Female top management in family firms and non-family firms: evidence from total population data

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Abstract: We exploit information on ownership, management and kinship to study the representation of women in top management teams in Swedish family and non-family firms among domiciled limited liability firms over the years 2004 to 2010. The share of female top managers is analysed across listed and non-listed firms as well as across industries. We then estimate the likelihood that a woman is elected into the top management team in family and non-family firms using a probit regression model where we control for firm- and individual-level characteristics, including the gender distribution of the firm and kinship relations to existing board members and firm owners. We find that non-listed family firms are more likely to appoint female top managers, whereas we find no differences among listed firms. Moreover, we find that the gender composition and kinship structures of firms influence the appointment of female top managers.

Keywords: female top management; family firm; family business; entrepreneurship; gender; gender equality; total population; executive board; chief executive officer; CEO; kinship.

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1 Introduction

Over the past three decades, family business research has gone from being a specialist field to an interdisciplinary one, involving researchers in a wide range of academic disciplines including business, economics and sociology. Many researchers today agree that family firms are important for most economies and that family ownership influences firm behaviour, e.g., in terms of their willingness to take risks, their investment behaviour and how they respond to economic policy (e.g., Hiebl, 2012, 2014; Hamelin, 2013; Bornhäll et al., 2016). Family business has also caught the attention of policy makers, and several programs to encourage family business have recently been launched in Europe and the USA (EC, 1994, 2006, 2009; US Small Business Administration, 2013).

Meanwhile, researchers and policy makers have become increasingly aware of the importance of female entrepreneurs for alleviating gender inequality and improving economic efficiency (Priem, 1990; Harveston et al., 1997; Hisrich and Fülöp, 1997; Bunderson, 2003; Vera and Dean, 2005; US Congress, 2009; EC, 2014; Hoffmann et al., 2015; Kay and Schlömer-Laufen, 2016).

To date, however, both research areas have developed separately and with little interaction (Barrett, 2014; Gherardi and Perrotta, 2016; Kay and Schlömer-Laufen, 2016). As a consequence, gender dynamics have traditionally been overlooked in family business research (Gherardi and Perrotta, 2016). Moreover, most family business research that *has* considered gender issues has focused on the dynamics of female heirs (daughters). Meanwhile, only a few studies have been made on the general role of women in family firms (Kang et al., 2007; Oehmichen et al., 2012; Wilson et al., 2013; Al-Dajani et al., 2014; Gherardi and Perrotta, 2016; Kay and Schlömer-Laufen, 2016).

A limitation to previous studies is that most have been limited to relatively small and narrow samples of firms, leaving some uncertainty as to the gender composition of family firms and non-family firms in general. Moreover, all previous studies have focused on the stock of women in top management. To the best of our knowledge, there are no studies so far on the determinants of female managerial appointments in family firms and non-family firms – i.e., *why* women are elected into top management in family firms and non-family firms. We aim to address these gaps in the literature.

The purpose of our study is twofold. First, we explore the gender distribution of top managers in family firms and non-family firms among all domiciled, Swedish limited liability firms over the years 2004 to 2010. Second, we explore the gender dynamics of newly appointed managers in family firms and non-family firms across the same population and time period.

We make several contributions to the literature. We employ detailed data for Sweden over the period 2004 to 2010 to present the first total population evidence on the top management gender distribution in family firms and non-family firms among all domiciled limited liability firms.[1] In total, approximately 175,000 firms and 280,000 top managers are included per year.

Next, we econometrically study the gender dynamics of top management in family firms and non-family firms across the same population and time period. More specifically, we employ a probit regression model and control for confounding individual and firm characteristics, such as kinship relations, board linkages and top management gender composition. Finally, we decompose our analysis and present the likelihood of women being appointed top managers in family firms and non-family firms across micro, small, medium and large firms.

We find that listed family firms employ a lower share of female top managers than listed non-family firms, whereas non-listed family firms employ a higher share of female top managers compared to their non-family equivalents. Moreover, we find that the average family firm differs only slightly from the average non-family firm in terms of top management gender distribution. However, when we control for individual-, firm- and industry-level characteristics, we find that family firms are significantly more likely to appoint female top managers than non-family firms among non-listed firms. Moreover, we find that kinship relations, the overall gender composition of firms and the number of current directorates held by female candidates positively influence the likelihood of women being appointed top managers. For non-listed firms, we find evidence for family firm-specific factors in excess of formal competencies, kinship relations and industry-related heterogeneity.

The rest of the analysis is organised as follows. The next section presents the current literature on family firms and female top management. Section 3 describes our data and empirical strategy. Section 4 presents the gender distribution of top managers among family firms and non-family firms across listed and non-listed firms – both in aggregates and across industries. Section 5 explores the dynamics of female top management appointments in family firms and non-family firms across listed and non-listed firms and furthermore across micro, small, medium and large firms. Section 6 provides concluding remarks.

2 Previous literature

2.1 Family firms and top management

Family firms exhibit unique traits that set them apart from other firms, for example, in terms of their willingness to take risks, their investment behaviour and how they respond to economic policy (e.g., Hiebl, 2012, 2014; Hamelin, 2013; Bornhäll et al., 2016). It is therefore unsurprising that the top management dynamics of family firms differ from those of non-family firms in terms of how top managers are elected and their role in firms (Bammens et al., 2011; Gersick and Feliu, 2013; Goel et al., 2013; Bettinelli et al., 2015).

