How do family ownership and founder management affect capital structure decisions and adjustment of SMEs?

Evidence from a bank-based economy

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Abstract

Purpose – The purpose of this paper s to study the financing behavior of family firms (FF), as these differ from their small- and medium-sized enterprise (SME) counterparts in their capital structure decision, mainly due to an increased risk aversion and the desire to maintain control over the firm.

Design/methodology/approach – A sample of 470 SMEs from a bank-based environment is examined for the period of 2005-2010. A dynamic panel data model is utilized to assess both the role of several capital structure determinants and the target-adjusting behavior for different subsamples of firms.

Findings – The results show that FF, whether controlled by founders or not, are relatively more leveraged. The aim to maintain long-term control and limited financing options and other factors seem crucial to the observed differences in leverage and dominate risk considerations associated with higher debt. Presumed differences in agency costs across generations do not drive capital structure decisions, as overall leverage does not differ between founder- and descendant-controlled family firms (FCFF and DCFF, respectively). Firms with a founder-chief executive officer (CEO), however, adjust faster to deviations from a target debt ratio. The effects of many proposed capital structure determinants differ across firm types, but are highly consistent with predictions from the pecking order theory.

Practical implications – Based on the results of this study, we suggest policy-makers in bank-based economies like Austria to strongly focus on mechanisms that facilitate the access to bank debt to ensure adequate allocation of finances to SMEs. This is especially important to stimulate growth and further innovation for the dominant group of FF, as they rely on debt the most to maintain family control.

Originality/value – This paper makes a novel contribution to the literature, as it combines an analysis of the capital structure of non-listed family firms (NFF) in a bank-based economy, the respective role of founder management, the dynamic adjustment to a presumed debt target and joint tests of capital structure theories.

Keywords Capital structure, Family firms, Founder management

Paper type Research paper

1. Introduction

It is commonly accepted that small businesses, and especially family firms (FF), are of fundamental importance for the economy and its growth possibilities (Ampenberger *et al.*, 2013; Gama and Galvão, 2012; Wu *et al.*, 2007). Given the economic and policy relevance[1] of

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their financial well-being, there is surprisingly little research on FF's corporate policy decisions (Ampenberger *et al.*, 2013) as most empirical work focuses on large listed firms (Degryse *et al.*, 2012). Financing and capital structure decisions are one field where special characteristics of small- and medium-sized enterprises (SMEs) (FF) and their operating environment have to be taken into account when testing conventional economic theories. SMEs are less transparent and, thus, particularly affected by information asymmetry (Ang, 1992; Berger and Udell, 1998; Michaelas *et al.*, 1999; Pettit and Singer, 1985) which induces relatively higher monitoring costs for capital providers (Ang, 1992; Berger and Udell, 2002; Michaelas *et al.*, 1999). External capital provision for SMEs is also affected by greater operating and default risks (Ang, 1992; Cassar and Holmes, 2003; Pettit and Singer, 1985) because of limited business diversification. As a result, the finance continuum of SMEs is restricted (as they typically lack access to capital markets) with internal funds and bank debt as the main financing channels (Berger and Udell, 1998; Petersen and Rajan, 1994). Despite extensive literature, there is still little research on capital structure decisions of private SMEs and especially on target-adjusting behavior with respect to leverage (a notable exception is López-Gracia and Sogorb-Mira, 2008). Existing work suggests and confirms that considerable disparities exist not only in the capital structure of listed and unlisted companies between small and large firms but also between listed and unlisted small firms (Berger and Udell, 1998; Chittenden *et al.*, 1996; Frank and Goyal, 2007; Giannetti, 2003; Titman and Wessels, 1988). SMEs (have to) finance differently[2], and as a dominant group[3] among SMEs, FF display features that distinguish their capital structure choice from that of non-family firms (NFF) (Wu *et al.*, 2007). Gama and Galvão (2012), for example, review these characteristics, such as overlapping roles within firm and family, long-term orientation, concern for subsequent family generations, etc., and their consequences, which are to be discussed in the following sections. Irrespective of whether these FF peculiarities point to more or less debt, several authors observe that capital structure differences are not simply due to (concentrated) family ownership, but attributable to family management (Ampenberger *et al.*, 2013; Ellul, 2009; Mishra and McConaughy, 1999).

We use panel data on SMEs in Upper Austria, the leading Austrian federal state in terms of industry, exports and technology to examine several questions. The first is whether FF systematically use more or less debt than NFF, augmenting the literature (López-Gracia and Sánchez-Andújar, 2007), observing that the capital structure of FF is different from that of small NFF. Second, and strongly connected, it is investigated whether the determinants of the leverage ratio differ between family and NFF. In this respect, we discuss different capital structure theories and the role of agency costs. Both parts of the analysis are also performed for FF with and without the founder (still) acting as chief executive officer (CEO), as especially the emergence of and the way agency costs are dealt with presumably differ across generations. The firms examined operate in an environment and institutional setting that is, as Ampenberger *et al.* (2013) describe for Germany, characterized by an underdeveloped stock market and a widespread practice of relationship lending by banks. Austria, similar to Germany, is a classic representative of a bank-based economy with intense bank – customer relationships and strong creditor rights. Relationship lending is deemed a powerful technology to mitigate adverse selection and moral hazard problems through contractual monitoring alongside other precautionary measures lenders may apply via credit costs and maturity, collateral and covenants (Berger and Udell, 2002; Serrasqueiro *et al.*, 2012). Austrian SMEs have unusually high shares of financial debt and strongly depend on banks compared to firms in other European countries (Heimer *et al.*, 2008) with the

average equity ratio of Austrian SMEs being 30 per cent, at least partly due to the institutional environment. Giannetti (2003) shows that unlisted firms in European countries with a high quality of creditor rights protection and with less-developed stock markets are more leveraged. Antoniou *et al.* (2008) argue that the debt capacity of firms (and actual leverage) is higher (in countries) with more prevalence of relationship banking and strong creditor rights. An important consequence is that with small (family) firms in such environments, it is essential to discriminate debt demand from supply effects, to disentangle the firms' theoretical motivations from their actual possibility to implement them, a point recalled by Molly *et al.* (2012). On the one hand, small firms willing to avoid debt will be restricted in accessing equity and, on the other hand, banks may ration credit. With this in mind, we add to the still sparse empirical literature on family SMEs in bank-based economies by estimating a model which nests and jointly tests (determinants proposed by) standard capital structure theories (López-Gracia and Sogorb-Mira, 2008). Moreover, capital structure dynamics are examined in the FF context, as in López-Gracia and Sánchez-Andújar (2007) and Serrasqueiro *et al.* (2011)[4]. As Heshmati (2002) or López-Gracia and Sogorb-Mira (2008) point out, typical non-dynamic approaches have limitations, as such models do not adequately capture the observed debt ratio, which may differ from the targeted one, and give no description of (the speed of) the adjustment process (and thereby, of the difficulties and costs it implies). An additional motivation for a dynamic analysis is provided by Lemmon *et al.* (2008), who argue considerable persistence in capital structures. Further contribution to the abovementioned literature on dynamic capital structure choice of small NFF in bank-based financial environments arises, as we augment the analysis by differentiating founder- and descendant-controlled family firms (FCFF and DCFF, respectively) and applying an unbiased estimation procedure.

FF are found to exhibit significantly higher debt ratios than NFF, consistent with the objective to control the firm while accepting creditor influence and an increased risk of bankruptcy. FCFF do not differ from those managed by later generations in their debt usage, but they adjust significantly faster to deviations from a proposed optimal leverage target. Capital structure decisions are made differently across groups of firms highlighted by a diverse impact of several leverage determinants proposed by the empirical literature. Our results are largely consistent with predictions from the pecking order theory (POT). However, limits to capital market access, control motivations and financing decisions based on rules of thumb may provide much simpler and more obvious explanations for the reported results.

