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# **Financing, Firm Size and Scale Efficiency: A Study of Family and Non-Family SMEs**

## **Abstract**

This paper aims to identify whether family firm financing may be constrained by family owners' tendencies to maintain their socio-emotional wealth endowment, and how such constraints in turn impact firm size and performance. Using panel data from over 3400 small to medium sized enterprises across three years, this paper empirically tests this potential size effect using technical efficiency as a measure of performance. Controlling for multiple covariates, the results of our panel regression analysis reveal that family firms avoid external finance, and are indeed significantly smaller than non-family firms.

Further, by means of non-parametric analysis of technical efficiency, we find that family firms on average are less technically efficient than their non-family peers. When we decompose this inefficiency into two components, 'pure' technical inefficiency and scale inefficiency, we find that, relative to non-family firms, family firms have a tendency to be sub-optimally small.

## **1. Introduction**

The role of non-economic factors in the management of the firm is a key distinguishing feature that separates family firms from other organisational forms. Recently, Gomez-Mejia et al. (2007) have comprehensively referred to these non-economic objectives as the preservation of Socio-Emotional Wealth (SEW). SEW, as defined by the authors, refers to the non-financial aspects of the firm that meet the family's affective needs, such as identity, the ability to exercise family influence, and the perpetuation of the family dynasty (Gómez-Mejía et al. 2007).

Fundamental to the SEW approach is the notion that firms make choices depending on the reference point of the firm's dominant principles; hence family owners evaluate problems in terms of assessing how actions will affect their socio-emotional endowment (Berrone et al. 2012). Although the concept of SEW has gained considerable momentum in the last few years (see for example Berrone et al. 2010; Stockmans et al. 2010; T. M. Zellweger and Dehlen 2011; Cruz et al. 2012), noticeably missing in the literature are explorations into how the pursuit of various SEW objectives might in turn impact firm performance. The purpose of this paper is to shed light on one particular channel through which this may occur. More specifically, SEW priorities are proposed to have an effect on the financing preferences, size, and ultimately the efficiency of the family firm.

Though the challenges specific to small-to-medium sized enterprise (SME) financing, commonly known as an SME financing gap, pertain to both family and non-family SMEs alike, the theoretical basis for an SME financing gap relates to issues of asymmetric information, agency and transaction costs, as well as risk and control aversion. As a result, we propose that the behaviours associated with the maintenance of SEW might affect these financing challenges, particularly for family firms.

Specifically, using a socio-emotional reference point, family SMEs, relative to their non-family counterparts, are likely to have a more pronounced priority on maintaining family control. As extracting SEW benefits from the firm necessitates a high level of owner sovereignty, a fundamental condition to the maintenance of SEW is for family owners to

retain control of the firm. Thus, in family firms, owners are expected to have a much stronger control motive than those in non-family firms. This and other family firm behaviour related to the preservation of SEW, such as an aversion to certain risk taking activities and an emphasis on the firm's reputation, may in turn influence the information asymmetry, risk, and agency issues between would-be financiers and the firm.

In this study, we propose that, relative to their non-family peers, family owners heavily favour, or have better access to, what we refer to as 'internal' sources of finance, while other, more external sources may be precluded entirely. We further provide evidence that such differences, which serve to maximise SEW objectives rather than the firm's profit, have the potential to negatively influence the firm's overall access to finance, its size in terms of scale, and ultimately its performance, in terms of scale efficiency.

This paper begins with Section 2, which explores the literature as far as the distinctive challenges of SME financing are concerned. Section 3 then develops hypotheses related to family ownership, the composition of finance, firm size and efficiency. Section 4 and 5 outline our methodology and data-set respectively. Section 6 presents the results from our analysis, and Section 7 concludes.

## **2. Literature review: The distinctive challenges of SME finance**

Given their economic importance<sup>1</sup>, the issue of financing small-to-medium sized enterprises (SMEs) has played a central role in the economic, finance and managerial literature for decades (see for example MacMillan Committee 1931; Butters and Lintner 1945). During this period, many have argued that SMEs in particular have non-trivial difficulties in obtaining financing, either through debt or equity, leading to what is commonly referred to as an 'SME financing gap'. Although there is no generally accepted definition of this gap, the term refers to the sizeable share of economically significant SMEs that cannot obtain financing from banks, capital markets or other suppliers of finance (Organisation For Economic Co-operation And Development 2006;2007)<sup>2</sup>.

From a theoretical point of view, the distinctive challenges that SMEs face in raising financial capital are rooted in themes of asymmetric information and agency costs (Leland and Pyle 1977; Barnea et al. 1981; Pettit 1985; Binks et al. 1992), the risk aversion of both the provider and recipient of finance (Knight 1965; Kihlstrom and Laffont 1979; Stiglitz and Weiss 1981), the desire of owners to maintain control of the firm (R. Cressy 1995; Chittenden et al. 1996; Berggren et al. 2000), and structural deficiencies in the broader market for finance. Adding further complexity to the matter is the fact that these theoretical issues may be influenced by forces relating to both the supply of and the demand for financing.

