effect from the structure of foundation governance to performance. In part they may reflect a degree of endogeneity, an important issue which we address more generally below. We therefore do not interpret our results as demonstrating that foundation boards can double the returns of their companies by reducing the number of company directors on the foundation board from 3 to 2, or double them again by listing a minority stake, as a naïve reading of the simple bivariate correlations in Table 5 would suggest. Since the components of our FG Index are correlated, the simple averages capture a bundle of governance and other effects that need joint consideration, and this is one rationale for aggregating them into an index.

Altogether, these basic statistics are strongly consistent with the hypothesis that the structure of foundation governance affects the economic performance of FOFs. We proceed to examine whether some of the components of our index might have non-linear effects, and in

particular that too much separation between the foundation board and the subsidiary company may have a negative effect on company performance.

C. Nonlinear Effects.

Board separation and outside ownership are the two components of our index that seem most likely to be non-monotonic in their effects on company performance. To test for non-linear effects, in Table 6 we break down each of these measures into six discrete intervals over the range from 0% to 100%, and calculate average ROA for the companies falling within each interval.

// Insert Table 6 around here //

We find evidence consistent with non-linear effects as hypothesized. In both cases – board separation and outside ownership – an F-test confirms the existence of significant level effects.²¹

With respect to board separation, ROA is highest with a positive but limited board overlap of up to 25%, which corresponds to one or two persons (since average foundation board size is 6 members). Board overlap in this range is associated with significantly higher ROA, while overlap greater than 25% is associated with profit rates significantly below average. We conjecture that this level of separation – with only one or two persons who sit on both boards – effectively makes the foundation board an independent, but informed, decision-making instrument.

The data also allows us to test tentatively the index levels at which FOFs over- and under-perform the average ROA (5%) of FOFs overall. FOFs with more than zero but no more than 25% board overlap, on average, significantly over-perform, while FOFs with higher or lower board overlap significantly under-perform.

With respect to outside ownership (i.e. the percentage of cash flow rights held by the foundation), ROA peaks when the foundation holds between 50% and 75% of the operating company's equity. Ownership in this range is associated with ROA significantly higher than average for the sample. If causality runs from ownership to performance, this suggests that there is value to attracting outside capital while retaining foundation control. (Recall that, for the companies in our sample, a majority of the voting rights is in all cases held by the foundation. In some cases this is achieved through dual class shares which permit the foundation to control a share of voting rights in the company that exceeds the foundation's share of invested capital.) A plausible interpretation is that the interests of foundation directors are stronger and better aligned as the foundation's share of equity capital increases but, at the same time, the presence of a substantial cohort of outside shareholders increases the pressure on foundation directors to make their operating company profitable.

In Figure 1 we plot ROA against our aggregate FG Indexindex.

²¹ The raw F-test for level differences is 7.23*** for foundation board overlap levels and 9.78*** for ownership levels, both highly significant. Taking into consideration clustering of residuals by company, the board overlap F-test is only significant at the 10% level overall, but remains significant for the intermediate – more than zero and less than 25% – overlap, where the performance effect is most pronounced. The ownership level effects also remain significant by F-test after clustering.

// Insert Figure 1 around here //

In this figure we observe a clear, almost linear, relationship between the FG Index and profitability. The economic effects are large: FOFs with high index scores do much better, and those with low index scores in fact perform quite modestly, with rates of return of only a few percentage points. While this chart is highly suggestive, however, it must be interpreted with caution, as must the simple bivariate correlations reported above. The relationships graphed in Figure 1, for example, are consistent with the hypothesis that only one of the components of our FG Index is related to company profitability, and that companies exhibiting many of those components are simply more likely, as a matter of chance, to have the one important component than are companies that exhibit fewer of the components. We must turn to regression analysis for a clearer view.

D. Regression Analysis

Although our sample is a panel, the governance variables change only slowly over time; consequently, the bulk of the variance is cross-sectional (between companies). For example, the mean value of the FG Index is 2.1, and the between-company standard deviation is 1.2 (Table 3), but the within-company standard deviation is only 0.23 or 1/6 of the between-companies variation. One of the component variables – Listed Shares – does not change at all during the observation period. Our preferred estimation is therefore regression analysis with standard errors clustered by company. A time-constant variable, such as Listed Shares, varies only by company and would drop out in panel data estimation with company fixed effects. Board Separation is more variable over time, but most members are not replaced every year, and the within-company variation is still three times as large as between-company variation, whose effects would be obscured if we controlled for company fixed effects.

Table 7 offers methodological comparisons. In each of the five models there, we regress company performance (ROA) on the FG Index plus variables to control for company size, company age, time (year), and industry effects. In Models 1 and 2, these are the only control variables. Model 1 employs ordinary OLS with the company-year as the unit of observation and errors clustered by company; Model 2 uses the company as the unit of observation, with variable values averaged over the five years that they cover. The results are broadly similar, as one would expect from the high stability of the governance variables. The FG Index is significant in both regressions at the 5% level, while company size is significant in Model 1 and not in Model 2. Although the details are not reported in Table 7, industry effects also appear to be important, as are the time dummies at the end of the period (the years 2007 and 2008), when the financial crisis began.