The remainder of the paper is structured as follows. The following section reviews literature on capital structure theories and determinants, as well as hypotheses and empirical results on the leverage of FF (in different intergenerational stages). Afterwards, the data and the variables applied in the empirical part are introduced, and estimation results are presented in the fourth section. The final part of the paper summarizes and discusses the results, their limitations and practical implications for FF and policy-makers and provides some suggestions for further research.

2. Literature review

2.1 Capital structure theories

Theoretical aspects relevant to capital structure decisions in the SME and FF context come from three sources[5]. The first is the trade-off theory (TOT), which is

based on the model of Modigliani and Miller (1958), amended by financial frictions in terms of taxes (Modigliani and Miller, 1963) and financial distress costs (Kraus and Litzenberger, 1973). The static version of the theory proposes an optimal debt ratio, as decision-makers consider its benefits (interest payments reduce profits and shield from taxation) and costs (higher leverage increases the probability and costs of bankruptcy). Firms, therefore, are supposed to choose a capital structure target that maximizes the firm's value (Fama and French, 2002; Jensen and Meckling, 1976; Stulz, 1990) with optimal leverage that equals marginal value enhancement of higher debt through tax shield and marginal reduction of company value resulting from increased costs associated with debt (Myers, 2001). Dynamic aspects enter the model through the consideration of adjustment costs (Fischer *et al.*, 1989), which induce an additional trade-off between costs of deviating from the targeted capital structure and the costs of adjusting toward it. Thus, deviations from the target debt ratio are only gradually corrected over time (Frank and Goyal, 2007).

A second theory proposes a pecking order of financing sources, "ranked" by the prevalence of informational frictions and associated (agency) costs. The POT by Myers (1984) and Myers and Majluf (1984) states that, due to asymmetric information, firms favor internal funds and prefer debt to external equity (in case internal funds are exhausted). To minimize asymmetric information and other financing costs, firms primarily finance investment with retained earnings. As no optimal capital structure is proposed, the POT is mute about adjustment to a leverage target (Degryse *et al.*, 2012; Fama and French, 2002). Debt-equity dynamics, therefore, are driven by profitability and capital demands, and firms' observed debt ratios reflect cumulative requirements for external finance (Myers, 2001). One prediction from the POT is a negative relation between profitability and leverage, which is empirically confirmed, e.g. by Rajan and Zingales (1995) and Fama and French (2002). However, the issuance of equity – ranked last due to informational advantage over capital providers inducing high costs by comparison – via the capital market is no option for SMEs in any case. Especially in bank-oriented systems like Austria, SME owners opt for bank lending once internal resources have run out, and are presumed to be skeptical about external equity like private equity and venture capital.

Third, and often connected to TOT and POT reasoning, arguments derived from agency theory apply to capital structure decisions. As, however, the separation of ownership and management is less-pronounced (or non-existent) for small businesses, agency problems associated with equity financing are less relevant in this context (Ang, 1992; Jensen and Meckling, 1976), as well as other aspects like the free cash flow problem (Fama and French, 2002; Jensen, 1986). On the other hand, potential conflicts between firms and debt holders may give rise to non-negligible agency costs of debt (Jensen and Meckling, 1976; Myers, 1977).

These theoretical considerations determine the variables chosen to explain the empirical capital structure of SMEs. Evidence provided by Michaelas *et al.* (1999), Sogorb-Mira (2005), López-Gracia and Sogorb-Mira (2008) or Degryse *et al.* (2012), for example, favors the POT, but the applicability of traditional theories in explaining the leverage of SMEs is obscured by specific financing constraints and motivations which are not present for larger firms.

2.2 Family firms

Among others, Jensen and Meckling (1976), Fama and Jensen (1983), DeAngelo and DeAngelo (1985) and Anderson *et al.* (2003) argue that in family businesses, agency costs of equity should be rather small – due to lesser separation between ownership and control – and that monitoring is improved by family control[6]. Because of typical family business characteristics (risk aversion and increased interest in long-term survival), agency problems between (owner-) managers and debt holders are also likely reduced[7]. The interests of family businesses and debt holders are largely aligned which hinders conflicts between families and creditors (Anderson *et al.*, 2003; Schmid, 2013), thus agency and moral hazard problems of debt like underinvestment and asset substitution (Jensen and Meckling, 1976; Myers, 1977) should play a minor role. Evidence suggests that creditors, indeed, tend to view and value FF differently. Anderson *et al.* (2003), for example, find that bond spreads are lower for FF compared to NFF.

FF focus on value creation over generations and long-term firm survival (Ang, 1992). Anderson and Reeb (2003) argue that this makes family businesses risk averse and leads them to establish special relationships, particularly with debt holders. López-Gracia and Sánchez-Andújar (2007) associate the desire to transfer the business to subsequent generations with more conservative and less-risky financial strategies. Along with the associated goals of avoiding bankruptcy and losing control this may result in a preference for internal funds and a low debt ratio, and probably in passing up growth opportunities. Further, in addition to long-term value creation, family reputation is of great importance (Ampenberger *et al.*, 2013; Ellul, 2009).

Moreover, families typically invest most of their wealth in the FF (around 70 per cent according to Anderson *et al.*, 2003). To reduce the risk from such an undiversified investment, FF managers prefer to be less indebted (Anderson and Reeb, 2003; Rajan and Zingales, 1995). The potential loss of private family assets which might serve as collateral (Pettit and Singer, 1985; Romano *et al.*, 2001) has to be considered as well. At the same time, a lower debt level also decreases the risk of losing firm human capital in case of bankruptcy, a risk which is hard to diversify (Amihud and Lev, 1981; Fama, 1980). Taken together, these arguments form the so-called "risk-reduction hypothesis": to ensure continuance and reputation, and to reduce potential financial distress and risk to their undiversified personal and family capital, family managers aim for a lower leverage (Ellul, 2009). Ampenberger *et al.* (2013) and Schmid (2013); however, speak of an excessive risk avoidance that may be costly for the firm.

Another major objective of FF connected to the long-term orientation mentioned above is the maintenance of independence and control (Blanco-Mazagatos *et al.*, 2007). In case internal funds are exhausted, a trade-off emerges, as firms may have to weigh the pursuit of value- and growth-enhancing investments against the possibility of losing or diluting control (Ellul, 2009; Wu *et al.*, 2007). Debt solves this problem, "as long as the firm faces no financial distress" (Ellul, 2009, p. 2)[8]. As debt is nonvoting, it helps to maintain the family's voting power (Harris and Raviv, 1991; Jensen and Meckling, 1976; Stulz, 1988). The desire to maintain control may therefore be indicative of higher leverage (termed the "control-motivation hypothesis" by Ellul, 2009) but then induces higher financial risk as well (Vos and Forlong, 1996; Wu *et al.*, 2007). On the other hand, several authors, such as Ampenberger *et al.* (2013) and Schmid (2013), argue that FF may avoid debt out of control considerations if there is increased monitoring and control

enforced by creditors, even and especially within tight bank – customer relationships. The relevance of such arguments, however, depends on the type and state of the FF. First, larger and listed firms (which are examined by the above authors) may opt for non-voting equity (with lower leverage resulting), but SMEs typically face the trade-off between debt finance and no investment nonetheless. Potential agency problems, such as suboptimal investment, wealth expropriation from bondholders to the family, and changes in the risk structure to the detriment of lenders (Jordan *et al.*, 1998; Pettit and Singer, 1985) are, admittedly, mostly forestalled via tight bank – customer relationships (with intense information rights, collateral and covenants, even personal guarantees or management control), but these relations in practice seem to be (seen as) sufficiently beneficial also for the firm so that debt finance is not avoided. Second, monitoring of FF by creditors may be much more relevant in later stages with non-founder CEOs and increasingly dispersed ownership. The (agency) problems emerging in this context are described in the next subsection.