In non-family firms, the primary role of the executive board is to supervise the behaviour of the firm's management (Hölmstrom, 1979). In a family firm, this function is somewhat

lessened, as its owners are often closely acquainted with its CEO and other managers (e.g., Fama and Jensen, 1983). Instead, family firms are more likely to use the board for advisory purposes and as a method of maintaining control over minority shareholders (Ling and Kellermanns, 2010; Bammens et al., 2011). In other words, family firms are likely to elect top managers whom they trust, who share their core views or who possess family firm-specific knowledge (Lester and Cannella, 2006; Basco and Calabrò, 2016). This is thought to be particularly applicable when family members themselves are engaged in the top management team, owing to lowered agency costs (Westphal, 1999; Olson et al., 2003; Corbetta and Salvato, 2004; Ensley and Pearson, 2005; Nordqvist, 2005; Eddleston and Morgan, 2014).[2]

2.2 Female top management

Turning to female top management, there is an apparent lack of theory that links gender to managerial behaviour (Barrett, 2014; Joshi et al., 2015a; Cabrera-Fernández et al., 2016). However, empirical and anecdotal evidence suggest that the behaviour of male and female top managers does not differ substantially (Cole, 1997; Sharma et al., 1997; Fitzgerald et al., 2001; Orhan and Scott, 2001; Sonfield and Lussier, 2004, 2009; Rutherford et al., 2006; Kepler and Shane, 2007; Kellermanns et al., 2008; Lerner and Malach-Pines, 2011; Coleman, 2016).

Although male and female managerial *behaviour* might not differ, a sizable amount of empirical evidence suggests that men and women enter top management for different reasons and at different rates. Women are consistently less likely to be part of a top management team and/or to engage in entrepreneurship – this has been verified over a wide range of time periods and geographical settings (Cole, 1997; Delmar and Davidsson, 2000; Langowitz and Minniti, 2007; Kelley et al., 2015).

The reason for this is commonly attributed to manifestations of gender roles (Brewer et al., 2002; Langowitz and Minniti, 2007; Lanaj and Hollenbeck, 2015), gender differences in entrepreneurial ambitions (Brush, 1992; Fischer et al., 1993; DeMartino and Barbato, 2003; Arshad et al., 2016; Coleman, 2016), discrimination (Joshi et al., 2015b; Artz et al., 2016; Glass and Cook, 2016), legal obstacles to free enterprise in women-dominated industries (Henrekson and Johansson, 2009) and 'homophily', i.e., the tendency for individuals to self-select into homogenous groups (Oehmichen et al., 2012; Pearce and Xu, 2012).

2.3 Female top management in family firms

Previous family business research on top management has mainly focused on gender-specific succession issues, emphasising the role of female heirs (daughters; Wang, 2010). A common conclusion is that women in family firms are hindered by factors that are both gender and family specific, such as conservatism, i.e., preference of male heirs over female heirs and 'role conflict' i.e., inability to mix business and domestic roles (Lyman, 1988; Salganicoff, 1990; Johnson and Powell, 1994; Galiano and Vinturella, 1995; Cole, 1997; Aronoff, 1998; Smyrnios et al., 1998; Cinamon and Rich, 2002; Curimbaba, 2002; Constantinidis and Nelson, 2009; Sonfield and Lussier, 2009; Wang, 2010; Ahrens et al., 2015).

This focus on intragenerational succession issues has recently received critique for being overly simplistic and shrouding many underlying gender issues faced by female entrepreneurs in family firms (Al-Dajani et al., 2014; Gherardi and Perrotta, 2016).

Recently, a handful of studies have moved past the kinship aspect of women's roles in family firms by reviewing the general role of women in family firms. They find that family firms are more likely to appoint a female top manager, where the main factor seems to be a historically higher share of female managers and female owners in family firms (Montemerlo et al., 2013; Wilson et al., 2013; Kay and Schlömer-Laufen, 2016).

Most closely related to our study is Kay and Schlömer-Laufen (2016), who studied the determinants of gender diversity in top management positions across a sample of large German firms during the period 2008 to 2012, where large firms are defined as those with an annual turnover exceeding €50 million. The authors estimated the likelihood for family firms and non-family firms to have at least one woman in their executive boards. They found that family firms are more likely to elect women into their executive boards because family firms have a higher share of female owner managers.

To conclude, there are only a few studies on female top management in family firms and most of them rely on limited samples of survey data.[3] It is therefore imperative that the subject be explored further.

2.4 Hypothesis development

Based on theory and empirical findings regarding the top management dynamics of family firms, we propose the following two hypotheses:

H1 Family firms are more likely than non-family firms to appoint women as top managers.

H2 The prevalence of women within the top management team is positively associated with the overall prevalence of women within a firm.

3 Empirical strategy

3.1 Data

To identify family firms and top management teams, we use total population data of both firms and individuals for Sweden over the period 2004–2010; the longest period to which we currently have data access. We exploit information on:

1 firms and firm-level characteristics

2 firm owners, managers and individual-level characteristics

3 kinship relations between owners and managers.