//Insert Table 7 around here //

In Model 3, which imitates Model 1 in employing ordinary OLS with errors clustered by company, we control for three additional aspects of board structure to test whether our FG Index is

indirectly reflecting more well-known structural effects. It could be, for example, that boards with smaller overlaps tend to be smaller in size and that this accounts for the apparent effect of the index on company performance. We control, in particular, for the size of the foundation board, the size of the company board, and the share of company managers on the company board. The latter variable is an (inverse) measure of board independence of management. We find that the significance of the FG Index is robust to these controls, which turn out to have no significant relationship of their own with accounting profitability.

Model 3 also includes two variables (% employee representatives on the company board and % employee representatives on the foundation board) to check whether our results are somehow an indirect effect of employee representation. As it turns out, there are few employee representatives on the boards of FOFs and even fewer (<10%) on foundation boards. Moreover, as we see in Model 3, the FG Index remains significant after controlling for employee representation, which itself does not rise to significance.

Finally, to capture lingering effects of control by the founder's family, Model 3 includes as an explanatory variable a simple index taking the value 1 if the foundation board contains one or more members of the founding family and 0 otherwise. (The variable is under-inclusive in that it only captures foundation board members with the same last name as the founder.) The coefficient on this variable is positive and significant, but it does not meaningfully alter the magnitude or significance of the coefficient on the FG Index.

Models 4 and 5 employ the same variables as Model 3, but differ in their estimation techniques. Model 4 uses random effects, while Model 5 uses company fixed effects. In Model 4 the foundation government index is significant only at the 10% level, while in Model 5 the index drops markedly in magnitude and is far from significant. (There is no coefficient for the presence of the founding family in Model 5, because that variable remains constant for all companies over the five years covered by our data, and hence shows no variance with company fixed effects.) Both of the latter two models are invalid, however, in the sense that chi-square tests indicate that they do not explain a statistically significant share of ROA. As a consequence, all of the subsequent regressions we report are essentially cross-sectional, employing OLS (or logit) with standard errors clustered by company, as in Models 1 and 3 of Table 7. Model 1 of Table 7 indicates that a one point increase in the FG Index is associated with a 1.1% higher ROA, which is similar to its magnitude in the other regressions we report here. This is economically substantial. Since the standard deviation of the index is 1.2, this translates into an average effect of 1.1×1.2 or 1.3 percentage points higher ROA for the average company. As seen in Table 3, mean ROA is 5.0%, so 1.3 percentage points is an economically important 26% increase in the ROA of the average company.

In Table 8 we test the extent to which our results are driven by individual components of the FG Index. In Model 1 we replace the index with individual values for each of the six components of the index. Only one of those components – outside ownership – proves significant, and then only at the 10% level, suggesting that the Index is not simply standing in for one or more of its components, but rather is a meaningful aggregate. Model 2 provides a further test by removing from the index one of its components – general charity objective – and including the value of that component as an independent explanatory variable. Models 3 through 7 are similar, except that they each isolate a different component of the foundation government index. In each of the Models 2 through 7 the modified index remains significant and relatively constant in value,

while only two of the separate components of the index – outside ownership and board separation – achieve significance, hence providing further support to the importance of the aggregate index.

//Insert Table 8 around here //

VI. Endogeneity, Causal Mechanisms, and Robustness

Taken together, the results we have presented so far suggest an important connection between our FG Index and company profitability. With our small and heterogeneous sample, we cannot establish that the individual components of our index do or do not play a role, directly or indirectly, in company performance. In any event, they all seem of secondary importance when taken individually. It is in the aggregate that we see their effect most clearly.

So far, however, we have examined only correlation. We now turn to questions of causation.

Like most empirical research on corporate governance, our study raises questions of endogeneity. *A priori*, it seems quite plausible that, for some or all of the components of our FG Index, the causal effect runs, not from governance structure to performance as we hypothesize, but instead from performance to governance structure. For example, a strongly-performing company may find it easier to list its shares, and may also have more of an incentive to do so to obtain capital with which to pursue profitable growth opportunities. A profitable company may likewise generate funds that the foundation can use to buy other companies. Public listing may call for more outside directors on the board to reassure investors. And the more profitable a company is, the more easily it can afford both outside directors and separate offices for its parent foundation.

Reverse causality of this sort may in fact help explain the strong correlation between our FG Index and company performance. But there are good reasons to believe that at least a substantial element of that correlation reflects the effects of governance structure on performance.

A. Tests of Causality

To begin with, the stability of the FG Index over time makes reverse causality less plausible. The governance structures of industrial foundations are very stable over our 5 year observation period, whereas company performance varies considerably. This stability tends to undercut the possibility that causation here runs from economic performance to the company's governance structure.

To test further for endogeneity, we constructed the FG Index for the year 1998, which is five years prior to the beginning of our observation period. Some foundations did not disclose sufficient information for 1998, but we were able to construct this “1998 FG Index” for 84 companies. In Table 9 we use it to address the endogeneity issue.

