The ties that bind:
family CEOs, management practices and firing costs

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Abstract: Family firms are the most prevalent firm type in the world, particularly in emerging economies. Although dynastic family firms tend to have lower productivity, what explains their underperformance is still an open question. We collect new data on CEO successions for over 900 firms in Latin America and Europe to document their corporate governance choices and provide the first causal evidence on the negative effect of dynastic CEO successions on the adoption of managerial structures tied to improved productivity. Specifically, we establish two key results and propose a novel mechanism. First, there is a preference for male heirs: when the founding CEO steps down they are 30pp more likely to keep control within the family when they have a son. Second, instrumenting with the gender of the founder's children, we estimate dynastic CEO successions lead to almost one standard deviations lower adoption of "best practices" managerial structures, suggesting an implied productivity decrease of up to 10%. To guide our discussion on mechanisms, we build a stylized model with two types of CEOs (family and professional) who decide whether to invest in better management practices. Family CEOs cannot credibly commit to disciplining employees without incurring reputation damage. This induces lower worker effort and reduces the returns to investing in management structures. We find empirical evidence that, controlling for lower knowledge and skill levels of managers, reputational costs constrain investment in productivity-enhancing management structures.[1]

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1 Introduction

Family ownership and control is the predominant type of firm governance structure across the world.[2] "Dynastic" family firms — where members of the founding family own a controlling share of the voting rights and have appointed a family member to serve as the CEO — account for up to a quarter of mid-sized manufacturing firms across countries. Although there is mixed evidence on whether dynastic family *ownership* is beneficial to firm outcomes [Bertrand and Schoar, 2006], the weight of the evidence suggests that dynastic family *control* — that is, appointing a family CEO — is detrimental to productivity [Bennedsen et al., 2007, Bertrand et al., 2008, Cai et al., 2013, Caselli and Gennaioli, 2013, Morck et al., 2000, Perez-Gonzales, 2006]. In this paper we propose that one channel leading to the under-performance of dynastic family firms is their internal organization and (lack of) structured management, and explore what might be the behind the organizational choices of these firms. We develop a new survey to collect detailed data on firm ownership and CEO succession in private manufacturing firms across 13 countries, and combine it with unique datasets on firm-level management structures and on firm outcomes that allow for a deeper understanding of the consequences dynastic family control.

Our analysis has two parts. First, we focus on the question of *whether* firms adopt structured management practices and present the first causal evidence that dynastic family firms adopt fewer of these practices. We start with documenting the relatively poorer performance of dynastic firms in terms of productivity and also lower adoption of structured management practices. Further, we show there is a positive relationship between structured management practices and productivity in both family and non-family firms. We address the endogeneity of CEO appointments in dynastic control successions using data on the family characteristics of the outgoing CEOs for 912 firms that had at least one succession from a sample of 13 countries. We exploit exogenous variation in the gender composition of the outgoing CEO's children as an instrument for dynastic CEO succession. Our results suggest that outgoing CEOs who, conditional on number of children, have at least one son are approximately 30 percentage points more likely to hand down the firm to a family member than those who had no male children. The IV results suggest that a succession to a family CEO leads to 0.96 standard deviations lower management score relative to firms with successions to non-family CEOs. Such management practices have been widely shown to positively affect productivity [Bloom et al., 2013, 2018, Bruhn et al., 2018, Gosnell et al., 2016] and the management deficit we estimate implies a productivity deficit of about 10%.

The second part of our analysis addresses the puzzle of *why* dynastic firms adopt fewer structured management practices, despite the clear link between these practices and higher productivity. Two mechanisms most often ascribed to the difficulty in implementing or-

[2] See [Faccio and Lang, 2002, La Porta et al., 1997, 1999] for a summary.

ganizational change relate to (a) lower levels of skill of family CEOs [Bennedsen et al., 2007, Bloom et al., 2013, Perez-Gonzales, 2006], and (b) lack of awareness of managerial underperformance [Gibbons and Roberts, 2013, Rivkin, 2000].[3] However, neither of these mechanisms reflect characteristics specific to family CEOs, or that may help explain systematic differences between the incentive structure of family and non-family CEOs. One well-established difference between firms run by each type of CEO is the strength of implicit employment commitments with workers. There is mounting empirical evidence that family firms treat their workers differently: they provide better job security as a compensating differential for lower wages [Bach and Serrano-Velarde, 2015, Bassanini et al., 2010], fare better in difficult labor relations settings [Mueler and Philippon, 2011] and provide more within-firm wage insurance [Ellul et al., 2014]. We interpret these findings from the literature as "implicit employment commitments" present in family firms.

We explore how such implicit employment commitments may affect the incentives for adoption of structured management practices in dynastic family firms, and build a stylized model to organize the discussion of the empirical evidence on this possible mechanism. In our model, we have two types of CEOs: family and non-family. All CEOs face an industry-specific cost of disciplining workers, but we assume family CEOs have an additional cost as a result of implicit commitments to the workers of their firms, where employees do not expect to be disciplined (for example, sanctioned or fired). There are two types of workers, high and low ability, who choose high or low effort. High ability workers exert high effort only when monitored, while low ability workers always exert low effort. We let structured management be analogous to adopting an improved monitoring technology that allows the CEO to observe (monitor) a worker's effort choice.

Our novel insight is linking this higher cost of disciplining to the family CEO's (dis)incentive to adopt structured management practices. In particular, we challenge the notion that family CEOs are necessarily not behaving optimally when choosing to adopt fewer structured management practices. Rather, as the objective function of a family CEO is not one of simple profit maximization,[4] analyses that fail to consider the impact on private benefit of control, including failing to account for potential negative workforce push-back of implementing structured management practices, lead to inaccurate conclusions about this unique (yet predominant) group of firms. We take our theoretical framework to the data and build proxies for the key parameters using data from a large firm-level data provider, BvD Orbis, and the World Management Survey (WMS). To measure firm-specific "reputation exposure", we build an indicator of eponymy for the full WMS dataset with ownership

[3] Bennett et al. [2015] show that skills and awareness alone fail to explain the full management gap in founder CEO firms, and we find a similar pattern when looking at dynastic family CEOs.

[4] But rather it includes maximizing the longevity of the firm, as well as personal and family utility. Gomez-Mejia et al. [2011]

data — that is, whether the firm bears the family name.[5] We measure industry-level costs of disciplining workers by aggregating the firm-level unionization rates measured by the WMS into 2-digit industry-level rates.

The model delivers two key predictions relevant for this paper. First, family firms with high reputation exposure will adopt fewer structured management practices: this is because the reputation exposure makes it relatively more costly to discipline workers and reduces the motivation to invest in structured management. Second, industries with higher costs of disciplining workers (i.e. higher labour power) will have fewer firms — under both types of CEOs — adopting structured management practices. This is because the higher common costs of disciplining workers reduce the incentive to invest in management practices for both types of CEOs. Using our rich combined dataset, we present a new set of supporting stylized facts that are consistent with these predictions.

This paper contributes to the literature on firm organization, process innovation, and their link to heterogeneity in firm outcomes. First, we add to the studies on the importance of family firms in the global economy. Beyond the cross-country works of La Porta et al. [1997, 1999], other studies have also documented the share of family firms in Europe [Claessens et al., 2000, Faccio and Lang, 2002, Iacovone et al., 2015], Asia [Cai et al., 2013], and the US [Anderson and Reeb, 2003]. We overcome the common limiting factor of data availability for private firms by hand-collecting new data and building first links across multiple rich datasets and show that dynastic family firms make up a substantial share of mid-sized manufacturing firms across the world. In terms of productivity, the literature focusing on the effect of family ownership — rather than control — offers mixed evidence, including findings of no relationship [Demsetz and Villalonga, 2001], an inverse-u relationship [Morck et al., 1988], a negative relationship [Caselli and Gennaioli, 2013, Miller et al., 2007, Morck et al., 2000, 2005] and a positive relationship [Anderson and Reeb, 2003, Claessens and Djankov, 1999, Khanna and Palepu, 2000, Sraer and Thesmar, 2007]. When considering the relationship between dynastic family *control* and productivity, however, it is clear that CEO "style" matters [Bertrand and Schoar, 2003] and the weight of the evidence points to a negative relationship between dynastic family CEOs and firm outcomes [Bandiera et al., 2012, Bertrand and Schoar, 2006, Bertrand et al., 2008, Cai et al., 2013, Claessens et al., 2002, Perez-Gonzales, 2006, Villalonga and Amit, 2006]. Closest to our study is Bennedsen et al. [2007], where the authors use a similar IV strategy to show a causal relationship between a succession to a family CEO and lower productivity in Denmark. We add to these results by considering the effect of dynastic CEO succession on the adoption of structured management practices, and also collecting the first such family characteristics data for firm managers of non-Scandinavian countries.

Second, we contribute to the literature on innovation in organizational processes —

[5] Belenzon et al. [2017] used eponymy as a measure of reputation for first-generation (founder-run) firms.

such as structured management practices — and productivity. Our paper bridges two sets of findings on the underperformance of family-run firms and the relationship between structured management and productivity: we suggest that the lower productivity outcomes of dynastic family firms could stem partially from their under-adoption of these management process innovations. A number of papers find large variations in management practices across firms are strongly associated with differences in performance [Bloom and Van Reenen, 2007, 2010, Bloom et al., 2013, 2015b, Giorcelli, 2016], and also that there are large differences in the quality of management across firms and CEO types [Bandiera et al., 2012, 2017, Bertrand and Schoar, 2003, Black and Lynch, 2001, Ichniowski et al., 1997, Kaplan and Sorensen, 2017].[6] We add to correlational evidence in Bloom et al. [2014] of this underperformance in dynastic family firm management by presenting the first causal estimates of the effect of a dynastic family CEO succession.

Third, we propose a novel mechanism behind the under-adoption of structured management and consider the role of implicit employment commitments empirically evident in family-run firms. This goes beyond the current hypotheses that the underperformance of family-run firms is a result of mainly CEOs' skill shortage [Bennedsen et al., 2007, Bennett et al., 2015, Bloom et al., 2013]. To be sure, we find evidence that family CEOs do have less formal education, but that this difference fails to fully explain family-run firms' underperformance. The literature suggests that family firms fare better in environments with difficult labour relations and provides evidence of stronger implicit employment commitments with employees via better job and wage security relative to non-family firms [Bach and Serrano-Velarde, 2015, Bassanini et al., 2010, Ellul et al., 2014, Mueler and Philippon, 2011]. We add to this literature by proposing that these implicit commitments act as a reputational constraint on the adoption of better management practices.

The remainder of this paper is organized as follows: Section 2 describes the key datasets used, characterizes the organizational choices of family firms, and, to motivate the following section, presents descriptive evidence on the relationship between management and productivity across family and non-family firms. Section 3 reports the empirical results of the causal relationship between a dynastic family CEO succession and adoption of structured management practices. Section 4 outlines a theoretical framework to guide the empirical analysis of possible mechanisms and presents empirical evidence in support of the model's predictions. Section 5 concludes.

[6] Further, Alexopoulos and Tombe [2012] estimates the effect of managerial process innovations on the economy and find a significant positive relationship between a managerial shock and aggregate output and productivity. In fact, they suggest that these innovations are "generally as important as non-managerial ones" in the macro context.

2 Data

2.1 Ownership and Control History data: The Ownership Survey

We designed and implemented a new survey to collect data on the full history of ownership and control changes in a firm from its inception — the Ownership Survey (OS).[7] For those firms that were founded by a single founder or founding family, we also collect information on their family characteristics and the family's involvement in the management of the firm; the first such detailed data for non-Scandinavian countries. To determine ownership, the interviewees are asked to describe who ultimately owns the firm, and the interviewer is instructed to probe enough to find out who the single largest shareholding is and whether they own more than 25% of the controlling shares.[8] In short, if the founder or the descendants of the founder own the firm and a family member is the CEO, we classify the firm under "family control".[9] If the shares of the firm are owned by one or many individuals and the CEO is not related to them, we classify the firm as "non-family control." If a firm is owned by a family but has a non-family CEO, we classify them under the "non-family control."

The sampling frame of the OS was the sample of firms interviewed in the World Management Survey (WMS), a cross-country data collection project described below. The sampling frame includes manufacturing firms with more than 50 employees. The OS pilot survey was carried out in 2013, and since then we have applied a portion of the questions alongside the 2014, 2015 and 2018 waves of the World Management Survey (WMS). We also hand-collected additional data and codified as many of the CEO information for previous waves of the WMS as possible. In the combined dataset, we have CEO information for 2710 firms across 18 countries, 1711 of which are not first-generation founder firms and have had at least one succession of control. Out of these firms, a total of 912 firms have had at least one succession that originated from a founder or family CEO as well as full information on the family history of the outgoing CEOs (920 succession points in total). This latter sample is the one we use for the IV analysis. Table **??** shows the distribution of ownership and control across the firms in the OS sample, while Table A4 shows the full

[7] Existing M&A databases, such as Zephyr and SDC Platinum only collect data on changes in *ownership* rather than changes in control. Fons-Rosen et al. [2008] have created a combined panel dataset using Zephyr data, and Bena et al. [2008] also developed an algorithm to create a Pyramid Ownership Structures dataset. Beyond the Scandinavian matched census datasets, however, there are no datasets that we are aware of that collect data on successions of *control* (rather than simply ownership), and include family characteristics of CEOs. More information on www.ownershipsurvey.org.

[8] We use the "25% of voting shares" threshold for majority ownership following what other firm surveys such as the World Management Survey and the Executive Time Use survey have done, though it is a higher bar than La Porta et al. [1997] set at 10%. Table A3 gives an overview of the ownership categories.

[9] Likewise, if a firm was sold to another entity (person or another family), and that entity (the new owner or a family member of the new owner) holds the CEO position, the firm would also be classified under "family control", though there were only two instances of this.

sample sizes by country and region.

Starting from the full WMS sample of over 10,000 firms, Figure 1 presents a description of ownership structures in mid-sized firms across 36 countries. Two key observations emerging from this graph are: (i) middle- and low-income countries have a much higher share of family firms; (ii) when looking at mid-sized firm range, the firm size distribution is not particularly different across countries, as evidenced by the similar circle sizes representing median firm size. Figure 2, in turn, uses only data from founder- and family-owned firms and disaggregates the share of firms controlled by each of three types of CEOs: first generation founder CEOs, second generation dynastic family CEOs and non-family CEOs. Nearly 70% of firms in Asia and Africa are first-generation, while the share is lower in Latin America and much lower in OECD countries. In the latter two regions there is a higher share of dynastic family CEO firms, with such firms accounting for 42% and 52% of firms in each region respectively. Non-family CEOs are not common in family firms, but they tend to appear more in European and Anglo-Saxon firms than elsewhere, as predicted by Burkart and Panunzi [2006].

2.2 Organizational data: the World Management Survey

The World Management Survey is a unique dataset that includes levels of structured management practices from over 10,000 manufacturing firms collected from 2004 to 2018 across 36 countries. The WMS methodology uses double-blind surveys to collect data on firms' adoption of structured management practices and focuses on medium- and large-sized firms, selecting a sample of firms with employment of between 50 and 5,000 employees.[10] The median firm size across countries ranges between 200 and 300 employees.

The WMS uses an interview-based evaluation tool, initially developed by an international consulting firm, that defines and scores a set of 18 basic management practices on a scoring grid ranging from one ("little/no formal practices") to five ("best practice"). A high score represents a best practice in the sense that a firm that adopts the practice will, on average, increase their productivity. The combination of many of these indicators reflects "good formal structured management practices" as commonly understood, and our main measure of management in this paper represents the average of these 18 scores. The tool can be interpreted as measuring the level of structured managerial practices in three broad areas: operations and monitoring, target-setting and people management practices.

The survey measures the extent to which these managerial structures are implemented in the firm, asking managers to describe their practices through open-ended questions rather than inviting their opinion. Analysts then independently evaluate these practices systematically on a set scale. Thus, the survey captures the degree of adoption and usage

[10]The WMS methodology was first described in Bloom and Van Reenen [2007]. Survey instrument available at `www.worldmanagementsurvey.org`.

rather than the manager's opinions and abstracts from possible mood influences of individual managers. Beyond the key measure of managerial structures at the plant level, the survey also collects a wealth of information on the firm, including firm location, size, and other organizational features. While the WMS does not collect performance data, it has firm identifiers that allow for matching with external databases such as Bureau van Dijk (Orbis and Amadeus), Compustat and individual statistical agencies. A more thorough description of the WMS is provided in Appendix B.2.

To build the management index we follow the original paper with this data Bloom and Van Reenen [2007] and create z-scores for each of the 18 ordinal management practices, then take the average across them and again take the z-score of this sum to proxy for level of structured management practices. We refer to this variable as "z-management" in all our regression tables and interpret the coefficients in terms of standard deviations of management.[11] The standard deviation of the full WMS sample is approximately 0.66 points.

3 Dynastic family firms, productivity and management practices

We start with exploring whether structured management practices matter for family firms, or whether there is something different about these types of firms that make such managerial structures less useful in terms of productivity. There is abundant evidence that practices matter in family-run firms as much as they matter in non-family firms. The best evidence to date on the topic is the experimental study in Bloom et al. [2013] with firms in India, all of which were family firms. They find that the treated firms who adopted a set of management structures recommended by an international consulting firm improved their productivity by 17% in the first year, and improved likelihood of expansion.[12] To supplement these experimental findings, we present evidence on the correlational relationship between ownership and firm performance for a cross-sectional sample of over 6000 primarily European firms as well as a panel sample of over 500 Brazilian firms in Appendix A.

The results suggest that there is a meaningful relationship between management and productivity across a range of countries, for both the samples of family and non-family firms. We take the combined evidence to suggest that improvements to the management structures we measure here are likely to improve firm performance — even in family firms. This should appease concerns that there is something happening within the organization of family firms that makes such practices irrelevant. Rather, we suggest that the lower

[11] We have tested the results using the Principal Component in place of the average, and the results are robust.

[12] For a look at the long-term impacts, see Bloom et al. [2018]

level of adoption of these structured management practices could be a reason behind the poor productivity performance of family firms vs. non-family firms documented elsewhere in the literature.

3.1 Family CEOs and management structures: descriptive evidence

Starting with a non-parametric look at the data, Figure 3 shows the cumulative distribution of management quality for family firms led by a family CEO, family firms led by a non-family CEO and non-family firms. The Kolmogorov-Smirnov test of equality of distributions suggests that the distribution of management quality in non-family firms is not statistically different from the distribution of management quality in family owned firms led by a non-family CEO. The test also suggests that both distributions are statistically different from the family-owned and -run distribution of management. A number of factors could be driving this relationship. For example, if only the worst firms have family CEOs because nobody except a family member would accept running the firm, we would see this pattern but it would not be caused by the family CEO. To overcome this limitation of a simple correlational analysis, in this section we use an instrumental variables approach to explore the question of whether worse management is indeed a consequence of a succession to a family CEO.

For this part of the analysis, we use the firms in our Ownership Survey sample that have had at least one succession of control and were founded by a family. Table 1 shows the main descriptive statistics of the sample of firms used, and the difference in means between family and non-family firms. As the literature suggests that the "family behind the family firm" drives important differences in firm governance [Bertrand and Schoar, 2006, Bertrand et al., 2008], we turn first to the family characteristics of the outgoing CEO. We see evidence that the characteristics of the former CEO's children in family vs. non-family firms are significantly different from each other. On average, outgoing CEOs of firms that switched to non-family control are likely to have fewer children and likely to have fewer sons. However, conditional on the first child being male, the average number of children (family size) is not statistically different between the two groups. Table **??** in the Appendix reports the summary statistics for the key dependent and independent variables in our empirical model in more detail.