Information on firms and their characteristics is available in the Swedish business register, which is complete register containing information on all Swedish firms and organisations, including links between parent companies and subsidiaries.[4] To identify firm owners, we use the Swedish ownership register, the Swedish Financial Supervisory Authority's Central registers for investments and investor alerts and the Swedish tax authority's statistics of earnings and deductions, which together contain information on

all owners in all domiciled firms. To identify firm managers, i.e., CEOs and executive board members, we use the Swedish register based labour market statistics and the Swedish Companies Registration Office's Executive Board Register, which is administratively compiled, registers containing employer-employee data for all firms, thereby allowing us to link all residents to their respective work places. To identify individual-level characteristics, we use the longitudinal integration database for health insurance and labour market studies, which contains labour market information on all Swedish residents, such as their education, income and age. Finally, to identify kinship, we use the Swedish multiple-generation register, which contains information on the parents of all residents (both biological and adoptive parents). Table 1 summarises the included registers and data.

Table 1 Registers and included data

Register	*Data*
Swedish business register	Register of Swedish firms and enterprise groups
Swedish financial supervisory authority's central register of investments and investor alerts	Register of controlling owners[11]
Swedish Tax Authorities statistics of earnings and deductions	Register of owner managers in closely held firms
Swedish register based labour market statistics	Register linking Swedish firms and employees
Swedish companies registration office's executive board register	Register of executive board members in Swedish limited liability firms
Longitudinal integration database for health insurance and labour market studies	Register of individual-level characteristics for residents
Swedish multiple-generation register	Register of kinship between Swedish citizens

Note: All data are provided by Statistics Sweden.

3.2 Identification of family firms and top managers

To discern the managerial specificities of family firms, we need to identify three components: the family, the family firm and its top management. This is performed in three steps, which are described in this section.

To identify families, we use the Swedish multiple-generation register. This allows us to readily identify all known parents and siblings for all Swedish residents during a given year, i.e., all Swedish nuclear families. However, this definition may be too narrow to capture the way that some family firms are owned and managed. Therefore, we expand the notion of family to encompass all known relatives of any given individual, including aunts, uncles, cousins and grandparents, as well as their spouses. We find that almost all Swedish families span across 1 to 3 generations, approximately 98%of the population.[5]

We then apply the European Commission (EC, 2009) definition of family firms, which states that a firm of any size should be considered a family firm if:

1 The majority of decision-making rights are in the possession of the natural person(s) who established the firm, or in the possession of the natural person(s) who has/have

acquired the share capital of the firm, or in the possession of their spouses, parents, child or children's direct heirs.

2 The majority of decision-making rights are indirect or direct.

3 At least one representative of the family or kin is formally involved in the governance of the firm.

4 Listed companies meet the definition of family enterprise if the person who established or acquired the firm (share capital) or the families or descendants possess 25% mandated by their share capital.

The choice of definition is motivated by its basis on meta-analysis of European definitions of family firms. Moreover, the EC (2009) definition has been adopted by established organisations such as the European Union and multinational family business networks, such as the European group of owners managed and family enterprises (GEEF), the Family Business Network (FBN) International and the Family Firm Institute (FFI), leading us to believe that it is likely to be further used in the future.[6]

To identify family firms using the EC (2009) definition, we use information from the Swedish business register. The register contains information on each firm's legal form and ownership category (i.e., whether a firm is privately and domestically owned, foreign owned or government owned). This is used to identify all private firms. Next, we exclude foreign owned firms as we lack background information on their owners. Lastly, we delimit ourselves to limited liability firms because only limited liability firms appoint executive boards and CEOs, whereas other private legal forms are directly governed by their owners.

To summarise, our population of potential family firms contains all domiciled, private limited liability firms in Sweden in a given year (both listed and non-listed firms). The method for identifying family firms among these is described below.

For listed limited liability firms, we have information on the identity of all owners, including the size of their holdings (both direct and indirect holdings). We link all holdings to all families in Sweden and define them as family firms if at least 25% of the firm's votes are controlled by one family, given that at least one family member is also present in the firm's executive board. We identify a total of approximately 150 listed family firms per year, which is equivalent to approximately one third of all listed firms in Sweden.

For non-listed limited liability firms, we have information on a majority of owner managers, namely, those who are active in closely held firms and have received dividend income during a given year. Dividend income by owner managers of closely held firms is reported individually to the tax authority using a special form and this has been used to identify them. We do not, however, have information on the size of each owner's holdings. Instead, we assume that the decision-making rights of each firm are approximately equally distributed among its owners. We then apply the EC (2009) definition and identify them as family firms if at least half of all owner managers are related.

A small number of non-listed limited liability firms, however, have no reported dividend yields, meaning that we have no information on their owners. However, analysis of known owners among non-listed firms shows us that almost all owners, over 90%, hold a place in the firms' executive boards. Therefore, we instead use information on

executive board structure and identify the remaining firms as family firms if at least 50% of the firms' executive board members are related.

In total, we identify approximately 164,000 family firms among non-listed limited liability firms; 144,000 through information on owner managers and an additional 20,000 through information on executive board structure. This constitutes almost 90% of all domiciled limited liability firms in Sweden during the studied time period.

Lastly, we define the top management team of each firm as its executive board and CEO.[7] To identify the executive board, we use the Swedish Companies Registration Office's Executive Board Register. Averages of approximately 280,000 board positions are held each year. To identify CEOs, we use information on occupational categories. On average, we identify approximately 175,000 CEOs per year in family firms and non-family firms.