The empirical evidence on the capital structure of FF largely focuses on larger and/or listed companies in market-based economies. Anderson and Reeb (2003), for example, find no significant difference in the capital structure of S&P 500 family and NFF. Mishra and McConaughy (1999), McConaughy and Phillips (1999) and McConaughy *et al.* (2001) argue that large US FF are less leveraged than their non-family counterparts. Lower debt ratios of listed FF compared to listed NFF are reported by Latrous and Trabelsi (2012) for the French case, as well as by Ampenberger *et al.* (2013) and Schmid (2013) for Germany, providing convergence of interest, higher risk aversion and tight creditor monitoring and influence as possible explanations. Evidence for the opposite, a relatively larger debt ratio of listed FF, is found by Setia-Atmaja *et al.* (2009) for Australia and by King and Santor (2008) for the Canadian case. Croci *et al.* (2011) argue for listed firms from 12 European countries that FCFF search less external finance, but if they do they rely on debt because it does not dilute control. Ellul (2009), when studying firms from 36 countries, finds that family ownership increases leverage.

Results for (unlisted) SMEs are mixed as well. Blanco-Mazagatos *et al.* (2007) and Wu *et al.* (2007) report, respectively, higher FF debt ratio for Spanish and Canadian SME samples. The latter argue that this is driven by aversion to monitoring by outside shareholders (control motivation hypothesis). Coleman and Carsky (1999) find no difference in credit usage for US FF and NFF. Both López-Gracia and Sánchez-Andújar (2007) and Serrasqueiro *et al.* (2011) observe a differential impact of several firm-level determinants on the capital structure of Spanish and Portuguese FF vs non-family SMEs. Their raw data, however, reveal no significant gap in leverage for these groups of firms.

2.3 Founder-controlled family firms

The capital structure of FF may vary in the intergenerational context and several of the arguments discussed above appear to be especially applicable to FF managed by the founder or descendants of the founder. As discussed by Mishra and McConaughy (1999) for FCFF, one can argue that especially FCFF should be averse to bankruptcy risk (and the associated loss of control) as there is more at stake in terms of management flexibility as well as investment of undiversified family wealth and human capital. Distress is avoided due to an increased concern about the viability of the firm. Because the FF might be seen as the founder's life-time achievement, the risk-reduction

hypothesis is supposed to be more important and FF managed by the first generation exhibit stronger debt avoidance (Ampenberger *et al.*, 2013). For similar reasons, Ampenberger *et al.* (2013) argue that control-motivated arguments should be more relevant for founder-managed FF. If, however, equity finance is no option, the relatively stronger preference of the founder for independence might translate into a higher debt ratio. Agency costs are expected to be lowest in the first generation as manager-shareholder interest convergence (the convergence-of-interest effect) is enhanced with the founder acting as CEO (Ampenberger *et al.*, 2013; Blanco-Mazagatos *et al.*, 2007).

In subsequent generations, however, the picture might be very different. If ownership is more dispersed across the family, debt avoidance might become relaxed as single family members are less overinvested in the firm, so the risk of wealth loss is less ponderous (Blanco-Mazagatos *et al.*, 2007; Schulze *et al.*, 2003). However, it is often argued that descendants have a higher fear of losing control and are less willing to take risks (cf. Molly *et al.*, 2012). The intergenerational transfer of the firm might induce agency costs due to founder-descendants' abilities and "frictions" arising from an increasing number of family members involved (Molly *et al.*, 2012), and within-family owners who are not active in firm management might thus be inclined to propose debt as a governance mechanism to prohibit managerial opportunism (Blanco-Mazagatos *et al.*, 2007; Schulze *et al.*, 2003). Quite generally, agency costs arise because of within-family rivalries, nepotism, as well as reduced cooperation, loyalty and trust (cf. Blanco-Mazagatos *et al.*, 2007; Gama and Galvão, 2012; McConaughy *et al.*, 2001), which might also threaten (potential) relationships with borrowers (Anderson *et al.*, 2003; Molly *et al.*, 2012). These conflicts of interest between family members are also presumed to hinder firm's growth, leading to stagnation (Molly *et al.*, 2012; Schulze *et al.*, 2003; Ward, 1997).

Empirically observed differences in debt ratios between FCFF and DCFF are non-uniform. No significant difference is reported by McConaughy and Phillips (1999) or Anderson and Reeb (2003). Also, Lussier and Sonfield (2010) report no significant generational differences in the use of debt, though their international survey reveals that in later stages of the firm there is a desire to maintain family control. For listed German FF, Ampenberger *et al.* (2013) find that the presence of a founder-CEO has a strong negative impact on leverage ratios. They hypothesize that if the founder is still involved in firm management, debt is avoided because of the expected influence exerted by banks. Croci *et al.* (2011) present evidence that the share of debt in external finance is especially high for FCFF due to increased fear of losing control. Molly *et al.* (2012) find that first-generation family businesses, among Belgian SMEs, have a relatively higher debt ratio; they attribute this to lower growth of second- and third-generation FF.

2.4 Capital structure determinants and associated hypotheses

Large parts of the empirical literature investigate firm-specific capital structure determinants for large listed – mainly US – companies, identifying several key factors (Harris and Raviv, 1991; Rajan and Zingales, 1995; the evidence is surveyed, e.g. by Frank and Goyal, 2007). Some authors strongly focus on country-specific determinants (de Jong *et al.*, 2008; Fan *et al.*, 2012), highlighting the impact of institutional factors (as creditor right protection or bankruptcy codes) on capital structure decisions.

2.4.1 Profitability/cash flow. Profitability is the most important factor to test the TOT against the POT with theories giving conflicting predictions on the relation between profits and leverage (Rajan and Zingales, 1995). The POT predicts a negative relation as the presumed preference for internal funds (Myers and Majluf, 1984) leads to lower debt levels of firms with increasing profits (probably also through debt repayments). A positive effect, on the other hand, is proposed by the TOT due to tax shields becoming more valuable with increased profitability (López-Gracia and Sánchez-Andújar, 2007). In line with this, more profitable firms might obtain more debt due to reduced bankruptcy risk (Heshmati, 2002). However, for SMEs and for FF in the SME context, a negative association between profitability and leverage is well-documented (Coleman and Carsky, 1999; Degryse *et al.*, 2012; López-Gracia and Sánchez-Andújar, 2007; López-Gracia and Sogorb-Mira, 2008; Michaelas *et al.*, 1999; Poutziouris, 2001; Serrasqueiro *et al.*, 2011). *H1* can thus be formulated as follows:

H1. In line with the POT, we expect companies with relatively more internal resources to have lower debt ratios.

2.4.2 Fixed assets. Firms' fixed assets can be used as collateral, reducing the agency cost of debt for lenders (Titman and Wessels, 1988). Therefore, and because of less financial distress costs, the greater the proportion of tangible assets (fixed assets divided by total assets), the more willing banks are to provide loans, and leverage becomes higher. Therefore, both main capital structure theories predict a positive relationship between asset tangibility and the debt ratio (Degryse *et al.*, 2012). In the SME context, however, the use of fixed assets as a measure of collateral can be disputed, as it does not capture private collateral provided by the owner (Hall *et al.*, 2004). Nevertheless, Sogorb-Mira (2005), Ellul (2009) and Degryse *et al.* (2012) find a positive correlation between the share of tangible assets and leverage, whereas Serrasqueiro *et al.* (2011) find no significant connection:

H2. Based on theoretical considerations and on previous evidence, debt ratios can be expected to increase with the relative importance of fixed assets.

2.4.3 Firm age. Predictions about the effect of the age of the firm on leverage are conflicting. On the one hand, established firms should have a relatively higher borrowing capacity because of reduced information asymmetries and lower bankruptcy risk. Reputation effects might work in a similar direction (Heshmati, 2002; Ramalho and da Silva, 2009). On the other hand, and consistent with the POT, internal funds retained over time should be sufficiently high to limit the need for external finance in later stages of the business lifecycle (López-Gracia and Sogorb-Mira, 2008; Romano *et al.*, 2001)[9]. Empirical evidence is in favor of mature SMEs and FF using less debt (Coleman and Carsky, 1999; López-Gracia and Sánchez-Andújar, 2007; López-Gracia and Sogorb-Mira, 2008; Michaelas *et al.*, 1999; Serrasqueiro *et al.*, 2011):

H3. Firm age shall be negatively related to leverage.