In many studies examining demand side forces, the underlying reason for the general avoidance of raising finance from external sources is the inherent information asymmetry

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<sup>1</sup> Although there are numerous accounts of the economic importance of SMEs, a notable study by Ayyagari et al. (2007) reports that, depending on the country, the SMEs sector is responsible for a significantly large share of formal and informal employment as well as a large contribution to GDP in most developed and developing economies. For example, in Australia, where this study's data is sourced, the SMEs sector's share of formal employment is greater than 50 percent and its contribution to total GDP is found to be 23 percent (Ayyagari et al. 2007).

<sup>2</sup> In an effort to determine the worldwide prevalence of an SME financing gap and to explore policies which foster an improved flow of financing to SMEs, the Organisation For Economic Co-operation And Development (2006;2007) published two books on the subject.

between the potential providers of finance and the owners of the firm, which results in an increase in the cost of finance, and a reduction in the attractiveness or accessibility of such financing (Cassar and Holmes 2003; Brav 2009); however, another major factor is the loss of control that raising external finance implies.

For example, an aversion to the sale of equity to outsiders, coined as ‘control aversion’, is based on the theoretical notion that small businesses are run by fiercely independent owner-managers, suspicious of outside control (R. Cressy 1995; R. C. Cressy et al. 1996; R. Cressy and Olofsson 1997; Berggren et al. 2000). A strong control aversion, or control motive among SME owners would explain why many researchers have suggested that SME owners adhere to a ‘pecking order’<sup>3</sup> with respect to financing, as they have been observed to prefer internally sourced finance, such as retained earnings, and financing from friends and family, more so than externally sourced finance (Berggren et al. 2000; Mueller 2008).

This line of reasoning leads us to the understanding that, under certain circumstances, financial explanations for an SME financing gap may be more closely associated with the characteristics of the owner-manager’s preference for investment funds rather than any deficiency in supply. Supporting this view, Hutchinson (1995) asserts that, where the objective of an owner-manager is to maintain control of the firm, a sub-optimal capital structure decision is made in the form of reduced demand for both equity and debt. Such demand side constraints arise from factors internal to the firm (R. Cressy 1996; R. Cressy and Olofsson 1997), which implies that the personal motives and intent of owners matters in terms of the magnitude and scope of financing accessible to the firm.

In this regard, family ownership is an interesting form of ownership since family business owners have very different objectives relative to non-family firms, many of which being non-financial in nature (Ward 1988; Harris et al. 1994; Sharma et al. 1997; Nelly and Rodríguez 2008). Specifically, using a socio-emotional reference point, family SMEs, relative to their non-family counterparts, are likely to have a more pronounced preference towards internally sourced finance. Next we discuss these potential differences with respect to both debt and equity financing and how such differences may manifest themselves in outcomes such as firm size and efficiency.

### **3. Hypotheses development: Family ownership, the composition of finance, firm size and efficiency**

Since SMEs do not have access to public debt markets, they typically rely heavily on financial intermediaries, particularly commercial banks, and trade creditors as primary sources of debt finance (Petersen and Rajan 1994). With that said, other, less orthodox, sources of debt financing are also important to consider in the context of SMEs. These sources may include loans from related or unrelated individuals and businesses (Harvey and Evans 1995).

Successfully accessing such sources of debt finance can be related to what other researchers have called organizational social capital, which refers to goodwill and resources a firm amasses because of its connections and relationships with others (Arregle et al. 2007). In the case of SMEs, relations between the firm and its stakeholders are expected to reflect personal

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<sup>3</sup> The Pecking Order Hypothesis (POH) developed by Myers and Majluf (1984), as suggested by the seminal work of Donaldson (1961), asserts that under conditions of asymmetric information, firms will prefer financing sources that minimise transaction costs, external interference, and ownership dilution.

relationships to a much higher degree than in larger firms where such relationships are more likely to be formalised.

In this regard, family SMEs may be disadvantaged since, as a result of their tendency to focus on building interpersonal networks with internal contacts within the family, they may fail to cultivate external networks with more diverse stakeholders outside of the family (Salvato and Melin 2008). This implies that, although the depth of family SME networks may be quite deep, their breadth may be limited. The notion that family firms have narrower external networks has lead researchers like Rosessl (2005) to hypothesise that family businesses tend to be less willing to enter into cooperative arrangements with outsiders, as many characteristics of family businesses have a hindering effect on such cooperation. In other words, external sources of debt financing are often not well known by family firms, and their networks are poorly structured, making access to them difficult.