3.3 Econometric strategy

To study the top management dynamics of family firms and non-family firms, we apply a probit regression framework where we regress the probability for a woman to be elected into the top management team during a given year against individual- and firm-level characteristics:

$$\Pr\left(Top\ manager\ Female_{it+1} = 1 \mid x_{it}\right) = G\left(\alpha + \beta 1 Family_{it} + \delta X_{it} + \mu Z_{it}\right), \quad (1)$$

where G(.) is a known function taking on the value open unit interval. X_{it} and Z_{it} refer to vectors of firm-level and individual-level characteristics during year t, respectively. The included variables are presented below.

3.3.1 Dependent variables

Our dependent variables constitute two dummy variables: Female CEO and Female Board. Female CEO assumes the value '1' if a woman has been appointed CEO in a limited liability firm during a given year and '0' otherwise. Female board assumes the value '1' if a woman has been elected into a firm's executive board during a given year and '0' otherwise.

3.3.2 Firm-level independent variables

On the firm level, the first thing that we wish to control for is whether a firm is family owned (family). This is represented by a dummy variable that assumes the value '1' if a firm is family owned and '0' otherwise. Next, top management dynamics may differ across industries. We therefore control for the industry of each firm at the one- and three-digit levels using the NACE rev. 2 industry classification; one-digit level for listed firms and three-digit level for non-listed firms (industry). Moreover, there may be cultural differences between firms in different geographic regions. We therefore control for the region of each firm in terms of municipalities, the smallest administrative regions in Sweden (region). Firm behaviour may also vary across time – we therefore control for the year in which each firm is observed (year).

Empirical research shows that firm characteristics, including the likelihood of employing female top managers, are likely to differ across firm sizes (Martin et al.,

2008). We therefore control for the absolute size of each firm at the end of the previous year. Firms are divided into four groups by size: micro (0–9 employees), small (10–49 employees), medium (50–249 employees) and large firms (≥ 250 employees), denoted micro, small, medium and large. Moreover, previous studies show that firms with large boards are more likely to appoint female top managers (Montemerlo et al., 2013; Wilson et al., 2013; Kay and Schlömer-Laufen, 2016). Therefore, we also control for the size of each firm's executive board at the end of the previous year (board size). Finally, it has been shown that the gender composition of firms influences their likelihood to appoint a female manager (Elvira and Cohen, 2001; Oehmichen et al., 2012; Pearce and Xu, 2012; Kay and Schlömer-Laufen, 2016). We therefore control for the share of women on four levels: the share of women in each firm's top management team (share women top management), the share of women in each firm outside the top management team (share women firm other) and the share of women within and outside top management within each firm's industry (share women top management industry, share women other, industry). Finally, we also control for whether the previous CEO was a woman (prev. CEO female). This is represented by a dummy variable that assumes the value '1' if the previous CEO was a woman and '0' otherwise.

3.3.3 Individual-level independent variables

On the individual level, we control for the age of each individual (age). Moreover, to capture work-life experience, we include the number of years each person has been in employment (experience). To capture onsite experience, we also control for whether or not a person, up until being appointed top manager, has been employed within the firm – this is represented by a dummy variable that assumes the value '1' if the person has been employed in the firm prior to being appointed top manager and '0' otherwise (insider).

We also wish to control for the formal competence of each individual; this is done in terms of each individual's highest attained level of education. Three educational levels are considered: primary education, secondary education and post-secondary education (primary, secondary and post-secondary). Another factor that may influence the appointment of top managers is the nascent top manager's connection to other firms. This is thought to be especially important for family firms, as they may use the interlocked firms as sources of advice, especially when board interlocks involve other family firms (Lester and Cannella, 2006). Therefore, we control for the number of directorates held by each individual during the previous year, divided into family firms and non-family firm directorates (no. of directorates family, no. of directorates non-family). To control for past top management experience, we also control for the total number of directorates held by each individual prior to being elected top manager (no. of past directorates). Next, empirical research tells us that entrepreneurial and managerial behaviour likely differs between married and unmarried individuals and that these differences further depend on whether an individual has dependent children living at home (DeMartino and Barbato, 2003). Therefore, we control for whether an individual is married (married) and whether an individual has dependent children currently living at home (dependent children).[8] Finally, previous literature tells us also that kinship between nascent and current management as well as kinship relations between nascent top managers and owners are likely to influence top management appointments. Therefore, we control for kinship

between nascent and current top managers, as well as between nascent top managers and owners (related).

4 Descriptive results

In Table 2, we present the average gender distribution of top management in family firms and non-family firms across all domiciled limited liability firms in Sweden during the period 2004 to 2010, divided across listed and non-listed firms. We find that family firms have a slightly higher average share of female executive board members compared to non-family firms, whereas they have a somewhat lower average share of female CEOs. We can also observe that listed family firms have a lower average share of female top managers than do listed non-family firms. Among non-listed firms, however, we find that family firms employ a higher share of female top managers compared to non-family firms. Thus, we find results similar to those of previous studies among non-listed firms, whereas we find opposite results for listed firms (Oehmichen et al., 2012; Wilson et al., 2013; Kay and Schlömer-Laufen, 2016).

Table 2 Average share of female CEOs and executive board members (%)

	Listed firms		*Non-listed firms*		*Total*	
	Family	*Non-family*	*Family*	*Non-family*	*Family*	*Non-family*
Female CEO share	2.3	4.7	15.6	10.6	15.6	10.5
Female board share	17.9	18.4	17.1	13.1	17.1	13.2

Notes: Family firms and non-family firms among domiciled limited liability firms, 2004–2010. All private, domiciled limited liability firms in Sweden over the period 2004–2010.