2.4.4 Firm size. Larger firms are more diversified and less likely to default, so size is an inverse proxy for business and bankruptcy risk (Degryse *et al.*, 2012; Rajan and Zingales, 1995). Banks should be more willing to supply debt, so size can be expected to be positively related to leverage. Such an association is also predicted by the POT, as larger firms face less information problems, and with size, the firms' bargaining power

toward lenders also might increase (Degryse *et al.*, 2012; Sogorb-Mira, 2005). That size points to increased leverage has been empirically documented for large companies (Fama and French, 2002; Frank and Goyal, 2003) but also for SMEs (Berger and Udell, 1998; López-Gracia and Sogorb-Mira, 2008; Michaelas *et al.*, 1999; Romano *et al.*, 2001; Sogorb-Mira, 2005):

H4. Higher debt ratios should be observable with increased firm size.

2.4.5 Firm growth. According to the POT, firms with higher investment opportunities are more likely to exhaust internal funds and, therefore, require more debt (Degryse *et al.*, 2012; Shyam-Sunder and Myers, 1999). In addition, in Austria's bank-based financial system, SMEs hardly have access to external equity to finance growth, as the market for venture capital and private equity is very small compared to other European countries (Heimer *et al.*, 2008). Therefore, we expect a positive influence of growth opportunities on leverage as reported in Michaelas *et al.* (1999), Sogorb-Mira (2005), Ramalho and da Silva (2009) and Degryse *et al.* (2012):

H5. Firms with higher asset growth rates have increased leverage.

2.4.6 Working capital (liquidity). A high working capital ratio indicates maturity matching between assets and liabilities and minimizes the risk that firms are unable to pay off maturing obligations. Working capital ratios are usually part of credit rating systems in Austrian banks. Furthermore, high working capital can be seen as a mechanism to reduce agency problems of debt and as a proxy for liquidity. Illiquid firms face limits in attracting debt as financial distress costs are relatively higher, and thus, the TOT suggests a positive relationship between liquidity and leverage (Degryse *et al.*, 2012). A proxy of liquidity related to working capital is applied by both Michaelas *et al.* (1999) and Degryse *et al.* (2012) and both report a positive relation to SME leverage:

H6. Debt ratios are positively related to working capital.

2.4.7 Operating risk. A firm's operating risk should affect its capital structure choice and the banks' willingness to lend. It can be hypothesized that a higher cash flow (earnings) uncertainty is associated with higher default risk and increased expected costs of financial distress. From TOT arguments, we would expect that CEOs have an incentive to lower leverage with more volatile earnings to minimize default risk (Fama and French, 2002). Therefore, the relationship between such risk and leverage should be negative, and several authors apply a measure of earnings volatility when seeking empirical evidence. López-Gracia and Sogorb-Mira (2008) find that risk is not a relevant capital structure determinant in the SME context. López-Gracia and Sánchez-Andújar (2007) report a negative relation for NFF, and Serrasqueiro *et al.* (2011) for FF:

H7. Higher operating risk should lead to a lower debt ratio.

2.4.8 Non-debt tax shields. According to the TOT, firms have an incentive to increase leverage to exploit the tax benefits of debt. However, interest payments are the only one way to reduce income tax. According to DeAngelo and Masulis (1980) and Titman and Wessels (1988), the presence of non-debt tax shields (NDTS), such as accelerated depreciation or investment tax credits, should influence decisions on the optimal capital structure. Firms can use NDTS to reduce corporate tax without debt and the associated distress risk (López-Gracia and Sánchez-Andújar, 2007). With increased NDTS, there

should be less interest in debt usage, which is confirmed for SMEs by Michaelas *et al.* (1999), López-Gracia and Sánchez-Andújar (2007) or López-Gracia and Sogorb-Mira (2008). Serrasqueiro *et al.* (2011) report such an effect only for FF:

H8. The higher the firm's NDTS are, the lower the debt ratio should be. Our measure of NDTS (see Section 3.2 for calculation details), however, should be positively related to leverage.

2.4.9 Interest coverage. The interest coverage (IC) ratio is (another) proxy for financial distress (default risk) and an important part of Austrian banks' credit rating systems. Firms that do not earn enough to meet the required interest payments bear a higher default risk and face difficulties in borrowing additional funds. According to the TOT, higher financial distress costs (a lower IC) should negatively correlate to debt ratios, so a positive association of IC with leverage is expected:

H9. According to the TOT, higher financial distress costs should negatively influence debt ratios. Thus, the higher the IC ratio, the higher the firm leverage.

2.4.10 Industry affiliation. The economic sector in which a firm operates is proposed to determine leverage due to factors such as differences in competition intensity or technology (Degryse *et al.*, 2012; Frank and Goyal, 2009). While the industry median leverage is found positively significant for firm debt ratios by Lemmon *et al.* (2008), Frank and Goyal (2009), Ampenberger *et al.* (2013) or Schmid (2013), other research reports sectoral effects to be dominated by firm-specific factors (Balakrishnan and Fox, 1993; MacKay and Phillips, 2005). The SME literature mostly fails to report significant industry-fixed effects via sectoral dummy variables (an exception is Michaelas *et al.*, 1999), and partly even does not expect a broad industry influence, as many small firms operate in market niches (Jordan *et al.*, 1998). Additionally, sectoral differences may be captured by other explanatory variables measured at the firm level, as already suggested by Myers (1984):

H10. In line with previous evidence for SMEs, industry-fixed effects are not expected to have explanatory power for debt ratios after controlling for firm-level factors.

2.4.11 Lagged leverage. According to the TOT, there is an optimal debt ratio the current one should converge against. As the dynamics of capital structure adjustment are also constitutive for the empirical specification, it is covered in the next, separate section.

2.5 Dynamic trade-off and speed of adjustment

It is typically derived from Chief Financial Officer (CFO) surveys (Graham and Harvey, 2001; Drobetz *et al.*, 2006) and from the empirical literature that most firms have a target debt ratio, but that adjustment toward it usually is not the management's main priority. Fama and French (2002) speak of "soft" leverage targets, and Leary and Roberts (2005) argue that the debt ratio is targeted within a certain range. Results from surveys mentioned above can be interpreted in this way as well and as being in line with Fischer *et al.* (1989) with respect to a non-stringent target orientation due to adjustment costs (Leary and Roberts, 2005). As a consequence, estimating the speed of adjustment (SOA) "is perhaps the most important issue in capital structure research today" (Huang and Ritter, 2009, p. 239). SOA is usually derived from an estimation of a partial adjustment

model (Flannery and Rangan, 2006, López-Gracia and Sánchez-Andújar, 2007, López-Gracia and Sogorb-Mira, 2008) where the unobservable optimal leverage is assumed to be determined (is proxied) by a set of firm characteristics. SOA estimates from empirical literature, however, vary considerably with samples of US firms ranging from very low ones reported by Fama and French (2002) to about 35 per cent by Flannery and Rangan (2006)[10].

Elsas and Florysiak (2011) argue that differences found in adjustment speeds across the previous studies are due to the estimators applied and that, even for the same dataset, results are sensitive with respect to the applied estimation method. Additionally, it has been shown that standard dynamic panel estimators are biased (Flannery and Rangan, 2006), even the one of Blundell and Bond (1998) is problematic with a slow adjustment and a highly persistent debt ratio, respectively (Huang and Ritter, 2009), and if there is second-order correlation in the estimation errors (Flannery and Hankins, 2013). The so-called long-difference estimator proposed by Hahn *et al.* (2007) solves the first objection and is applied by, for example, Huang and Ritter (2009).