// Insert table 9 around here //

First, in Model 1 we regress company performance (ROA) on the 1998 FG Index. In this case, reverse feedback from performance to governance structure is less plausible. We find that performance (ROA) for the later period 2003-2008 is significantly influenced by the 1998 FG Index with much the same effect as it is by the FG Index in 2003-2008. This is consistent with the expectation that the structural features reflected in the FG Index would influence company performance more in the long run than in the short run: it takes time for top level decisions to influence company behavior, and important results may reflect a cumulative series of decisions rather than one-off change.

Second, in Model 2 we regress ROA in 2003-2008 on 1998 ROA to check whether the correlation between governance structure and performance is caused by stability of both variables. We find no significant effect of past profitability on predictability of subsequent profitability. Finally, in Model 3 we find that profitability in 1998 is *negatively* correlated with the FG Index in 2003-2008, which is highly inconsistent with reverse causality from strong company performance to a high score on the FG Index.

Taken altogether, the results reported in Table 9 indicate that the FG Index in 1998 predicts profitability a decade later, but that profitability in 1998 does not predict either profitability or index ranking a decade later. This suggests, in turn, that causality runs, at least in substantial part, from the FG Index to profitability.

There is, to be sure, a great deal of variance in short run accounting profitability. We therefore cannot rule out the possibility that profitability in 1998 was an outlier, and that average ROA over (say) the five years ending in 1998 would predict subsequent index ranking much better than does ROA for 1998 alone, and – despite the strong significance of the negative coefficient on 1998 ROA in Model 3 – might even reverse our results. Limitations on the foundation data have not permitted us to undertake such a test.

B. CEO Turnover

Confidence in the FG Index will be stronger if we can point to mechanisms through which a high index score translates into performance-enhancing behavior. The propensity to replace weak managers might be one such mechanism. We hypothesize that a higher index score will be associated with higher managerial turnover in the FOFs, particularly after periods of weak performance (see Defond and Hung 2004; Bushman, Dai, and Wang 2010; Taylor 2010).

For the reasons we have surveyed above, it is probably easier for a foundation board that operates at a distance from its company to replace company managers than it is for the company board. Formally, of course, this decision is made by the company board, but it is the foundation board that has the right of ultimate control.

We collected data on CEO change over our 5-year observation period and constructed a simple dummy variable:

CEO Change:

- = 1 if the name of the company CEO is different from the preceding year;
- = 0 otherwise.

We are unable to distinguish between forced and voluntary replacement, and we lack access to information on CEO age that could proxy for this distinction, but we nevertheless hope to discern

broad patterns. From the descriptive statistics we know that roughly 6.5% of the company CEOs in our sample are replaced annually, which is low in international comparison.²²

We report results on the relationship between our FG Index and CEO Change in Table 10.

// Insert Table 10 around here //

In both Model 1 and Model 2, the FG Index is positively and significantly related to CEO change, and the magnitude of the relationship is economically meaningful. The odds of replacement are 1.6 times higher for each unit increase in the FG Index. Quantitatively, a one standard increase in the FG Index (1.4) is associated with an increase in the odds of replacement by 2.2 percentage points, which is 1/3 of the average replacement odds of 7%. Moreover, Model 2 – which includes a variable for the interaction of the FG Index and ROA – shows a smaller relationship between the index and CEO replacement when profitability is high, with significance at the 10% level. This suggests that the relationship between foundation governance and company performance is stronger when profitability is low, i.e., in case of bad performance. In other words, a high ranking on the FG Index is associated with faster replacement of managers, particularly in badly performing companies. This could be one reason why FOFs characterized by more effective foundation governance, as reflected in our index, tend to perform better.

C. Further Robustness Analysis

In Table 11 we report several additional tests of the robustness of our results.

Model 1 is similar to Model 1 of Table 7 except that it substitutes sales growth for ROA as the dependent variable. We find a significant positive relationship between sales growth and the FG Index. This is consistent with the results above indicating greater profitability when the FG Index is high, since profits of course provide income for reinvestment.

Model 2 differs from Model 1 in using, as the dependent variable, a linear combination of the ROA and sales growth variables obtained through factor analysis. The result is an increase in the significance of the FG Index. Using ROA as our dependent variable might be misleading if accounting profitability were commonly obtained at the cost of unusually high leverage. That this is not the case is indicated by Model 3, which includes company debt/equity ratio as an independent variable, and which attributes to that variable a significantly *negative* association with ROA.

Model 3 likewise includes company volatility as an explanatory variable, measured as the standard deviation of ROA. The negative and insignificant coefficient on that variable indicates that company profitability is also not obtained at the cost of greater volatility.

Finally, in Model 4 of Table 11 we include as an explanatory variable an index that takes the value 1 if the foundation that owns the company has its own (full-time) CEO, as many of the larger foundations do, and takes the value of zero otherwise. Roughly 1/3 of the foundations in

²² For example, Kaplan and Minton (2012) report average turnover rates of 17% for US companies. Gao, Harford and Li (2015) report CEO turnover of 9.6% in public companies and 7.9% in private companies excluding turnover during the first two years of tenure.

our sample (36%) employ a CEO. *A priori* it seems plausible that the presence of a separate foundation CEO could, in itself, have either a negative or a positive (or no) effect on company profitability. A separate CEO for the foundation might, on the one hand, increase the foundation directors' sense of independence from the company. On the other hand, the CEO herself might, as a consequence of full-time engagement with the company and its affairs, come to identify strongly with the company, and to push the foundation's board in the same direction. Whether for the latter reason or for other reasons, Model 4 shows a significant negative relationship between company profitability and the presence of a separate foundation CEO.