Further the aforementioned pecking order hypothesis developed by Myers and Majluf (1984) proposes that when firms have information that outside investors do not have, firms will prefer internal over external sources of finance. This approach can be explained by a desire to minimize the transaction costs of raising finance, which becomes especially important in the context of SME finance (Chittenden et al. 1996). Considering a pecking order, Romano et al. (2001) have found that small family businesses in particular tend to rely heavily on family loans, rather than loans from outsiders as a source of finance. Consistent with SEW maximising behaviour, these preferences protect the family's influence over the management and operation of the firm.

However, from a financing perspective, lower social capital with outsiders would hinder the family firm's ability to access these sources and limit it, to some extent, to internal sources of debt finance. This coupled with a strong control motive and resulting preference for internal loans from family implies that family firms will utilise more internal rather than external sources of debt finance. This can be tested under the following hypothesis:

*Hypothesis 1: Loans from internal sources, as a proportion of total debt, are greater for family firms relative to non-family firms.*

Since firm's can obtain finance by issuing both debt and equity, differences in internal debt composition alone cannot reveal the full extent of the influence family owners, via their SEW reference point, might have of the financing positions taken by the firm. Thus, just as family owners are expected to influence the firm's composition of debt, they are also expected to influence the firm's composition of equity.

As SMEs typically do not reach the required scale to issue shares on organised equity markets, they tend to rely heavily on private equity<sup>4</sup> and retained earnings. For SMEs, equity financing preferences consistent with a pecking order theory have empirically been shown to hold (Cassar and Holmes 2003). That is, the most commonly utilised sources of SME private equity are raised from internal resources, such as the principal owner themselves (including retained earnings), followed by their family and friends (Berger and Udell 1998). Lower on the order of preferred equity sources is equity raised from external resources, such as venture capitalists, unrelated individuals and eventually organised equity markets (Myers and Majluf

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<sup>4</sup> Broadly speaking, private equity refers to equity securities that are not registered and not publicly traded on an exchange. Thus private equity can be sourced from both internal and external sources.

1984). Similar to the case of debt financing, family ownership and a SEW reference point is also expected to influence the utilisation of these sources of equity financing.

On a positive note, as per the family business literature, patient capital is a valuable asset for family firms (Sirmon and Hitt 2003). Patient capital, a potential benefit of SEW preservation, refers to the equity holder's ability to focus on long term, rather than immediate, returns. Family owners are thus not as accountable for short-term results as nonfamily firms. For example, the presence of family owners, with their increased time horizon<sup>5</sup>, may reduce the riskiness of an investment and hence the risk-equivalent cost of equity capital (T. Zellweger 2007). However, it is important to consider that a reduction of investment risk might also relate solely to internal, rather than external, equity providers. A tendency for internal equity providers to be more 'patient' could in turn translate to a greater availability of equity from such sources.

Further, due to an intermingling of business and family finances in family owned businesses, there are potentially more sources of internal working owner equity for family firms than in non-family firms. Sirmon and Hitt (2003) refer to this advantage as survivability capital, another potential benefit of SEW preservation, which represents the pooled personal resources that family members are willing to loan, contribute, or share for the benefit of the family business (Dreux 1990; Haynes et al. 1999).

Although it is understood that SMEs in general will rely heavily on such sources of equity, greater patient and survivability capital, along with the tendency to build a strong equity base over time through the retention of profits (Poutziouris 2001), would suggest that family firms may access internal equity, such as equity from working owners and retained earnings, more so than non-family SMEs. To test this, we formulate the following hypothesis.

*Hypothesis 2: Internal equity from working owners, as a proportion of total equity, is greater for family firms relative to non-family firms.*

In addition to the reasons already discussed, and since we are curious about the composition of equity finance, we may also find Hypothesis 2 to be true due to the notion that family owners' first financing objective is not to lose control of the business (Lopez-Gracia and Sanchez-Andujar 2007). Thus, if the family firm were to raise external equity, it would be from related sources such as other non-working family members and friends, rather than unrelated individuals or businesses. Thus, on the negative side, family firms have limited sources of external financial capital because they avoid sharing equity with nonfamily members (Sirmon and Hitt 2003).

Although family ownership may reduce the asymmetric information problems associated with internal equity holders, asymmetric information between current family owners and prospective external investors may be enhanced due to the family firm's strong preference to maintain control (Schulze et al. 2003). Adherence to a pecking order of financing sources in itself would imply that family owners have information that outside investors do not, and in turn this would raise the transaction costs of external equity financing. The notion that family firms are more opaque<sup>6</sup> further enhances this information asymmetry problem (Anderson et

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<sup>5</sup> Zellweger (2007) argues that family firms display a longer time horizon than most of their nonfamily counterparts, since family firms display a longer CEO tenure, and strive for long-term independence and succession within the family.

