Family ownership and the decentralization of decision making*

By Andrew Wait† and Jack Wright‡

September 11, 2014

Abstract

We examine decentralization – the use of more than one decision maker – in small- to medium-sized organizations, with a particular focus on family firms. If a firm has a single decision maker, almost all are male with a average of 15 years managerial experience. Our estimation results suggest that larger firms decentralize more often, as do firms with newer owners, organizations with a greater proportion of managers and firms in which non-directors have a significant ownership stake. On the other hand, centralization (using one key decision maker) is more likely in firms that use network communication technologies and benchmark firm performance. In regards to family firms, the relationship between ownership and decision making is nuanced. Overall, however, family-owned businesses are more likely to centralize, and this is particularly true when a family member is the director or proprietor. Furthermore, both first- and second-generation family firms have a greater tendency to be centralized than non-family businesses.

Key words: decentralization, centralization, decision making, decision management, decision control, family ownership.
JEL classifications: D23, L23, L29.

*We would like to thank Hajime Katayama, Nicolas de Roos, Bonnie Nguyen, Katrien Stevens and Don Wright for their helpful comments. The authors are responsible for any errors.

†Economics, University of Sydney, NSW 2006 Australia, andrew.wait@sydney.edu.au
‡NSW Treasury, Jack.Wright@treasury.nsw.gov.au

1 Introduction

Without exaggeration, the allocation of decision-making authority is one of the key management choices a firm faces; this choice, no doubt, can make or break a firm. Recently, as a consequence, there has been a growing academic literature on the delegation of decision-making rights in organizations. For example, Colombo and Delmastro (2004) examine the delegation of capital and labor-related decisions in Italian manufacturing plants. They find delegation is more likely in larger organizations and for labor decisions. Acemoglu et al. (2007) consider the profit-versus-cost center choice, showing that delegation is more likely to occur in new firms that are closer to the productivity frontier.[1] Bloom et al. (2010) find that delegation is related to a more competitive product market. Similarly, Meagher and Wait (2014) show that delegation of the decision to introduce a significant organizational change is more likely when product market competition is strong, in larger firms and when a workplace exports.

This paper contributes to this empirical literature in two key ways. First, our unique data allows us to examine the decentralization of decision making, in contrast to delegation, in that we consider whether or not a firm uses one person (centralization) or more than one individual (decentralization) to make its major decisions. While decentralization naturally requires some delegation, delegation need not require the dispersion of decision making rights. In this way, our measure of decentralization examines a complementary aspect of decision-making authority to the measures used in the existing research.

Second, our unique data allows us to also examine the differences between family and non-family firms. Moreover, there are also questions about what constitutes a family firm (see Chua et al. (1999) and Chua et al. (2003) for example). Not only do we know whether a firm is family owned, we also have details on the type of family operation a firm is (family member as a director, or an employee or as a non-working decision maker) and how many generations of family ownership a firm has enjoyed. In addition, we have information on the diversity of ownership and the length of tenure of the firm's current owner. To our knowledge, this level of detail regarding ownership and decision-making authority is novel. Among other things, this allows us to extend the research of Feltham and Barnett (2005). Feltham and Barnett (2005) examine decision making in Canadian family-owned businesses and found that family businesses are highly dependent on a single individual for decision making; their results show that owner-managers made all major decisions in at least three of five functional areas in 65 per cent of firms. Moreover, dependence on the single decision maker is decreasing in the value of the firm, the number of shareholders, the age of the firm and the age of the manager (his or her proximity to retirement). However, dependence on a single decision maker is more likely when the owner-manger's family have voting control within the firm. This study also complements Fiegener (2010) who found that self-owned firms have significantly less family involvement family-owned firms that have a broader ownership base. By analyzing decision making using novel data, we contribute to the study of the organizational structure in family firms, one of the most prevalent types of business in the world (see

[1] Also see Christie et al. (2003) for a study of the profit-versus-cost center decision.

La Porta et al. (1999), Faccio and Lang (2002) and Anderson and Reeb (2003)).[2]

Theories of the delegation of decision making have focused on: incentives (Aghion and Tirole (1997), Acemoglu et al. (2007), Zabojnik (2002) and Bester (2004)); communication with informed but biased agents (Dessein, 2002) and information processing (Radner (1993), Bolton and Dewatripont (1994) and Van Zandt (1999)). As a framework for our empirical analysis of decentralization, we utilize the arguments of Fama and Jensen (1983); when a decision maker is not a major residual claimant, decision-making rights need to be diversified so as to guard against opportunistic behavior. Specifically, Fama and Jensen (1983) suggest that decision management (authority regarding initiation and implementation of a project) should be separated from decision-control rights (ratification and monitoring of a project) to mitigate agency costs. From this, we predict that there will be greater decentralization of decision-making rights when decision makers are non-owners, as in non-family firms and when the director does not have a significant ownership stake in the firm.