In Table 3, we present the average share of female top managers in family firms and non-family firms across industries over the years 2004 to 2010.

In most industries, women hold approximately the same share of top management positions in family firms and non-family firms; between approximately 5% and 15% (industries A, C, D, E, F, I and J). These include traditionally male-dominated sectors, such as agriculture, forestry, mining, manufacturing and construction, with a historically low share of women. Considering that the overall share of women in these industries ranges from approximately 8 to just over 30%, this would nonetheless suggest that women are underrepresented in top management positions in these industries.

Women are especially common in the top management team of family firms and non-family firms in female-dominated industries. Women hold almost 40% of all executive board directorates in wholesale and retail sale (G), hotels and restaurants (H), education (M) and health and social work (N). Education (M) and health and social work (N) were previously subject to market regulation and women have only recently been able to assume executive posts in these industries. In practice, recent developments seem to have enabled employees (women) in female-dominated industries to exploit industry-specific skills to entrepreneurial and managerial ends in the same way as employees (men) have traditionally been able to in male-dominated industries. If these industries did not allow for private actors, the share of female top managers in Sweden would drop by over 1 percentage point. Women are still, however, considered

underrepresented as top managers in female-dominated industries (industries G, H, M and N), given that over 70% of all employees in these industries are women.

Table 3 Share of female top managers in family firms and non-family firms across industries, 2004-2010

Ownership category		*CEO share*			*Board share*		
Code	*Industry*	*Family firms*	*Non family firms*	*Difference*	*Family firms*	*Non family firms*	*Difference*
A	Agriculture, hunting and forestry	8.2	12.7	–4.4	11.0	15.8	–4.7
B	Fishing	3.3	13.4	–10.1	3.5	19.0	–15.5
C	Mining and quarrying	5.9	4.1	1.8	9.6	6.9	2.6
D	Manufacturing	7.8	5.9	1.9	10.7	8.6	2.1
E	Electricity, gas and water supply	8.9	5.1	3.8	14.9	16.0	–1.1
F	Construction	3.9	2.6	1.3	5.5	4.2	1.3
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	18.4	8.1	10.3	19.7	9.4	10.3
H	Hotels and restaurants	25.7	21.7	4.0	25.7	17.6	8.1
I	Transport, storage and communication	6.3	4.4	1.9	8.7	7.9	0.7
J	Financial intermediation	10.2	9.2	1.0	12.9	12.9	–0.1
K	Real estate, renting and business activities	17.9	10.8	7.1	19.1	13.9	5.2
L	Public administration and defense; compulsory social security	15.5	51.6	–36.1	6.2	21.4	–15.3
M	Education	37.3	34.1	3.2	36.2	34.6	1.6
N	Health and social work	38.2	34.4	3.8	38.0	39.0	–1.1
O	Other community, social and personal service activities	31.8	17.0	14.8	31.9	20.4	11.5
P	Activities of households	-	-	-	-	-	-
Q	Extra-territorial organisations and bodies	-	-	-	-	-	-
-	Unclassified activity	16.7	10.1	6.6	17.6	13.7	3.9
	Industry average:	15.6	10.5	5.1	17.1	13.2	3.9

Note: Industries are reported in accordance with NACE rev. 2.

One industry stands out in terms of gender composition among top managers in family firms and non-family firms: public administration and defence (L). We find that non-family firms employ over 35% more female CEOs and approximately 15% more female executive board members in this industry. This is largely explained by the nature of the industry, where private firms constitute those that are involved in the supply and maintenance of infrastructure within the Swedish government sector. This industrial category is dominated by a handful of family and non-family firms, where only a few individuals represent the absolute difference in female managerial appointments between family and non-family firms. Moreover, these results are to be taken lightly, as family firms and non-family firms are, in many cases, not involved in the same sub-industries.[9]

The exposition in Table 2 includes only seated executive board members, i.e., it does not include alternate board membership. When we include alternate board members, systematic differences emerge between family firms and non-family firms. For family firms, when alternate board members are included, the share of female top managers rises to approximately 30%; for non-family firms, however, the share of female top managers remains largely unchanged.[10] This suggests that family firms involve a high share of women, but that women are largely unprecedented in the front lines of management. This supports the claim by previous authors that women often assume an 'invisible' role in the top management team of family firms (Salganicoff, 1990; Galiano and Vinturella, 1995; Cole, 1997; Smyrnios et al., 1998; Wang, 2010; Lewis and Massey, 2011; Vadnjal and Zupan, 2011; Anshu, 2012; Gherardi and Perrotta, 2016).

The results presented in Table 2 and Table 3 does not concern the gender *dynamics* of top management in family firms and non-family firms, however, but rather its composition. Moreover, the results presented in this section are not adjusted for firm- and individual-level characteristics that may influence the gender dynamics of top management teams. Therefore, in the next section, we explore the gender dynamics of top management in family firms and non-family firms using the econometric specification presented in Section 3.

5 Econometric results

Table 4 presents the estimated likelihood of a woman being elected top manager (CEO or executive board member) in family firms and non-family firms across domiciled listed and non-listed limited liability firms in Sweden for the period 2004–2010.