VII. Interpretations

Taken together, the empirical results are consistent with our basic conjecture: that the economic performance of FOFs correlates with the structural elements of foundation governance that are reflected in our aggregate FG Index, and that this correlation reflects, in important part, the effect of governance structure on performance.

We examine here our aggregate empirical results more broadly, to see if they might throw further light on the relationship between governance structure and economic performance, not just in FOFs, but in conventional investor-owned firms as well.

A. Independent Directors

In recent decades, publicly-traded corporations in developed economies have come under increasing pressure, both from the law and from norms of "best practice," to have independent directors comprise a majority, and perhaps the entirety, of the board of directors and its most important committees. Nevertheless, the empirical literature has failed to establish a relationship between director independence and company performance (Fogel, Ma, and Morck 2015, Hermalin and Weisbach 2003).

Our results -- contrary to this general absence of empirical support -- suggest that, for companies controlled by industrial foundations, company value is positively associated (at least to a point) with the proportion of foundation directors who are independent of the company's own board. We must be cautious in interpreting these results. (See Model 5 of Table 8 where, when the Board Separation measure is separated out from the other components of the FG Index, the coefficient is positive but is significant only at the 10% level.) They are, however, suggestive enough to lead us to ask why a positive effect of board independence in the governance of FOFs might be consistent with a finding of no systematic effect in studies of investor-owned firms.

One reason might lie in the relative randomness of the available samples. Before the advent of law and norms favoring independent directors, investor-owned business corporations may have adopted board structures that seemed -- and generally were -- compatible with the individual firms' particular needs. Thus, correlation between the presence of independent directors and firm profitability could have been largely unobservable.²³ Subsequent regulation mandating a large role for independent directors might then have created the opposite situation -- similarly resistant to empirical exploration -- in which there is little variation across firms in the role of independent directors, though perhaps greater variety in firm profitability induced by the

²³ [HH: Cite Demsetz and Lehn.]

one-size-fits-all regulatory regime. In contrast, the degree of board independence in industrial foundations seems to have been chosen more or less randomly, hence facilitating statistical analysis.

Another possible reason is that the independent directors of industrial foundations are “more independent” than their counterparts in conventional business corporations. In particular, the foundation directors are effectively immune to removal from office, in contrast to independent directors of investor-owned corporations, and thus presumably less subject to stock market pressures for short-termism or other inefficient behavior.

B. Framing Effects

Five of the six components of our FI Index – all but General Charity – reflect contextual factors that, while not directly affecting profitability, might have the effect of making the subsidiary company’s relative profitability more salient for the foundation’s directors. Thus, the significance of our FI Index is plausibly due to a framing effect, reflecting the importance, for economic performance, of confronting foundation directors with a clear and unbiased perception of their subsidiary company’s economic performance.

If, owing to the general absence of pecuniary incentives, this framing effect is relatively stronger for the directors of industrial foundations than it is for the directors of non-FOFs, it could be one of the reasons that FOFs perform comparably to non-FOFs despite the nonprofit character of the FOFs’ controlling shareholders. Again, our data, which contains observations only on FOFs, does not permit us to compare them directly with conventional investor-owned firms.

C. Short-Termism

As we have noted above, directors of industrial foundations are presumably less influenced by short-term fluctuations in stock market prices than are their counterparts in investor-owned firms. By including the Listed Shares variable in our FG Index, however, we are proposing an even stronger hypothesis – namely that, for FOFs, market pricing of the firm’s shares not only has a less deleterious effect on firm performance than it does for non-foundation-owned firms, but that, on the contrary, it has a *positive* effect on firm performance. The logic behind this proposition is that, since the foundation boards in our sample are effectively immune from outside sanction no matter how far their company’s stock price falls, foundation directors are free to pay attention to what they consider informative in stock market pricing and ignore the rest. This hypothesis is consistent with the strong positive correlation between listing and profitability in Table 5, and arguably as well with the lack of significance for the Listed Shares variable when it is separated from the other elements of the FG Index in Model 6 of Table 8.

It is tempting to infer that, if in fact avoidance of short-termism contributes importantly to the strong performance of FOFs, it follows that the performance of investor-owned firms can be improved by insulating them further from shareholder control, contrary to the frequent appeals today for shareholder empowerment. But this inference may be misleading. For one thing, it may be valid only if shareholder control is eliminated entirely, and the board is permanently entrenched. Further, it may require that control of the company reside in a separate (nonprofit) entity. And finally, it may require that the directors feel that they are trustees, not for passive shareholders, but for a deceased entrepreneur or for charity.