We first use the full World Management Survey dataset and run the OLS model below, and subsequently restrict our sample to only firms that have had at least one succession of control and use an IV approach. We report this exercise to be explicit about the sample we use in our dynastic firm analysis relative to the full random sample of firms in the WMS. The OLS results are reported in Table 2.

$$M_{isc} = \alpha + \boldsymbol{\beta_1'}\mathbf{Family_{isc}} + \boldsymbol{\beta_2'}\mathbf{NonFamily_{isc}} + \boldsymbol{\theta' V_i} + \omega_s + \delta_c + u_{isc} \quad (1)$$

where M_{isc} is the z-scored management index for firm i in industry s in country c. $\mathbf{Family_{isc}}$ and $\mathbf{NonFamily_{isc}}$ are vectors of dummy variables indicating five ownership and control categories broken down as follows: family firms are subdivided into "dynastic (2+ gen) family CEO" and "founder (1st gen) CEO," while non-family firms are subdivided into "privately owned, professional CEO" and "family owned, professional CEO."[13] The reference category omitted here is "dispersed shareholders". $\mathbf{V_i}$ is a vector of controls for firm i, including the log of the number of employees, log of firm age and a dummy variable for multinational status. The survey noise controls are a set of interviewer dummies, manager's tenure, day of week, survey year and interview duration. We also include country and industry fixed effects.

Columns (1) and (2) use the full WMS sample. Column (1) shows the baseline relationship between the sub-categories and management excluding all controls, while Column (2) includes industry, firm and noise controls. The industry controls only slightly reduce the coefficients, but firm and noise controls account for a more substantial share of the variation. The estimates in Column (2) suggest that the average family owned, family CEO firm has 0.269 standard deviations worse management than the average dispersed shareholder firm. The average founder owned, founder CEO firm has 0.326 standard deviations worse management than the average dispersed shareholder firm. We also observe that firms with non-family CEOs, either family or privately owned, are also worse managed than dispersed shareholder firms but better managed than firms with family CEOs.

We include a parameter test of the equality of coefficients within and between the two broader categories of firm control and provide results at the bottom of the table. We first test the equality of the coefficients within each category of control, that is, a comparison of (i) dynastic family CEO and founder CEO; and of (ii) family owned, non-family CEO and privately owned, non-family CEO, showing that much of the difference between professionally-managed firms is accounted for by firm and industry controls. There are still significant differences, however, between family-run firms and non-family-run firms.

Columns (3) is restricted to only the countries that are also used in the IV analysis below, and Column (4) uses only the firms within these countries that are included in the IV specification. The sample we use for our IV approach is based on there being at least one *change in CEO* (or, succession of control) and also for which we have enough family history data (that is, data on our instrumental variables). All considered, our final dataset is a cross-section of 920 successions from 912 firms, where we have information on the

[13] We refer to non-family CEOs as professional CEOs not to discredit family CEOs who are also professional CEOs, but rather to be clear about what we are considering the primary identity of each firm leader.

outgoing CEO's family characteristics (that is, a $t-1$ family information).

The coefficients in Column (4) are similar to those in Column (3). The exception is that the coefficient on family owned, non-family CEO firms is no longer significantly different from dispersed shareholder firms, though this might be reflecting a noisier estimate as a result of the lower number of this type of firm in the particular subset of countries we study.

The purpose of this exercise is to show that the pattern of lower adoption of structured management practices in dynastic family CEO firms is persistent across several subsamples of the data. The coefficient in Column (4) suggests that family-controlled firms in our analysis sample have, on average, 0.23 standard deviations worse management than dispersed shareholder firms. This is equivalent to about 35% of the standard deviation in the full management dataset.

3.2 Causal evidence: Instrumental Variables approach

It is not clear ex-ante which direction the OLS bias could run. On the one hand, if the firm is able to stay alive as a family controlled firm in a competitive environment, there is likely some positive productivity shock that both drives CEO choice and their choice of management practices. On the other hand, if only the worst firms are passed down to family CEOs because no non-family CEO would accept taking the job, we would expect a negative bias. There could also be reverse causality, as different control structures — say, less concentrated control — could lead firms to adopt more structured management practices, but it is also possible that more structured management in turn allows firms to transition to control structures with, say, less concentration of control at the top. In short, it is difficult to pin down the real effect of family control on firm performance and organization from an OLS analysis.

Thus, we explore the gender composition of the children of the outgoing owner-CEO of dynastic firms as a source of variation in family control that is exogenous to the adoption of management practices. We use three main variations of this instrument: (a) a dummy variable for whether there was at least one son among the children, conditional on the number of children (b) the number of sons, conditional on number of children, and (c) a dummy variable for whether the first child was male. The rationale is that if the owner-CEO has a male child he is more likely to keep the firm under family control.[14] The gender of the first child instrument has been used by Bennedsen et al. [2007] with Danish data of family firms CEOs, for example.[15]

[14] We say 'he' throughout because the vast majority of founder/family owners and CEOs in our sample are, in fact, male.

[15] In the context of the countries in our sample, where larger families are the norm, whether the first child is male or female is less predictive of family succession than whether at least one child out of the full

By design, this IV strategy requires that at least one succession of power has taken place. Essentially, we are comparing "stayers" with "switchers": the "stayers" are firms that stay in family control, while the "switchers" are firms that were founded by a founder/founding family, but have since "switched" into non-family control (where the CEO is not related through family ties to the majority shareholders of the firm). We use the measure of managerial structures adopted that is contemporaneous with the CEO presiding during that time, and the information on the gender of the preceding CEO's children as the identifying variation.

The dependent variable of the first stage of our two stage least squares (2SLS) strategy is $FamilyCEO_i$, a dummy variable that takes a value of 1 when the firm has a dynastic family CEO and 0 when it does not. The first instrument, $HADSONS_i$ is a dummy variable that takes a value of 1 if the outgoing CEO had at least one son. The second instrument, $SONS_i$ is the number of sons the outgoing CEO had, entered as a step function. The third instrument, $FIRSTSON_i$, is a dummy variable that takes a value of 1 if the outgoing CEO had a male first child and 0 if not. $\boldsymbol{X_i}$ is the vector of firm controls. The first stage equations are as follows:

$$\begin{aligned} FamilyCEO_i &= \alpha_A + \rho_A HADSONS_i + \vartheta_A children_i + \boldsymbol{\eta'_A X_i} + \nu_{A,i} \\ FamilyCEO_i &= \alpha_B + \sum_{j=1}^{3} \rho_j SONS_j + \vartheta_B children_i + \boldsymbol{\eta'_B X_i} + \nu_{B,i} \\ FamilyCEO_i &= \alpha_C + \rho_C FIRSTSON_i + \boldsymbol{\eta'_C X_i} + \nu_{C,i} \end{aligned} \tag{2}$$

The second stage regression of the effect of dynastic family succession on the adoption of structured management practices is:

$$M_i = \alpha_D + \beta_D \widehat{FamilyCEO_i} + \vartheta_D children_i + \boldsymbol{\phi' X_i} + \epsilon_i \tag{3}$$

where M_i is a measure of managerial structures in the firm, $\widehat{FamilyCEO_i}$ is the predicted value from the first stage regression and $\boldsymbol{X_i}$ is the set of firm-level controls. The coefficient of interest is β_D: the effect of dynastic family control on the adoption of structured management practices. Table 3 shows a summary of the OLS and IV results. Column (1) repeats the OLS regression in Table 2 for ease of exposition. Column (2) shows the reduced form using the instrument from our preferred IV specification.

The bottom panel of table 3 shows the first stage results for the three main instruments we use in Columns (3) to (5), and repeats the results for the instrument with the most straightforward interpretation — whether there was at least one son, conditional on number of children — in Columns (6) to (8). Column (3) of table 3 suggests that, controlling for

set of children is male.

number of children, a firm is approximately 30 percentage points more likely to have a succession to a family CEO if the previous CEO had at least one son. The Kleibergen-Paap Wald F-statistic test for weak instruments is 23.78, well above the Stock and Yogo [2005] 10% maximal IV size critical value (reported in the table for comparison). This suggests that the largest relative bias of the 2SLS estimator relative to OLS for our preferred specification is 10%.[16]

Column (4) shows the results of using the number of sons as an IV, entered as a step function with a dummy variable for each number of sons. The coefficients and significance levels are similar to those of the "had sons" IV in Column (3), predicting an approximate 29 percentage points likelihood of a firm staying in the family if there is exactly one son in the family, and similarly for higher numbers of sons. Because we have multiple instruments here we report the Sargan-Hansen test of over-identifying restrictions resulting Hansen's J statistic (because of the clustered standard errors) and corresponding p-value. We cannot reject the joint null hypothesis that the instruments are valid. However, this specification seems to have weaker instruments than our preferred specification as suggested by the lower Kleibergen-Paap Wald F-statistic of approximately 8.3.

In Column (5) we use the gender of the first child as the instrument. The coefficient suggests that having a male first child is associated with an approximately 15 percentage points higher probability of the firm remaining under the control of a family CEO. Considering the weak instruments test, the Kleibergen-Paap statistic sits between the specifications in Columns (3) and (4) with a statistic of 19.97. Although the gender of the first child would, in principle, be the most "random" instrument of our set, it is less informative than the other instrument sets because the majority of outgoing CEOs in our sample had multiple children (Table 1). Thus, our preferred specification is the one in Column (3), where we argue that, conditional on the number of children the outgoing CEO had, whether at least one was a son is as good as random. We expand on this argument below.

Turning to the top panel of table 3 shows the second stage results, along with the OLS results and reduced form. The results in Column (3) suggest that a succession to a family CEO leads to 0.96 standard deviations worse management practices, significant at the 5% level. The coefficients of the different iterations of the IVs are similar to each other, and not statistically different. Although the coefficient in Column (5) is not significant, the sign and magnitude of the coefficient are broadly consistent with that of the other iterations of the instrument, albeit quite imprecisely estimated.

In Columns (6) to (8) we break down the WMS management score into its three main

[16]The Kleibergen-Paap Wald statistic [Kleibergen, 2002, Kleibergen and Paap, 2006] is the heteroskedasticity-robust analogue to the first-stage F-statistic, and we report this value because we use clustered standard errors at the firm level. Although there are no critical values specifically for the K-P statistic, Baum et al. [2007] suggests that the Stock and Yogo [2005] critical values for the Cragg-Donald Wald F-statistic could be used and thus we report them here to facilitate comparison.

components, including operations and monitoring, target setting and people management. We see that the coefficients are broadly consistent with the overall management measure, suggesting the negative relationship between a family succession of control and management is not likely to be driven by any one particular sub-area of management, but rather is a more general effect. Table A5 in the Appendix repeats the analysis including sampling weights and different functional forms of the instrumental variables; the results are broadly consistent in terms of coefficient magnitude and direction of sign.

3.2.1 Instrument informativeness

The results from the first stage are economically meaningful and statistically significant, suggesting our instruments are informative. The strongest instrument we have is the dummy variable for whether the outgoing CEO had at least one son, conditional on the total number of children. In contrast to prior literature, we find that in the countries that we study, the gender of the *first child* is not as strong a predictor of family succession, with a male first child predicting only a 15 percentage points higher chance of family control. Figure 4 breaks down the firm control succession by the number of sons of the former CEO, providing a "visual first stage" and reinforcing the idea that outgoing CEOs who had at least one son are more likely to pass control of the firm dynastically.

3.2.2 Exclusion restriction

The identifying assumption is that the gender of the CEO's children is not directly related to any part of our measure of adoption of structured management practices. In our preferred specification, one concern is that CEOs who preferred male heirs could continue having children until they "successfully" had a son to pass the firm to. The exclusion restriction would not hold if this desire for a male heir led both to a larger family (more sons) and also to systematically more (or fewer) managerial structures. We address this potential issue in two ways.

First, we consider the relationship between desire for a male child and total number of children. At the time of data collection, all CEOs had completed their family size choices, which allows us to consider whether there is evidence of gender-picking in the sample. If the founders in our sample made family size decisions based on a desire to have at least one son, we could expect family sizes to be smaller if the first child was "successfully" male. Figure 5 plots the distribution of number of children conditional on the first child being male or female and shows that selectivity of family size based on the gender of the children is not much of a concern in the historically catholic countries studied here (the p-value of the Kolmogorov Smirnov test of equality of distributions is 0.955).[17]

[17]See [Bassi and Rasul, 2017] for evidence on faith-based fertility decisions in Brazil, for example. For

Second, we argue that the level managerial structures is not directly vulnerable to biases related to higher effort. It is plausible that founders who were determined to conceive a male heir to take on the family business may also put in more effort in their business. This could be a problem when looking at outcomes that could be affected more directly by a CEO's higher effort (i.e. time spent) to leave a legacy to their children — such as sales or profits. Management, however, is an outcome that simple CEO effort or sheer determination has a much less straightforward effect on, as drivers of better management are not as simple as spending more time at work. Although it could be that more devoted CEOs also spend more time to increase their own levels of education — noted in Bloom et al. [2014] as one of the drivers of structured management — it is unclear it would yield large enough changes in the short run that would upset the validity of our IV.[18]

As additional evidence, we can exploit a set of firms in the WMS for which there is panel data covering a change in ownership and control between survey waves. Figure 6 uses data only for firms that had a change from founder ownership and control into either a dynastic or non-dynastic succession. Panel A ($t = 0$) shows that the management score for both types of ownership changes were not statistically different when they were founder controlled. Panel B ($t = 1$) shows that firms which had a non-dynastic succession improved their management score by more than twice as much as firms with the dynastic succession. This suggests that founders are not likely to be putting in differential effort into their management structures relative to the future succession decisions.

4 Mechanisms: why do dynastic family firms adopt fewer best practices?

The result that dynastic family CEO firms adopt fewer productivity-enhancing management structures leaves us with a puzzle. If the management structures we study lead to better firm performance, why are firms not adopting them? Though there are a number of barriers to organizational change, two mechanisms in particular are often ascribed to family firms: lower levels of skill of family CEOs [Bennedsen et al., 2007, Bloom et al., 2013, Perez-Gonzales, 2006], and lack of awareness of managerial underperformance [Gib-

a sub-sample of families, we have the order of the gender of the children and could run a model to check for stopping rules: that is, whether the probability of the last child being male or female was related to the first child being male or female. We do not find evidence of stopping rules in this sample. In terms of the IV specification using the gender of the first child, this is rather "purely" random since the countries we are including in the analysis do not have histories of selective abortion or infanticide.

[18] See Bandiera et al. [2012] for evidence on CEO time use. New evidence in *Lemos, (mimeo)* suggests that the effect of quality and quantity of tertiary education on management is significant, but small. Bloom et al. [2013] note that one of the reasons firm owners in their Indian experiment were not adopting better management practices was lack of information — they simply did not know that they were poorly managed or how to adopt these practices.

bons and Roberts, 2013, Rivkin, 2000]. Bennett et al. [2015] show that skills and awareness alone fail to explain the full gap in management underperformance of firms run by founder CEOs, and we find a similar pattern when looking at dynastic family CEOs.

The WMS includes two relevant measures of awareness and skills. The first proxy variable comes from a self-scoring question asked at the end of the WMS interview: "On a scale of 1 to 10 and excluding yourself, how well managed do you think the rest of your firm is?" The answer is then re-scaled to match the 1 to 5 scale of the WMS. The second proxy variable is an indicator for whether the manager has a college degree. The results suggest that although both proxy variables are correlated with better management, both fail to explain much of the gap in management quality in dynastic family firms. However, neither of these potential mechanisms reflect fundamental characteristics of family CEOs that may help explain systematic differences between the incentive structure of family and non-family CEOs. One well-established difference between firms run by each type of CEO relates to the strength of implicit employment commitments with workers of their firms, for example, family firms provide better job security as a compensating differential for lower wages [Bach and Serrano-Velarde, 2015, Bassanini et al., 2010], fare better in difficult labor relations settings [Mueler and Philippon, 2011] and provide more within-firm wage insurance [Ellul et al., 2014]. In this section we explore how these implicit commitments may affect the incentives for adoption of structured management practices using a stylized model to organize our discussion of the empirical evidence on this possible mechanism.

4.1 Model: dynastic family CEOs and reputation exposure

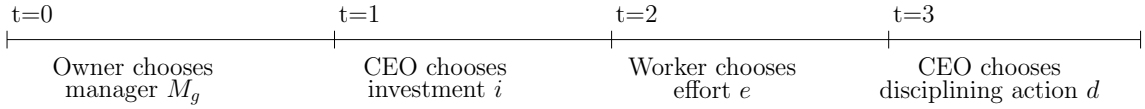
Consider a game with three players: the owner, the CEO and the worker. An action set for an owner is a binary choice $Mg \in \{PRO, FAM\}$, where $Mg = PRO$ means the owner hires a non-family CEO (henceforth, professional CEO), and $Mg = FAM$ means the owner choses to manage the firm herself and acts as a family CEO.

An action for a CEO is a pair: an investment choice, i, and a disciplining choice, d. The investment choice is a binary investment choice $i \in \{i_y, i_n\}$, where $i = i_y$ denotes investment in the monitoring technology (i.e. adopting structured management practices) and $i = i_n$ denotes no investment. The disciplining choice is a binary choice $d \in \{D_K, D_L\}$, where $d = D_K$ denotes keeping the worker, and $d = D_L$ denotes disciplining the worker. An action for worker is a binary effort choice, $e \in \{\overline{e}, \underline{e}\}$. The worker is hired by the CEO and is not a family member.

The worker can be of high or low ability: high ability workers have low cost of effort and will opportunistically choose to exert low effort (shirk) depending on the chance of getting caught. Low ability workers have high cost of effort and will never choose high effort. For any given industry, there is a share of workers η who will be of high ability, and

a share of workers $(1-\eta)$ that will be of low ability.

The model's timeline of the order of the actions is presented below. Consider a firm owner at $t = 0$, and the owner moves first to choose a manager (family or professional). At $t = 1$, the appointed CEO chooses whether to invest in a monitoring technology or not. At $t = 2$ the workers decide whether to exert effort. At $t = 3$ production is realized and total profits generated. The CEO then decides whether to keep or fire workers and final payoffs are realized.



All decisions by the owner and the CEOs are public information. The worker's effort choice is observable by the CEO only if the CEO invested in the monitoring technology, otherwise the worker's decisions are private. Individual worker ability is private information, but within each industry the share of workers who are high ability, η, is public information.

Although investing in monitoring technology allows the CEO to observe the worker's effort level, the technology has a fixed cost and it is only worth adopting if the CEO uses the information to discipline (fire) the low-effort workers. All CEOs incur a fixed "industry cost" of disciplining workers, but the family CEO also has an implicit commitment with their workers that implies an additional cost of disciplining. The model does not assume that professional CEOs are of higher ability than family CEOs, distinguishing this model from others such as Burkart and Panunzi [2006]. This model allows CEOs to be of similar ability and consider alternative explanations behind the observed lower levels of profitability under the assumption that they are making rational and informed choices.[19] Here, profits are a function of worker effort and are higher when CEOs invest in monitoring because it induces higher worker effort.[20]

4.1.1 Payoffs

Workers The payoff of a worker is a function of effort, wages and the disciplining decision of the CEO. Let the utility function for the worker be:

[19] Conceptually, the model includes a cost of adoption of the management technology, m that is assumed to be equal across family and non-family CEOs. If we allow m to have a distribution that differs across CEO types, it is possible to take into account skills as well. It would only exacerbate the results of the model, rather than change the direction of the effects.

[20] It abstracts from the possibility that workers in family firms can have intrinsic motivation at this point. **?** find evidence that workers in family firms have lower absenteeism, possibly evidence of intrinsic motivation. This is an extension that we can explore in the future, and we return to this in the discussion of results.

$$u_w = \begin{cases} W & & \text{if } e = \underline{e} \quad \text{and} \quad d = D_K \\ W - c_e & & \text{if } e = \overline{e} \quad \text{and} \quad d = D_K \\ W & - \ell_w & \text{if } e = \underline{e} \quad \text{and} \quad d = D_L \\ W - c_e & - \ell_w & \text{if } e = \overline{e} \quad \text{and} \quad d = D_L \end{cases} \tag{4}$$

where W is the worker wage, c_e is the cost of effort if the worker chooses to exert effort ($e = \overline{e}$), and ℓ_w is the fixed utility cost of being laid off if the CEO chooses $d = D_L$.

CEOs The payoffs are specified for the family CEO and the professional CEO separately below, but note how they follow the same structure. Let the cost of disciplining workers that is common to all CEOs be exogenously set at ℓ_c, let us call it the "industry cost". Family CEOs incur an additional cost of disciplining workers, f, based on the firm reputation exposure. Let the cost of investment in the monitoring technology be m. Let firm profits be a function of worker effort: $\pi(e)$.