Another reason to use more than one decision maker for major decisions is if the requisite information is held by different individuals and it is impractical to transfer this information to one person. Acemoglu et al. (2007) argue that delegation is more likely in technological advanced firms as the crucial knowledge is more likely held by those lower down in hierarchy. In a similar way, delegation occurs in Sah and Stiglitz (1986) as workers on the shop-floor have information about local conditions that is not known by the central office. Following this, decentralization is more likely in larger firms, as there are probably a greater range of complex decisions to be made. Similarly, a new owner – who has less experience at that firm due to their limited tenure – is less likely to have all the required information to make an informed decision, increasing the use of decentralization. On the other hand, use of a single key decision maker is more likely when information can be transferred to one individual, for example when there the firm has an integrated information-technology network, and when the scope of the firm is relatively contained, such as when a firm contracts out production of some inputs to external parties – this allows a firm to focus on their core activities more readily.

Our key empirical findings, outlined in Section 3, are as follows. We find an increase in the probability of centralization in family-owned firms. The relationship between decision making and family involvement, however, is not straightforward; centralization is more likely when a firm has a family owner working as a director or proprietor. However, centralization is not any more likely in family firms than in non-family businesses if a firm characterizes itself as a family firm because it has: family members who are non-employees that contribute to decision making; family members working as employees in the operation. We also find that decentralization is more likely when there is a lower share of the firm owned by the director. These results are consistent with the predictions of Fama and Jensen (1983); there is an increased probability of a separation of decision management and decision control (hence decentralization) relating to major decisions of the firm when agents are not major wealth holders in the business.

[2]Family-owned firms account for 83 per cent of all businesses in Australia account for approximately 50 per cent of private sector employment (Dana et al. (2010).

Succession is an issue of major concern for many family businesses (Chua et al., 2003). We find that both first- and second-generation family firms make greater use of a single decision maker than their non-family firm counterparts. On the other hand, firms with three or more generations of family ownership are not more centralized than non-family firms. This suggests that there is a change in the decision-making structure in family firms upon succession, as suggested by Nguyen and Wait (2012) who argued parent owners have different preferences than their successor children. These changes in decision-making structure could also be due to differences in what each generation knows about the business; for example, Saito (2008) found that after succession, financial performance improved in a family firm that separated ownership and decision-making authority by making use of a professional manager.

In a similar way to Acemoglu et al. (2007) who find that younger firms use more delegation, our results suggest that firms with younger owners decentralize more; this is consistent with the notion that tenure provides the opportunity for an owner to gather the required information to make effective decisions. We also find that centralization of decision authority is more likely when: a firm has an integrated communication technology network; contracts out activities it previously undertook; benchmarks itself against its rivals; and has a formal business plan. On the other hand, use of multiple decision makers is more likely in firms with a higher proportion of managers as a fraction of total employees; organizations with a higher proportion of managers are more likely to be dealing with a broader range of decisions of greater complexity (as in the hierarchy model of Garicano (2000)). These findings are also consistent with information-processing models that predicts that decision-making rights will be decentralized to make better use of dispersed knowledge.

Finally, centralization is more likely when a firm exports some of its output, and when it operates at more than one location. This second result, in particular, suggests that a firm centralizes decision-making rights when coordination is important (see Alonso et al. (2008)).

2 Data Set

We use the Business Longitudinal Survey 1995-1998 (BLS95), a cross-industry survey conducted between 1995-98 of 9550 Australian firms with less than two hundred employees.[3] This data has the advantage of having detailed information on each firm's: (i) decision-making structure; (ii) ownership and other internal characteristics; (iii) communication technology; and (iv) the firm's engagement in the product-market.

2.1 Dependant Variable

Our dependent variable *Decentralization* identifies firms that have one individual solely responsible for a business's major decisions (centralization, coded 0) or, alternatively, if the firm does not have a unique decision maker (decentralization, coded 1). This has the advantage of not conflating 'delegation' and 'decen-

[3]Note, as some key variables, including our dependent variable are only available for one year, our results are cross-section estimates.

tralization'. Moreover, our dependent variable is also a direct measure of the structure of decision making in that we identify whether there is a unique decision maker over a set of major decisions, rather than relying on a composite measure of decision making or a general indication of the degree of worker autonomy.