<sup>6</sup> Anderson et al. (2009), by developing an index to gauge relative opaqueness, argue that information about firm activities is significantly less transparent in the presence of founder or heir ownership.

al. 2009; Bianco et al. 2012). Evidence of this has been presented in the literature. For example, using different approaches, Mahéroult (2000;2004), Poutziouris (2001), and Lopez-Gracia and Sanchez-Andujar (2007) all have found that the financial development of family firms in regards to equity is governed by a “keep it in the family” tradition.

Together, these characteristics suggest that family SMEs tend to have a more limited external equity financing base, but a wider base of internally generated equity, excluding equity from working owners, which has been tested for separately in Hypothesis 2. This can be tested under the following hypothesis:

*Hypothesis 3: Equity from internal sources other than working owners, as a proportion of total equity, is greater for family firms relative to non-family firms.*

Despite our expectations that there will be differences in the sources of debt and equity finance utilised by family firms, we acknowledge that family ownership may negatively impact the quantum of finance overall. For example, an over-reliance on internal or related sources of debt and equity may limit the total amount of finance the family firm can raise in the first place due to the likelihood that such sources are less endowed, in terms of capacity to finance, than external ones. While less endowed sources of debt and equity will limit the total amount of financing *available* to family firms, a strong control motive will also limit the total amount of finance that family firms are *willing* to raise externally. This can be tested under the following hypotheses

*Hypothesis 4: The quantum of total debt is lower for family firms relative to comparable non-family firms.*

*Hypothesis 5: The quantum of total equity is lower for family firms relative to comparable non-family firms.*

If, due to a preference towards internally sourced finance, family firms have lower values of both equity and debt, then such preferences could lead to a self-imposed physical capital, or size, constraint. A more direct relationship between firm size and the concept of SEW preservation in particular has only briefly been discussed in the literature. For example, Gomez-Mejia (2011) contend that firm size will moderate the family firm’s ability to pursue SEW objectives since, as firms grow in size, they culturally display a greater ‘distance’ between the organization’s identity and the founding family’s identity; thus, “as the family firm grows in size, the use of SEW as a primary reference point for guiding managerial choices tends to decrease”.

With that said, the discussion thus far leads us to the expectation that, in their pursuit of SEW objectives and resulting financial preferences, family SMEs will also be smaller in size than their equivalent non-family peers, which can be tested under the following hypothesis.

*Hypothesis 6: All things being equal, family firms are smaller than non-family firms.*

A smaller firm size alone will not necessarily impact performance; however, as family ownership may bring about a smaller firm, we recognise that family SMEs may particularly

be susceptible to the potential inefficiencies related to a sub-optimal scale of production<sup>7</sup>. This can be tested under the following hypothesis.

*Hypothesis 7: Family firms will exhibit greater inefficiencies related to a sub-optimal scale of production relative to their non-family counterparts.*

Although a smaller firm size does not automatically imply a sub-optimal situation, all things being equal, the presence of greater ‘scale inefficiencies’ would. With respect to Hypothesis 7, we further postulate that family firms will in particular tend to be sub-optimally small, i.e. if larger they would reap efficiency benefits. The aforementioned scale efficiency is a primary component of Farrell’s (1957) well-established, theoretically founded measure of technical efficiency, which has largely been overlooked in the family business and entrepreneurship literature (Anokhin et al. 2011).

#### **4. Method: Technical and scale efficiency**

Efficiency is a success indicator and a performance measure by which firms can be evaluated and compared. This paper is concerned with measuring the performance of both family and non-family SMEs which convert inputs, such as physical capital and labour, into outputs, such as goods and services. Based on the distance to a constructed efficient frontier, Farrell’s (1957) technical efficiency (TE) is measured as the ratio of a firm’s actual productivity to the productivity of the equivalent optimal, best practice, or efficient firm.

To date, previous studies have utilised either a parametric<sup>8</sup> or non-parametric approach to estimate the efficient frontier (Førsund et al. 1980). The non-parametric method, coined as Data Envelopment Analysis (DEA) by Charnes, Cooper, and Rhodes (1979;1981), does not require any assumptions about the functional form, as the DEA frontier itself is the linear programming calculation of an efficient firm which is then used to compute the TE score of the firm being evaluated. The measure is best explained using a visual illustration. Figure 1 highlights a one input, one output case. If known, the efficient frontiers OO’ and SS’ represent the various input and output combinations of firms using best practices in their production processes which exhibit constant and variable returns to scale respectively.