Professional CEO: Professional CEOs are paid a share of profits, $\lambda\pi(e)$, as their compensation. λ is exogenously set. The professional CEO's cost of effort in running the firm is embedded in the contract design and the "wage" she has accepted the contract at. The payoff of a professional CEO is a function of wages $\lambda\pi(e)$, cost of adopting management m, and cost of disciplining workers ℓ_c.[21]

$$u_{pro} = \begin{cases} \lambda\pi(e) & & \text{if } d = D_K \text{ and } i = i_n \\ \lambda\pi(e) - \ell_c & & \text{if } d = D_L \text{ and } i = i_n \\ \lambda\pi(e) & - m & \text{if } d = D_K \text{ and } i = i_y \\ \lambda\pi(e) - \ell_c & - m & \text{if } d = D_L \text{ and } i = i_y \end{cases} \tag{5}$$

Family CEO: The family CEO incurs a cost of effort of running the firm $c_{Mg} \in [0, 1]$, but unlike the professional CEO she also accrues a private utility benefit from controlling her family firm, $B \in [0, 1]$. Let Γ be the net utility cost of control: $\Gamma = c_{Mg} - B \in [-1, 1]$.

Because of the implicit commitments to employees, the family CEO incurs an additional cost of disciplining workers: a firm reputation exposure f. The payoff of a family CEO is a function of the profits of the firm $\pi(e)$, the cost of control Γ, the cost of the investment choice, m, and the total costs of disciplining workers, $\ell_c + f$:

[21] The cost of adopting the monitoring technology m is incurred by CEO rather the firm as she is the executive in charge of pushing changes through.

$$u_{fam} = \begin{cases} \pi(e) & & & \text{if } d = D_K \text{ and } i = i_n \\ \pi(e) - (\ell_c + f) & & & \text{if } d = D_L \text{ and } i = i_n \\ \pi(e) & - m & - \Gamma & \text{if } d = D_K \text{ and } i = i_y \\ \pi(e) - (\ell_c + f) & - m & - \Gamma & \text{if } d = D_L \text{ and } i = i_y \end{cases} \tag{6}$$

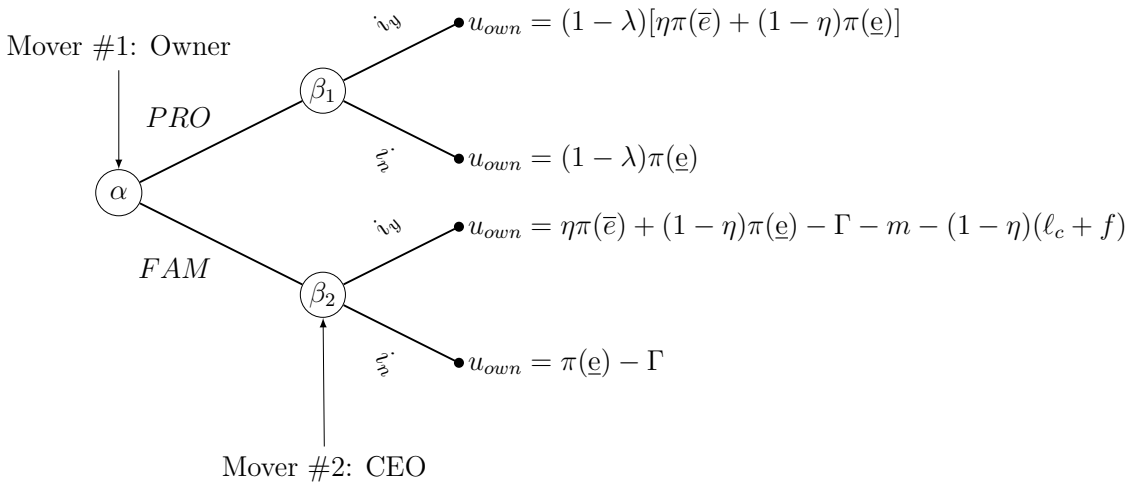
In short, the two types of CEOs face the same payoff structure, but family CEOs have a set value of $\lambda = 1$, and professional CEOs have set values of $f = 0$ and $\Gamma = 0$.

Owner The family firm owner's payoffs are the family CEO's if she chooses to manage the firm herself, $Mg = FAM$, and the share of leftover profits if she chooses $Mg = PRO$:

$$u_{own} = \begin{cases} \pi(e) & & & \text{if } Mg = FAM,\ d = D_K \text{ and } i = i_n \\ \pi(e) - (\ell_c + f) & & & \text{if } Mg = FAM,\ d = D_L \text{ and } i = i_n \\ \pi(e) & - \Gamma - m & & \text{if } Mg = FAM,\ d = D_K \text{ and } i = i_y \\ \pi(e) - (\ell_c + f) & - \Gamma - m & & \text{if } Mg = FAM,\ d = D_L \text{ and } i = i_y \\ (1 - \lambda)\pi(e) & & & \text{if } Mg = PRO \end{cases} \tag{7}$$

4.2 Equilibrium: backward induction

The model is solved by backward induction in Appendix C.2. We reproduce here the last step of the game, the owner's choice, which depends on the utility the owner would get if she acted as family CEO, versus the utility she would get from receiving the profits achieved by the professional CEO. The tree below shows the owner's payoffs at each terminal node if we substitute in the subgame perfect equilibria at each node.



The owner's decision depends on whether she would choose investment or no investment given a set of parameters, as well as her opportunity cost, which depends on the professional CEO's investment decision. There are four possible set of parameters that determine the space for four equilibria: the CEO can be a professional or a family type, and each can reach an equilibrium where they invest in monitoring and one where they do not. Each of the cases and possible equilibria are described below. There will be three threshold values that determine the parameter space based on the utility functions above, defined here to simplify notation. Given an industry ability share η, cost of hiring a professional CEO λ, cost of investing in monitoring m and $\Delta\pi = \pi(\overline{e}) - \pi(\underline{e})$, the thresholds are:

$$\text{Cost of disciplining for the professional CEO:} \quad \overline{L_p} = \frac{\eta\lambda\Delta\pi - m}{1-\eta}$$

$$\text{Cost of disciplining for the family CEO:} \quad \overline{L_f} = \frac{\eta\Delta\pi - m}{1-\eta}$$

$$\text{Net cost of control for the owner:} \quad \overline{\Gamma} = \frac{\lambda\pi(\underline{e})}{1-\eta}$$

Figure 7 depicts the four possible parameter regions for each equilibria, and are color coded such that family CEO is shown in green shades and professional CEO is shown in blue shades; investment is shown in darker shades and no investment in lighter shades. The purpose of this figure is simply to serve as a visual guide for the four cases described below, and the values $\eta = 0.5$ and $\lambda = 0.3$ are imposed here for this example.[22] The four cases are:

(a) both CEO types choose to invest in monitoring;

[22]This implies half of the workforce is high ability and the share of profits that need to be paid in wages to the professional CEO is 30%.

(b) neither CEO type chooses to invest in monitoring;

(c) only the professional CEO chooses to invest in monitoring;

(d) only the family CEO chooses to invest in monitoring.

4.3 Mechanisms: discussion and interpretation

This simple model yields three main relevant predictions. To characterize the predictions and consider whether they are consistent with empirical evidence, we present a series of stylized facts using a combination of the WMS and BvD Orbis. In this section we proxy for investment in worker monitoring with the sub-index of the WMS measure of management that focuses on people management rather than the full management index. The people management score measures the adoption of practices relating to monitoring, selection and worker reward within the firm.

Prediction 1: *Family CEO firms with high reputation exposure will adopt fewer structured management practices.*

The model assumes that family CEOs face a cost (f) of disciplining workers owing to the implicit commitment to workers within family firms. Conceptually, investing in monitoring is only useful it if the extra information garnered from the investment will be used and there can be credible commitment that it will result in disciplining the low effort workers. Thus, we expect to see family CEO firms with relatively higher reputation exposure investing less in monitoring relative to family CEO firms with higher reputation exposure.

One proxy for reputation exposure is whether the firm is an eponymous firm — that is, whether the firm bears the founding family's name — as there is evidence that eponymy in family firms is linked to both reputation benefits and costs Belenzon et al. [2017]. Using the full WMS dataset of family firms that could be matched with Directors names in the BvD Orbis database, we show the cumulative distribution function for people management for eponymous and non-eponymous family firms in Figure 8. The CDF for non-eponymous firms stochastically dominates the distribution for eponymous firms (Kolmogorov-Smirnov test of equality has a p-value of 0.0105), suggesting eponymous firms have fewer people management practices, consistent with the model's prediction.

Table 4 summarizes the empirical support for this prediction. Columns (1) and (2) show the reduced form results of a dynastic family firm dummy on overall management practices, and columns (4) and (5) and (7) and (8) repeat the exercise for only the people management index and the operations management index.[23] Column (1) shows that a dy-

[23]Note that for this analysis we use the full WMS dataset, though only include firms for which we could match CEO/board member names to the firm names from BvD Orbis.

nastic family firm adopts 0.14 standard deviations fewer structured management practices, and the coefficient barely moves when the skills and knowledge proxies are included. In Column (3) we split the dynastic firm dummy into two: *eponymous* dynastic firms and *non-eponymous* dynastic firms. The results suggest that the negative relationship between the adoption of overall structured practices is being driven by the eponymous dynastic firms. Though both are negative and statistically significant, the eponymous dynastic firms coefficient is significantly different from the non-eponymous dynastic firms coefficient at the 10% level (p-value 0.066).

However, the model suggests that the lower adoption of structured management practices in firms with higher reputation exposure is likely to go through people management practices; thus, we break the management index into its people management and operation management components. Consistent with the prediction of the model, Column (6) suggests that the lower adoption of structured people management practices is driven by eponymous dynastic firms. The non-eponymous coefficient is not significant, and is statistically different from the eponymous coefficient at the 10% level (p-value 0.075). Finally, we also see a difference between eponymous and non-eponymous coefficients in operations management, though they are marginally not statistically different from each other at the 10% level (p-value 0.103).

Prediction 2: *Both family and non-family CEOs in industries with higher overall disciplining costs will adopt fewer structured management practices.*

The industry cost of disciplining workers (ℓ_c) is a common determinant of whether family and professional CEOs have an incentive to invest in good management. A proxy of ℓ_c is unionization rate within an industry; for example, we could expect that CEOs in industries with high unionization rates would be less likely to adopt structured management practices as they might encounter severe push-back in any disciplining attempts. Similarly, the process of disciplining workers in countries with stringent labour laws may be too costly to undertake.[24]

Non-parametrically, Figure 9 reports the lowess plot of the relationship between share of unionized workers and the firm's score in people management shows that the lower the share of unionized workers within a firm, the higher the quality of people management practices in the firm. This is the case for both family and non-family CEO firms. Theoretically, Figure 7 shows that when $\ell_c > \overline{L}$ both family and non-family CEOs opt for no investment

[24] Another possible way to think about unionization rates would be that in a highly unionized environment there is a higher need for monitoring and "paperwork" in order to fire a worker, and thus there should be an incentive to invest in monitoring. The concept of ℓ_c here is, however, that it is more expensive generally to fire workers when there is higher union power, and even if there was a high investment in monitoring it may still be expensive to fire workers despite having documentation — so much so that it is no longer profitable to invest in monitoring.

in the monitoring technology.

Corollary: *Family CEO firms with high reputation exposure in higher labour power industries will adopt even fewer structured management practices.*

The model predicts an interaction effect between the common costs of disciplining, such as unionization rates, and reputation exposure: even when there is low unionization rates, firms with high reputation exposure will adopt fewer management practices. To illustrate the marginal effects, we use a continuous measure of unionization — log of industry unionization — and plot the marginal effect at each level of unionization rates for eponymous and non-eponymous firms in Figure 10.

5 Conclusion

We set out to investigate the effect of dynastic family succession on firm organization and performance, and provide a novel take on what might be behind the apparent under-adoption of productivity-enhancing structured management practices. Given the dearth of data for private and family firms, particularly for emerging economies, we collect a rich new dataset on the history of ownership and control successions for a sample of firms in Latin America and Europe, and match it with a unique dataset on firm organizational structure and managerial practices. We go beyond the correlational findings of Bloom and Van Reenen [2007, 2010] and, using an instrumental variables approach, provide the first estimates of a causal relationship of dynastic CEO succession and lower adoption of structured management practices. We exploit the gender of the outgoing CEO's children as exogenous variation, and our OLS and IV-2SLS results suggest that there is a statistically significant negative effect of family control, with estimates of -0.234 (OLS result) and -0.959 (IV result) standard deviations lower adoption of structured management practices.

Relying on the body of work that has provided evidence on the strong relationship between managerial practices and firm performance, we suggest that this under-adoption is likely a reason behind dynastic family firms' documented lower levels of productivity. We add to the evidence on the relationship between management practices and performance by presenting estimates focusing on family firms specifically, and the first such estimates for Brazil, an economically important middle-income country. Combining our IV results with the correlation between management and productivity, the results suggest and implied productivity decrease up to 10%. This result is within the same range as the main productivity deficit results of dynastic family firms in Denmark [Bennedsen et al., 2007].

We then consider the possible mechanisms behind this under-adoption of structured management in family firms, despite the productivity benefits of such practices. We first explore the often-cited reason of lower levels of skill among family CEOs and, although

managers in family firms are less aware of the true nature of their quality of management and tend to have lower skill levels, we show that these factors do not fully explain their gap in investment in good management practices. We then propose that the implicit employment commitments of family firms that have been previously documented in the literature may affect the incentives of family CEOs to adopt better management practices. We build a stylized model to help organize the discussion of the empirical evidence on this aspect, and take it to the data where we find support for the predictions.

The model assumes family CEOs have implicit commitments to the workers of their firms, and thus incur a higher cost of disciplining workers relative to non-family CEOs. The model's predictions rest on three key parameters that affect the motivation for investing in a structured management technology: the family reputation exposure f, the industry cost of disciplining ℓ_c, and the share of high-ability workers in an industry η. This framework helps explains why we might see the distribution of management practices presented here, where both family CEO firms and professional CEO firms have high and low adoption of management across the distribution, but the distribution of management adoption in professional CEO firms stochastically dominates the family CEO distribution. A key difference in this model relative to previous models is that we do not need to assume that family CEOs are of lower ability, but rather that they are simply responding to differential costs of investing in a type of monitoring technology (here, managerial practices) because of the unique structure of implicit commitments with their employees. We find empirical support for the predictions of the model.

There are important policy implications from this work. As family firms make up a large share of mid-sized firms, which in turn make up a large share of employment, improving productivity in these firms is an key policy goal. Process innovation such as improved managerial practices has been shown to be an important driver of aggregate productivity but, naturally, only if firms and organizations adopt the innovative processes. Thus improving such practices as well as increasing their adoption rates can be an important lever to improving productivity. To the best of our knowledge, this is the first piece of work to show causal evidence of this negative effect of dynastic family control on *internal organization of the firm*. Although a naive solution could be that all family firms hire professional CEOs, that would be an unrealistic prescription. There are binding institutional constraints that bar many firm owners in emerging economies from pursuing this avenue — for example, when rule of law is wanting and the risk of expropriation is too high to be worth appointing a professional CEO — and also owner-managers preferences for being their own boss. If we accept family control is the necessary (or preferred) control structure for many firms, it is thus crucial to understand what may be the barriers to adoption of better management practices *within family firms*. Implicit commitments between family managers and their workers should factor into both how management upgrading projects are presented

to prospective firm managers as well as into the expected take-up and long-term adherence of such improvements.

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Tables

Table 1: Difference in means: family vs. non-family succession

	Family Mean	Non-family Mean	Diff in means	T Stat	Family N	Non-family N
Family characteristics						
Of outgoing founder						
First child = male	0.76	0.62	-0.14***	-3.62	725	176
Had at least one son	0.95	0.79	-0.16***	-5.05	732	180
# children	3.14	2.53	-0.61***	-4.43	732	180
# children | first = boy	3.13	2.97	-0.15	-0.85	554	109
# boys	2.01	1.48	-0.53***	-5.61	729	179
Firm characteristics						
# employees	451.23	580.57	129.33	1.83	732	180
Firm age	50.91	45.99	-4.92*	-2.03	732	180
% of managers with degrees	54.56	67.43	12.87***	4.55	732	180
Multinational = 1	0.12	0.42	0.30***	7.82	732	180
Share in low tech industries	0.46	0.37	-0.09*	-2.22	732	180
Levels between CEO and shopfloor	3.20	3.50	0.31**	2.81	732	180
# direct reports to plant manager	7.23	7.19	-0.04	-0.10	732	180
Avg hrs/wk, manager	48.34	47.98	-0.36	-0.66	729	180
Avg hrs/wk, non-manager	42.67	42.78	0.11	0.35	728	180
# production sites, total	2.48	3.23	0.76	1.20	732	180
# production sites, abroad	0.50	1.37	0.88	1.48	732	180

Table 2: Ownership and control structures on quality of management: regressions using full WMS sample and sample used in the IV analysis

	(1) z-management	(2) z-management	(3) z-management	(4) z-management
Dispersed shareholders (reference category)				
Family CEO				
Family owned, family CEO	-0.544***	-0.269***	-0.277***	-0.234**
	(0.025)	(0.023)	(0.032)	(0.106)
Founder owned, founder CEO	-0.789***	-0.326***		
	(0.024)	(0.024)		
Non-family CEO				
Family owned, professional CEO	-0.355***	-0.117***	-0.100**	0.125
	(0.035)	(0.031)	(0.041)	(0.205)
Privately owned, professional CEO	-0.265***	-0.116***	-0.117***	-0.237*
	(0.021)	(0.019)	(0.028)	(0.134)
Observations	15960	15960	6596	920
R^2	0.148	0.363	0.284	0.254
Noise controls		✓	✓	✓
Firm controls		✓	✓	✓
Industry controls	✓	✓	✓	✓
Sample used:	**Full WMS**	**Full WMS**	**IV countries**	**IV firms only**
Tests of equality (p-values)				
Family CEOs	0.000	0.017		
Non-family CEOs	0.009	0.996	0.663	0.086
Family vs non-family CEOs	0.000	0.000	0.000	0.051

* $p < 0.1$, ** p < 0.05, *** $p < 0.01$. Standard errors in parentheses.

Note: All columns estimated by OLS with standard errors clustered by firm. All data comes from the World Management Survey. z-management is the plant-level standardized management score. General controls include firm-level controls for average hours worked and the proportion of employees with college degrees (from the survey), plus a set of country dummies. Noise controls include a set of interviewer dummies, the seniority and tenure of the manager who responded, the day of the week the interview was conducted, the time of day the interview was conducted and the duration of the interview. The base category here is firms with dispersed shareholder ownership.

Table 3: IV-2SLS results for the effect of family control on firm managerial structures

	OLS	**Reduced Form**	**IV Second Stage results**					
	(1) z-mgmt	(2) z-mgmt	(3) z-mgmt	(4) z-mgmt	(5) z-mgmt	(6) z-ops/monitor	(7) z-targets	(8) z-people
Family CEO = 1	-0.234**		-0.959**	-0.877**	-0.531	-0.782*	-0.925**	-0.836**
	(0.106)		(0.431)	(0.424)	(0.465)	(0.451)	(0.428)	(0.419)
Had at least 1 son		-0.274**						
		(0.126)						
# Firms			912	908	902	912	912	912
K-P Wald F-statistic			23.78	8.287	19.97	23.78	23.78	23.78
Stock-Yogo 10% CV			*16.38*	*16.38*	*16.38*	*16.38*	*16.38*	*16.38*
Stock-Yogo 15% CV			*8.96*	*8.96*	*8.96*	*8.96*	*8.96*	*8.96*
Stock-Yogo 20% CV			*6.66*	*6.66*	*6.66*	*6.66*	*6.66*	*6.66*
Hansen's J statistic				1.158				
Hansen's J p-value				0.561				
			IV First Stage results					
Excluded instruments								
Had at least 1 son			0.300***			0.300***	0.300***	0.300***
			(0.061)			(0.061)	(0.061)	(0.061)
1 son				0.285***				
				(0.063)				
2 sons				0.305***				
				(0.064)				
3+ sons				0.338***				
				(0.069)				
First child = male					0.149***			
					(0.033)			
Control for family size: linear	✓	✓	✓	✓		✓	✓	✓
# Firms	912	912	912	908	902	912	912	912
# Observations	920	920	920	916	909	920	920	920
R^2	0.333	0.346	0.061	0.066	0.029	0.061	0.061	0.061

* $p < 0.1$, ** p < 0.05, *** $p < 0.01$. Standard errors in parentheses.