Table 1: Who is a Decision Maker?[a]

Variable	Mean	Std. dev.	Minimum	Maximum
EDUCATION				
School	0.341	0.473	0	1
Trade	0.241	0.426	0	1
Tertiary	0.377	0.484	0	1
GENDER				
Male	0.931	0.123	0	1
Female	0.069	0.003	0	1
QUALIFICATIONS				
Years Experience	15.601	10.537	1	42
Business Training	0.528	0.156	0	1

Notes: a) Source BLS 95-98. These summary statistics are in terms of those businesses which responded "yes" to having a unique decision-maker; approximately 4.4 per cent of firms with sole decision makers did not answer the Education question.

Who is a sole decision maker? Table 1 reports that approximately 93 per cent of individuals with sole responsibility for their business's major decisions descriptive are male. This is in stark contrast to the percentage of female worker proprietors, partners or directors (27 per cent of the total number of directors), of other managers (22 per cent of the total number of other managers) and the percentage of part and fulltime employees (30 and 59 per cent respectively) in the surveyed businesses. Second, approximately 38 per cent of those responsible for the major decisions of the firm have tertiary qualifications. Interesting in light of the predictions of Hart and Moore (2005) that generalists should supervise specialists, 53 per cent of those with tertiary education received qualifications in business management, commerce or administration. Third, sole decision makers tend to have extensive on-the-job experience, with an average of 15-and-a-half years in management.

2.2 Explanatory variables

Ownership.— To investigate the relation between family ownership and decentralization, we include several measures of family involvement in our estimations. First, the dummy variable *Family* indicates whether the firm considers itself to be a family business (1) or not (0) – approximately 27 per cent of the firms sampled are family businesses. This variable is included in the estimates for Model I. Second, three additional dummy variables relating to the nature of the family business are included in Model II: (i) *Director* indicates whether family members are directors or proprietors of the business; (ii) *Decision Maker* indicates whether family

members contribute to decision making but are non-working members of the business; and (iii) *Employee* indicates whether family members are employees of the organization. It is important to note that these variables are not mutually exclusive. Descriptive statistics for each of these measures are provided in Table 2; they show that 91 per cent of family firms have family members who are directors or proprietors. Third, we have information about how many generations a firm has been in the family. For the estimation in Model III we include separate dummies for a family firm: (i) in its first generation (*1st generation*); (ii) *2nd generation*; or (iii) if ownership has been in the family for three or more generations (*3rd generation*).

Table 2: Breakdown of Family Businesses[a]

Variable	Mean	Std. Dev.	Minimum	Maximum
Director	0.910	0.285	0	1
Decisions	0.092	0.289	0	1
Employee	0.476	0.499	0	1

Notes: a) Source BLS 95-98. b) It is important to note that these summary statistics are in terms of those businesses which responded "yes" to being a family business.

Table 3: Number of generations of family business[a]

Variable	Number (Proportion)
No generations	5699(73.19)
1st generation	1380(17.72)
2nd generation	550(7.06)
3rd (or more) generations	158(2.03)

Notes: a) Source BLS 95-98.

To explore the relationship between ownership and decision-making protocols more generally, we include the variable *Equity* that measures the percentage of equity not under the control of either a director, owner or proprietor. This variable indicates how widely held ownership is; the more widely held ownership (and the smaller the stake of a director) the greater need there is to have checks and balances on his or her decisions. Hence, we follow Fama and Jensen (1983) in predicting that the decentralization of decision making is more likely when the ownership widely held. Conversely, if a director or proprietor has a major ownership in the firm, there is less concern about the divergence of interests between a principal and agent – hence, smaller values of *Equity* increase the likelihood there is a co-location of decision management and decision control rights (centralization).

Size and structure.— We include variables pertaining to the size and structure of the firm. Following Acemoglu et al. (2007), the variable *Size* is coded as the natural logarithm of the total number of employees. Previous studies suggest that delegation is more likely in larger firms (see Colombo and Delmastro (2004)

and Meagher and Wait (2014); we predict a similar result relating to decentralization. This is because centralization of decision making is less feasible in larger firms that likely face a greater number and range of decisions, requiring a broader knowledge base unlikely to be found in one single decision maker.