D. Identification with Role

A stronger version of the framing effects hypothesis is the identity economics hypothesis that attributes the strong economic performance of FOFs to, in important part, a supposed identification by the (independent) members of the foundation board with the founder's vision for the company. This interpretation also fits well with the apparent strength of our FG Index. Further, it offers an explanation for the marked disparity in performance between foundation-owned industrial firms such as those in our sample and Denmark's foundation-owned banks. Thus a charismatic entrepreneur with a well-regarded firm may be an important prerequisite for the creation of a successful FOF. We cannot test this proposition directly, however, because our data lacks proxies for the reputations of founders and their firms.

E. Separate Holding Company

The closest parallel to FOFs among conventional investor-owned firms is arguably an arrangement in which control over one or several operating companies is held by a holding company that serves no other purpose than to control its subsidiaries – the difference from the FOFs being that, in the latter, the holding company is nonprofit rather than investor-owned. It is therefore interesting to compare our results with studies of investor-owned conglomerates. While those studies cast doubt on the efficiency of large diversified conglomerates, there is evidence that smaller conglomerates – those operating in three industries or less – perform comparatively well (Lee and Cooperman 1989).

Might it be, therefore, that the mere presence of a holding company, without regard to its nonprofit nature, contributes importantly to the success of FOFs, perhaps because the holding company reinforces the framing effects reflected in our FG Index? Without data on comparable investor-owned firms, we cannot test this proposition directly. There is, however, reason to doubt it. In particular, it may be that the directors of industrial foundations have, paradoxically, a more proprietary feeling toward the foundation and the company it owns – that is, that they act more like virtual owners – than they would if they were instead directors of a holding company producing profits that are distributed to outside shareholders. In a sense, the board of a foundation *is* the foundation, and what the foundation owns, the board effectively owns – not for purposes of personal consumption, but to manage largely free from the competing authority of other persons. Put differently, the board of an investor-owned holding company may be less motivated to produce profits for the personal prosperity of investors in the company's stock than – as in the case of an industrial foundation's board – for reinvestment to increase the glory of the company and the foundation that owns it, or for distribution to worthy charities.

F. Charity

Our General Charity variable was intended to test the hypothesis that an industrial foundation's directors are more effective, or their subsidiary's employees are more productive, when they believe that the company's profits are going to charity instead of being paid out to private shareholders, and this company-wide increase in productivity is a principal source of the efficiency of FOFs. But our tests of that variable show at most a very weak effect. The simple correlation between General Charity and ROA in Table 5 is positive at only the 10% level. And

when, in Model 1 of Table 8, we split off the General Charity variable from the (other elements of the) FG Index, the coefficient, while still positive, is not significant. On the other hand, the General Charity variable may do a poor job of capturing the strength of an industrial foundation's commitment to supporting charity. In particular, that variable assumes that foundations charged with supporting charity in general are more intensely focused on supporting charity than are foundations with charters that commit them, instead, to specific types of charities, which is conceivably the opposite of the situation in reality. Thus our results may not be probative for the productivity-enhancing effects of an industrial foundation's commitment to charity.

G. Just a Danish Thing?

Regardless of the interpretation given to our results, one can wonder whether there is something special about Denmark. Perhaps the Danish business community is so small and tightly connected, compared to its counterparts in other countries, that social norms of good business practice play a much larger role in Denmark than elsewhere. Denmark and the Nordic countries certainly score very high on the world bank governance indices and other social indicators (Thomsen 2016).

Yet as our data confirms, even within Denmark the profitability of FOFs varies substantially. Clearly something beyond general business norms has an important effect on the performance of these companies – an inference that is strongly reinforced by the relatively poor performance of Danish foundation-owned banks.

Moreover, there are successful industrial foundations in a number of countries other than Denmark. And, as we have noted, even in the United States we see an apparent parallel to industrial foundations in the increasing use of nonprofit foundations as holding companies for hospitals and affiliated companies. Indeed, our results here suggest a rationale for the rapidly increasing popularity of that holding company structure since the 1980s (McGovern 1988), when the market for hospital services became more competitive owing to changes in technology and the structure of public and private hospital insurance plans.

VIII. Conclusion

Industrial foundations are a fascinating anomaly. As nonprofit entities with minimal diversification, the continuing success of the companies they control is a strong challenge for standard agency theory. In this paper we have presented evidence that the profitability of FOFs depends on the foundation's governance structure, and in particular on the relationship between a foundation's board and the management of the foundation's industrial subsidiary.

We find support for two closely related interpretations of this result. The first is that a substantial degree of separation between the directors of the foundation and the managers of the foundation's subsidiary facilitates effective monitoring of the subsidiary and reduces pernicious co-optation of the foundation board by company management that might result from, for example, influence activities, confirmation bias, or groupthink. The second interpretation is that, with the appropriate governance structure, information and decisions are framed for the foundation's directors in a fashion that induces them to identify strongly with their assumed role as virtual owners of the operating company, and indeed as virtual heirs of the company's founding

entrepreneur. The latter interpretation has the attraction that it suggests at least a partial explanation for the robust economic performance of FOFs in general.

Our data does not permit us to distinguish clearly between these two complementary interpretations. Nor does the data allow us to offer a clear test of two other reasons sometimes offered to explain the success of industrial foundations: freedom from short-termism and dedication to charity. Greater clarity will, we expect, require closer examination of the varying circumstances under which the industrial foundations were created and have evolved, and more direct comparisons of FOFs with similar firms that have more conventional ownership structures.