A further problem is noted by Chang and Dasgupta (2009) and Iliev and Welch (2010), and described as "mechanical mean reversion" being due to the bounded nature of a (leverage) ratio as the dependent variable. As a consequence, active capital structure adaptation may mistakenly be deduced and a serious bias of SOA estimates emerges. While Iliev and Welch (2010) introduce a bias correction, Elsas and Florysiak (2011) propose an unbiased estimator – the so-called DPF estimator for dynamic panels with a fractional dependent variable – based on a doubly censored Tobit specification. By applying this to a sample of US firms, they obtain an SOA estimate of 26 per cent.

In this paper, the DPF estimator is applied on a partial adjustment model, the main empirical research vehicle in the dynamic capital structure context (Elsas and Florysiak, 2011; Flannery and Rangan, 2006). The estimation equation is:

$$L_{i,t} = (1 - \lambda)L_{i,t-1} + \beta X_{i,t} + \mu_i + \varepsilon_{i,t} \quad (1)$$

where L is the leverage (debt) ratio and X is a vector of explanatory variables. The SOA estimate, λ, can be derived from the autoregressive parameter of the debt ratio (and is 1 minus the adjustment coefficient; López-Gracia and Sogorb-Mira, 2008, p. 122). The firm-fixed effect takes the form:

$$\mu_i = \alpha_0 + \alpha_1 L_{i,0} + E(X_i)\alpha_2 + \alpha_i \quad (2)$$

with L_0 as the leverage ratio in the initial period. The vector $E(X)$ stands for the within-averages of the explanatory variables, so α_2 is a vector as well. The dynamic equation (1) is then estimated by Tobit. The dynamic adjustment of FF's capital structures is, though with different estimators, examined by López-Gracia and Sánchez-Andújar (2007) and Serrasqueiro *et al.* (2011), which renders them the main articles for a comparison of results. However, the estimator used in this paper, due to its characteristics, should provide more reliable SOA estimates. As in the reference literature, the partial adjustment model is estimated separately for NFF and FF (as well as FF subsamples), whereas tests on parameter differences are based on pooled estimation of interactive effects. While estimation results from both methods are

equivalent, separate-sample results have the advantage of being portrayable more clearly and, thus, are reported.

3. Data and variables

3.1 Construction of the dataset

To examine the capital structure of FF, data on companies located in Upper Austria (one of nine Austrian federal states, with a broad industrial structure and a large importance of SMEs/FF) with less than 250 employees is applied, extracted from the Amadeus database of Bureau van Dijk. For the sample period from 2005 to 2010, data on 606 such firms are available. However, data cleansing (exclusion of cooperatives and firms with a cooperative or the public sector as the ultimate main owner, holding companies and firms with zero fixed assets), the construction of the explanatory variables, the removal of some extreme outliers and the dynamic nature of the estimation reduce the sample to 470 firms. The unbalanced panel comprises 1,557 observations (firm years).

An FF is defined by a single person or family owning more than 50 per cent (possibly through a private foundation). About 70 per cent (328) of the estimation sample are such FF, and about 28 per cent (93) of those are (co-)managed by the founder. The information on the presence of a founder-CEO was hand-collected (by a mail survey, supplemented by telephone calls and information from the companies' internet presence).

3.2 Variables and definitions

Among the employed potential determinants of the capital structure are (the logarithm of) firm age, firm size (log of total assets), tangible assets (in per cent of total assets), the cash return on assets (ROA) ratio ("cashflow ratio", cash flow divided by total assets), the growth rate of total assets and the ratio of working capital (inventories plus trade receivables minus trade payables) to total assets. Further variables applied measure risk, the prevalence of NDTS and interest expense coverage through earnings[11]. The risk measure is based on the volatility of earnings and is calculated as the inverse coefficient of variation of the Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA), multiplied by minus one. Using the reciprocal value of the variation coefficient (and, thus, dividing the mean by the standard deviation) avoids interpretation problems for firms with negative average earnings, for which the coefficient of variation would be ill-defined[12]. For the same reason, the NDTS is calculated by dividing the EBITDA by depreciation. The higher this variable, the lower are the NDTS. IC (the ability to meet debt obligations) is defined as the EBITDA divided by interest expenses and, therefore, measures how often the regular costs of debt are covered by earnings.

Unfortunately, neither figures on turnover nor the tax burden could be processed due to data problems and errors. As mentioned before, taxes are a main factor in the TOT and there is evidence for a positive correlation with leverage (DeAngelo and Masulis, 1980; Fama and French, 2002). Studies on SMEs, however, often find no (Ellul, 2009; López-Gracia and Sánchez-Andújar, 2007; Michaelas *et al.*, 1999) or even a negative relation (Degryse *et al.*, 2012; Sogorb-Mira, 2005), and "that the tax status of a company is not informative" (Degryse *et al.*, 2012, p. 435). It can be suggested that managers of small firms use other instruments to lower taxes (Sogorb-Mira, 2005), or that financial restrictions hinder them to use debt in this manner (López-Gracia and Sogorb-Mira, 2008). It could also be the case that tax shields are not overly important due to small

firms not being that profitable (Pettit and Singer, 1985), as tax considerations are important mainly for the capital structure of profitable firms and firms with low income volatility (López-Gracia and Sogorb-Mira, 2008).

The partial adjustment model described by equation (1) is estimated, which allows to examine the influence of the variables mentioned above on (target) leverage and to estimate the SOA[13]. Additionally, year and industry dummies are considered[14]. Tables I and II report descriptive statistics for the estimation sample (based on within-firm averages over the sample period), correlations are shown in Table III. Some of the minimal and maximum values are rather extreme, which is also due to special features of some very small firms and the fact that the observation period comprises years of economic crisis. For several variables, the mean, thus, appears small relative to variation, but this is partly caused by the variables' nature as well (with small positive means emerging when positive and negative values are possible). However, the observations remaining at the end of the variables' distributions after removing the most extreme outliers were checked not to be influential to the estimation results. Table I shows the mean leverage ratio to be 68.62 per cent, whereas it is 71.32 per cent (62.69 per cent) in the FF (NFF) subsample. When testing statistical differences between subgroups (via a simple regression using the appropriate dummy variable), it turns out that FF have a significantly (at the 1 per cent level) higher leverage ratio, a lower IC ratio and are smaller than NFF (at 1 per cent level). Additionally, they have smaller cash flow ratios (at 5 per cent level). Within the FF group, FF with a founder-CEO tend to be smaller and more growing, but significantly differ from the rest only with respect to age (at 1 per cent level) – they are relatively younger – and risk (the risk measure is lower for these firms, though the difference is only significant at 10 per cent level). Additionally, mean comparisons for all variables were conducted by use of the Tukey Honestly Significant Difference (HSD) test (following an ANOVA), the respective results are reported in Table II. This procedure does not find a significant size difference between FF and NFF, whereas the significance level for the difference in risk between FCFF and DCFF is now reported below 5 per cent.

In the sample at hand, the average FF is relatively more leveraged compared to non-family businesses, whereas there is no difference in the debt ratios of FCFF and DCFF. This is against results for German-listed FF, for which Ampenberger *et al.* (2013) find less leverage and that the presence of a founder-CEO significantly reduces the debt ratio. The relatively higher leverage of Austrian FF is compatible with the control motivation hypothesis and with better access to credit than to equity instruments. To maintain control, however, these firms "pay a price", namely, higher financial risk. It should be noted that FF debt ratios are also higher than those in the samples of López-Gracia and Sánchez-Andújar (2007) and Serrasqueiro *et al.* (2011), who report 56 and 65 per cent, respectively. Proposed differences between FCFF and DCFF with respect to risk aversion, control considerations and agency costs appear not to be confirmed or opposite effects cancel each other out.