The variable *Contract Out* specifies whether the firm contracted out activities previously undertaken within the boundaries of the firm. We predict that if a principal is able to contract out peripheral tasks, centralization is more likely for the narrower set of decisions that remain.

Locations is a dummy variable indicating whether the business operates over multiple locations (1) or not (0). Colombo and Delmastro (2004), and Meagher and Wait (2014) found that centralization is more likely when a firm has more than one plant undertaking similar activities, consistent with the idea of economies of scale in decision making and with the need for coordination between sections of the firm (Alonso et al., 2008).

Levels measures the number of managerial employees as a proportion of the total number of employees. Colombo and Delmastro (2004) present evidence suggesting that firms with flatter hierarchial structures are more likely to be centralized. Acemoglu et al. (2007) also make the point that an increase in managerial employees lends itself to greater autonomy and a higher degree of decentralized decision making.

Business Plan indicates whether the firm has a formal strategic plan (1 if so, 0 otherwise). Explicitly documenting its strategy in this manner could suggest that a central manager has made the major decisions, and is using the plan to communicate the plan to lower-level employees in the hierarchy. We predict that the adoption of a formal business plan will be associated with higher levels of centralization. This interpretation suggests that the plan is a way of communicating the manager's vision to the employees.

Information.— We also include variables relating the informational systems and requirements of the business. The dummy variable *Comparison* indicates whether a firm made any formal comparisons with other firms in their industry (1 if yes, 0 if not). The ability to benchmark enhances a principal's access to relevant information, potentially aiding centralization. Given that formal comparisons are only feasible if firms are sufficiently similar, this result complements the findings of Acemoglu et al. (2007) that industry heterogeneity contributes to delegation.

We also include variables on the owner's *Tenure* separated into five distinct cohorts: less than 2 years of ownership, 2-5 years of ownership, 5 to 10, 10 to 20, and over 20 years of ownership. Acemoglu et al. (2007) also argue that older firms are more likely to be centralized because the experience of senior management affords the opportunity to observe and accumulate public signals concerning performance and technology.

Further, the control variable *Network* indicates whether the firm has a networked administrative computer system (1) or not (0). Bloom et al. (2009a) find that the adoption of intranet communication technology was associated with centralization; on the other hand, Colombo and Delmastro (2004) find that delegation is more frequent in firms that have networked computer systems, interpreting their result as consistent with the idea that information systems allow for better monitoring of subordinate behavior.

Finally, a firm may have different informational requirements or greater competitive pressures when it

competes in an export market. This could possibly lead to a different choice of decision-making structure. For instance, Meagher and Wait (2014) find that exporters tend to delegate decisions on major change or restructuring; they argue that exporters face more complex decisions and significant costs of delay, a situation that encourages greater delegation. On the other hand, Meagher and Wang (2008) suggest that centralization will be preferred if it avoids delays; Bloom et al. (2010) argue that competitive export markets can provide an incentive against delegation if greater competition reduces incentives for agents to invest when profitability is blunted. To investigate this relationship we include the variable *Export* that is coded as 1 if the firm exports goods or services and 0 otherwise.

Table 4 lists the variables of interest and their summary statistics for the estimation sample.

Table 4: Summary Statistics for Estimation Sample (n=7787)

Variable	Mean	Std. dev.	Minimum	Maximum
Decision making				
Decentralization	.377	0.485	0	1
Ownership				
Family	0.268	0.443	0	1
Director	0.251	0.433	0	1
Decisions	0.023	0.150	0	1
Employee	0.135	0.342	0	1
1st generation	0.177	0.382	0	1
2nd generation	0.071	0.256	0	1
3rd generation	0.020	0.141	0	1
Equity	0.186	0.379	0	1
Size and structure				
Size	2.542	1.163	0.693	5.278
Contract Out	0.072	0.259	0	1
Locations	0.212	0.409	0	1
Levels	0.355	0.307	0	1
Business Plan	0.279	0.449	0	1
Information				
Comparison	0.267	0.442	0	1
Tenure$\leq$ 2	0.103	0.304	0	1
2 <Tenure$\leq$ 5	0.173	0.378	0	1
5 <Tenure$\leq$ 10	0.254	0.435	0	1
10 <Tenure$\leq$ 20	0.271	0.445	0	1
Tenure $>$ 20	0.199	0.399	0	1
Network	0.404	0.491	0	1
Export	0.140	0.347	0	1

Notes: Source BLS 95-98.