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Table 1 Foundation Ownership and Accounting Profitability (Means, %)

	Dispersed Investor Ownership	Family Ownership	Foundation Ownership
Return on equity 1982-1992	10.9	11.3	11.4
Return on equity 1995-2002	9.1	12.4	14.5
Return on equity 2003-2008 (standard deviation)	12.7 (27.0)		11.1 (18.7)

Sources: Thomsen (1996, 2004), Thomsen and Hansmann (2016). The differences among the means in each of the three rows are not significant.

Note: The 1982-1992 figures compare companies among the 300 largest by sales. The 1995-2002 figures compare companies among the 1000 largest by sales. The 2003-2008 figures compare 109 foundation--owned companies to all listed Danish companies. Return on equity = ebit/shareholder equity (%) (omitted if > 100% or <-100%).

Table 2. Foundation Boards Compared to Boards of Non-Foundation-Owned Listed Companies

	Danish Industrial Foundations	Non-Foundation-Owned Listed Danish Companies
Danish board members as % of all board members	99%**	89%
International board members as % of all board members	1%**	11%
Average board size	6.0	6.3
Average tenure of board members (years)	9.8**	6.8
Average age of board members	64**	55
Male chair as % of boards	93%	100%
Female directors as % of all board members	14.0**	12%
Employee representatives on the board as % of boards	21%**	45%
Employee representatives as % of board members	9.6%**	20.0%
Sample (number of boards)	96	140
Average compensation per foundation board member	\$13,593	\$42,162
Average size (equity)	\$326m	\$405m
Sample (number of boards)	78	149
	14 Listed Foundation-Owned Danish Companies	14 Listed Non-foundation-owned Danish Companies
Average compensation per listed company board member	\$76,015	\$75,610
Average size (equity)	\$4114m	\$2208m
Sample (number of boards)	14	14

The table compares industrial foundation boards to the boards of listed companies. The foundation boards were selected for data availability among the 120 largest industrial foundations. The listed company data covers the majority of the approximately 175 listed Danish companies. In addition, the compensation of 14 listed foundation-owned boards is compared to compensation of other listed companies. The figures were collected for different years 2007-2010.

**=significantly different from listed companies at 5% level.

Note: Average compensation per listed company board member compares all of the 14 FOFs that are listed to the 14 largest non-FOFs that are listed.

Table 3. Descriptive Statistics for 110 FOFs 2003-2009

Variable	N (obs)	Mean	Median	Std. dev.	Min	Max
Performance Variable						
Return on assets % (winsorized)	538	5.0	4.8	8.1	-22.7	34.4
Foundation Governance Variables						
Board separation (dummy)	611	0.40	0.0	0.49	0	1
Private minority ownership (dummy)	611	0.29	0.0	0.45	0	1
Listed shares (dummy)	611	0.13	0.0	0.34	0	1
Multiple companies (dummy)	611	0.27	0.0	0.45	0	1
Different address (dummy)	610	0.24	0.0	0.42	0	1
General charitable purpose (dummy)	610	0.738	1.0	0.44	0	1
FG Index (dummy)	610	2.1	2.0	1.2	0	5
Other Governance Variables						
Founding family presence (dummy)	611	0.45	0.0	0.49	0	1
Company CEO change (dummy)	595	0.065	0.0	0.25	0	1
Foundation board size	538	5.98	5.00	2.56	3	15
Company board size	600	6.10	5.00	2.49	3	12
Company board independence of managers	527	0.92	1.00	0.11	0.63	1.00
Employees shares of company board	538	0.11	0.00	0.14	0.00	0.46
Employees' share of foundation board	538	0.07	0.00	0.16	0.00	1.00
Control Variables						
Company size (log assets) (winsorized)	538	6.16	5.88	1.83	2.71	11.02
Company leverage (D/E) (winsorized)	538	1.32	0.93	1.25	0.03	5.99
Company age (log)	593	3.65	3.95	1.13	0	5.84
Company volatility (std dev of ROA)	607	4.52	2.94	4.90	0.082	31.22
Sales growth (winsorized)	337	0.09	0.06	0.57	-1.00	4.42
Number of employees	507	2435	256	9922	1	119599

The table shows descriptive statistics for the 110 FOFs in our sample. The number of foundations is a slightly smaller 111 since two foundations each own 2 companies in the sample. The time period is 5 years from 2003 or 2004 (depending on accounting year) to 2008 or 2009.

Table 4a. Correlation Coefficients (Performance Variables, 110 companies)

	Return on Assets	FG Index	Company Size	Company Leverage	Company Volatility	Company Age
Return on assets	X					
FG Index	0.30**	X				
Company size (log assets)	0.27**	0.37**	X			
Company leverage (D/E)	-0.06*	-0.00	0.06**	X		
Company age (log)	-0.01	0.14**	0.12*	-0.12**	X	
Company volatility (std dev of ROA)	-0.17**	0.05**	-0.24**	0.07**	-0.06**	X

*=significant at the 10% level, **=significant at the 5% level.