4. Results: FF vs NFF, FCFF vs DCFF

Equation (1) is estimated by using the DPF estimator as in Elsas and Florysiak (2011), with zero and 100 per cent as lower and upper bounds for the debt ratio[15], and separately for FF and NFF. Subsequently, a Chow test is applied to test the hypothesis that there are no differences between the two sets of estimated coefficients, using a full

	Mean	SD	Minimum	Maximum
Full sample (470 firms)				
Leverage ratio (%)	68.62	21.45	0.66	130.86
Cashflow/total assets (%)	10.36	10.04	−57.79	77.88
Fixed assets share (%)	34.99	24.52	0.22	99.21
Firm age (years)	26.32	30.65	1	405
Firm size (total assets, million euro)	25.58	107.93	0.49	2,218.84
Asset growth rate (%)	5.08	13.99	−55.04	89.31
Working capital/total assets	23.80	20.46	−31.25	77.32
Risk	−3.66	4.29	−41.64	1.80
NDTS (%)	7.02	25.38	−75.91	398.19
IC	126.23	405.47	−162.33	3.755
FF (328 firms)				
Leverage ratio (%)	71.32	20.04	12.69	130.86
Cashflow/total assets (%)	9.72	9.55	−57.79	44.59
Fixed assets share (%)	34.61	23.98	0.22	98.52
Firm age (years)	27.61	33.75	1	405
Firm size (total assets, million euro)	22.91	123.12	0.88	2,218.35
Asset growth rate (%)	5.10	14.54	−55.04	89.31
Working capital/total assets	23.88	20.76	−31.25	77.32
Risk	−3.66	4.46	−41.64	1.72
NDTS (%)	5.96	23.38	−19.27	398.19
IC	77.73	229.94	−162.33	2,006.75
NFF (142 firms)				
Leverage ratio (%)	62.39	23.31	0.66	99.22
Cashflow/total assets (%)	11.84	10.98	−23.28	77.88
Fixed assets share (%)	35.88	25.80	0.39	99.21
Firm age (years)	23.34	21.68	2	135
Firm size (total assets, million euro)	31.76	59.48	0.49	421.81
Asset growth rate (%)	5.02	12.68	−38.47	42.45
Working capital/total assets	23.62	19.83	−15.33	68.27
Risk	−3.64	3.91	−21.97	1.80
NDTS (%)	9.49	29.43	−75.91	203.95
IC	238.24	637.29	−123.81	3,755.00
Family firms with founder-CEO (93 firms)				
Leverage ratio (%)	71.03	17.85	16.13	104.24
Cashflow/total assets (%)	9.52	12.04	−57.79	34.38
Fixed assets share (%)	33.45	24.56	1.26	91.44
Firm age (years)	16.49	12.26	1	63
Firm size (total assets, million euro)	15.12	19.79	0.88	152.12
Asset growth rate (%)	6.78	17.38	−28.99	89.31
Working capital/total assets	25.46	20.64	−30.30	68.78
Risk	−4.40	6.85	−41.64	1.72
NDTS (%)	5.11	11.78	−11.81	105.86
IC	76.94	295.18	−162.33	2,006.75

Table I.
Descriptive statistics (of within-firm averages; full and subsamples)

	NFF	FF-NFF	FCFF	DCFF-FCFF
Leverage ratio	62.39	8.93 (0.000)***	71.03	0.41 (0.873)
Cashflow/total assets	11.84	−2.12 (0.035)**	9.52	0.27 (0.822)
Fixed assets share	35.88	−1.27 (0.604)	33.45	1.61 (0.589)
Firm age	23.34	4.27 (0.158)	16.49	15.53 (0.000)***
Firm size	31.76	−8.85 (0.415)	15.12	10.87 (0.407)
Asset growth rate	5.02	0.08 (0.952)	6.78	−2.34 (0.168)
Working capital/total assets	23.62	0.26 (0.899)	25.46	−2.21 (0.375)
Risk	−3.64	−0.02 (0.952)	−4.40	1.02 (0.050)**
NDTS	9.49	−3.53 (0.166)	5.11	1.18 (0.702)
IC	238.24	−160.51 (0.000)***	76.94	1.11 (0.981)

Notes: Columns NFF (FCFF) show the mean of the respective variable for the subsample of non-family firms (founder-controlled family firms); FF-NFF (DCFF-FCFF) is the difference in the mean between FF and NFF (DCFF and FCFF) subsamples; *P*-values in parentheses; FF, family firms; NFF, non-family firms; FCFF, founder-controlled family firms; DCFF, descendant-controlled family firms; *significant at 10%; **significant at 5%; ***significant at 1%

Table II.
Mean comparison tests (Tukey HSD after ANOVA)

model with all observations from both firm groups, a family dummy and interaction terms. Estimation results are presented in Table IV, coefficients of the time and industry (group) dummies, as those of the within-averages of the covariates, are not reported. A similar procedure is applied to the FCFF and DCFF subsamples (Table V).

4.1 SOA estimates

As can be seen from Table IV, FF are slower with adjusting the debt ratio to the target. This opposes results of López-Gracia and Sánchez-Andújar (2007) obtained for Spanish SMEs, who find that FF have less information asymmetry in relation to their creditors and, thus, are able to react more quickly to deviations from the targeted leverage. Serrasqueiro *et al.* (2011) find no difference in SOA for total debt (but a slower adjustment of FF with respect to short-term, and a faster with respect to long-term debt) for Portuguese firms. However, the difference in the coefficient of the lagged dependent variable in Table IV is not statistically significant, compatible with the results of Serrasqueiro *et al.* (2011).

SOA estimates are rather small compared to those from similar studies. López-Gracia and Sogorb-Mira (2008) report an estimate of 0.35 for Spanish SMEs, and López-Gracia and Sánchez-Andújar (2007) show 0.51 for Spanish FF and 0.33 for NFF. The respective figures inferable from Serrasqueiro *et al.* (2011) are 0.31 and 0.3, respectively, for the Portuguese case. The empirical literature often describes even such estimates as low, suggesting considerable adjustment costs which prevent firms from re-establishing the targeted capital structure even if the current one is suboptimal (Heshmati, 2002). In other words, the observed behavior reveals that firms bear the costs of being away from target, as these are lower than the costs of adjusting (López-Gracia and Sogorb-Mira, 2008). Adjustment speed, however, may not only depend on the ability to quickly raise more debt due to the quality of creditor relationships and reduced opacity but on the access to equity or the willingness to target a debt ratio as well. High-leverage persistence might stem from the fact that adjusting may often imply the need to reduce leverage, which is difficult, especially in bad times. Slow adjustment might also indicate

Table III.
Correlations (full sample)

	1	2	3	4	5	6	7	8	9
1. Leverage ratio									
2. Cashflow/total assets	−0.26***								
3. Fixed assets share	−0.14***	0.00							
4. Firm age	−0.16***	0.05	0.19***						
5. Firm size	−0.17***	−0.02	0.22***	0.09***					
6. Asset growth rate	0.00	0.08**	−0.05	−0.04	0.08*				
7. Working capital/total assets	0.13***	−0.06	−0.48***	−0.08**	−0.09***	−0.02			
8. Risk	0.01	−0.21***	−0.13***	−0.07	−0.03	−0.02	0.05		
9. NDTS	−0.05	0.14***	−0.01	−0.08*	0.26***	0.02	−0.01	0.00	
10. IC	−0.21***	0.26***	−0.08**	0.01	0.06	0.05	−0.07	−0.08*	0.07

Notes: *Significant at 10%; **significant at 5%; ***significant at 1%

	FF	NFF
Lagged leverage ratio	0.811*** (0.000)	0.749*** (0.000)
Cashflow/total assets	−0.618*** (0.000)	−0.535*** (0.000)
Fixed assets share	−0.044 (0.133)	0.085* (0.073)
Log (firm age)	1.284 (0.345)	0.144 (0.946)
Log (firm size)	0.770 (0.535)	−1.577 (0.416)
Asset growth rate	0.074*** (0.000)	0.116*** (0.000)
Working capital/total assets	0.017 (0.442)	0.085** (0.032)
Risk	−0.156*** (0.008)	0.032 (0.795)
NDTS	−0.016 (0.266)	0.032** (0.011)
IC	0.002** (0.043)	−0.0004 (0.634)
Constant	7.136** (0.026)	5.324 (0.267)
SOA	0.189	0.251
Number of firms	328	142
Number of observations	1042	515
Log likelihood	−3255.04	−1726.01
Model chi-square	5645.38	2962.93