We find weak indications that listed family firms are *less* likely to appoint female CEOs compared to listed non-family firms; approximately 4.8%. Meanwhile, we find strong evidence that non-listed family firms are *more* likely to appoint female CEOs and female executive board members compared to their non-family firm equivalents (1.4 versus 2.2%, respectively). The relationship persists even if we control for kinship bonds between nascent and current top managers, as well as kinship bonds between nascent top managers and owners. Therefore, family firms do seem to have a preference for female top managers. One reason for this may be that family firms base their top management choices on informal factors, such as trust, rather than on formal qualifications, which are included in the model. By this, we are able to partially confirm the findings of previous

studies that family firms are more likely to appoint female top managers (Montemerlo et al., 2013; Wilson et al., 2013; Kay and Schlömer-Laufen, 2016).

Next, we find that the share of female top managers and non-managerial workers within firms positively affects the likelihood that women are elected into top management teams. For both listed and non-listed firms, we find a positive relationship between the share of women in non-managerial positions and the likelihood of a woman being appointed top manager. For non-listed firms, we moreover find a positive link between the share of female top managers and the appointment of additional female top managers. This implies that a key determinant of women's representation in top management is the overall representation of women in firms and industries. This gives merit to the idea of homophily as a determinant to the gender distribution in top management teams (Oehmichen et al., 2012; Pearce and Xu, 2012; Kay and Schlömer-Laufen, 2016).

Meanwhile, we find mixed results for the relationship between board size and the representation of women in top management. For non-listed firms, we find a negative relationship on the likelihood of appointing a female CEO, while we find it to be positively related to the likelihood of appointing female executive board members. Our results thereby both verify and contradict those of previous studies (i.e., Montemerlo et al., 2013; Wilson et al., 2013; Kay and Schlömer-Laufen, 2016).

On the individual level, we analyse two categories of characteristics: individual and demographic characteristics, as well as top management-specific qualifications.

In terms of individual characteristics, we find (with some exceptions) that well-educated and experienced women are more likely to become top managers compared to less experienced and/or less educated women. This applies to both listed and non-listed firms. These results are expected; top managers are known to typically have above-average education and relatively long work-life experience. We moreover find that married women and women with dependent children are less likely to become executive board members in listed and non-listed firms. This is likely driven by the preferences and choices of individuals rather than of firms. By this, we mean that married women with (or without) children are more likely to engage in unpaid household work, thereby reducing their opportunities to compete for top management positions. Finally, for non-listed firms, we find that women who are related to the current management and/or owner(s) of a firm are more likely to be appointed top managers. This could indicate similar dynamics as discussed previously, i.e., that family firm chooses top managers that they know and trust. It may also indicate nepotism among non-listed family firms, however.

Regarding top management-specific qualifications, we find that women who hold multiple directorates are more likely to become CEOs in listed and non-listed firms as well as executive board members in non-listed firms. This could be interpreted to mean that firms actively use board interlocks to access business information and/or to form business networks. Alternatively, this result could simply imply that competent managers are likely to hold multiple directorates. Moreover, we find that listed firms are less likely to appoint business insiders as top managers, whereas we find an apparent preference to select business insiders among non-listed firms. Lastly, we find that the number of past directorates held by women reduces their chances of being appointed top managers in both listed and non-listed firms.

Table 4 Likelihood of appointing a female top manager in family and non-family firms

Marginal effects (∂Y/∂X)	*Listed firms*		*Non-listed firms*	
Dependent variable	*Female CEO*	*Female board*	*Female CEO*	*Female board*
	(1)	*(2)*	*(3)*	*(4)*
Family firm	–0.048*	0.011	0.014***	0.022***
	(0.029)	(0.016)	(0.004)	(0.0029)
Share women top management	0.11	0.066	0.51***	0.079***
	(0.076)	(0.046)	(0.0068)	(0.0043)
Share women firm other	0.19***	0.093***	0.23***	0.19***
	(0.041)	(0.027)	(0.0038)	(0.0041)
Share women top management, industry	–0.52*	0.67	–0.14	0.057
	(0.31)	(1.63)	(0.34)	(0.27)
Share women other, industry	0.37	–1.60*	–0.33	–0.15
	(0.23)	(0.95)	(0.25)	(0.21)
Prev. CEO female [1]	0.0074	_[1]	–0.32***	_[1]
	(0.039)	_[1]	(0.0063)	_[1]
Board size (log)	–0.0022	–0.012	–0.048***	0.013***
	(0.032)	(0.0097)	(0.0029)	(0.0014)
Age	0.0064	0.009	–0.0017	0.0034***
	(0.012)	(0.0081)	(0.0011)	(0.0011)
Experience	0.0062**	0.011***	–0.000092	0.00093***
	(0.003)	(0.00035)	(0.00037)	(0.00035)
Primary education	_Ψ	–0.067	–0.038***	–0.040***
	_Ψ	(0.048)	(0.004)	(0.0046)
Post-secondary education	0.037	0.063***	0.015***	0.020***
	(0.023)	(0.014)	(0.0035)	(0.0026)
Married	–0.04	–0.063***	0.0049	–0.019***
	(0.026)	(0.015)	(0.0031)	(0.0027)
Dependent children	–0.037	–0.031**	–0.0038	–0.0091***
	(0.027)	(0.015)	(0.0031)	(0.0028)
Related	–0.013	0.015	0.019***	0.019**
	(0.032)	(0.021)	(0.0055)	(0.008)

Notes: Domiciled limited liability firms in Sweden, 2004-2010. Family firms and non-family firms. All regressions include year-, size-, industry- and region-specific effects. Industry is controlled for in accordance with NACE rev 2 on the one-digit level for listed firms and three-digit level for non-listed firms. Region is controlled for in terms of municipalities. Reference groups: micro-sized firms and directors whose highest attained educational level is secondary school.
[1] 'Previous CEO female' is only included for estimates regarding female CEO appointments.
Ψ There were no CEOs in listed firms that had not completed at least secondary education.