*[Insert Figure 1 here]*

In the diagram point P represents the observed input, R, and output, Q, of firm P. Compared to firm A, which is optimally scaled since it exhibits constant returns to scale (CRS) in its production process,  $TE_{CRS}$  in the use of inputs for firm P can be defined as  $QA/QP$ . Compared to firm C, which is sub-optimally scaled since it exhibits increasing returns to scale (IRS) in

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<sup>7</sup> The term ‘sub-optimal scale’ describes a condition in which the production capacity of some firms is too small, or even too large to be efficient (Weiss 1964). Specifically, for those sub-optimal firms which are too small, economies of scale are achievable if the firm were to increase its production scale, and for those sub-optimal firms which are too large, a diminishing marginal product means that efficiency gains are achievable if the firm were to decrease its production scale (Stigler 1958). If achieved, such efficiencies would serve to minimise the long run average cost of production, or in other words an optimally scaled firm would be producing at its so-called minimum efficient scale of production (Savign 1961; Weiss 1964;1979). However, optimal scale need not relate to production costs alone, as the theory of economies of scale is the theory of the relationship between the scale of use of a properly chosen combination of all productive services and the rate of output of the firm (Stigler 1958).

<sup>8</sup> The parametric, or stochastic frontier approach, as described in Bauer (1990), is distinguished by the assumption of an explicit functional form for the production technology. The frontier is then constructed based on the OLS estimation of the unknown parameters of, for example, a production, cost, or profit function.



its production process, ‘pure’  $TE_{VRS}$  in the use of inputs can be defined as  $QC/QP$  and is devoid of any scale efficiency effects<sup>9</sup>. From these two definitions of efficiency,  $QA/QC$  measures the inefficiency due to the divergence of the actual size of  $P$  from the optimal scale, which is referred to as scale efficiency,  $SE$ . An  $SE$  score of 1 indicates that the firm is operating at the most efficient production scale<sup>10</sup>.

By solving both the efficiency score for each firm in a given industry, and thus estimating an efficient frontier per industry<sup>11</sup>, we can subsequently find the  $SE$  of each firm as per Figure 1. Once we have obtained  $SE$  for each firm in our sample, we will then be able to specify econometric comparisons between composition of finance, firm size and scale efficiency across family and non-family owned firms. Specifically, for each dependent variable in a panel framework we estimate the following random effects model, which, in the context of this paper, can be expressed as.

$$(1) \quad \gamma_{it} = \alpha_{it} + \beta_{it}FF + \delta_{it}X_{jt} + u_i + \varepsilon_{it}$$

where  $\gamma$  denotes some dependent variable specific to  $i$  in time period  $t$ , which are related to our hypotheses proposed in Section 3, such as proportion of internal debt and equity finance, measures of firm size, and scale efficiency.  $\alpha$  is a common intercept parameter which will vary by  $i$  and  $t$ .  $FF$  is a dummy variable equating to 1 if the firm is classified as a family firm and 0 otherwise. As such,  $\beta$  captures the difference in the dependent variable  $i$  between family and non-family firms and will be the parameter of interest as far as testing our proposed hypotheses is concerned.  $\delta$  is a vector of estimated parameters with respect to  $X$ , which denotes a vector of  $j$  control variables<sup>12</sup>.

Not only will a random effects panel framework effectively control for any unobserved heterogeneity, but it utilizes all the available data in our sample. In the context of our analysis, we estimate a random-, rather than a fixed-, effects model since 1) the family ownership constant we are concerned with cannot be directly estimated using a fixed effect model approach as only the within variance, variance over time, is considered and the between variance, variance across firms, is disregarded; 2) a fixed effects model will not be able to identify the impact of time-invariant variables<sup>13</sup> (Baltagi 2001); and 3) as is the case in our sample, we assume that the firm specific intercept values are randomly drawn from a larger population of firms. The individual differences in the intercept values, i.e. the unobserved

<sup>9</sup> Equivalently, using an output oriented measure, the  $TE$  of  $P$  can be defined as  $RP/RB$  and pure  $TE$  can be defined as  $RP/RD$ . This implies that it is possible that firm  $P$  will be observed to exhibit either IRS or DRS in production depending on which orientation is used since they yield different projection points on the  $SS'$  frontier (Golany and Yu 1997).

<sup>10</sup> Given the hypotheses proposed in Section 3, family owned firms are expected to exhibit greater inefficiencies related to a suboptimal scale of production compared to their non-family counterparts. These potential scale inefficiencies are separate from any potential inefficiency related to resource use. By decomposing technical efficiency as per Figure 1 we can isolate the impact of family ownership on both components separately, which enables an otherwise impossible insight into potential efficiency differentials across firm ownership. Further, as we have shown, any efficiency comparisons across firm ownership which do not account for these simultaneous scale effects will be confounded by firm size and thus flawed.

<sup>11</sup> As it is expected that the prevailing underlying production technology will be very specific to the industry in which the firm is operating, it is extremely important to compare each firm to its industry specific frontier when calculating efficiency.

<sup>12</sup> We control for 37 ANZSIC categories, firm age, capital structure, capital intensity, firm size and efficiency.