3 Empirical Results

We estimate a probit model of the probability of decentralization as a function of the ownership, size and structure, information variables and 2-digit industry dummy variables. The estimated marginal effects are reported in Tables 5 for the three models using the different measures of family ownership. As noted previously, our reduced-form estimates do not imply causality, however, our results do highlight some relationships of interest. We discuss the results related to each of these key aspects in turn. All probit estimations for Models I, II and III are calculated with the full set of controls using clustered standard errors at the 2-digit industry level. We discuss the result for ownership, size and structure and informational requirements in turn.

3.1 Ownership

Focusing on Model I, the coefficient on *Family* is negative and significant (at the 5% level); a family businesses is approximately 5 percentage points more likely to have one individual responsible for the major decisions than non-family businesses. This result supports the empirical findings of Feltham and Barnett (2005) that family-owned firms often have more centralized decision-making than non-family firms. This result is also consistent with Fama and Jensen (1983) – there is no need to separate decision control and decision management when the decision maker is a major residual claimant.

We further explore the relationship between decision making and the type of family ownership in Model II. First, the coefficient on *Director* is negative and significant; there is a 6 percentage point increase in the probability of centralization when a family owner is a director. By contrast, centralization is not statistically more likely in family firms than in their non-family counterparts when family owners do not work at the establishment, but are contributors to decision making. If family members are non-working decision makers, it could be the case that there is a collaborative relationship between those external family owners and senior management, resulting in a separation of decision control and management rights. The other family dummies (*Employee* and *Decisions*) are also insignificant at conventional levels, however both categories have relatively small numbers of observations. In all, however, these results suggests that the type of family ownership potentially matters for the structure of decision making. As a whole, these results suggest that the analysis of decision making in family firms needs to account for the type of family involvement in the organization. That is, our findings suggest that family businesses attempt to design their organizational architecture in response to the degree and nature of family involvement, given the different ownership structures and the incentives it creates.

Model III examines the relationship between generations of family ownership and use of a single major decision maker. *1st generation* family firms are 5 percentage points more likely to centralize, and *2nd generation* family firms have an increase in 7.4 percentage points in the probability of centralization.[4] The

[4]Note, there marginal effects are not significantly different at conventional levels.

marginal effects for *3rd generation* family firms is not significantly different from zero, suggesting no statistical difference between these firms and non-family operations. Several researchers suggest that succession in family firms is critical and could result in a change in organizational architecture, and financial returns (see Perez-González (2006), Bennedsen et al. (2007) and Cucculelli and Micucci (2008)). Notably, Saito (2008) found that the performance of family firms both owned and managed by descendants of the founder to be inferior to their non-family counterparts. However, following succession family firms benefitted from a separation of ownership and control, in that their financial performance improved if they employed an outside (non-family) professional manager. Further to this, Nguyen and Wait (2012) suggest a change in decision-making structures could eventuate after succession, given differences in the preferences of the parent-principal and the successor child. Our empirical study presented here adds to this literature, indicating that centralization is more likely when the firm is operated by the founding generation.

Turning our attention to how widely ownership in the firm is held, in all three models the marginal effect on *Equity* is positive and statistically significant at the 1% level; this suggests that a decrease in the percentage of firm equity under the control of either a director or proprietor is associated with an increase in the probability of decentralization. Again, this result is consistent with the argument of Fama and Jensen (1983) that there should be a separation of decision management and decision control rights (hence some form of decentralization) when a decision maker is not a major residual claimant.

3.2 Size and structure

With an increase in firm *Size*, there is an increase in the probability of having more than one key decision maker. Typically a larger firm will have more decisions, requiring a diverse range of knowledge. This lends itself to using more than one decision maker. Moreover, given the limits of managerial attention, as the number of decisions needing to be made grows, one decision maker is less likely to be able to cope with the work load on their own. This finding is consistent with the increased use of delegation in larger firms (Colombo and Delmastro (2004), Acemoglu et al. (2007), Meagher and Wait (2014)).

If a firm opts to *Contract Out* activities formally undertaken within the firm itself, it has a approximately a 3.5 percentage point increase in the probability of centralizing by using one key decision maker. Contracting out limits the number of activities, and hence the specific knowledge required by a single decision maker. Contracting out allows a firm to focus on its core activities, increasing the likelihood that one individual has the requisite knowledge to make the major decisions.