Note: Columns (1) and (2) estimated by OLS with standard errors clustered by firm. Columns (3) through (6) are estimated by IV-2SLS using Stata's `ivreg2` command. Management data comes from the World Management Survey. z-management is the plant-level standardized management score. Ownership and family history data comes from the Ownership Survey. General controls include firm-level controls for average hours worked, whether the firm is listed on the stock market, plus a set of country dummies. Noise controls include a set of interviewer dummies, the seniority and tenure of the manager who responded, the day of the week the interview was conducted, the time of day the interview was conducted and the duration of the interview.

Table 4: Mechanisms: higher cost of firing (eponymy)

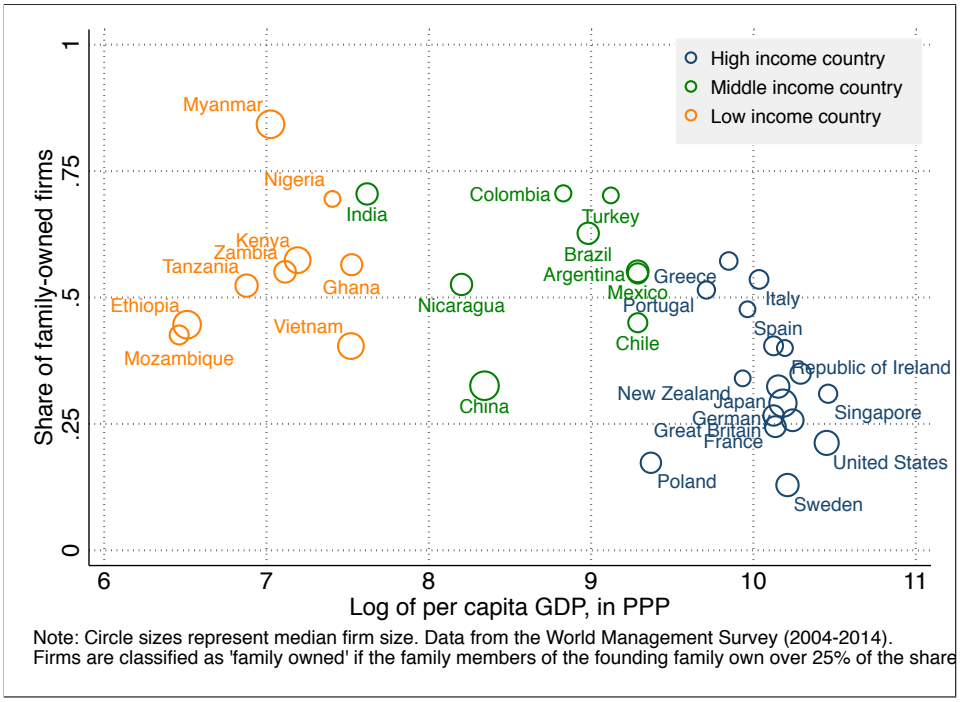
	Overall management			**People management**			**Operations maangement**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Private firms (reference category)									
Dynastic family firm	-0.135***	-0.134***		-0.093***	-0.092***		-0.140***	-0.139***	
	(0.028)	(0.027)		(0.029)	(0.028)		(0.029)	(0.028)	
Family: eponymous			-0.147***			-0.121***			-0.144***
			(0.046)			(0.046)			(0.046)
Family: non-eponymous			-0.059**			-0.035			-0.064**
			(0.028)			(0.030)			(0.029)
Skills control		✓	✓		✓	✓		✓	✓
Knowledge control		✓	✓		✓	✓		✓	✓
Noise and firm controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	8465	8465	8465	8465	8465	8465	8465	8465	8465
# Firms	6104	6104	6104	6104	6104	6104	6104	6104	6104
R^2	0.282	0.323	0.322	0.234	0.276	0.275	0.268	0.299	0.298
Tests of equality (p-value)									
Eponymous x non-eponymous			0.066			0.075			0.103

* $p < 0.1$, ** p < 0.05, *** $p < 0.01$. Standard errors in parentheses.

Note: Excludes founder firms. Firm controls include: firm employment, firm age, multinational status, unionization rate. Noise controls include: analyst dummies, day of week of interview, manager tenure in the company, duration of the interview. Dynastic family firm is an indicator taking a value of 1 if the firm is a second generation (onwards) family firm (descendants of the founder). Family (eponymous) is an indicator variable taking the value of 1 if the firm is named after the founding family. Skills (degree) is the log of the share of employees with college degrees in the firm. Knowledge is the management score the manager attributed to the firm at the end of the WMS interview. z-mgmt is the average management score (18 topics), z-people is the average of the people management questions (6 topics) and z-ops is the average of all non-people management questions (12 topics). All regressions include inverse probability weights to account for the family firms we did not have director information for.

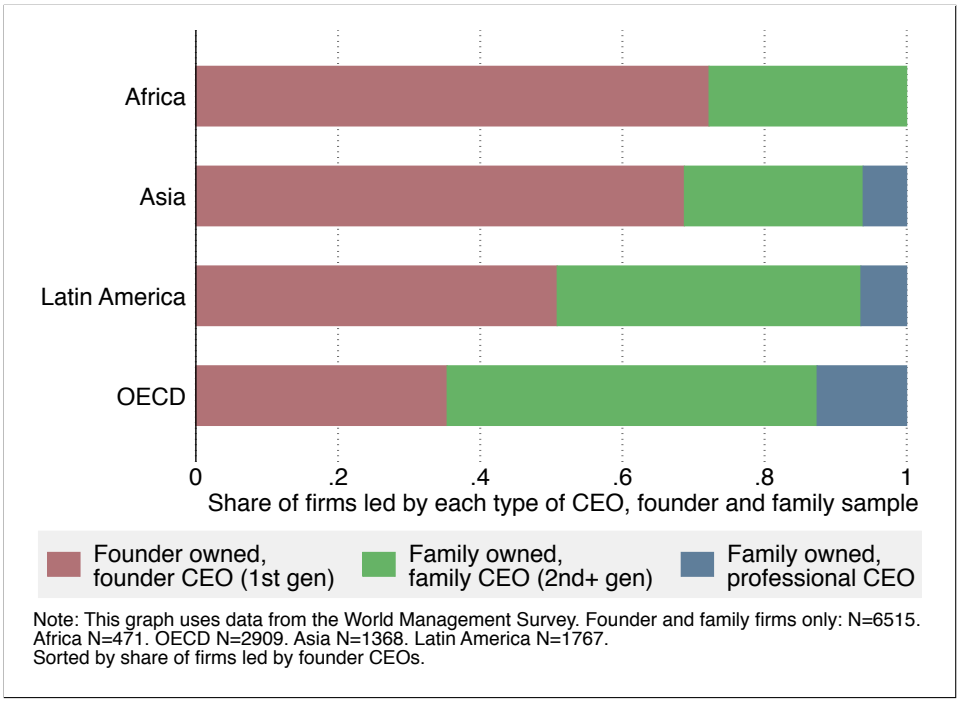
Figures

Figure 1: Share of family or founder firms across the world, manufacturing



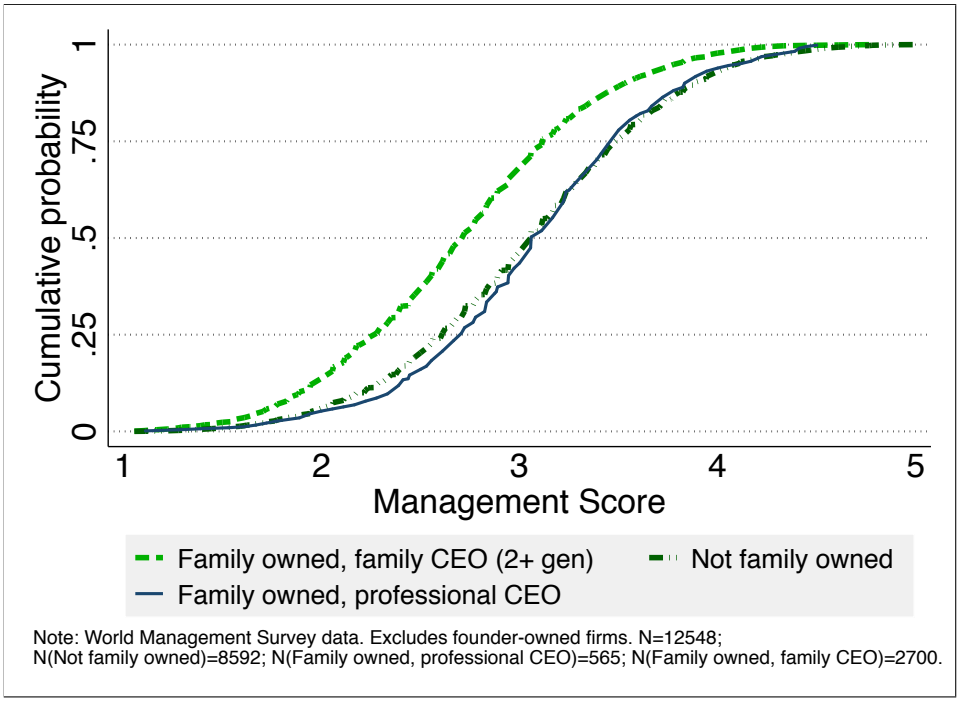
Note: Circle sizes represent median firm size. Data from the World Management Survey (2004-2014).
Firms are classified as 'family owned' if the family members of the founding family own over 25% of the share

Figure 2: Share of CEO type leading family or founder firms



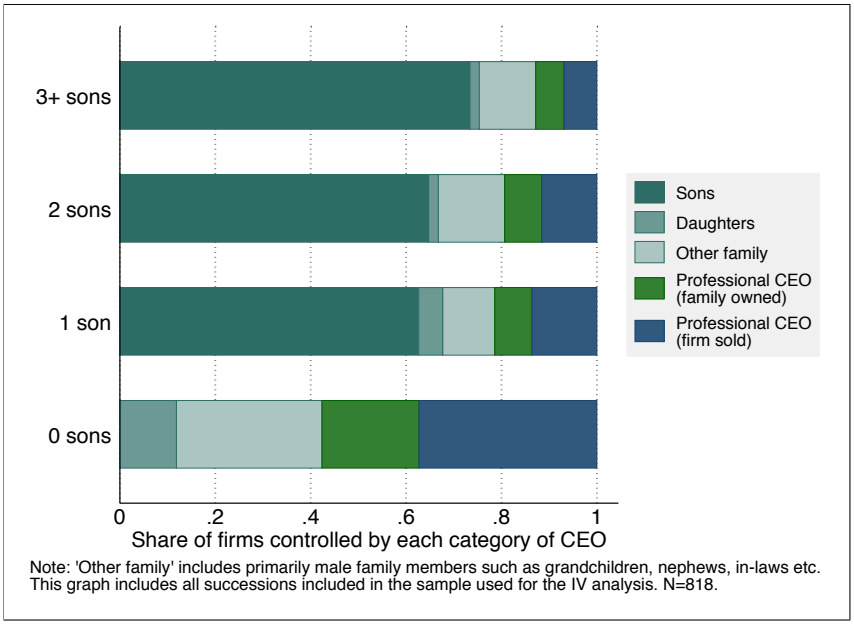
Note: This graph uses data from the World Management Survey. Founder and family firms only: N=6515.
Africa N=471. OECD N=2909. Asia N=1368. Latin America N=1767.
Sorted by share of firms led by founder CEOs.

Figure 3: Quality of management practices, by type of ownership



Note: World Management Survey data. Excludes founder-owned firms. N=12548;
N(Not family owned)=8592; N(Family owned, professional CEO)=565; N(Family owned, family CEO)=2700.

Figure 4: Successions from founder or family control, by number of sons of the outgoing CEO



Note: 'Other family' includes primarily male family members such as grandchildren, nephews, in-laws etc.
This graph includes all successions included in the sample used for the IV analysis. N=818.

Figure 5: Distribution of family size (number of children) conditional on gender of the first child