<sup>13</sup> Considering that our sub-sample of the BLS is a relatively short panel (i.e. the number of cross-sectional subjects,  $N=3450$ , is greater than the number of time periods,  $T=3$ ), the family ownership dummy specified in (1) is in fact constant for each family firm across the entire period under analysis.

heterogeneity, of each firm are now reflected in the error term which is separated into two components 1), the unobserved random disturbance,  $u_i$ , for the  $i^{\text{th}}$  variable and constant through time; and 2) the combined time series and cross-section disturbance,  $\varepsilon_{it}$ . Next we discuss the data which is crucial to both the estimation of the efficient frontier and equation (1).

## 5. Data: The Business Longitudinal Survey

The Australian Bureau of Statistics' '*Business Longitudinal Survey*' (BLS) was designed to provide information on the growth and performance of privately held Australian SMEs, i.e. firm with less than 200 employees. The BLS is the longitudinal component of several waves of the '*Business Growth and Performance Survey*'. As such, the structure of the data includes not only a cross-sectional component, but also a longitudinal aspect for the years 1994-95 to 1997-98 inclusive<sup>14</sup>. The BLS has the potential to inform many areas of research with respect to SMEs, including industrial relations, business, finance and economics (Hawke 2000); however, for the purpose of our analysis, and the neo-classical theory of production, some narrowing of the data was required.

For example, only those firms which reported positive values for our measures of value added, output and inputs were included. Furthermore, to test our results over time, and to eliminate any selection or attrition bias, this study is exclusively focused on those firms which participated in each year of the study. Consequently, firms which did not participate in each wave of the BLS, from 1994 to 1998, were excluded. Further, as the question regarding the composition of finance had subsequently changed, the first year of the survey was dropped. This treatment has reduced our sample to 3450 firms per year over a three year period. Most importantly, given the context of this study, the BLS includes information on whether the firm is considered to be family owned for each firm included in our sample. For the sake of brevity our relevant dependent and independent variables are summarised in Table 1.

[Insert Table 1 here]

Using the variables defined in Table 1, we estimate equation (1) for each dependent variable of interest, the results of which are presented in the next section.

## 6. Analysis

The results of equation (1) are listed across four panels in Table 2. Heteroskedasticity, which is likely to occur in panel data, is accounted for by using a Panel Corrected Standard Error (PCSE) methodology to estimate the coefficients in the analysis (Beck and Katz 1995). To test if a random effects model is appropriate, we employ the Breush and Pagan lagrange multiplier test, which tests the null hypothesis that there are no random effects. With a p-value of 0.00, we reject the null and conclude that there are in fact random effects.

[Insert Table 2 here]

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<sup>14</sup> The BLS samples were drawn from the ABS Business Register, with 8745 business units being selected for inclusion in the 1994–95 survey. For the 1995–96 survey, 4948 of the original selections for the 1994–95 survey were selected, and this was supplemented by 572 new business units added to the ABS Business Register during 1995–96. The sample for the 1996–97 survey included 4541 businesses which were previously sampled, and an additional sample of 529 new businesses from the 1995–96 interrogation of the Business Register, and 551 new businesses from the 1996–97 interrogation of the Business Register.

Starting with financing preferences, Panel A presents the estimated coefficients when proportion of internal finance is the dependent variable. As we can see, family firms hold a significantly greater proportion of their debt and equity obtained from internal sources relative to their non-family counterparts. Specifically, family firms hold 6 percent more debt sourced from related individuals, as well as 20 and 3 percent more equity sourced from working owners and other internal shareholders respectively. These results hold after controlling for multiple measures of firm size and support Hypotheses 1, 2 and 3.

Moving on, Hypotheses 4 and 5 are also strongly supported as the family firm intercept coefficients estimated in Panel B show that family firms hold a significantly lower quantum of both debt and equity on their balance sheet. As there is a significant and positive correlation between the quantum of finance and firm size<sup>15</sup>, it is not surprising that family firms are also found to be significantly smaller than non-family firms. Specifically, Panel C reports that family firms produce less output, employ fewer workers, and possess less capital. These results strongly support Hypothesis 6.

Finally, there is strong evidence that the smaller firm size exhibited by family firms is the result of a capital constraint i.e. family firms are sub-optimally small. This is shown in Panel D where we can see that, relative to sub-optimally small non-family firms, which on average are 17 percent less scale efficient, family firms are a further 5 percent less scale efficient on average. With that said, contrary to our expectations, there are no significant differences between sub-optimally large family and non-family firms. These results substantiate Hypothesis 7 and hold after controlling for multiple covariates including age, industry, size, capital intensity, and capital structure.

## **7. Discussion and limitations**

It is well known that small-to-medium sized enterprises (SMEs) in general have difficulties accessing finance, but the literature which examines how family ownership may mitigate or enhance these difficulties remains largely dispersed and anecdotal in nature. Furthermore, the studies that do draw upon theory do so in an ad hoc manner and do not consider a holistic view of the family firm's financing decisions. By examining recent advances in the family business literature regarding the overarching paradigm of socio-emotional wealth (SEW) (Gomez-Mejia et al. 2007; 2011) and the various behaviours by family owners which result from the preservation of such wealth, this study develops and tests an argument on how these relatively unique tendencies may manifest themselves in the financing decisions of family owners and ultimately the performance outcomes of family firms.