When it operates in more than one *Location*, there is an increase in the probability of centralization in a firm by 3 percentage point (consistent across all three Models, and significant at the 10% level). This is consistent with the finding of both Colombo and Delmastro (2004) and Meagher and Wait (2014) who found that centralization was more likely when a firm had multiple locations undertaking similar activities. This result could be indicative of several things. This could be reflective of the need to centralize when

Table 5: Decentralization of Decision Making: Probit Marginal Effects with clustered standard errors

Variable	Model I	Std. Err.	Model II	Std. Err.	Model III	Std. Err.
OWNERSHIP						
Family	$-.0512^{**}$	.024	-	-	-	-
Director	-	-	$-.058^{**}$	.024	-	-
Decisions	-	-	.036	.029	-	-
Employee	-	-	.003	.015	-	-
1st generation	-	-	-	-	$-.051^{**}$	.024
2nd generation	-	-	-	-	$-.074^{***}$	.027
3rd generation	-	-	-	-	.040	.115
Equity	$.116^{***}$	.028	$.115^{***}$	.027	$.327^{***}$	.043
SIZE AND STRUCTURE						
ln(Size)	$.061^{***}$	.015	$.061^{***}$	.015	$.061^{***}$	.015
Contract Out	$-.035^{**}$	.016	$-.035^{**}$	.016	$-.034^{**}$	.016
Locations	$-.028^{*}$	.016	$-.029^{*}$	.015	$-.030^{*}$	.015
Levels	$.140^{***}$	.024	$.143^{***}$	.025	$.396^{***}$	.072
Business Plan	$-.045^{***}$	.014	$-.046^{***}$	.014	$-.045^{***}$	.014
INFORMATION						
Comparison	$-.073^{***}$	.013	$-.074^{***}$	.014	$-.073^{***}$	.014
Tenure$\leq$ 2	$.053^{*}$	.030	$.054^{*}$	.030	$.057^{*}$	.030
2 <Tenure$\leq$ 5	$.085^{***}$	.021	$.086^{***}$	.021	$.089^{***}$	.021
5 <Tenure$\leq$ 10	$.066^{***}$	.017	$.067^{***}$	.017	$.070^{***}$	.017
10 <Tenure$\leq$ 20	.020	.015	.021	.015	.024	.016
Network	$-.046^{***}$	.011	$-.045^{***}$	.011	$-.046^{***}$	.011
Export	$-.034^{**}$	.016	$-.034^{**}$	.016	$-.035^{**}$	.0161
Industry	Yes	-	Yes	-	Yes	-
N	7787	-	7787	-	7787	-
$\ln L$	-4920.542	-	-4919.192	-	-4916.905	-

Notes:***, **, * represent the 1%, 5% and 10% level of significance, respectively. b) Except for the *generations* and the *Age* variables, marginal effects calculated at the mean of each variable and a firm with its owner's tenure set between 10 and 20 years. The marginal effects for the *generations* dummy variables are calculated at the mean of each variable, for a firm with its owner's tenure set between 10 and 20 years relative to the default of a non-family business. The marginal effects for the *Age* variables calculated at sample means for all variables relative to the default of an owner with more than 20 years experience. Marginal effects for discrete variables are calculated for a change from 0 to 1.

coordination between plants is important (Alonso et al. (2008) and Hart and Moore (2005)).

Levels measures the proportion of employees who are managers. Managers are typically have higher levels of skill and education, making them better placed to make important decisions (Garicano (2000)). The estimated marginal effect conforms with our expectation – there is an increase in use of multiple decision makers when there is a higher proportion of the firm who are managers.

Finally, there is a decrease in approximately 4.5 percentage points in the probability of decentralization if a firm has a formal business plan, significant at the 1% level. If a decision maker has the requisite information, a formal business plan in one way of communicating this with the employees in the organization.

3.3 Information

If a firm makes formal *Comparisons* with other firms in their industry, there is approximately a 7 percentage point increase in the probability of centralization; this result is consistent across all three Models. Performance comparisons allow a manager to collect information, which would help with decision making. However, further to that, a manager in a position to establish a formal benchmarking process must already have a significant amount of information about what to measures are important and how to interpret the data when it arrives. This echoes the arguments of Acemoglu et al. (2007) that a principal will not be able to retain decision-making rights if they do not have the requisite information, which is more likely when a firm is close to the productivity frontier.