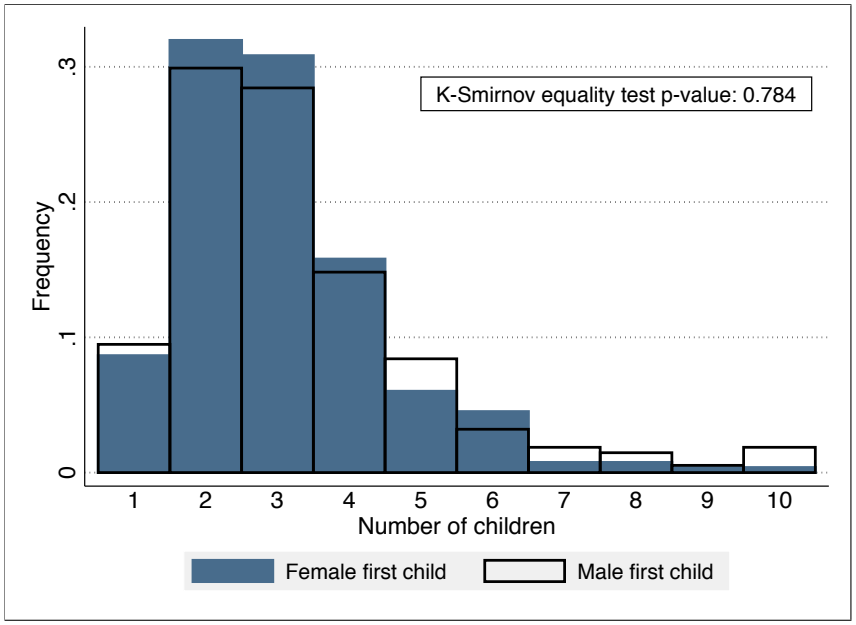


Figure 6: Quality of management practices, by type of ownership

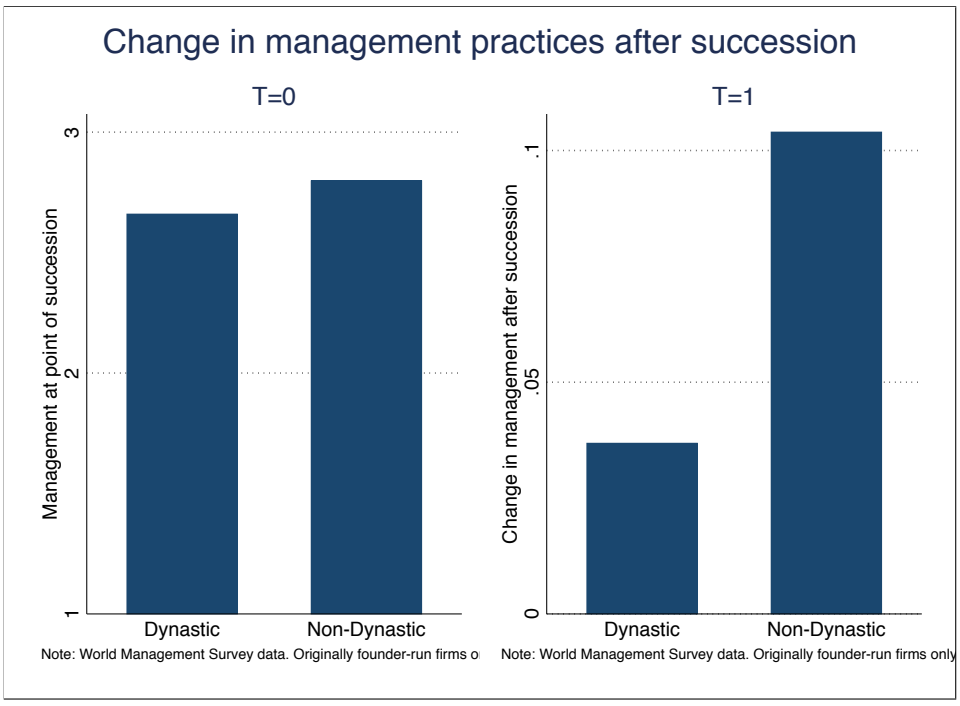


Figure 7: Parameters determining the four equilibria space, for $\eta = .5$

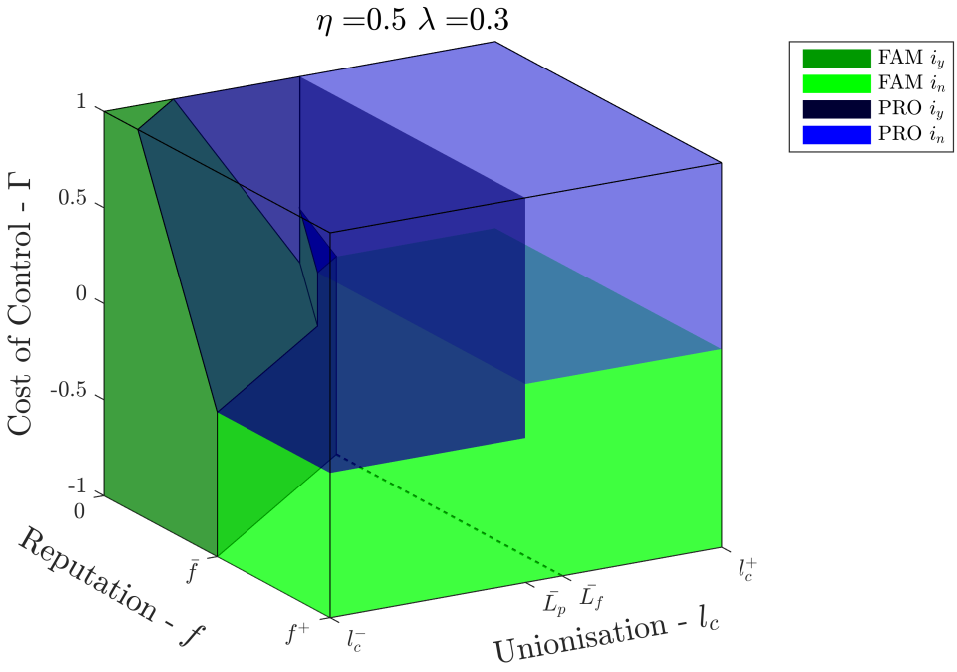


Figure 8: Prediction 1: firms with higher reputation costs (f) vs management

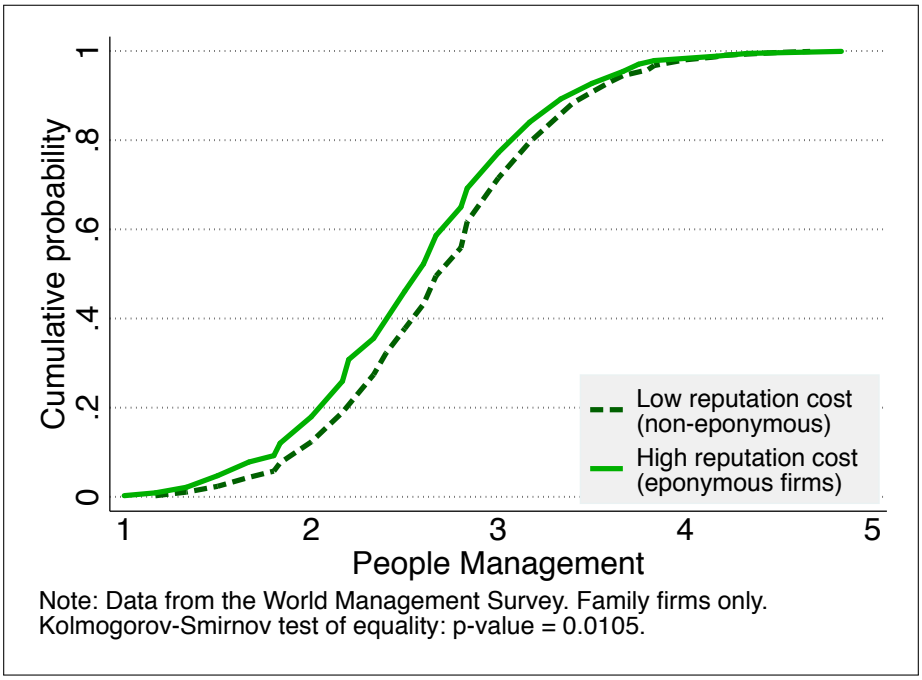


Figure 9: Prediction 2: common firing costs ℓ_c and investment in management

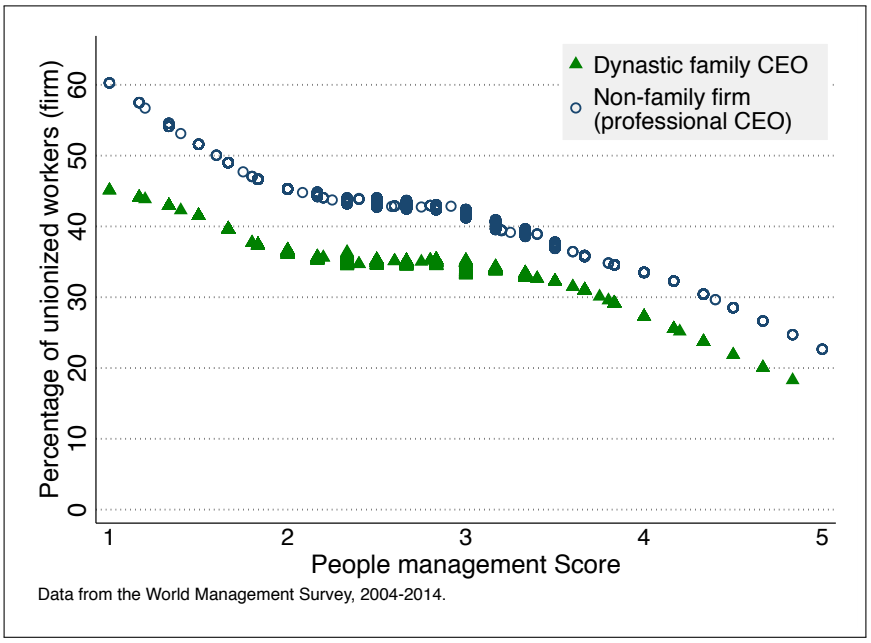
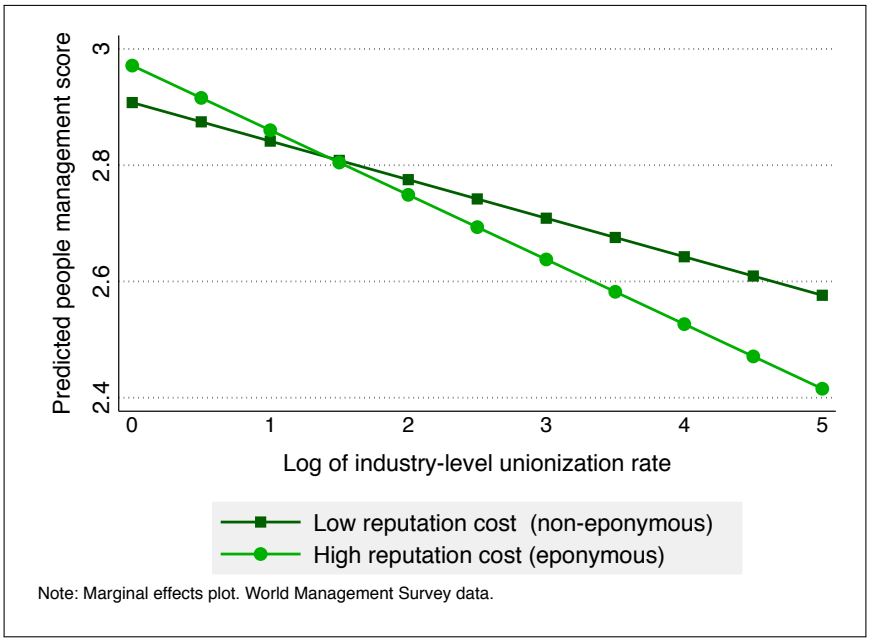


Figure 10: Corollary: investment in management and the interaction of common firing costs ℓ_c and reputation costs f



Appendices

A Data

A.1 Family firms and productivity

The performance data used in this section comes from two sources: first, we use production data from the Bureau van Dijk's Orbis database, one of the most comprehensive databases of public and private firm information available. This database aggregates information from public accounting data in corporate annual reports, and is most comprehensive for European countries because of the relatively more stringent private firm reporting requirements in the continent. Nearly 80% of the matched sample in this section comes from European and Anglo-Saxon countries[25] with the remaining 17% from Asia[26] and 3% from Latin America.[27] In total, 6,125 firms from the WMS sample match with production data from Orbis and include information on gross sales, employment and capital (tangible fixed assets). Second, we use the Brazilian Industrial Census (PIA) data from 1999 to 2014 and match it to over 500 Brazilian firms covered in the WMS. The census includes measures of firm gross sales, firm value added, a measure of capital and of intermediate inputs.[28]

Starting with the larger dataset of developed countries from Orbis, we present the descriptive relationship between dynastic family control and firm performance. We use log of sales as the measure of firm performance, and create a set of indicators for each category of ownership and control. Our indicator of interest is for firms that are family owned and have a second-generation family CEO ("dynastic family CEO"), and table A1 reports the summary results.[29] Column (1) shows the baseline relationship between firm performance and dynastic family control. The coefficient suggests that having a dynastic CEO is correlated with 37% lower sales, relative to a private firm with a professional CEO (reference category). Column (2) reports the results of a Cobb-Douglas OLS specification, including measures of log of capital and log of labor, along with country fixed effects, log of firm age and an indicator for multinational status. The coefficient reduces substantially to -0.113, though it remains significant. Including industry fixed effects further explains the gap in performance, but still suggests dynastic family CEO firms have, on average, approximately 8% lower productivity. Column (4) includes our standardized measure of management practices, which absorbs a substantial portion the variation captured by the dynastic family CEO indicator. The coefficient on the management measure suggests a one standard deviation increase in management practices is associated with approximately 6% higher firm sales. Column (5) includes an interaction between management and the dynastic family CEO indicator to consider whether management "matters" differently for dynastic firms. The coefficient on the interaction term is small and not significant, and the coefficients on management and the dynastic family control indicator show barely any change from column (4). Finally, columns (6) and (7) repeat the specification in column (4) with the sample of dynastic family firms and the sample of non-family firms respectively. The coefficient on management is not statistically different between the two specifications.

[25] Countries include: Australia, France, Great Britain, Germany, Greece, Ireland, Italy, Northern Ireland, New Zealand, Poland, Portugal, Sweden, United States.

[26] Countries include: China, India and Japan.

[27] Countries include: Argentina, Brazil, Chile and Mexico.

[28] The capital variable is not part of the census survey but has been constructed by *Instituto de Pesquisa Econômica Avançada* (IPEA), a Brazilian economic research institute and provided to us by request in the Brazilian confidential data use room.

[29] Table **??** reports the results for all ownership category indicators.

As a result of the data limitations described above, the analysis presented above focuses primarily on developed countries and is limited to a cross-sectional data. As family firms are particularly ubiquitous in emerging economies, we present further descriptive results from matched data from one large emerging economy: Brazil. We argue that Brazil is an ideal context in which to study family firm management for three main reasons. First, it is a large and economically important country in a developing region and also has a large proportion of family firms (compared to the US/UK where only 20-30% of firms are founder or family owned). Second, it is one of the countries for which we have the largest number of data points for ownership and firm organization, and third, the data both exists and is accessible. As the Brazilian Census data has both panel data available as well as more detailed measures of intermediate inputs, we run both a Cobb-Douglas OLS specification as well as a Levinsohn and Petrin [2003] specification, using inputs to control for unobservables. There is a vast literature on estimating production functions and a number of papers that use the Brazilian industrial census.[30] In contrast, our focus here is on the coefficient on the management variable and we use two methods to estimate the correlation between management and productivity.

Table A2 reports the descriptive results of this additional exercise. For the Brazilian WMS sample, a standard deviation is 0.647 points. Turning first to the OLS models in columns (1) through (4), we use only the cross-section of data that is contemporaneous to the 2008 WMS Brazilian survey. The results suggest that the correlation between management and value added is strong and substantial for the Brazilian firms in our sample. Column (1) suggests that one standard deviation higher management quality is associated with 12% higher value added for family firms, and 18% higher value added for non-family firms. The results are slightly lower in terms of sales, suggesting a bump of 5% higher sales for family firms and 9% for non-family firms. Columns (5) through (6) repeat the exercise but take advantage of the panel structure of the Brazilian industrial census and include data from 1999 to 2014 to run a Levinsohn and Petrin [2003] model. The relationship between management and productivity in both family and non-family firms remains robust to using a different model specification.

A.2 Ownership categories and additional summary statistics

The variables we are collecting include a full history of ownership and control from the time of foundation and dates of these changes. For firms that at the time of inception were family firms, we ask whether the founder had children. If yes, then we ask for the gender of the first child, how many children the founder-CEO had in total and the gender of all the children. For each succession we also ask who the control was transferred to, in terms of family relationship. With this information we can ascertain whether the founder had children at all, whether the first child was male, the ratio of male to female children, and who control of the firm was passed on to within the family.

Our survey is specifically concerned with *controlling shares of ownership*, similar to how Bureau van Dijk's datasets are compiled. Thus, by more than 25% of the controlling shares we mean more than 25% of the "voting shares" or equivalent terminology. We exclude government firms from our analysis. The interviewees for the Ownership Survey are one of the following: firm CEO or executive assistant to the CEO, head of administration, or if the firm was recently sold, the longest tenured employee at the managerial level. For the WMS, the interviewees are usually the plant manager. In 2011 the WMS team conducted a follow-up project that looked to cross-check the survey information with external data sources, such as Bureau van Dijk's data, online research through company documents and

[30] For a summary, see Marc-Andreas Muendler's website at http://econweb.ucsd.edu/muendler/html/brazil.html

websites and call-backs. The ownership structure data from the survey was correct over 75% of the time, and was amended otherwise.

Table A3 describes the definition of ownership and control structures used in this paper. We differentiate between *combined* ownership and control, which we refer to generally as "family firms" (for ease of exposition) and *separate* ownership and control "non-family firms." Table **??** shows the summary statistics of the dataset we use in our main analysis.

Our survey also allows us to document family involvement in managerial positions within family firms across regions. As our focus is on dynastic firms, we calculate the average family involvement for family owned firms with either a dynastic family CEO or a non-family CEO within each global region, and present the averages relative to the involvement in first-generation founder firms. The pattern in Figure A3 suggests that when firms "professionalize" the top tiers of management, they also do so throughout the managerial ranks. Firms owned by families but who have non-family CEOs have substantially lower average involvement of family members in management relative to the average for founder CEO firms in the region. Firms owned by families with a family CEO, however, either retain the same average number of family members involved (Anglo-Saxon and European countries) or increase it (African, Asian and Latin American countries).[31]

A.3 Robustness checks

We have carried out a series of robustness checks of our main results. Table A5 reports the results for our specifications from Table 3 using two different sets of sampling weights in Columns (1) to (3) and (4) to (6), and the results for two different functional forms of the number of sons IV, in Columns (7) and (8). The sampling weights in the first set of columns were calculated within each country, while the second set were calculated for the full sample including country fixed effects. The results are qualitatively similar to those in the main results table. The two different functional forms of the IV that we are exploring as a robustness check are:

$$\begin{aligned} FamilyCEO_i &= \alpha_{fs} + \sum_{j=2}^{3} \rho_j SON_j + \vartheta_1 SON_1 + \vartheta_2 children_i + \boldsymbol{\eta'} \boldsymbol{X_i} + \nu_i \\ FamilyCEO_i &= \alpha_{fs} + \sum_{j=1}^{3} \rho_j SON_j + \sum_{j=1}^{3} \vartheta_j children_j + \boldsymbol{\eta'} \boldsymbol{X_i} + \nu_i \end{aligned} \tag{8}$$

In Column (7), we attempt to address the possible concern that number of sons is endogenous because families have multiple children until they "finally get a son." Here we input the dummy variable for "exactly one son" as a *control* rather than an IV. The rationale for this is to test whether the result was being driven by a family having *the first boy* - that is, we control for the "first boy effect," by pulling it out of the IV set and adding it to the set of controls. Given that the second stage results are not statistically different, this serves as evidence that the effect is not wholly driven by having exactly one boy. Column (8) shows the number of sons IV controlling for family size (number of children) also as a step function - that is, including number of children dummies instead of the single variable. We lose efficiency by including an extra set of dummy variables, but the coefficients are not statistically different from the other two iterations of this IV.

[31] Figure A1 in the Appendix shows the average number of family members involved by region.

A.4 Family firms and wages: evidence from Brazil

We matched 613 firms from the Brazilian WMS sample (over 70%) and use RAIS data from 2008, matching the survey year of the majority of the matched firms. We merged in the governance structure information to consider the relationship between ownership structure and wages. Similar to evidence from France Bach and Serrano-Velarde [2015], Bassanini et al. [2010] and Italy Ellul et al. [2014], we find that family firms in Brazil pay lower wages. Table A6 reports the correlation between each type of governance structure and log of monthly wages relative to Dispersed Shareholder firms for Brazilian firms. Column (1) includes industry and basic firm controls (firm size, firm age and MNE status) and industry fixed effects and suggests that dynastic firms pay 34% lower wages relative to dispersed shareholder firms. Including worker characteristics (race, education, occupation) in Column (2) reduces the coefficient to -0.236. Column (3) includes the worker "person effect" estimated using an AKM model Abowd et al. [1999] which proxies for individual worker ability.[32] The coefficients suggest that dynastic family firms pay wages that are 13% lower relative to other non-family firms. Other non-family firms — private firms and family firms with professional CEOs — pay wages that are not statistically different from those of dispersed shareholder firms.

A.5 Management across regions and industries

One important consideration is to what extent we should be treating this relationship between family control and management practices as something that is common across countries. It could be that family ownership and control matters more in countries where there is less competition, better rule of law, or a different mix of industries. To consider this, we broke the full WMS sample into the continental regions and report the results in Table A7. The coefficients across nearly all regional specifications are not statistically different from each other, with the exception of Africa. This suggests that across the world, being owned and controlled by a founder or founding family is associated with a similar negative effect on firm management.

Finally, another interesting feature to consider in terms of firm characteristics is the industrial mix in each group of firms. Figure A5 shows the relationship between management and the share of family firms within each 2-digit industrial sector. Each observation is an industrial sector and it is colour coded to indicate high (red) and low (hollow blue) tech industries. High tech industries are overwhelmingly both better managed and have lower shares of family firms. This result echoes one of the findings in Bennedsen et al. [2007], where they suggest that the negative effect of family CEOs are worse for firms in higher tech industries. To take this into account we ensure we add industry fixed effects to all our specifications, and this is an avenue of research that could be explored in the future with more detailed administrative datasets.

A.6 Appendix A Tables and Figures

[32]The Abowd et al. [1999] AKM person effect was estimated in a separate project, with Ian Schmutte and Chris Cornwell.

Table A1: Management and firm performance in dynastic family firms: descriptive evidence using public accounts data (Orbis)

	(1) ln(sales)	(2) ln(sales)	(3) ln(sales)	(4) ln(sales)	(5) ln(sales)	(6) ln(sales)	(7) ln(sales)
Ownership and control categories							
Private firms (reference category)							
Dynastic family CEO	-0.365***	-0.113***	-0.080**	-0.038	-0.036		
	(0.060)	(0.034)	(0.033)	(0.034)	(0.034)		
Management variables							
z-management				0.057***	0.063***	0.087***	0.052***
				(0.014)	(0.017)	(0.031)	(0.017)
z-management x Dynastic family CEO					-0.005		
					(0.029)		
Firm controls		✓	✓	✓	✓	✓	✓
Industry FE			✓	✓	✓	✓	✓
Survey noise controls				✓	✓	✓	✓
Observations	6125	6125	6125	6125	6125	895	4465
R^2	0.275	0.754	0.776	0.780	0.780	0.799	0.782
Sample:	**All WMS firms**	**All WMS firms**	**All WMS firms**	**All WMS firms**	**All WMS firms**	**Family WMS firms**	**Non-family WMS firms**

* $p < 0.1$, ** p < 0.05, *** $p < 0.01$. Standard errors in parentheses.

Note: Regressions estimated by OLS. Standard errors clustered by firm. Sales, employment and tangible assets (capital) data from Orbis Bureau van Dyjk (public accounts data). Includes only data from the WMS that could be matched to sales data from BvD. Management data from the World Management Survey. z-management is the plant-level standardized average management score (18 practices). Firm controls include country dummies, log of employment, log of capital, log of firm age, and whether the firm is a multinational. Industry fixed effects are at the 3-digit SIC level. Survey noise controls include analyst dummies, year of survey, day of week, and manager tenure.

Table A2: Management and firm performance in dynastic family firms: descriptive evidence using Brazilian Industrial Census data

	Model: OLS				**Model: Levinsohn-Petrin**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ln(va)	ln(va)	ln(sales)	ln(sales)	ln(va)	ln(va)	ln(sales)	ln(sales)
z-management	0.115***	0.179***	0.050***	0.090***	0.129***	0.194***	0.057***	0.080***
	(0.029)	(0.031)	(0.011)	(0.018)	(0.038)	(0.038)	(0.01)	(0.013)
Firm controls	✓	✓	✓	✓	✓	✓	✓	✓
Industry FE	✓	✓	✓	✓	✓	✓	✓	✓
# Observations	213	290	213	291	3000	3595	3269	3963
# Firms	213	290	213	291	213	290	213	291
Sample	**Family**	**Non-family**	**Family**	**Non-family**	**Famiy**	**Non-family**	**Family**	**Non-family**

* $p < 0.1$, ** p < 0.05, *** $p < 0.01$. Standard errors in parentheses.

Note: Each column of regressions is estimated by either OLS or by the Levinsohn and Petrin [2003] method as identified in the table. OLS models cluster standard errors by firm. Firm value added, capital measures and industry codes come from the Brazilian Industrial Survey (PIA). Data from 1999 to 2014. z-management is the plant-level standardized average management score (18 practices). Firm controls include country dummies, log of employment, log of capital, log of firm age, and whether the firm is a multinational. Industry fixed effects are at the 3-digit SIC level. Survey noise controls include analyst dummies, year of survey, day of week, and manager tenure.

Table A3: Data categories - The Ownership Survey

Ownership category	**Ownership & control**	
	Non-family	Family
Founder or family owned		
Founder owned, founder CEO		✓
Founder owned, professional CEO	✓	
Family owned, family CEO		✓
Family owned, professional CEO	✓	
Privately owned (non-founding family owners)*		
Single owner, owner CEO		✓
Single owner, professional CEO	✓	
Many owners, owner CEO		✓
Many owners, professional CEO	✓	
*Dispersed shareholders***	✓	

** For the category of Privately owned, at least one entity owns more than 25% of voting shares, and they are not members of the founding family.*

*** For the category of Dispersed shareholders, no one entity owns more than 25% of voting shares.*

Table A4: Sample of firms: country level

Country	WMS sample N	Ownership Survey sample N	Response Rate %	Potentially eligible (non-founder)	IV analysis sample N	Inclusion Rate* %
Latin America						
Argentina	249	164	66%	128	94	73.4%
Brazil**	814	554	68%	329	230	69.9%
Chile	239	103	43%	81	38	56.8%
Colombia	170	65	38%	46	31	67.4%
Mexico	281	142	51%	104	62	59.6%
Latin American total	**1753**	**1028**	**59%**	**688**	**455**	**66.1%**
Africa* **						
Ethiopia	131	116	89%	84	-	-
Ghana	108	79	73%	55	-	-
Kenya	185	158	85%	103	21	20.4%
Mozambique	109	43	39%	72	-	-
Nigeria	118	118	100%	52	-	-
Tanzania	150	74	49%	99	-	-
Africa total	**801**	**588**	**73%**	**465**	**21**	**20.4%**
Europe						
France	206	141	68%	126	31	24.6%
Great Britain	390	296	76%	281	44	15.7%
Germany	136	77	57%	71	23	32.4%
Italy	320	318	99%	285	120	42.1%
Netherlands	143	124	87%	222	102	45.9%
Portugal	101	99	98%	74	37	50.0%
Turkey	332	163	49%	83	79	95.2%
Europe total	**1628**	**1218**	**76%**	**1142**	**436**	**43.4%**
Total	**4182**	**2834**	**68%**	**1933**	**912**	**47.1%**

Note: Notes: The pilot of the Ownership Survey was carried out immediately following the 2013 World Management Survey (WMS) wave, and a portion of the survey was also applied during the 2014 WMS European wave. First column shows the the total number of firms interviewed in the 2013/14, and the second column shows the number of firms for which we also collected data for the Ownership Survey.