Notes: Dependent variable: leverage ratio; coefficients of year and industry group dummies, the initial leverage ratio and within-averages of the independent variables are not shown; *P*-values in parentheses; FF, family firms; NFF, non-family firms; *significant at 10%; **significant at 5%; ***significant at 1%

Table IV.
Regression results (DPF estimator)

	FCFF	DCFF
Lagged leverage ratio	0.757*** (0.000)	0.848*** (0.000)
Cashflow/total assets	−0.661*** (0.000)	−0.606*** (0.000)
Fixed assets share	−0.006 (0.920)	−0.078** (0.020)
Log (firm age)	0.376 (0.889)	1.520 (0.333)
Log (firm size)	3.898* (0.087)	−0.672 (0.649)
Asset growth rate	0.106*** (0.000)	0.061*** (0.000)
Working capital/total assets	0.058 (0.193)	−0.002 (0.922)
Risk	−0.213*** (0.003)	−0.052 (0.591)
NDTS	0.044 (0.448)	−0.023 (0.125)
IC	0.005*** (0.010)	0.001 (0.665)
Constant	21.129*** (0.001)	−0.182 (0.960)
SOA	0.243	0.152
Number of firms	93	235
Number of observations	281	761
Log likelihood	−890.54	−2332.97
Model chi-square	1415.87	5190.92

Notes: Dependent variable: leverage ratio. coefficients of year and industry group dummies, the initial leverage ratio and within-averages of the independent variables are not shown; *P*-values in parentheses; FCFF, founder-controlled family firms; DCFF, descendant-controlled family firms; *significant at 10%; **significant at 5%; ***significant at 1%

Table V.
Regression results (DPF estimator)

that considerations described by the POT may play a more important role in FF management than those connected to debt targets (Degryse *et al.*, 2012).

However, Table V shows that FCFF adjust significantly faster and more flexible than FF managed by descendants. Possible reasons may include that those firms are less far in their lifecycle and have the most pronounced control motivations. Banks, on the other hand, might be more willing to provide debt to founder firms due to reduced agency costs (López-Gracia and Sánchez-Andújar, 2007). This enables FCFF to adjust faster, indicating that it is important to take a closer look at different types of FF. Additionally, decision-making of founder-CEOs might be faster and more flexible due to stronger decision power, entrepreneurial talent or special capabilities.

4.2 Capital structure determinants

Profitability (the cash flow ratio) has a significantly negative relation to leverage for all types of firms. This is in line with POT predictions and with previous evidence in the SME/FF context and strongly supports hypothesis 1. Whether FF or not, SMEs prefer internal funds for their investment needs or use these to reduce debt. The respective coefficient is more negative for FF (significantly so at the 10 per cent level; see Table IV), as in López-Gracia and Sánchez-Andújar (2007) and, with respect to ROA, in Serrasqueiro *et al.* (2011). Thus, it appears that the POT is more pronounced for FF, the debt ratio more sensitive (negatively) to financial slack. A quite similar result emerges in Mishra and McConaughy (1999) who argue that this is due to FF being more averse to loss of control.

To ensure that our conclusions on the POT are not perturbed by being derived from a general capital structure model, non-dynamic POT models (without the assumption of an optimal debt ratio) as in López-Gracia and Sánchez-Andujar (2007) or López-Gracia and Sogorb-Mira [2008, equation (7)] were estimated as well for all subsamples. The results, reported in Table VI, show qualitatively similar results on the cash flow ratio and the other POT-related variables.

Some support for *H2* is provided by Table IV, as it shows that the proportion of fixed assets is positively related to the debt ratio, but for NFF only. As for FF, problems of asymmetric information in lending are presumed to be less striking; this is not overly surprising. Within FF (Table V) those with more tangible assets have less leverage if

	FF	NFF	FCFF	DCFF
Cashflow/total assets	−0.464*** (0.000)	−0.459*** (0.000)	−0.441*** (0.000)	−0.475*** (0.000)
Log (firm age)	−0.385 (0.798)	−0.818 (0.720)	0.548 (0.863)	−0.779 (0.652)
Asset growth rate	0.032*** (0.001)	0.074*** (0.000)	0.063*** (0.001)	0.019** (0.014)
Constant	22.955*** (0.000)	5.143 (0.137)	32.529*** (0.000)	8.415*** (0.002)
Number of firms	328	142	93	235
Number of observations	1042	515	281	761
Log likelihood	−3563.88	−1850.58	−989.82	−2549.06
Model chi-square	2385.58	962.80	488.37	2493.48

Table VI.
Regression results (fixed-effects Tobit model)

Notes: Dependent variable: leverage ratio; coefficients of year and industry group dummies, the initial leverage ratio and within-averages of the independent variables are not shown; *P*-values in parentheses; FF, family firms; NFF, non-family firms; FCFF, founder-controlled family firms; DCFF, descendant-controlled family firms; *significant at 10%; **significant at 5%; ***significant at 1%

they are descendant-controlled. As this is contrary to expectations, we hypothesize that for these FF, the provision of private collateral as well as soft facts (reputation and management quality, trust and the closeness of relationships) are more important than physical collateral (see Ramalho and da Silva, 2009, for a similar argument on private collateral with respect to micro firms).

Tables IV and V show that *H3*, referring to firm age, is not confirmed, but *H4* partly is. The age of the firm is not a significant determinant of our sampled firms' capital structure, whereas firm size is, but for FCFF only. In comparison, FCFF are by far the smallest and youngest, indicating size determines capital structure, especially at the beginning of the business lifecycle. A certain size and accomplished growth (bringing on reduced risk and opaqueness) appears to be necessary to gain increased access to bank debt.

Results reveal strong support for *H5*. Asset growth, as a proxy for growth opportunities, is consistently positively related to debt ratios, indicating that all types of SMEs finance growth via bank debt after internal resources have run out. Growth seems to put a strain on internal funds and to push firms into borrowing, which is in line with POT and findings of other SME studies. Our results do not support Myers' (1977) underinvestment hypothesis where growth opportunities and debt levels are negatively correlated (Fama and French, 2002; López-Gracia and Sogorb-Mira, 2008; Titman and Wessels, 1988). The influence of asset growth on the debt ratio, however, is different across firm groups in both Tables IV and V at the 5 per cent level. FF's leverage reacts relatively less to growth, which is probably consistent with more conservative financing choices to avoid losing control over generations. Due to a certain priority of non-financial goals like independence and firm survival (López-Gracia and Sánchez-Andújar, 2007; Ward, 1997), FF may try to finance growth while minimizing leverage. It might be presumed that this effect is more prevalent with FCFF, but the opposite is found (Table V), which is in line with Molly *et al.* (2012) who argue that later generations increasingly fear losing family control through the use of debt. DCFF, however, may have better access to non-debt financing sources as well.

The expected positive relation between working capital and the debt ratio (*H6*) emerges for NFF only. As with asset tangibility, it can be argued that for NFF, hard facts play a relatively more important role in the credit rating process and thus higher working capital is associated with an increased willingness of banks to provide debt due to reduced agency costs. For FF, on the other hand, other (softer) factors are more important in comparison.

Our measure of operating risk is significantly and negatively related to leverage only for FF (which only partially confirms *H7*, see Table IV), as found by Serrasqueiro *et al.* (2011) also. The results in Table V show that this originates in the group of FCFF, suggesting that especially founder-CEOs reduce financial leverage in unstable operating environments. While this might be a consequence of safer financial policies due to control and intergenerational transfer motivations (López-Gracia and Sánchez-Andújar, 2007), it could also be the case that lenders become more restrictive with increasing income variability and opacity (Heshmati, 2002), which shows up especially with firms lacking other financing options.