We have shown that, with regards to composition of finance, family SMEs prefer internal, rather than external, sources of both debt and equity finance. Controlling for various factors, we propose that such preferences translate to a significantly lower quantum of finance raised by family firms as compared to their non-family counterparts. We show this to be true, as family firms hold significantly less debt and equity on their balance sheets. A lower quantum of finance held by a firm is highly correlated with a smaller firm size, so it is not surprising that we also find family firms to be significantly smaller than their non-family counterparts. These results are robust to multiple measures of size. With that said, we have not statistically

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<sup>15</sup> A greater quantum of debt and equity are found to be significantly correlated with a larger firm size, measured by value added, labour, and capital. These correlations, not presented here for brevity, are available upon request to the author.

demonstrated any causal links, but only show that these phenomena are occurring simultaneously.

The notion that family firms are smaller is not new; however, despite the well-established links between owners' financing preferences and firm size, as well as the descriptive links between family ownership and a smaller firm size, surprisingly very little research has investigated how firm size may be a direct outcome, rather than an antecedent or moderator of family owners' ability and willingness to maintain SEW. One of the reasons for this is that most comparisons between family and non-family firms focus on performance, rather than size, differentials. With that said, one of the main limitations of this study is our measure of SEW, which is simply a dummy variable related to family ownership. As more research is devoted to measuring the dimensions of SEW (see for example Berrone et al. 2012), in future research we hope to measure the degree of internal finance, size and efficiency in relation to the degree of the SEW endowment.

With regards to performance, the DEA efficiency computations reveal that family firms on average are less technically efficient than their non-family peers. When we decompose this inefficiency into two components, 'pure' technical inefficiency and scale inefficiency, we find the largest component of family firm inefficiency is due to scale. In other words, family firms are not reaching the *most* productive scale size, and as a result are paying an efficiency penalty. Considering that family run businesses are the prevalent form of business among OECD economies<sup>16</sup>, any SME financing constraints specific to family firms will have an impact on the socio-economic and entrepreneurial development in those economies.

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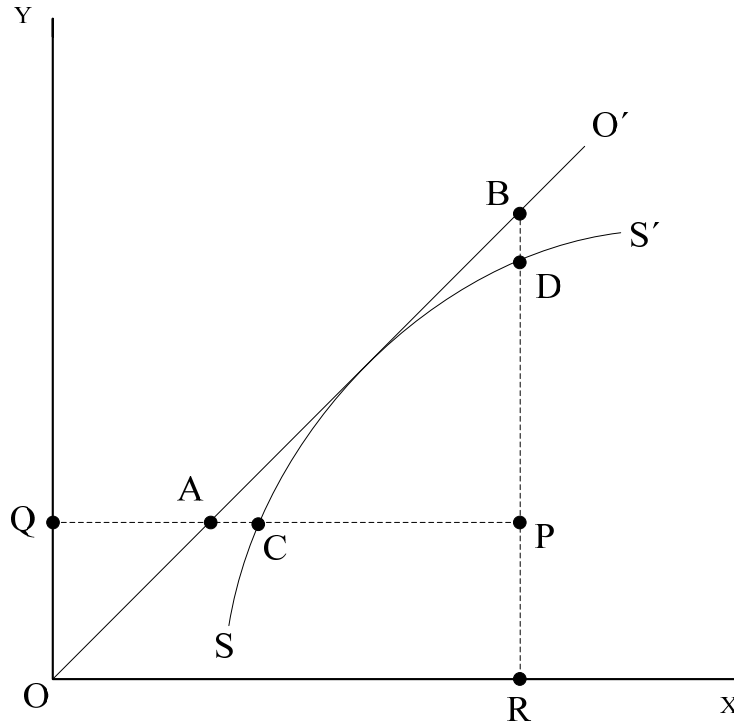
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<sup>16</sup> Burns and Whitehouse (1996) report that 85 percent of businesses in the European Union and 90 percent of businesses in the United States are family controlled. It is also generally recognized that family businesses are critical to entrepreneurship and socioeconomic development and industrialization in unstable, low income or transitional economies.