* We use a more conservative definition of response rate here, referring to "full response rate". That is, there were some firms for which we had a positive response to part of the survey, but not all the information we needed to be able to include the firm in our IV sample. The rates shown here refer only to these "full information" firms, rather than all firms that responded to the survey at least in part.

** The inclusion rate for Brazil is higher than the number of firms in the 2013/14 sample because we also contacted firms in the 2008 wave of the World Management Survey for Brazil to expand the sample in Brazil in particular.

*** The sample for Africa in the Ownership Survey is included in the stylized facts section of the paper, but only Kenya is used in the IV analysis because the sample of firms that had *at least one succession* from the founder was too small to be included. Only Kenya passed the minimum threshold sample of 20 observations and thus is the only country included while the others are noted as zeroes. Although we have some data for these countries, we report here only the data points used in the analysis.

Table A5: IV-2SLS results, robustness checks

	Sampling weights: by country			**Sampling weights: overall**			**IV functional forms unweighted**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Family CEO = 1	-1.360**	-1.151**	-0.425	-1.202**	-0.997*	-0.501	-0.584	-0.824*
	(0.591)	(0.553)	(0.420)	(0.555)	(0.522)	(0.435)	(0.474)	(0.425)
# Firms	912	908	902	912	908	902	805	908
K-P Wald F-statistic	15.49	5.436	22.48	16.40	5.789	21.40	4.839	12.41
Stock-Yogo 10% CV	*16.38*	*16.38*	*16.38*	*16.38*	*16.38*	*16.38*	*16.38*	*16.38*
Stock-Yogo 15% CV	*8.96*	*8.96*	*8.96*	*8.96*	*8.96*	*8.96*	*8.96*	*8.96*
Stock-Yogo 20% CV	*6.66*	*6.66*	*6.66*	*6.66*	*6.66*	*6.66*	*6.66*	*6.66*
Hansen's J statistic		4.054			3.843		1.201	0.291
Hansen's J p-value		0.132			0.146		0.548	0.589
					IV First Stage results			
Excluded instruments								
Had at least 1 son	0.269***			0.271***				
	(0.068)			(0.067)				
First child = male			0.170***			0.163***		
			(0.036)			(0.035)		
1 son		0.253***			0.254***		0.285***	0.285***
		(0.071)			(0.069)		(0.080)	(0.063)
2 sons		0.283***			0.286***		0.297***	0.305***
		(0.072)			(0.070)		(0.083)	(0.064)
3+ sons		0.295***			0.297***		0.332***	0.338***
		(0.076)			(0.075)		(0.088)	(0.069)
1 child							0.079	
							(0.118)	
2 children							0.074	
							(0.113)	
3+ children							0.132	
							(0.116)	
Control for family size: linear	Yes	Yes	No	Yes	Yes	No	No	Yes
# Firms	912	908	902	912	908	902	805	908
# Observations	920	916	909	920	916	909	813	916

* $p < 0.1$, ** p < 0.05, *** $p < 0.01$. Standard errors in parentheses.

Note: All columns are estimated by IV-2SLS using Stata's `ivreg2` command. Management data comes from the World Management Survey. z-management is the plant-level standardized management score. Ownership and family history data comes from the Ownership Survey. General controls include firm-level controls for average hours worked, whether the firm is listed on the stock market, plus a set of country dummies. Noise controls include a set of interviewer dummies, the seniority and tenure of the manager who responded, the day of the week the interview was conducted, the time of day the interview was conducted and the duration of the interview. Columns (1) through (3) use sampling weights based on firm size by country, and Columns (4) through (6) use sampling weights based on firm size overall (across all countries). Columns (7) and (8) are unweighted.

Table A6: Family firms and wages

	(1) ln(monthly wage)	(2) ln(monthly wage)	(3) ln(monthly wage)
Family run firms			
Family owned, family CEO	-0.335***	-0.236***	-0.133***
	(0.086)	(0.061)	(0.047)
Founder owned, founder CEO	-0.304***	-0.223***	-0.129***
	(0.084)	(0.060)	(0.047)
Non-family run firms			
Family owned, professional CEO	-0.122	-0.101	-0.073
	(0.140)	(0.102)	(0.070)
Privately owned, professional CEO	-0.110	-0.064	-0.016
	(0.086)	(0.056)	(0.043)
Dispersed Shareholders (reference category)			
Observations	183,898	183,898	183,838
# Firms	613	613	613
R^2	0.337	0.576	0.786
Firm controls	✓	✓	✓
Industry controls	✓	✓	✓
Worker characteristics	✓	✓	✓
Sample used:	**WMS-RAIS (BR)**	**WMS-RAIS (BR)**	**WMS-RAIS (BR)**
Tests of equality			
Family (controlled) firm	0.488	0.725	0.896
Non-family (controlled)	0.925	0.705	0.383
Family vs non-family (controlled)	0.000	0.001	0.002

* $p < 0.1$, ** p < 0.05, *** $p < 0.01$. Standard errors in parentheses.

Note: All columns estimated by OLS with standard errors clustered by firm. All data comes from the World Management Survey. z-management is the plant-level standardized management score. General controls include firm-level controls for average hours worked and the proportion of employees with college degrees (from the survey), plus a set of country dummies. Noise controls include a set of interviewer dummies, the seniority and tenure of the manager who responded, the day of the week the interview was conducted, the time of day the interview was conducted and the duration of the interview. The base category here is firms with dispersed shareholder ownership.

Table A7: Management and family ownership and control across regions, WMS

	Anglo-Saxon	Sca' via & W. Europe	S & C Europe	Latin America	Asia	Africa
Family Control = 1	-0.166***	-0.149***	-0.162***	-0.211***	-0.168***	-0.122***
	(0.024)	(0.032)	(0.030)	(0.021)	(0.029)	(0.034)
Ln(employment)	0.123***	0.153***	0.178***	0.221***	0.129***	0.134***
	(0.008)	(0.012)	(0.017)	(0.010)	(0.010)	(0.016)
Observations	4299	2438	1904	3049	2453	867
Noise controls	✓	✓	✓	✓	✓	✓
Industry controls	✓	✓	✓	✓	✓	✓
Firm controls	✓	✓	✓	✓	✓	✓

* $p < 0.1$, ** p < 0.05, *** $p < 0.01$. Standard errors in parentheses.

Note: All columns estimated by OLS with standard errors clustered by firm and reported in brackets below the estimates. Sample includes all firms with controls data. Management is the plant-level management score. Controls include a full set of country dummies, US-SIC dummies and year dummies, as well as firm-level controls including the proportion of employees with college degrees (from the survey), interviewer dummies, the seniority and tenure of the manager who responded, the day of the week the interview was conducted, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer.

Figure A1: Average number of family members involved in the management of family or founder firms, by global region

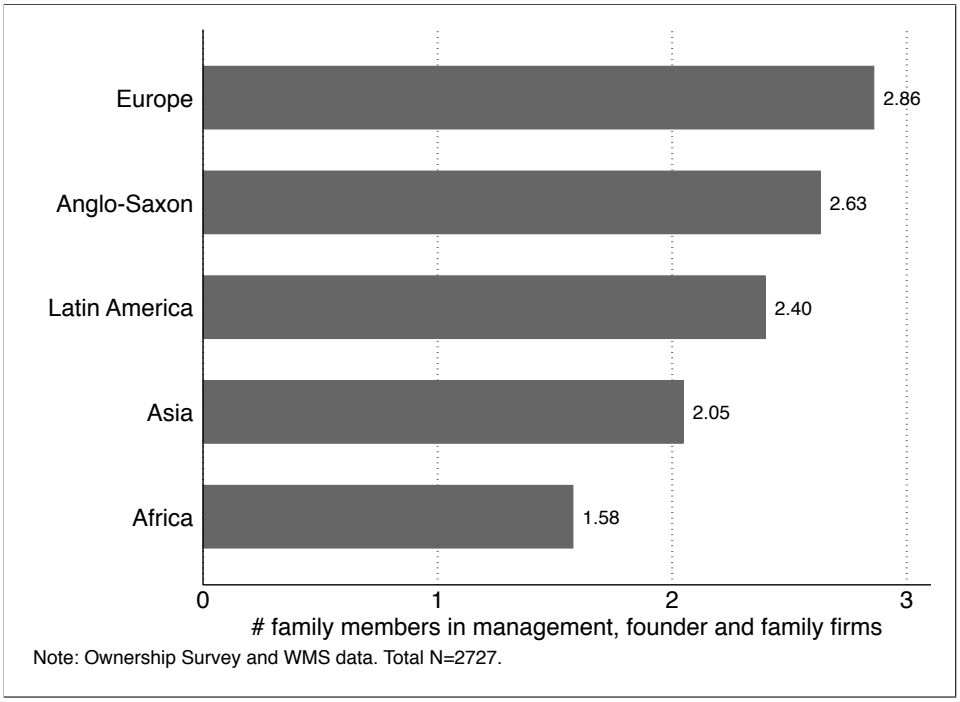


Figure A2: Brazilian firms: value added, by type of ownership

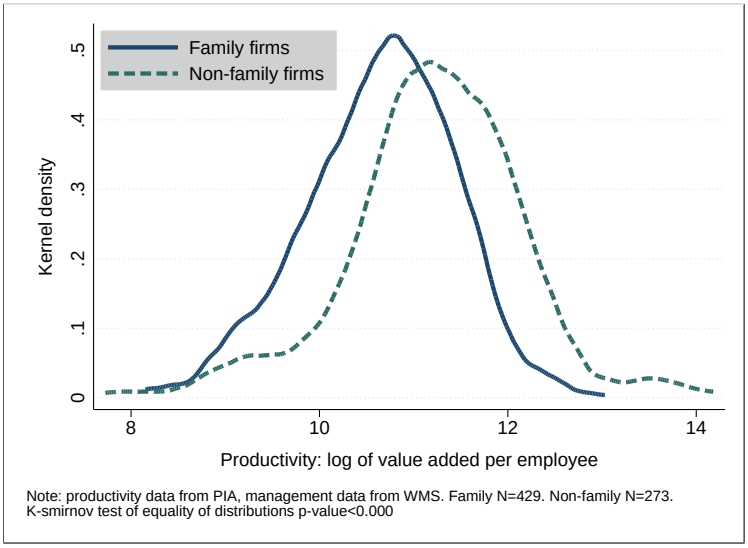
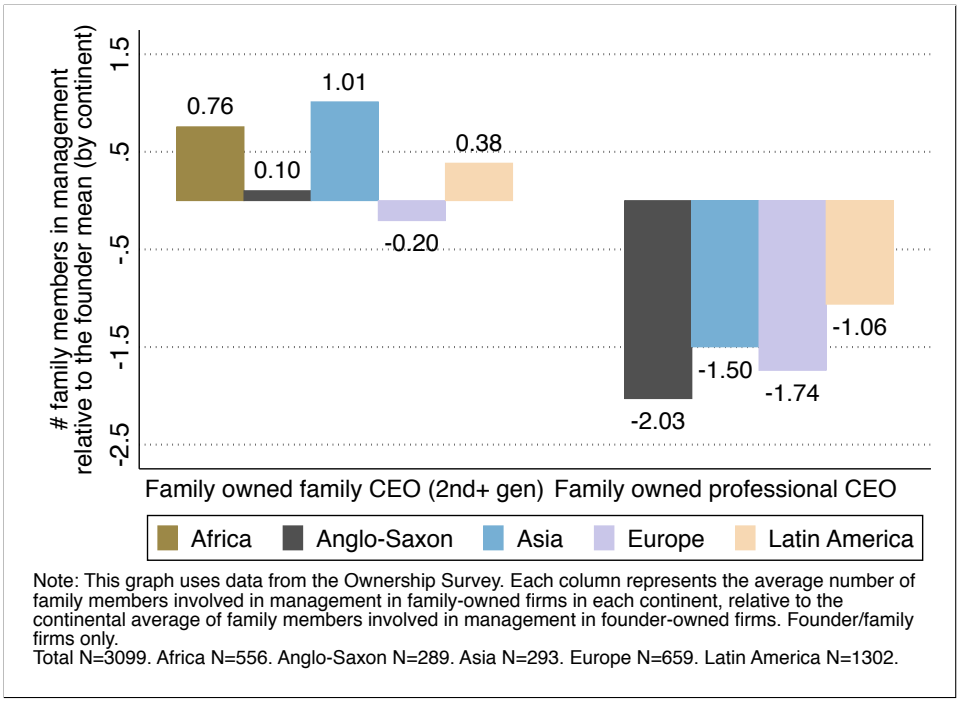


Figure A3: Number of family members involved in management of family firms, relative to the founder mean (by continent)



Note: This graph uses data from the Ownership Survey. Each column represents the average number of family members involved in management in family-owned firms in each continent, relative to the continental average of family members involved in management in founder-owned firms. Founder/family firms only.
Total N=3099. Africa N=556. Anglo-Saxon N=289. Asia N=293. Europe N=659. Latin America N=1302.

Figure A4: Prediction 3: Parameters determining the four equilibria space, for $\eta = .2$ and $\eta = .8$

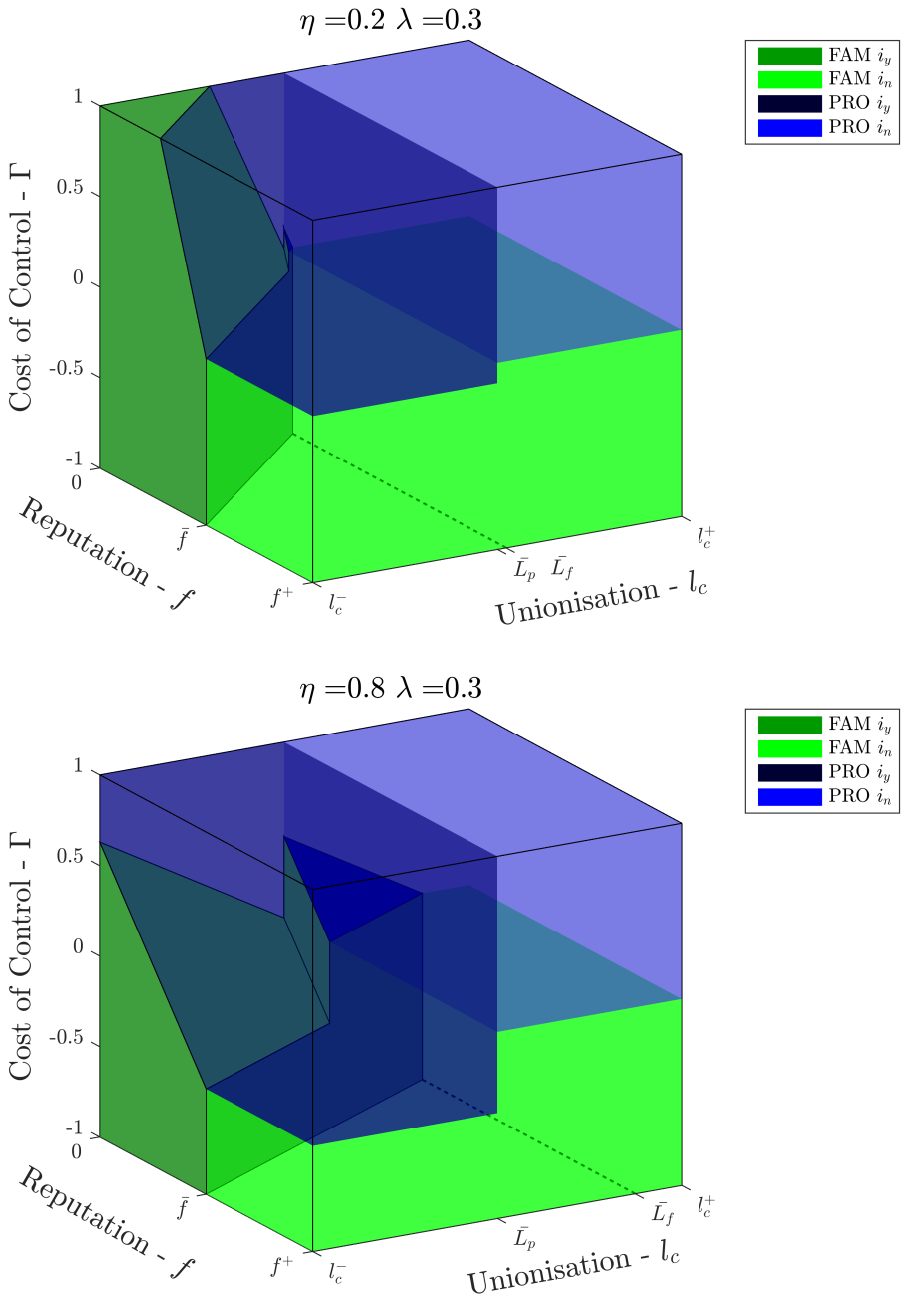
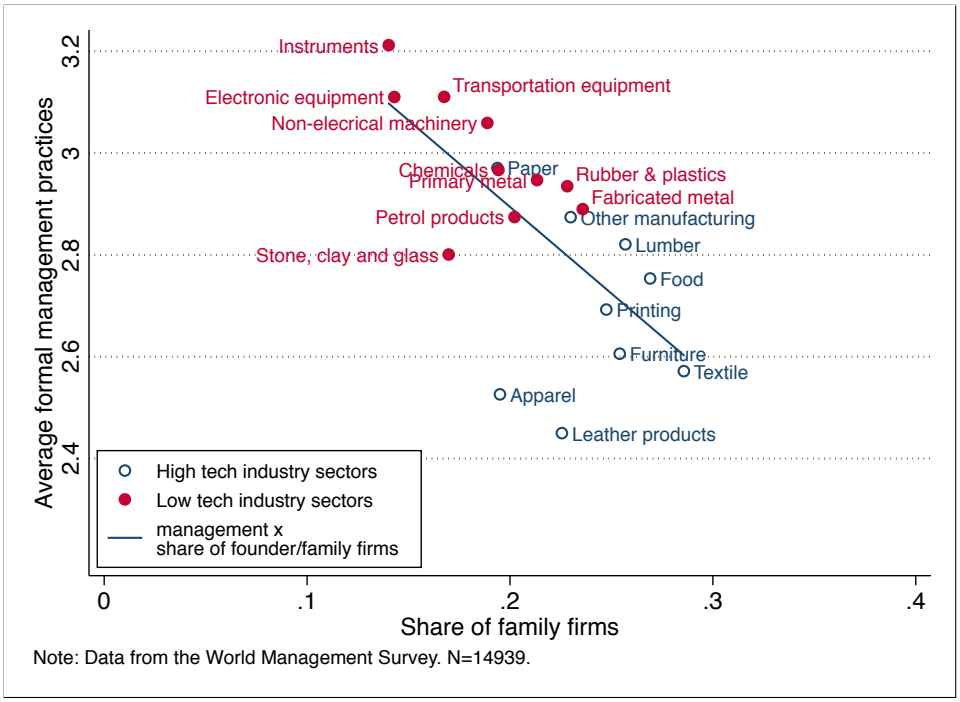


Figure A5: Share of family firms and average management scores, by industry



Note: Data from the World Management Survey. N=14939.