Table 4b. Correlation Coefficients for FG Index Components (110 companies)

	FG Index	Board Separation	Listed Shares	Private Ownership	Multiple Companies	Physical Separation
FG Index	X					
Board separation	0.62*	X				
Listed shares	0.58*	0.24*	X			
Private ownership	0.18*	-0.00	-0.25*	X		
Multiple companies	0.44*	0.09*	0.35*	-0.23*	X	
Different address	0.61*	0.32*	0.35*	-0.02*	0.10*	X
General charity	0.33*	-0.01	0.09*	-0.09*	-0.02*	-0.04*

*=significant at the 10% level.

**Table 5. Governance Measures and Company Performance (110 Companies)
(Test of Differences in Means with Unequal Variance)**

	N (Company Years) %	Return on assets %
Board Separation		
>2 company officers on the foundation board	59%	3.8
≤2 company officers on the foundation board	41%	6.4***
Listed Shares		
Unlisted	87%	4.2
Listed	13%	10.6***
Private Ownership		
No private minority ownership	71%	4.9
Private minority ownership	29%	5.3 n.s.
Multiple Companies		
Foundation owns one company	73%	4.1
Foundation owns two or more companies	27%	7.4***
Physical Separation		
Foundation and company have same address	76%	4.2
Foundation and company different addresses	24%	7.3***
General Charity		
Foundation has no general charitable goal	27%	4.0
Foundation has a general charitable goal	73%	5.4*
FG Index		
0	6%	3.3
1	26%	2.9
2	37%	4.1
3	18%	6.1*
4	8%	9.7***
5	5%	12.6***
Total	100% (n=537)	5.1

Note: ***=significant at the 1% level, **=significant at the 5% level,

*=significant at the 10% level (t-tests with unequal variance).

ROA is winsorized at the 1% level.

Significance of average ROA by FG Index intervals is evaluated relative to FG Index = 0 (ROA=3.3).

Table 6. Governance Index Component Levels and Company Performance (Mean ROA, 110 Companies)

	Observations (company years)	Return on assets %
Company executives and directors on the foundation board (%)		
0%	7%	3.5***
0 < % ≤ 25	16%	9.4***
25 < % ≤ 50	17%	4.5*
50 < % ≤ 75	18%	3.9***
All set 75 < % < 100	3%	4.5*
100%	39%	4.0***
Total	100% (n=538)	5.0
Foundation's fraction of equity capital		
0%	-	-
0 < % ≤ 25	4%	4.6*
25 < % ≤ 50	14%	6.6***
50 < % ≤ 75	12%	9.9***
75 < % < 100	12%	4.8
100%	58%	3.7***
Total	100% (n=538)	5.0

Note: ROA is winsorized at the 1% level.

*, **, *** indicate differences from sample mean at the 10%, 5%, and 1% level, respectively.

Table 7. FG Index and Company Performance (ROA)

Model	1	2	3	4	5
Dependent Variable	Winsorized ROA	Winsorized ROA	Winsorized ROA	Winsorized ROA	Winsorized ROA
Estimation method	Clustered OLS	Average Values OLS	Clustered OLS	Random effects, clustered	Fixed effects, clustered
Independent Variables					
FG Index	1.108** (0.429)	1.423*** (0.485)	1.164** (0.518)	0.983* (0.552)	0.056 (0.981)
Company size (log assets, winsorized)	0.577** (0.266)	0.340 (0.322)	0.161 (0.321)	0.259 (0.307)	1.401 (1.067)
Company age (log)	-0.008 (0.472)	0.095 (0.494)	-0.057 (0.460)	-0.260 (0.521)	-4.290** (1.972)
Foundation board size			-0.054 (0.207)	-0.056 (0.220)	0.339 (0.651)
Company board size			0.395 (0.293)	0.376 (0.262)	0.356 (0.525)
Company board independence			1.158 (4.251)	-0.631 (3.923)	-1.264 (6.831)
Employees on the foundation board %			4.604 (2.876)	4.366 (2.778)	24.109 (29.767)
Employees on the company board %			-4.982 (4.811)	-1.817 (3.911)	2.758 (7.774)
Founding family on foundation board			2.469** (1.186)	2.622** (1.156)	
Constant	YES	YES	YES	YES	YES
Time effects	YES	YES	YES	YES	YES
Industry effects	YES	YES	YES	YES	YES
Company effects	NO	NO	NO	Random	Fixed
F test (Chisq)	7.39***	2.33***	6.59**	0.91 ns	0.91 ns
R-square	0.29	0.39	0.26	0.025	0.024
N (companies)	110	110	107	108	108
N (company years)	526	110	514	516	516

Note: Standard errors in parentheses; *= significant at 10% level, **=significant at 5% level, ***=significant at 1% level (t-tests).