Table 4 Likelihood of appointing a female top manager in family and non-family firms (continued)

Marginal effects (∂Y/∂X)	*Listed firms*		*Non-listed firms*	
Dependent variable	*Female CEO*	*Female board*	*Female CEO*	*Female board*
	(1)	*(2)*	*(3)*	*(4)*
No. of directorates family firms	0.0063**	0.00005	0.00070**	0.00025***
	(0.0028)	(0.00044)	(0.0003)	(0.000071)
No. of directorates non-family firms	0.0013	–0.00094	0.0011***	0.0012***
	(0.0013)	(0.00087)	(0.00023)	(0.00016)
No. of past directorates	–0.0052***	–0.0020**	–0.014***	–0.0095***
	(0.0018)	(0.00081)	(0.00082)	(0.00039)
N (number of appointed women)	643	3,561	70,779	108,969
Pseudo R^2	0.219	0.13	0.239	0.095

Notes: Domiciled limited liability firms in Sweden, 2004-2010. Family firms and non-family firms. All regressions include year-, size-, industry- and region-specific effects. Industry is controlled for in accordance with NACE rev 2 on the one-digit level for listed firms and three-digit level for non-listed firms. Region is controlled for in terms of municipalities. Reference groups: micro-sized firms and directors whose highest attained educational level is secondary school.
[1] 'Previous CEO female' is only included for estimates regarding female CEO appointments.
Ψ There were no CEOs in listed firms that had not completed at least secondary education.

Table 5 presents an analysis equivalent to that of Table 4, where we decompose our analysis and study the gender dynamics of top management in family firms and non-family firms across firm sizes. In this table, we only include non-listed firms. This is because there are too few listed firms within each size category to conduct such an analysis. For brevity, only the estimated differences between family firms and non-family firms are presented. As we can see from column 1 and column 2 of Table 5, non-listed micro-sized family firms are more likely to appoint both female CEOs and female executive board members compared to their non-family equivalents. This could be because a majority of all female owner-managed firms are non-listed and micro-sized. Therefore, firms in this category should, based on the notion of homophily, be more likely to appoint female CEOs (Loscocco et al., 1991; Rosa et al., 1996; Cliff, 1998; Rietz and Henrekson, 2000; Orser and Hogarth-Scott, 2002; Watson, 2006; Klapper and Parker, 2011; Oehmichen et al., 2012; Pearce and Xu, 2012; Bulanova et al., 2016; Coleman, 2016). In addition, we find that small and large family firms are more likely to appoint female executive board members compared to their non-family equivalents, whereas medium-sized family firms are less likely to appoint female CEOs compared to medium-sized non-family firms.

Summarising the contents of this section, we find that family firms are more likely to appoint female top managers compared to non-family firms among non-listed firms, whereas we find no differences for listed firms. Moreover, we find that firms with a

higher share of women, both within and outside the top management team, are more likely to appoint female top managers. Current outside board engagements of women also seem to increase women's chances to be appointed top managers, whereas their number of historical board engagements reduces these chances. Finally, for non-listed firms, we find that women who share kinship bonds with a firm's current management and/or owner(s) are more likely to be appointed top managers.

Table 5 Marginal effect of appointing a female top manager in family and non-family firms across micro, small, medium and large firms

Firm categories	*Non-listed firms*	
Dependent variable	*Female CEO (1)*	*Female board (2)*
Micro (0–9)	0.031***	0.028***
	(0.005)	(0.004)
Small (10–49)	0.003	0.016***
	(0.006)	(0.004)
Medium (50–249)	–0.027**	–0.007
	(0.012)	(0.007)
Large (≥ 250)	-0.018	0.029*
	(0.034)	(0.029)

Notes: Domiciled, private non-listed limited liability firms, 2004–2010.
Domiciled, non-listed firms only. Same specification as in Table 3 except interaction terms with family firm and firm size. Listed firms are not included because of the low number of firms across certain sizes.

6 Concluding remarks

This paper confirms the findings of previous studies and suggests that family firms differ from other firms in their top management gender dynamics – both in terms of women's prevalence and their role in the top management team. We find that family firms are more likely to employ women in the top management team and our results imply that this is not driven by observable factors, such as formal competence, kinship, or the gender composition of firms and industries.

This highlights the need for policy makers' awareness of the dynamics of family firms when designing policy targeting gender equality, where family firms may require different economic incentive schemes to meet these goals. Policy makers are, in fact, devoting increased attention to the role of women in family firms (US Small Business Administration, 2011; European Parliament, 2015). This bears the potential to enhance the gender equalisation process of the economy. Our results regard Sweden, a traditionally progressive and relatively rich country. Because of the intrinsically cultural nature of gender studies, there are limitations to as to how far our results can be generalised. However, we argue that our results should be applicable to most Western countries.