B Survey details

B.1 Ownership Survey: A brief illustration using the early days of the Ford Motor Company

Beyond understanding how our data is matched to the WMS, a crucial definition worth reiterating is that when we use the term *family firm* we mean family control of the firm in terms of the same family entity owning the majority of the voting shares of the firm *as well as* having a family member presiding over the company as CEO: *combined* ownership and control. To illustrate the data we collected and our definitions, it is useful to consider a well-known example such as the early days of the Ford Motor Company. Ford was founded in 1903 by Henry Ford, who had one son. In 1919 Henry Ford passed the position of CEO to his son, Edsel, until Edsel (unexpectedly) died in 1943. Edsel had four children: three boys and one girl. Henry Ford briefly took control for the interim two years until 1945 when Edsel's first son, Henry Ford II, returned to the US and assumed the helm of the firm. Henry Ford II had three children: two girls and one boy, Edsel Ford II.[33] In 1956, Ford went public in the largest IPO (initial public offering) of common stock shares in history at the time, but the Ford family still retained 40% of the voting shares.[34] Up to this point, the Ford Motor Co. would be considered a *family firm* in the Ownership Survey as the Ford family held over 25% of the voting shares and a family member from the original founding family held the CEO position in the firm. We would have, thus far, registered three successions of power within the family.[35]

A *non-family firm*, on the other hand, has *separate* ownership and control. Continuing with the Ford Motor Co. example, in 1980 Phillip Caldwell became the first non-Ford-family member to take the post of CEO. From 1980 onwards Ford is considered a *non-family firm* in our analysis. The data point would be recorded as "family owned, professional CEO," but as discussed earlier, we combine all categories that are not owned and controlled by families under *non-family firm*. If the Ford family ever chose to divest or dilute their voting shares such that the family's voting ownership stake of the firm fell to below 25% of the shares, they would then continue to be coded as a *non-family firm* category, but their ownership sub-category would change to *dispersed shareholders*.[36] Crucially, our identification strategy would not use ownership successions that, for example, started as "family owned, professional CEO" and switched to "dispersed shareholders, professional CEO." Our identification is coming from firms that have successions of *control*, such as a "family owned, family CEO" firm hiring a professional CEO or, alternatively, selling the firm outright/diluting their shares to under 25% voting ownership to non-family investors who then hire a professional CEO.

A concern could be that what we capture with this strategy is the effect of the change in ownership rather than the change in control. The best scenario would, indeed, be to

[33] Edsel Ford II ran Ford Australia between 1978 and 1980.

[34] According to Ford Motor Co.'s website. It is important to note that when they took the company public the family separated the type of stock offered into 95% Class A shares (no voting rights) and 5% Class B (voting rights) shares. The Ford family in fact owned less than 2% of the company as a whole, but crucially, they own 40% of the *Class B voting shares*, affording them majority control of the company.

[35] Henry Ford 1903-1919, Edsel Ford 1919-1943, Henry Ford 1943-1945, Henry Ford II 1945-1979.

[36] History of the Ford Motor Co. primarily obtained from the Ford Motor Co.'s website: https://corporate.ford.com/company/history.html, last accessed on January 15, 2016.

have a large sample of firms that switched from having family ownership and control to family ownership and professional control, but that is a limitation of our dataset (indeed, of "reality") that we do not think is fatal. First, although the family ownership with professional CEO structure is relatively more common in OECD countries than in middle- and low-income countries, it still constitutes a very small share of the overall ownership and control structures that we study. Among the countries we study it is an even smaller part of the share of firms in the economy. Thus, the next best alternative is comparing family owned and controlled firms with non-family owned and professionally controlled firms.

B.2 World Management Survey

One of the binding constraints for growth and development in emerging economies and low income countries is a lack of capital, both tangible and intangible. Investments in tangible capital such as better machines or other hard technology are relatively straightforward and often enacted by governments because of their greater visibility and ease of procurement, but there are large costs associated with such tangible capital upgrading programs. Investment in intangible capital such as organizational capital (ie. management practices) can often yield similar returns with lower levels of investment. For example, substantial improvements to organizational practices in firms can yield a return that could be comparable to increasing the workforce by 15% or capital by 40%.[37] In education, a one standard deviation improvement in the quality of management in a school is associated with better student outcomes in year-end exams to the order of 0.2-0.4 standard deviations.[38]

The idea that *management matters* dates at least as far back as 1887, when Francis Walker wrote the following in the first volume of the Quarterly Journal of Economics: "It is on account of the wide range [of management quality] among the employers of labor, in the matter of ability to meet these exacting conditions of business success, that we have the phenomenon [...] of some employers realizing no profits at all, while others are making fair profits."

Since then, a large literature has developed around the idea of management and productivity, and universities have even launched a whole new set of professional schools focused on producing graduates of business administration. Empirical evidence on management practices, however, had been generally presented in the form of case studies, until Bloom and Van Reenen [2007] pioneered the use of a new survey tool to systematically measure the quality of management in manufacturing firms across countries. This new research finds that large variations in the quality of management across firms and countries are also strongly associated with differences in performance. For example, better managed firms tend to have significantly higher productivity, higher profitability, faster growth, higher market value (for quoted firms) and higher survival rates (see Bloom et al. [2014] for a survey).

The WMS is a unique dataset that measures the quality of management practices of firms via over 15,000 one-hour, structured phone interviews with plant managers. The data currently spans waves between 2002 to 2014, and includes 35 countries. The management survey methodology, first described in Bloom and Van Reenen [2007], uses double-blind surveys to collect data on firms' use of operations management, performance monitoring,

[37] World Management Survey team [2015]
[38] Bloom et al. [2015a]

target setting and talent management in their day-to-day runnings. The WMS focuses on medium- and large-sized firms, selecting a sample of firms with employment between 50 and 5,000 workers. The project is among a significant surge of emerging research on this subject, which has attempted to move beyond selective case studies and collect systematic and reliable data to empirically test management theories.

To measure management practices, the WMS uses an interview evaluation tool based on the questionnaire McKinsey & Co. uses in their baseline client evaluations. The tool was then adapted for research purposes and enhanced to include insights from the management literature that would be important for researchers to measure. For example, the WMS tool measures practices similar to those emphasized as relevant in earlier work in the management literature, by for example Ichniowski et al. [1997] and Black and Lynch [2001]. The tool was piloted in 2002 and further refined, and since the first major wave in 2004 it has remained largely the same. The tool defines a set of 18 basic management practices and scores each practice on a scale from one ("worst practice") to five ("best practice") on a scoring grid.[39] A high score represents a best practice in the sense that firms adopting the practice will, on average, see an increase in their productivity. The combination of many of these indicators reflects "good management" as commonly understood, and the main measure of management practices represents the average of these 18 scores.

Conceptually, the scores suggest a gradual increase in formalization and usage of the management practices being followed. A score of 1 indicates little to no formal processes in place, and suggests the firm deals with day to day activities in a very ad-hoc manner. A score of 2 suggests that there are some informal processes in place, though they are enacted by the acting manager and not part of the "official" day to day running of the firm. If the manager was not in the plant for any reason, the practices would not be followed. A score of 3 indicates that a firm has some formalized management processes in place, though they have some weaknesses such as the process is not regularly reviewed or it is not often used properly. If the manager was away, however, the process could be picked up by a stand-in manager as it would be known as "normal running" of the firm by most staff. A score of 4 suggests that firms have good and flexible processes in place, that are routinely reviewed and are well-known to at least all managers in the firm. A score of 5 suggests that the firm not only has "best-practice" processes in place, but that these processes are deeply embedded in the corporate culture and have substantial employee buy-in, from the shopfloor, through middle management and up to the C-suite. It is considered that firms scoring under 2 are very badly managed firms, and those scoring over 4 are well-managed firms.

The survey measures management practices in three broad areas:

1. *Operations management & performance monitoring practices*: testing how well lean (modern) manufacturing management techniques have been introduced, what the motivation and impetus behind changes were, whether processes and attitudes towards continuous improvement exist and lessons are captured and documented, whether performance is regularly tracked with useful metrics, reviewed with appropriate frequency and quality, and communicated to staff, and whether different levels of performance lead to different process-based consequences.

[39]The full instrument is available at www.worldmanagementsurvey.org

2. *Target setting practices*: testing whether targets cover a sufficiently broad set of metrics, including short and long-term financial and non-financial targets, and whether these targets are based on solid rationale, are appropriately difficult to achieve, are tied to the firm's objectives, are well cascaded down the organization, are easily understandable and are openly communicated to staff.

3. *Talent management practices*: testing what emphasis is put on overall talent management within the firm and what the employee value proposition is, whether there is a systematic approach to identifying good and bad performers and rewarding them proportionately or dealing with bad performers.

Crucially, this methodology is uniquely useful because the types of questions asked ensure the survey is capturing how management practices are implemented in the firm, rather than how the managers feel or what their opinions are about management. The survey questions ask managers to describe their practices including several examples, and the interviewer independently evaluates the responses systematically on a pre-set scale. Thus, the WMS captures the degree of usage rather than the superficial adoption of these practices and abstracts from possible mood influences of individual managers. Beyond the key measure of management practices at the plant level, the WMS also collects a wealth of information on the firm, including firm location, size and ownership structure.

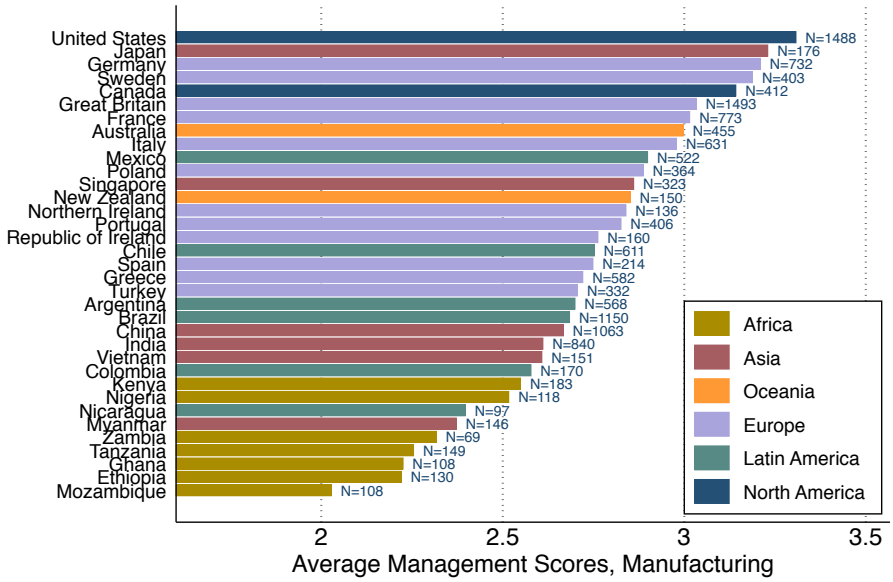
The management data has been collected in waves over 12 years with cross-section of firms in new countries added every wave as well as panel data for selected countries. The US, UK, France, Germany, Italy and Greece were surveyed in 2004, 2006, 2010 and 2014. China, Japan, Poland, Portugal, and Sweden were surveyed in 2006 and 2010. India was surveyed in 2006, 2008 and 2010. Brazil was surveyed in 2008 and 2013. Canada and Ireland were surveyed in 2008. Australia and New Zealand were surveyed in 2009. Chile was surveyed in 2009 and 2013. Argentina and Mexico were surveyed in 2010 and 2013. Singapore was surveyed in 2012. Colombia, Ethiopia, Ghana, Kenya, Mozambique, Nicaragua, Nigeria, Spain, Tanzania, Turkey and Zambia were surveyed in 2013. Myanmar, Vietnam were surveyed in 2014.

One of the key stylized facts emerging from the WMS data is that firms in developing countries have much worse management practices than firms in developed countries. Figure B1 shows all countries in the WMS sample ranked by the average quality of management in the country. The ranking is surprisingly stable even after controlling for firm size, suggesting it is not simply a matter of rich countries having larger firms that are better managed. It is immediately clear that developing countries are at the bottom of the rank, with only the middle-income economies of Mexico and Chile placing among the top half of the country ranking.

Beyond a wide distribution of scores across countries, the data also shows that there is a substantial amount of variation within countries as well. In fact, Bloom et al. [2014] suggest that the low average quality of management in developing countries appears to be attributed to a large tail of badly managed firms coexisting with firms boasting world-class management practices. Figure B2 depicts this point, showing the distribution of the management measure across countries. The vertical line marks where the score of 2 is in each sub-graph, and it is immediately clear that in the lower-ranked countries such as, for example, India or Brazil, the mass of firms with a score under 2 is much larger than in

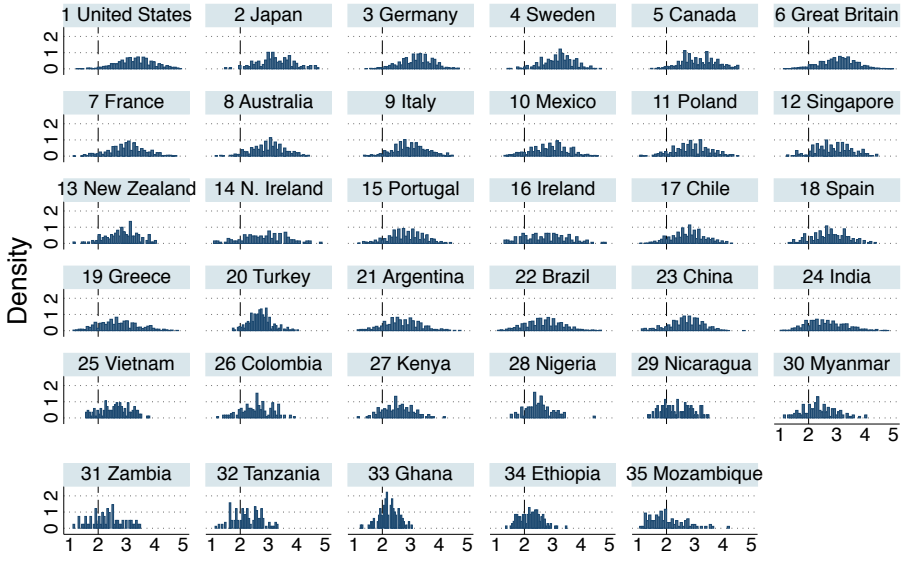
countries higher up in the ranking such as the US, Germany or Great Britain. In Latin America and Asia, 15% of firms fall in this range while in Africa the share is just under 30%. In contrast, the share of firms scoring under 2 is only 2% in North America and 8% in Europe. Taking a closer look at the characteristics of firms populating the lower tail of the distribution yields a striking observation: 75% of the firms in Latin America and Asia in this range are family firms. The share is 60% in Africa, 35% in North America and 50% in Europe.

Figure B1: Developing countries rank lowest in quality of management



Notes: Graph created by the author using data from the World Management Survey. N indicates the number of firms in the sample. The WMS dataset is a random sample of manufacturing firms within the 50-5000 employee range.

Figure B2: There is wide variation of management quality within countries



Notes: Graph created by the author using data from the World Management Survey.
The WMS sample includes firms between 50 and 5000 workers.

B.3 WMS topics

Practices	What is the WMS measuring
Operations Management and Performance Monitoring	
Introducing Lean (modern) Techniques	Measures how well lean (modern) manufacturing management techniques have been introduced
Rationale for introducing Lean (modern) Techniques	Measures the motivation/impetus behind changes to the operational processes, and whether a change story was well communicated turning into company culture
Continuous Improvement	Measures attitudes towards process documentation and continuous improvement
Performance Tracking	Measures whether firm performance is measured with the right methods and frequency
Performance Review	Measures whether performance is reviewed with appropriate frequency and follow-up
Performance Dialogue	Measures the quality of review conversations
Consequence Management	Measures whether differing levels of firm performance (not personal but plan/process based) lead to different consequences

Target Setting	
Target Balance	Measures whether targets cover a sufficiently broad set of metrics and whether financial and non-financial targets are balanced
Target Interconnection	Measures whether targets are tied to the organization's objectives and how well they cascade down the organization
Time Horizon of Targets	Measures whether the firm has a '3 horizons' approach to planning and targets
Target Stretch	Measures whether targets based on a solid rationale and are appropriately difficult to achieve
Clarity and Comparability of Targets	Measures how easily understandable performance measures are and whether performance is openly communicated to staff

People Management	
Managing Talent	Measures what emphasis is out on overall talent management within the organization
Rewarding High Performers	Measures whether there is a systematic approach to identifying good and bad performers and rewarding them proportionately
Removing Poor Performers	Measures how well the organization is able to deal with underperformers
Promoting High Performers	Measures whether promotion is performance-based and whether talent is developed within the organization
Retaining Talent	Measures whether the organization will go out of its way to keep its top talent
Creating a Distinctive Employee Value Proposition	Measures the strength of the employee value proposition

C Model

C.1 Equilibrium: preliminary analysis

Four actions with four binary choices lead the full game to be quite high in dimensionality. However, there are some actions that we can rule out as outcomes because they are never optimal for the actors to take. To reduce the dimensionality of the game and simplify the problem, these actions are replaced with their sub-game perfect equilibrium outcomes. The actions are as follows:

1. The CEO will never fire a worker who he observes exerting effort, since firing workers is a costly action. Thus, D_L is only not chosen when:
   - the CEO chooses not to invest monitoring and thus cannot observe effort ($i = i_n$)

     or
   - the CEO chooses to invest monitoring ($i = i_y$) and the worker exerts effort ($e = \bar{e}$).
2. The worker will not exert effort unless the cost of effort is lower than the cost of being laid off. Workers choose low effort ($e = \underline{e}$) when:
   - the CEO chooses not to invest monitoring and thus cannot observe effort ($i = i_n$),

     or
   - the worker is of low ability.

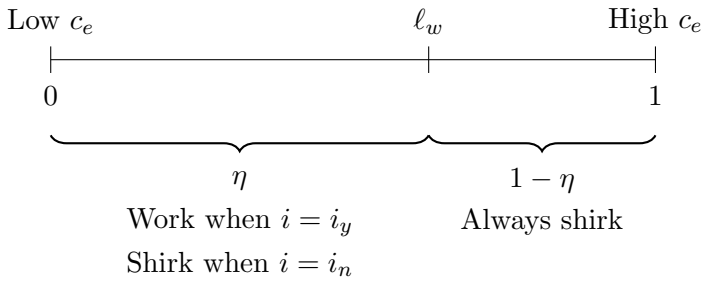
Therefore, eighteen out of thirty two outcomes can be replaced by their subgame perfect equilibria. For example, in both the branches where the CEO opts not to invest in monitoring ($i = i_n$), no firing happens as they cannot tell which workers shirked. We can replace all the relevant CEO disciplining choice branches with the outcome of D_K. Similarly, when workers know that they will not be caught shirking because the CEO did not invest in monitoring, they always choose to shirk as exerting effort is too costly in this context. Thus, we can replace all the relevant worker choice branches with the outcome of $e = \underline{e}$. Imposing these results yields the game tree in Figure B6, which is a relatively more straightforward problem to deal with.

To isolate the key insights of the model, one can make further simplifications. The key choice that we seek to understand with this framework is the investment choice of each CEO. The first choice of the game determining whether the owner will be a family CEO or choose to hire a professional CEO is a choice that has been explored in the literature before, and here is simply a function of the size of the private benefit of control. As both CEO types face the same set of choices with slightly different payoff functions, the focus the backward induction exercise is on determining the subgame equilibria for each CEO type and discuss the owner's choice last.

C.1.1 Equilibrium: comments on modelling choices

Worker's effort choice Let workers have a cost of effort $c_e \sim U(0, 1)$. There is a share of workers, η, for which the cost of effort is below the fixed cost of getting laid off l_w, such

that $c_e \leq \ell_w$. These workers will choose to exert effort if they have a chance of getting laid off, and will choose not to exert effort if they have no chance of getting laid off. There is a share of workers $1-\eta$ for which the cost of effort is above the cost of getting laid off, such that $c_e > \ell_w$. These workers will never exert effort, regardless of the chance of getting laid off. A way to interpret this setup is to think of employees as being of high or low ability and a share of them who have high ability (η) can choose to work as it is not too costly, whereas a share $1-\eta$ has low ability and always find it too onerous to work.



Professional CEO compensation $\lambda\pi(e)$ is the executive's compensation. The CEO is assumed to not have enough capital to purchase the firm outright and thus has to be employed. λ is assumed to be exogenous and represents the CEO net wages, taking into account the manager's cost of effort of running the firm. The λ here could also include any profit appropriation that may happen because of low legal oversight, as in Burkart and Panunzi [2006]. This payoff is assumed to be larger than their outside option, such that there is at least one professional CEO who always agrees to manage the firm if the contract is offered.

CEO costs of control Γ is the net cost of control. It is representing the cost of effort that a CEO has to expend to run a firm, net of any private benefit of control he may accrue from doing so. Intuitively, the variable setup suggests that if the private benefit of control is relatively low, the family CEO would compare the cost of effort to the financial cost of hiring a professional CEO. If the family CEO gains a very high level of private benefit from control relative to how onerous it is for him to manage the firm, the utility cost would be "negative".