On a similar note, Acemoglu et al. (2007) provide theoretical and empirical support for the hypothesis that newer firms are more likely to delegation. Our data allows for the examination of a related issue – owner tenure. Concentrating on Model I, our results suggest that, overall, firms with newer owners are relatively more decentralized than organizations with an owner with a longer tenure (all coefficients are in relation to the omitted category of *Tenure*> 20 years). This empirical finding is consistent with the idea that experience helps the owner attain the requisite knowledge to make key decisions, reducing the need to delegate authority to agents with an informational advantage lower down in the hierarchy. There is, moreover, a slight concavity in the *Tenure* marginal effects, which increase then subsequently decrease through the categories for owners with a longer tenure – a likelihood ratio test rejects the hypothesis that the difference between adjacent *Tenure* marginal effects are the same ($\chi^2(2) = 6.74$, $p > \chi^2 = 0.03$). It is possible that new owners sometimes wish to centralize to set a strategic direction for their newly acquired enterprize, and this mitigate the informational disadvantage they have which would otherwise encourage decentralization.[5]

Our estimation of the coefficient on *Network*, indicates a negative and significant relationship between the implementation of networked administrative communication technology and decentralization (at the 1% level); firms that adopt network communication technologies are 5 percentage points less likely to be decentralized than firms that have not adopted such technologies. This is consistent with the use of communication technologies to gather information and monitor agents' effort by the principal (see Bloom et al. (2009b) for a discussion).

Meagher and Wait (2014) found that an exporter is more likely to delegate a decision regarding a major change in the workplace as compared with a non-exporter. Our empirical estimates show that firms that export are approximately 3 percentage points more likely to centralize than non-exporters (5% level of significance). There are some key differences in these two studies, however. As noted, they study the delegation of a major decision regarding change in a workplace; here, we study the use of one or more than one decision maker for all of the firm's key decisions. Both studies indicate, however, that product-market

[5] An alternative to this explanation is that inexperienced owners try to centralize and do it, only realize their hubris. After

factors are potentially important considerations for a firm when it chooses its decision-making protocols.

4 Concluding Comments

One key theme in the literature is that family firms are different (for example, Sraer and Thesmar (2007) and Cucculelli and Micucci (2008) suggest a difference in financial returns between non-family and family owned firms).[6] Our results indicate that family firms are different, but not in unpredictable ways. Using the separation of decision management and decision control rights (Fama and Jensen, 1983) as a foundation for our analysis, we examine whether an organization uses: (i) one individual for all of its major decisions (centralization); or (ii) more than one individual is involved (a decentralized decision-making structure). Family firms are more centralized than non-family firms, particularly when family ownership takes the form of a family member being the director of the business. There is, however, no increase in the likelihood of the use of one key decision maker in family firms characterized by family owners who contribute to the decision-making process but do not personally work at the firm, and in family-owned businesses with family-member employees. These results are consistent with the theory of Fama and Jensen (1983); decision making is more likely to be split between agents to reduce agency problems when decision makers are not major wealth holders. First and second generation family firms are also more likely to be centralized than their non-family owned counterparts. On the other hand, family operations with three or more generations of ownership are no more likely to centralize than non-family firms.

This study complements previous studies on the delegation of decision-making rights with its focus on the single/multiple decision-maker choice of a firm. Decentralization is more likely when there is more equity held by individuals who are not the director or proprietor. Decentralization is also more likely in larger firms and have a relatively inexperienced owner. Both results suggest that when key information is dispersed, decision-making rights will be decentralized. Similarly, in an attempt to utilize their human capital, decentralization is also more likely when a firm has a large fraction managers. Centralization, in the form of using one key decision maker for all major decisions, is more frequent when: a firm contracts out activities they previously used to undertake; benchmarks performance; and has a formal business plan. Information again seems to be the key element here; centralization is feasible when the principal can obtain (and disseminate) the requisite information, or when the principal can manipulate the firm's tasks so that she does have the requirement knowledge to make an informed decision. Finally, there is a increase in the use of centralization when a firm operates at more than one location. This finding is consistent with arguments that centralization aids coordination (Alonso et al. (2008)).

[6] Also see Chami (2001).

References

Acemoglu, D., Aghion, P., Lelarge, C., Van Reenen, J., Zilibotti, F., November 2007. Technology, information, and the decentralization of the firm. Quarterly Journal of Economics 122, 1759–1799.

Aghion, P., Tirole, J., 1997. Formal and real authority in organizations. Journal of Political Economy 105, 1–29.

Alonso, R., Dessein, W., Matouschek, N., March 2008. When does coordination require centralization? American Economic Review 98 (1), 145–179.

Anderson, R. C., Reeb, D. M., 2003. Founding-family ownership and firm performance: Evidence from the S&P 500. Journal of Finance 58, 1301–1328.