A limitation to our analysis, however, is that it does not encompass ambition and motives – where previous literature suggests that women are likely to pursue top management positions for reasons different from men. As a consequence, women are

thought to be more likely to own and manage smaller firms, whereas men are expected to be more represented in large firm management (Loscocco et al., 1991; Rosa et al., 1996; Cliff, 1998; Rietz and Henrekson, 2000; Orser and Hogarth-Scott, 2002; Watson, 2006; Klapper and Parker, 2011; Bulanova et al., 2016; Coleman, 2016). Our results may therefore be influenced by exogenous factors related to gender.

We contribute to the literature by presenting the first total population evidence of the top management gender distribution in family firms and non-family firms – this is achieved using total population data for all domiciled limited liability firms in Sweden over the period 2004–2010. Next, we further contribute to the literature by presenting, to the best of our knowledge, the first comparative study of the likelihood that a female top manager is appointed in family firms and non-family firms over the same population and time period. This is achieved using a probit regression framework while controlling for individual- and firm-level characteristics, such as kinship relations, board linkages and their overall gender composition.

We find that listed family firms employ a lower share of female top managers than listed non-family firms, whereas non-listed family firms employ a higher share of female top managers compared to their non-family equivalents. Moreover, we find that the average family firm differs only slightly from the average non-family firm in its top management gender distribution. However, when we control for individual-, firm- and industry-level characteristics, we find that family firms are significantly more likely to appoint female top managers than non-family firms among non-listed firms. Hence, for non-listed firms, we are able to confirm our first hypothesis that family firms are more likely than non-family firms to appoint women as top managers. For listed firms, however, we find weak evidence of a reverse relationship with female CEO appointments.

Moreover, we find that the overall gender composition of firms and the number of current directorates held by female candidates positively influence the likelihood of women being appointed top managers. Hence, we are able to confirm our second hypothesis that the prevalence of women within the top management team is positively associated with the overall prevalence of women within a firm. Lastly, we also find that women who are related to the owner(s) are more likely to be appointed top managers in non-listed firms.

For future research, we suggest that the connections between family ownership and female top management appointments be explored further, with an explicit focus on female non-family members. This may give indications as to why family firms differ from non-family firms in their top management gender dynamics. This holds the potential to further uncover the driving forces behind gender equalisation processes in family firms and, by extension, in a vast majority of all firms. This not only bears relevance to equality itself but also may benefit large parts of the economy as we widen our pools of entrepreneurial and managerial talent.

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Notes

1 Top managers are defined as CEOs and executive board members.

2 Research on female entrepreneurship and female top management is at the juncture between multiple disciplines. This means that there are many possible strands of research to consider when studying female entrepreneurs. However, we choose to limit ourselves to the literature that explicitly concerns the performance and professional behaviour of female entrepreneurs and top managers. This is motivated from the scope of our study, as it focuses on labour market dynamics rather than social construct.

3 Montemerlo et al. (2013) used survey data of about 2,000 Italian firms with revenues exceeding €50 million; Wilson et al. (2013) used an extensive dataset on UK firms. However, the study's main focus was firm survival, not female top management.

4 As we have information on parent companies and subsidiaries, we can trace the ultimate ownership of firms through enterprise groups. Pyramid ownership is hence taken into account.

5 A small number of and five generation families are also identified (2% versus. 0.02%); the inclusion of these families does not affect our results, however.

6 In fact, several studies have already used the EC (2009) definition; see, for instance, Bjuggren et al. (2011, 2013), Grundström et al. (2012), Backman and Palmberg (2015), Bornhäll et al. (2016) and Kay and Schlömer-Laufen (2016).

7 Only publicly traded firms are required to appoint a CEO in Sweden, while closely held firms choose whether to appoint one. We therefore apply a hierarchical decision-making framework to identify all the highest-ranking managers (CEOs or equivalent) in Swedish limited liability firms. If there is an appointed CEO in the firm, then that person is, by definition, denoted as its CEO. If no CEO has been officially appointed, then the topmost ranking manager is denoted as the CEO. As firms may choose to assign different levels of hierarchy, we may identify the CEO at different levels for different firms. We therefore assign a hierarchical rating for the topmost managerial positions within firms, where the post of CEO is considered the highest position and the position of executive board member is considered the lowest. A person is then identified as the CEO if (s)he holds the highest ranking managerial position in the firm. If there are several managers occupying the same position, then the highest paid individual among these is denoted as the CEO. If, by chance, two or more of the highest ranking managers are equally paid, then the most senior manager of these is denoted as the CEO. This method has been used previously with success by Efendic et al. (2016).

8 Dependent children are defined as children under the age of 18 who live at home. Eighteen is the age of majority in Sweden.

9 This bears relevance to our results, as policy makers in Sweden may list gender equality as a requirement for firms to be eligible for government procurement contracts (Swedish Association of Local Authorities and Regions, 2012). Policy makers may, however, choose to waive this right. Our results regarding Public administration and defense (L) may therefore be the result of differences in institutional pressure between sub-industries.

10 Results regarding alternate board members in family firms and non-family firms are available upon request.

11 Any person who owns shares in Swedish listed firms through a Swedish legal person is obliged by law to report control of that legal person if (s)he controls at least 10% of the legal person's, a) share capital b) votes c) cash flow rights.