Table 8. Elements of the FG Index and ROA

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Dependent Variable	ROA	ROA	ROA	ROA	ROA	ROA	ROA
Independent Variables							
FG Index modified		1.414*** (0.508)	0.937** (0.431)	0.965* (0.495)	0.994* (0.577)	1.261** (0.477)	1.315*** (0.482)
Multiple companies	-0.453 (1.354)						-0.261 (1.338)
Listed shares	0.222 (1.818)					-0.256 (1.654)	
Board separation	1.261 (0.846)				1.376* (0.784)		
Different address	1.579 (1.474)			1.621 (1.428)			
Private ownership	2.034* (1.086)		2.311** (0.257)				
General charity objective	0.959 (1.151)	0.730 (1.141)					
Company size	0.685** (0.326)	0.570** (0.276)	0.624** (0.272)	0.568** (0.272)	0.594** (0.280)	0.691** (0.304)	0.594** (0.273)
Company age (log)	-0.049 (0.467)	-0.047 (0.467)	-0.006 (0.462)	-0.027 (0.472)	0.004 (0.478)	0.008 (0.472)	-0.077 (0.466)
Company effects	NO	NO	NO	NO	NO	NO	NO
Industry effects	YES	YES	YES	YES	YES	YES	YES
Time effects	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES
F-test	6.41***	7.30***	7.27***	7.13***	7.13***	7.17***	7.27***
R-square	0.29	0.29	0.29	0.29	0.29	0.29	0.29
N (companies)	109	110	110	110	110	110	110
N (company years)	526	526	526	526	526	526	526

Note: In all but the first regression, the modified FG Index excludes one of the six components of the overall index. The omitted component is then entered as a separate variable in the regression. Standard errors in parentheses. *= significant at 10% level, **= significant at 5% level, ***= significant at 1% level (t-tests).

Table 9. Past FG Index (1998) and Company Performance (ROA)

Model	1	2	3
Dependent Variable	ROA 2003-2008	ROA 2003-2008	FG Index 2003-2008
Estimation methods	OLS Clustered Standard Errors	OLS Clustered Standard Errors	OLS Clustered Standard Errors
Independent Variables			
FG Index (1998)	1.288** (0.595)		
Company size (2003-2008)	1.035*** (0.282)	1.093** (0.320)	0.227*** (0.031)
ROA (1998)		-0.047 (0.045)	-0.019*** (0.005)
Company age (2003-2008)	0.736 (0.776)	1.722** (0.809)	0.289 (0.061)
Time effects	YES	YES	YES
Industry effects	YES	YES	YES
Company effects	NO	NO	NO
Constant	YES	YES	YES
R-square	0.32	0.31	0.32
F test			
N (companies)	77	83	83
N (company years)	375	405	405

Note: Standard errors in brackets: *= significant at 10% level, **=significant at 5% level, ***=significant at 1% level (t-tests).

Table 10. FG Index and CEO Turnover.

Model	1	2
Dependent Variable	CEO Change	CEO Change
Estimation methods	Clustered Logit	Clustered logit
Independent variables		
ROA (t-1)	-0.084*** (0.030)	0.0165 (0.069)
FG Index (t-1)	0.489** (0.245)	0.765** (0.325)
FG Index (t-1) * ROA (t-1)		-0.041* (0.023)
Company size (t-1) (log assets)	0.227 (0.160)	0.202 (0.160)
Company age (t-1)	-0.285 (0.289)	-0.317 (0.297)
Company leverage (D/E) (t-1)	0.200 (0.187)	0.207 (0.198)
Time effects	YES	YES
Industry effects	YES	YES
Company effects	NO	NO
Constant	YES	YES
Pseudo R2	0.167	0.180
Chisq test	37.07**	40.0**
N (companies)	343	343
N (company years)	94	94

Note. CEO change (dummy) equals 1 if there is a new CEO in a given year compared to the year before. Company Size (log assets), Company Leverage (D/E) and Company ROA have been winsorized.

Table 11. FG Index and Company Performance.

Robustness Tests. (Random effects with standard errors clustered by company)

Model	1	2	3	4
Dependent Variable	Sales Growth	Combined Performance Factor	ROA	ROA
Estimation	Clustered OLS	Clustered OLS	Clustered OLS	Clustered OLS
Independent Variables				
FG Index	7.935** (3.681)	0.228*** (0.070)	1.168** (0.449)	1.249*** (0.428)
Company assets (log)	-0.960 (1.971)	0.022 (0.040)	0.690** (0.305)	0.713** (0.271)
Company age (log)	-5.559 (3.685)	-0.080 (0.069)	-0.333 (0.447)	-0.237 (0.482)
Company leverage (d/e)			-0.968** (0.445)	
Company volatility (std dev of ROA)			-0.181 (0.209)	
Foundation CEO				-2.802** (1.313)
Time effects	YES	YES	YES	YES
Industry effects	YES	YES	YES	YES
Company effects	NO	NO	NO	NO
Constant	YES	YES	YES	YES
R-square	0.161	0.230	0.320	0.304
F test	2.27***	3.53***	8.02***	7.76***
N (companies)	91	91	109	110
N (company years)	333	333	524	526

The Combined Performance factor was constructed by factor analysis of sales growth and profitability (ROA).

Note: Standard errors in brackets: *= significant at 10% level, **=significant at 5% level, ***=significant at 1% level (t-tests). Company Size (log assets), Company Leverage (D/E) and Company ROA have been winsorized.

Figure 1. FG Index and Profitability