Bennedsen, M., Meisner Nielsen, K., Perez-Gonzalez, F., Wolfenzon, D., 2007. Inside the family firm: The role of families in succession decisions and performance. Quarterly Journal of Economics 122, 647–691.

Bester, H., 2004. Externalities and the allocation of decision rights in the theory of the firm, discussion Papers 23, SFB/TR 15 Governance and the Efficiency of Economic Systems, Free University of Berlin.

Bloom, N., Garicano, L., Sadun, R., Van Reenen, J., 2009a. The distinct effects of information technology and communication technology on firm organization, NBER Working Papers 14975.

Bloom, N., Sadun, R., Van Reenen, J., July 2009b. The organization of firms across countries, NBER Working Paper 15129.

Bloom, N., Sadun, R., Van Reenen, J., 2010. Does product market competition lead firms to decentralize? American Economic Review 100, 434–38.

Bolton, P., Dewatripont, M., 1994. The firm as a communication network. Quarterly Journal of Economics 109, 809–839.

Chami, R., 2001. What is different about family businesses? IMF Working PaperWP/01/07.

Christie, A. A., Joye, M. P., Watts, R. L., 2003. Decentralization of the firm: Theory and evidence. Journal of Corporate Finance 9, 3–36.

Chua, J., Chrisman, J., Sharma, P., 1999. Defining the family business by behavior. Entrepreneurship: Theory and Practice 23, 19–39.

Chua, J., Chrisman, J., Sharma, P., 2003. Succession and nonsuccession concerns of family firms and agency relationship with nonfamily managers. Family Business Review 16, 89–107.

Colombo, M., Delmastro, M., 2004. Delegation of authority in business organizations: an empirical test. Journal of Industrial Economics 52 (1), 53–80.

Cucculelli, M., Micucci, G., 2008. Family succession and firm performance: Evidence from Italian family firms. Journal of Corporate Finance 14, 17–31.

Dana, L., Smirnios, K. X., Prestney, S., 2010. The MGI Australian Family and Private Business Survey 2010. RMIT University.

Dessein, W., October 2002. Authority and communication in organizations. Review of Economic Studies 69, 811–838.

Faccio, M., Lang, L., 2002. The ultimate ownership if western european corporations. Journal of Financial Economics 65, 365–395.

Fama, E. F., Jensen, Michael, C., 1983. Separation of ownership and control. Journal of Law and Economics 26 (2), 301–325.

Feltham, T., Barnett, J., 2005. The dependance of family business on a single decision maker. Journal of Small Business Management 43 (1), 1–15.

Fiegener, M., 2010. Locus if ownership and family involvement in small private firms. Journal of Management Studies 47, 296–321.

Garicano, L., 2000. Hierarchies and the organization of knowledge in production. Journal of Political Economy 14, 159–181.

Hart, O. D., Moore, J., 2005. On the design of hierarchies: Coordination versus specialization. Journal of Political Economy 113 (4), 675–702.

La Porta, R., Lopez-de Silane, F., Schleifer, A., 1999. Corporate ownership around the world. Journal of Finance 54, 471–517.

Meagher, K., Wait, A., 2014. Delegation of decisions about change in organizations: The roles of competition, trade, uncertainty and scale. Journal of Law, Economics and Organization forthcoming.

Meagher, K., Wang, W., 2008. Firm organization and market structure: Centralization vs. decentralization, university of New South Wales.

Nguyen, B., Wait, A., 2012. Participation and decision making in family firms. Organizational Economics Proceedings 1 (1).

Perez-González, F., 2006. Inherited control and firm performance. American Economic Review 96 (5), 1559–1588.

Radner, R., 1993. The organization of decentralized information processing. Econometrica 61, 1109–1146.

Sah, R., Stiglitz, J., 1986. The architecture of economic systems: Hierarchies and polyarchies. American Economic Review 76 (4), 716–727.

Saito, T., 2008. Family firms and firm performance: Evidence from Japan. Journal of the Japanese and International Economices 22, 620–646.

Sraer, D., Thesmar, D., 2007. Performance and behavior of family firms: Evidence from the French stock market. Journal of the European Economic Association 5, 709–751.

Van Zandt, T., 1999. Real-time decentralized information processing as a model of organizations with boundedly rational agents. Review of Economic Studies 66, 633–658.

Zabojnik, J., 2002. Centralized and decentralized decision making in organizations. Journal of Labor Economics 20 (1), 1–22.