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**Figure 1:** one input, one output measure of technical efficiency with constant and varying returns to scale



**Table 1:** BLS proxies for dependent and independent variables

Concept	Proxy variable	Operationalization <sup>a</sup>
Production output	Value added (VA)	$VA_{it} = Sales_{it} + Closing\ inventory_{it} - Opening\ inventory_{it} - Purchases_{it}$ .
Labour input	Full-time equivalent employees (FTE)	$FTE_{it} = Full-time\ employees_{it} + Part-time\ employees_{it} * Equivalent\ ratio_{it}$ .
Capital input	Total assets	$Capital_{it} = Total\ liabilities_{it} + Total\ equity_{it}$ .
Family business	Self-determined	Do you consider the business to be a family business? Yes = 1; No = 0
Capital intensity	Capital to Labour ratio (K/L)	$K/L_{it} = Capital\ input_{it}/Labour\ input_{it}$
Internal Debt	Debt sourced from individuals involved in the business or their families (INTD)	$\%INTD_{it} = INTD_{it}/Total\ liabilities_{it}$
Working owners' Equity	Equity sourced from working owners (WO)	$\%WO_{it} = WO_{it}/Total\ equity_{it}$
Internal Equity	Equity sourced from family of non-working owners (INTE)	$\%INTE_{it} = INTE_{it}/Total\ equity_{it}$
Firm Size	Value added, Labour, and Capital inputs.	Defined above
Scale Efficiency	Scale efficiency (SE) as per DEA linear programming	$SE = TE_{CRS}/TE_{VRS}$

<sup>a</sup> *i* denotes an individual firm in time period *t*.

**Table 2:** *Estimated parameters for family firm internal financing, quantum of finance, size, and scale efficiency<sup>a</sup>*

	<i>Panel A: Internal financing</i>			<i>Panel B: Quantum of finance</i>		<i>Panel C: Firm size</i>			<i>Panel D: Scale efficiency</i>
	%INTD	%WO	%INTE	TL (000)	TE (000)	VA (000)	L (FTE)	K (000)	SE
Intercept	0.15*** (0.01)	0.74*** (0.03)	-0.01 (0.01)	3415.46** (1517.56)	2002.38*** (690.85)	1630.61*** (344.93)	16.04*** (0.92)	6218.41** (2824.67)	0.88*** (0.00)
<b>Family Firm</b>	<b>0.06***</b> (0.01)	<b>0.20***</b> (0.01)	<b>0.03***</b> (0.00)	<b>-2297.23***</b> (208.33)	<b>-1024.87**</b> (447.58)	<b>-1953.49***</b> (115.91)	<b>-9.71***</b> (0.47)	<b>-3305.95***</b> (528.16)	<b>-0.01</b> (0.01)
Labour	-0.00*** (0.00)	-0.00*** (0.00)	0.00*** (0.00)	-	-	-	-	-	0.00 (0.00)
Value Added	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-	-	-	-	-	0.00** (0.00)
Capital	0.00 (0.00)	0.00*** (0.00)	-0.00 (0.00)	-	-	-	-	-	0.00* (0.00)
IRS	-	-	-	-	-	-	-	-	-0.17*** (0.01)
DRS	-	-	-	-	-	-	-	-	-0.19*** (0.02)
<b>IRS*Family Firm</b>	-	-	-	-	-	-	-	-	<b>-0.05***</b> (0.01)
<b>DRS*Family Firm</b>	-	-	-	-	-	-	-	-	<b>0.01</b> (0.01)
Age <sup>b</sup>	-0.00 (0.00)	-0.01 (0.01)	0.01*** (0.00)	223.09*** (44.84)	48.46 (77.55)	288.13*** (44.96)	2.47*** (0.39)	149.32 (132.17)	0.01*** (0.00)
Capital intensity <sup>c</sup>	-0.00 (0.00)	-0.00*** (0.00)	0.00** (0.00)	5.47*** (1.12)	1.89*** (0.29)	2.08*** (0.25)	-0.00*** (0.00)	7.56*** (0.70)	0.00*** (0.00)
Capital structure <sup>d</sup>	0.01*** (0.00)	0.00 (0.00)	-0.00 (0.00)	251.01*** (93.34)	-189.27*** (4.29)	-6.38 (14.51)	0.19*** (0.07)	-102.69* (61.22)	0.00 (0.00)
Industry <sup>e</sup>	yes	yes	yes	yes	yes	yes	yes	yes	yes
Cross-section	Random	Random	Random	Random	Random	Random	Random	Random	Random
Time (3 periods)	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
N (3450/period)	10350	10350	10350	10350	10350	10350	10350	10350	10350
Adj R <sup>2</sup>	0.03	0.08	0.01	0.10	0.03	0.14	0.34	0.10	0.16

<sup>a</sup> Level of significance: \*\*\*1%; \*\*5%; \*10%. Panel corrected standard errors in parentheses.

<sup>b</sup> Age ranges are as follows: (1) Less than 2 years, (2) 2 to less than 5 years, (3) 5 to less than 10 years, (4) 10 to less than 20 years, (5) 20 years or more.

<sup>c</sup> Capital intensity measured as total capital/total labour.

<sup>d</sup> Capital structure measured by the debt ratio, total liabilities/total assets

<sup>e</sup> 36 ANZSIC dummy variables were controlled for in the estimation, but not listed in Table 2 for brevity. Property and Business Services was excluded and used as the benchmark industry.