$\Gamma = 0$ for professional CEO is a simplification to make the model tractable. Conceptually, the professional CEO would also incur c_{Mg}, but this cost would be included into the $\lambda\pi(e)$ payoff bundle. We are implicitly assuming that c_{Mg} is equal for professional CEOs and family CEOs — that is, in a sense we are assuming the same level of ability for both CEO types. This is a departure from the usual assumption in previous models, but one that can be relaxed at a later time.[40]

CEO firing costs All CEOs incur a common cost of firing workers, $\ell_c \in \{\ell_c^-, \ell_c^+\}$, where ℓ_c^- denotes the lowest cost possible across all industries and ℓ_c^+ denotes the highest. In the game, this cost is exogenously set in each industry. Conceptually, we can interpret this cost as, say, an industry with higher rates of unionization than the average having an ℓ_c

[40]For example, Burkart and Panunzi [2006] assume professional CEOs have higher ability.

closer to ℓ_c^+, or a country with lax labour laws relative to the average country having ℓ_c closer to ℓ_c^-.[41] The industry for each firm and worker is determined before the game.

Family CEOs incur an additional firm reputation utility cost, f if they have to discipline workers (regardless of effort). This cost reflects how emotionally important the firm's standing in the community is for the family CEO, and is consistent with the idea that family firms are held to a higher "moral standard" than faceless corporations: for example, if a family firm CEO fires workers they can suffer a backlash from the wider community the firm is located in. For professional CEOs, it is always the case that $f = 0$.

For each CEO, there will be a threshold $\overline{L}$ at which the cost of disciplining workers is too high to be worth investing in monitoring. Because the cost is increasing in both ℓ_c and f, this implies that the total cost of firing workers will always be higher for the family CEO, except in the case where $f = 0$ for the family CEO.

C.2 Backward induction

Figure B5 shows the game tree outlining the possible decisions of the CEO, already including the results from the preliminary analysis in place of the full set of choices wherever possible. The utility functions shown as the payoffs next to each terminal node specify the utility functions for the family and professional CEOs and for the worker. Note that it only specifies the owner's payoffs as a family CEO, as I will address the owner's choice last accounting for the payoffs under a professional CEO as well. β, ν and δ inside the nodes or dashed lines label the information sets.

Fourth mover (last) — CEO: The last actor to make a decision is the CEO. He chooses whether he will fire the worker ($d = D_L$) or keep the worker ($d = D_K$). This is the CEO's second action choice; the CEO's first action choice is the investment choice ($i \in \{i_y, i_n\}$).

CEO Strategy: The CEO has only one rational choice at the information sets δ_B and δ_C: D_K (to keep the worker). The action chosen at δ_A depends on the world and firm reputation costs of firing workers, $\ell_c + f$. Recall there is a threshold at which firing costs become too high — say, $\overline{L}$, and for each industry, there is a share η of workers who will work and a share $(1 - \eta)$ who will shirk and could be fired.

Thus, the CEOs strategies at $\{\delta_A, \delta_B, \delta_C\}$ are:

1. $H_C = \{D_K, D_K, D_K\}$ if $\ell_c + f > \overline{L}$
2. $H_C = \{D_K, D_L, D_K\}$ if $\ell_c + f \leq \overline{L}$

In his disciplining choice, he will choose to fire a worker under the following conditions:

(a) the worker shirks ($e = \underline{e}$)

and

(b) the CEO invested in monitoring ($i = i_y$)

and

[41] In a dynamic model, there would be a cost of recruitment for the next period.

(c) the costs of firing workers is below the threshold: $(\ell_c + f) \leq \overline{L}$.

If any of these three conditions is violated, the CEO will keep the worker ($d = D_K$). We discuss the firing choice in context of the investment decision after describing the investment decision for the second mover.

Third mover — worker: Moving backwards, the second-last actor to make a decision is the worker. Workers naturally prefer to exert low effort and not be fired. However, they make their effort decision conditional on what they expect the response of the CEO will be, and on their own type.

Worker strategy: The worker has only one rational choice at the information sets ν_B, ν_C and ν_D: $e = \underline{e}$, since effort will not be observed at these nodes. The action chosen at ν_A depends on worker type. For each worker, if they are of low ability type ($c_e > \ell_w$), the action at all nodes will be $\underline{e}$. If they are of high ability type ($c_e \leq \ell_w$), the action at information set ν_A will be $\overline{e}$. In summary, the worker has two strategies:

1. $H_{W,L} = \{\underline{e}, \underline{e}, \underline{e}, \underline{e}\}$ if $c_e > \ell_w$ (low ability type)
2. $H_{W,H} = \{\overline{e}, \underline{e}, \underline{e}, \underline{e}\}$ if $c_e \leq \ell_w$ (high ability type)

For a given industry with share η of workers of high ability type, we expect that η share of workers will choose the second strategy and $(1 - \eta)$ will choose the first strategy.

In summary, workers will exert effort ($e = \overline{e}$) under the following conditions:

(a) the worker is of high ability type ($c_e \leq \ell_w$)

and

(b) the CEO invests in monitoring ($i = i_y$).

Second mover — CEO: The CEO knows how workers make their choices, and also knows η and ℓ_c in his industry. This is the CEO's first action choice, before the second action choice of disciplining $d \in \{D_K, D_L\}$). The CEO will choose to invest in monitoring iff the additional expected profits (and utility) are larger than the expected costs incurred. Formally, the expected utility for each CEO type under $i = i_y$ is:

$$\begin{array}{rlllll} \text{Family CEO:} & \eta[\pi(\overline{e})] & +(1-\eta)[& \pi(\underline{e}) & -(\ell_c + f) \quad] & -m - \Gamma \\ \text{Professional CEO:} & \eta[\lambda\pi(\overline{e})] & +(1-\eta)[& \lambda\pi(\underline{e}) & -\ell_c \quad\quad\quad] & -m \end{array}$$

The equivalent expected utility under $i = i_n$ is:

$$\begin{array}{rll} \text{Family CEO:} & \pi(\underline{e}) & -\Gamma \\ \text{Professional CEO:} & \lambda\pi(\underline{e}) & \end{array}$$

CEO STRATEGY: Let $\Delta\pi = \pi(\overline{e}) - \pi(\underline{e})$. At information set β each type of CEO will choose $i = i_y$ and invest in the monitoring technology iff the following conditions hold:

$$\begin{array}{rrcll} \text{Family CEO:} & \eta\Delta\pi & \geq & (1-\eta) \quad (\ell_c + f) & +m \\ \text{Professional CEO:} & \lambda\eta\Delta\pi & \geq & (1-\eta) \quad (\ell_c) & +m \end{array}$$

For each representative CEO type, let $\overline{L}$ generally be the threshold at which it becomes optimal for any CEO to invest in monitoring. Let the threshold be $\overline{L_f}$ for the family CEO and let the threshold be $\overline{L_p}$ for the professional CEO. Rearranging the terms in the conditions above yields the following thresholds:

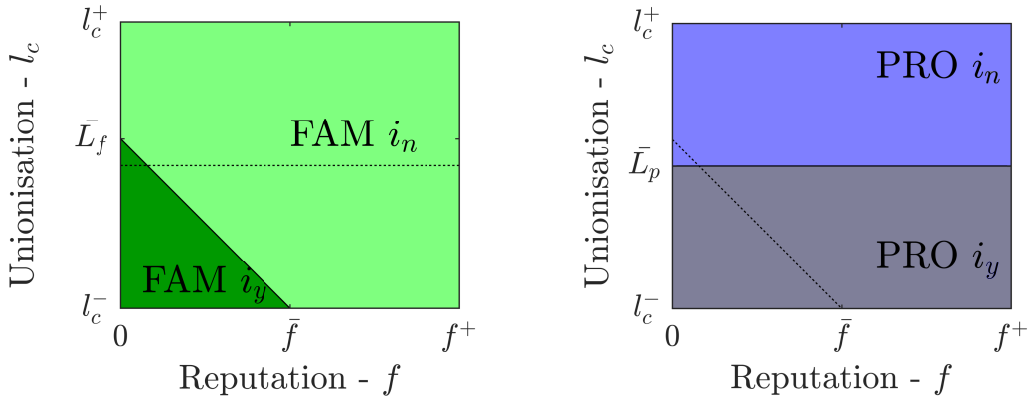
$$\text{Family CEO:} \quad \overline{L_f} \leq \frac{\eta\Delta\pi - m}{(1-\eta)}$$

$$\text{Professional CEO:} \quad \overline{L_p} \leq \frac{\lambda\eta\Delta\pi - m}{(1-\eta)}$$

Conceptually, these conditions suggest that the professional CEO will only invest if the cost of firing is less than or equal to the added profit they can expect the firm to make minus the cost of investment, multiplied by the inverse of the share of low ability workers. Notably, this threshold is relatively lower for the professional CEO as they only get a share of the profits: the first term on the numerator of the condition is $\lambda\eta\Delta\pi$ for the professional CEO and $\eta\Delta\pi$ for the family CEO. Thus, $\overline{L_f} > \overline{L_p}$.

Figure B3 shows the two-dimensional space of ℓ_c and f for each CEO type. The darker colours indicate investment in monitoring and the lighter colours indicate no investment and are divided along the L thresholds for each type. Each graph also includes a dotted line with the threshold of the other CEO type for ease of comparison.

Figure B3: CEO investment decision: parameter space

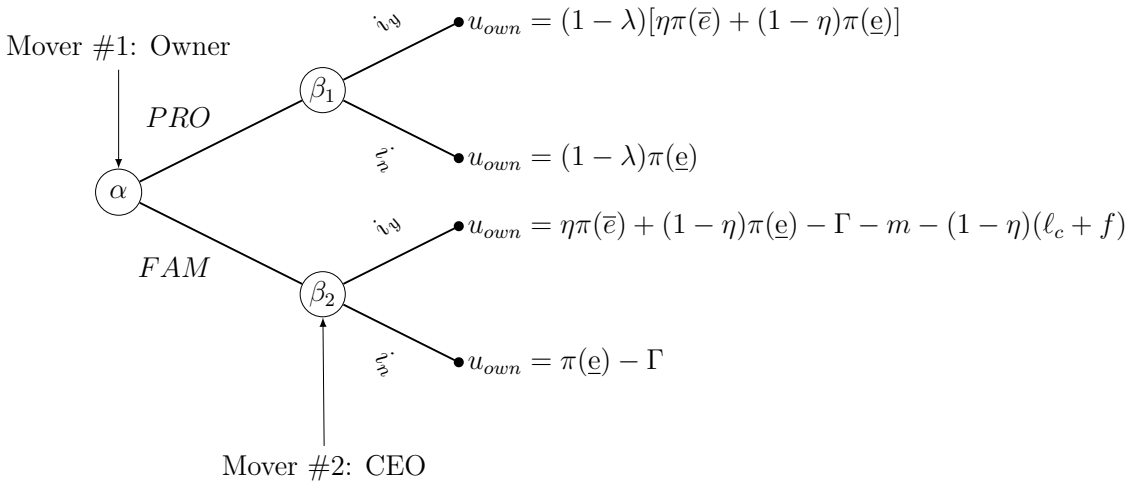


The CEOs full strategies at $\{\beta, \delta_A, \delta_B, \delta_C\}$ are:

1. $H_C = \{i_n, D_K, D_K, D_K\}$ if $\ell_c + f > \overline{L_f}$ (family) or if $\ell_c > \overline{L_p}$ (professional)
2. $H_C = \{i_y, D_K, D_L, D_K\}$ if $\ell_c + f \leq \overline{L_f}$ (family) or if $\ell_c \leq \overline{L_p}$ (professional)

First mover – owner: Finally, the owner's choice depends on the utility he would get if he acted as family CEO, versus the utility he would get from receiving the profits achieved by the professional CEO. Figure B4 shows the owner's payoffs at each terminal node if we substitute the game for the subgame perfect equilibrium at that node.

Figure B4: Game tree: owner's decision



The owner's decision depends on whether he would choose investment or not given a set of parameters, as well as his opportunity cost, which depends on whether the professional CEO would have invested or not. There are four possible set of parameters that determine the space for four equilibria:

Case 1: Both CEOs choose to invest in monitoring. Both CEOs would choose to invest, $i = i_y$, if $\ell_c \leq \overline{L_p}$ and $\ell_c + f \leq \overline{L_f}$. The owner's choice is based on the following utilities:

- $u_{own}(PRO, i_y) = (1-\lambda)[\eta\pi(\overline{e}) + (1-\eta)\pi(\underline{e})]$
- $u_{own}(FAM, i_y) = \eta\pi(\overline{e}) + (1-\eta)\pi(\underline{e}) - \Gamma - m - (1-\eta)(\ell_c + f)$

The owner will choose $Mg = PRO$ when both CEOs opt for $i = i_y$ iff his utility from doing so is higher than his utility from running the firm himself,[42] otherwise, he will choose $Mg = FAM$:

$$(1-\lambda)[\eta\pi(\overline{e}) + (1-\eta)\pi(\underline{e})] > \eta\pi(\overline{e}) + (1-\eta)\pi(\underline{e}) - \Gamma - m - (1-\eta)(\ell_c + f)$$

[42]Rearranging the terms provides an intuitive interpretation: the wage he expects to pay the professional CEO is smaller than the costs he will face if he chooses to manage the firm himself: $\lambda[\eta\pi(\overline{e}) + (1-\eta)\pi(\underline{e})] < \Gamma + m + (1-\eta)(\ell_c + f)$

The conditions specifying where each equilibrium lies are as follows:

$$Mg = PRO, i = i_y \quad \text{if:} \quad \ell_c + f + \frac{\Gamma}{1-\eta} > \overline{\Gamma} + \overline{L_p}$$

$$Mg = FAM, i = i_y \quad \text{if:} \quad \ell_c + f + \frac{\Gamma}{1-\eta} \leq \overline{\Gamma} + \overline{L_p}$$

Case 2: Both CEOs choose not to invest in monitoring. Both CEOs would choose not to invest, $i = i_n$, if $\ell_c > \overline{L_p}$ and $\ell_c + f > \overline{L_f}$. The owner's choice is based on the following utilities:

- $u_{own}(PRO, i_n) = (1-\lambda)\pi(\underline{e})$
- $u_{own}(FAM, i_n) = \pi(\underline{e}) - \Gamma$

The owner will choose the CEO following the same logic, and the conditions for the key parameters are as follows:

$$Mg = PRO, i = i_n \quad \text{if:} \quad \ell_c + f + \frac{\Gamma}{1-\eta} > \overline{\Gamma} + \overline{L_p}$$

$$Mg = FAM, i = i_n \quad \text{if:} \quad \ell_c + f + \frac{\Gamma}{1-\eta} \leq \overline{\Gamma} + \overline{L_p}$$

Case 3: Only professional CEO chooses to invest. The professional CEO would choose to invest, $i = i_y$, while the family CEO would not, $i = i_n$ if: $\ell_c \leq \overline{L_p}$ and $\ell_c + f > \overline{L_f}$. The owner's choice is then based on the following utilities:

- $u_{own}(PRO, i_y) = (1-\lambda)[\eta\pi(\overline{e}) + (1-\eta)\pi(\underline{e})]$
- $u_{own}(FAM, i_n) = \pi(\underline{e}) - \Gamma$

The owner will choose the CEO following the same logic, and the conditions for the key parameters are as follows:

$$Mg = PRO, i = i_y \quad \text{if:} \quad \frac{\Gamma}{1-\eta} > \overline{\Gamma} + \overline{L_p} - \overline{L_f}$$

$$Mg = FAM, i = i_n \quad \text{if:} \quad \frac{\Gamma}{1-\eta} \leq \overline{\Gamma} + \overline{L_p} - \overline{L_f}$$

Case 4: Only family CEO chooses to invest. The family CEO would choose to invest, $i = i_y$, while the professional CEO would not, $i = i_n$ if: $\ell_c > \overline{L_p}$ and $\ell_c + f \leq \overline{L_f}$. The owner's choice is then based on the following utilities:

- $u_{own}(PRO, i_n) = (1 - \lambda)\pi(\underline{e})$
- $u_{own}(FAM, i_y) = \eta\pi(\overline{e}) + (1 - \eta)\pi(\underline{e}) - \Gamma - m - (1 - \eta)(\ell_c + f)$

The owner will choose the CEO following the same logic, and the conditions for the key parameters are as follows:

$$Mg = PRO, i = i_n \quad \text{if:} \quad \ell_c + f + \frac{\Gamma}{1 - \eta} > \overline{\Gamma} + \overline{L_f}$$

$$Mg = FAM, i = i_y \quad \text{if:} \quad \ell_c + f + \frac{\Gamma}{1 - \eta} \leq \overline{\Gamma} + \overline{L_f}$$

C.3 Theoretical framework: game trees

Additional game trees The information sets are shown in nodes of the summary game tree in Figure B6, and are shown inside the nodes when they are singletons and inside the dashed lines when they are sets. Let α be the information set when the owner chooses who to manage the firm. Let β_1 and β_2 be the information sets at the time the CEOs take their investment action. Let ν_1 to ν_8 be the information sets at the time that the worker has to take their effort action. Let δ_1 to δ_6 be the information sets at the time the CEO has to take their disciplining action.

Figure B5: Game tree: CEO's investment decision

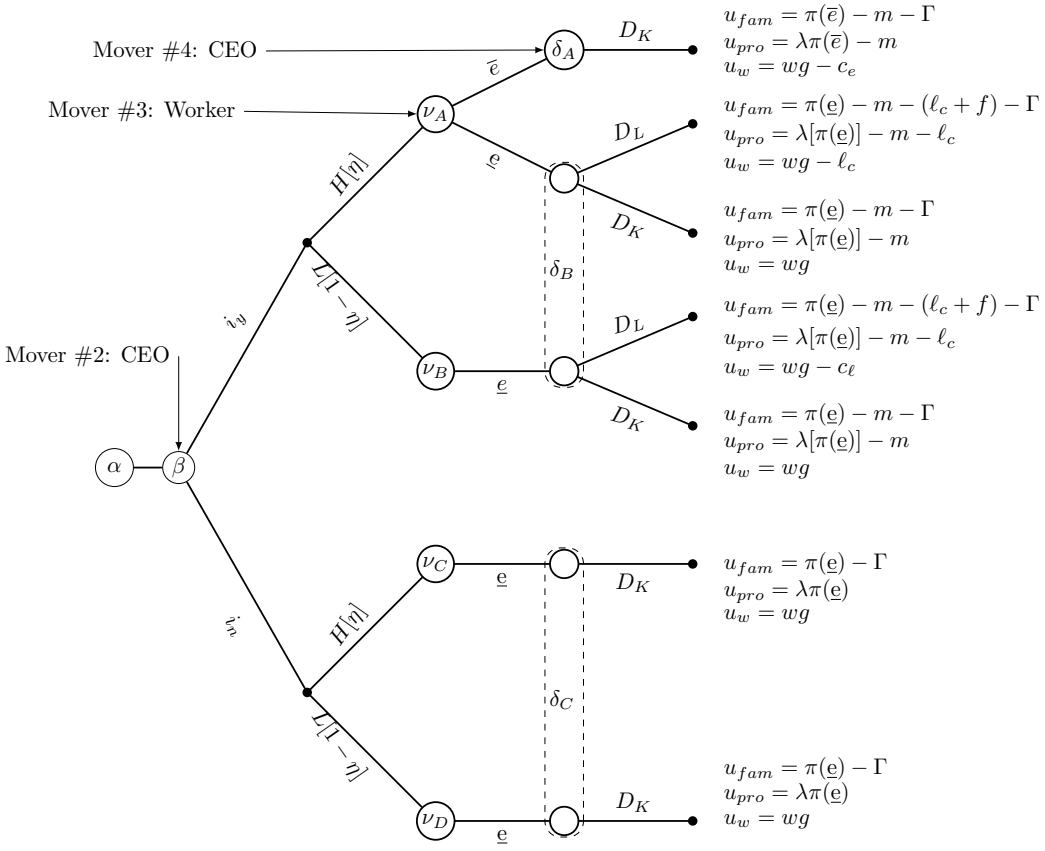


Figure B6: Game tree: summary decision set