As can be seen from Table IV, NDTS and leverage are found to be significantly associated, supporting *H8*, although solely for NFF. It could be hypothesized that because FF have significantly higher debt levels, they take advantage of debt tax

shields, and, therefore, NDTS are less relevant. However, as discussed above, it is often argued that tax considerations in general, and due to several reasons, are not tremendously influential in FF's capital structure decisions.

According to the regression results in Table IV, the expected positive association of the IC ratio with leverage (*H9*) is significant for FF only. It may be argued that IC as a measure of financial risk affects capital structure predominantly at high debt levels, which are more prevalent within the group of FF. From Table V, it can be inferred that the connection to leverage is significant for FCFF, which indicates that hard facts and figures like the IC play a more prominent role in bank finance for FF in early stages (also with respect to bank relationships).

The coefficients of the industry dummies are mostly insignificant at the 5 per cent level (results are not reported in tabular form), the only exception is the lower debt ratio for the wholesale and trade sector (compared to manufacturing) in the NFF sample. Thus, there are almost no observable industry-fixed effects, given the firm-specific leverage determinants described above, which is very much in line with previous SME research (and *H10*).

To sum up, the debt ratios of both FF (whether founder- or descendant-controlled) and NFF are determined by cash flows and asset growth, which is in line with POT where leverage is lower for more profitable firms and higher for firms with more investment. However, several differential impacts emerge in Tables IV and V. These are confirmed by Chow tests on parameter differences[16], as in López-Gracia and Sánchez-Andújar (2007) for the determinants of Spanish FF's and NFF's debt ratios. The results of Serrasqueiro *et al.* (2011) point toward such significant differences in the determination of capital structures as well.

4.3 Robustness issues

The robustness of our results is examined with respect to the definition of both FF and key variables. First, we apply a more general classification for FF, comprising also companies where a single person or family owns exactly 50 per cent of the firm, or with the ultimate owner being a German FF (due to the geographical nearness and the similarity of economic systems, such firms can be considered similar to "pure" Austrian FF). By these criteria, about 78 per cent (365) of the firms can be characterized as FF, with about 26 per cent (96) of them being (co-)managed by the founder. The main consequence is that, with respect to FF vs NFF results, some variables lose their significance (IC in the FF sample, working capital and NDTS for the group of NFF), which is not overly surprising with a non-trivial number of firms switching groups with different *ex-ante* impacts. The remaining factors are not qualitatively affected, as is the whole set of results from Table V.

Second, the ROA is applied instead of the cashflow ratio, as it is used as a measure of profitability in most empirical studies (the FF in our sample are less profitable in comparison also with respect to the ROA). By this, the levels of significance of some variables are affected, but not their general explanatory power. Third, by using cash flow variability to measure risk, risk loses its significance throughout the examination, which confirms the finding that it depends on how risk is measured for whether it is a determinant of SMEs' capital structure choice (Cassar and Holmes, 2003).

5. Summary and discussion

Prior empirical evidence on the capital structure of FF is mixed, even though most researchers find peculiarities in FF's financing behavior. Given the trade-off between risk aversion and the desire of families to maintain control, it is not surprising that the literature has produced non-uniform results. Furthermore, the focus is mainly on large listed companies, which can issue non-voting equity without diluting their control (King and Santor, 2008). The research pursued in this paper sheds light on the peculiarities of SMEs in a bank-oriented financial system. Because capital markets and public equity are often no options for such SMEs, bank debt plays an even more important role in their capital structure. The strongest impact of agency costs on leverage and capital structure decisions could be expected for FCFF. The convergence-of-interest effect (alignment between the interests of management and capital providers) should be associated with lower agency costs, higher debt capacity and, therefore, higher leverage, long-term commitment and reputation arguments should be especially applicable. The founder-CEO might be particularly concerned about any loss of control over the firm, which may lead to higher leverage, but the literature also provides arguments for founders' descendants exhibiting similar concerns and behavior. However, if all these proposed lines of reasoning are dominated by risk aversion, the opposite constellations with respect to the use of debt might emerge.

By using a sample of Austrian SMEs, this paper examines the capital structure and its determinants for FF of different generations in an economy with pronounced relationship banking and strong creditor rights. The analyses reveal that FF exhibit higher debt ratios than NFF, which is consistent with motivations to maintain control over the firm. However, this is also consistent with alternative explanations, such as a limited use of financing options (either due to restricted access or by choice) or agency issues being less important or solved by special relationships. Due to the fact that SMEs have only limited access to alternative external equity (venture capital, private equity and stock market issuance), the pecking order of their financing continuum often finds an end with bank debt. In such an environment, risk considerations which would point toward less leverage have less merit and close monitoring takes place in any case (and is countered by the advantages of close relations with creditors). This explains the difference to the results of Ampenberger *et al.* (2013) and Schmid (2013) for Germany, as listed firms, which are examined in these studies, have much more and better options to avoid debt.

Presumptions that several of the arguments (convergence of interest, risk and control motivations) have a stronger influence on the revealed leverage of FCFF do not materialize in the examined data or cancel each other out, as FCFF and DCFF exhibit quite similar capital structures on average. The determination of the capital structure of FF and NFF (as well as FCFF and DCFF) is diverse, which is revealed by differences in the economical and statistical significance of the proposed influence factors and confirmed by respective Chow tests. FF, on average, have higher debt ratios than NFF, but the estimates of the adjustment speed to the target do not differ significantly. On the other hand, FCFF adjust significantly faster than those managed by later generations, which may be due to special favorable characteristics of entrepreneurs that probably lead to improved personal creditworthiness and lower monitoring costs for lenders as well. On the other hand, flexibility in later generations may be mitigated by agency conflicts and increased information asymmetry between firms and lenders.

Several of the results point toward the POT being more explanatory for Austrian SMEs' leverage decisions, increasingly so for FF: the high degree of persistence in debt ratios, the negative (positive) effects of profitability (asset growth rates), and the fact that several determinants motivated by the TOT – with the exception of operational risk – are insignificant or only relevant for NFF. FF, however, seem willing to accept higher distress risk (via higher debt levels as well as lower IC ratios and lower cash flows, also due to higher interest payments) to maintain control, whether founder-controlled or not. Some results, thus, appear to be in line with the POT, though the maintenance of control and a presumed limited usage of outside equity may be behind the observed ordering of financing sources (Romano *et al.*, 2001). As Blanco-Mazagatos *et al.* (2007, p. 200) argue, FF put more effort into keeping control of the firm over generations than into a "comprehensive assessment of complex financial issues (e.g. optimal leverage)", confirming the results from surveys that financing decisions are often based on rules of thumb and informal rules (Drobetz *et al.*, 2006; Graham and Harvey, 2001). A strict targeting of an optimal debt ratio and, thus, the practical applicability of the TOT are probably obscured by a less-than-expected importance of tax shields for FF. It can be concluded from our results that the nature, characteristics and motives of FF are important drivers of their capital structure choice (López-Gracia and Sánchez-Andújar, 2007), corroborating the view of Ang (1992) that it is difficult to describe financial decisions of small firms with traditional financing theories.

Despite FF's features like long-term orientation and wealth concentration in the firm, the results for our sample of Austrian FF do not support the risk-reduction hypothesis. Debt ratios are high and strongly persistent, indicating that these firms suffer from high (adjustment) costs in financing. The size and the rigidity of debt ratios induce high bankruptcy risk and an increased probability of distress in case of external shocks. This has severe implications for firms, capital providers and policy-makers and several recommendations can be derived from our results. For family businesses, it seems advisable to more closely monitor costs (to increase profits) and operating risk and, if necessary, to improve the associated management skills. Public policy should support this, also by providing a stable economic environment for small firms. Our results confirm the SME literature in that small firms reduce debt if profits increase, but seek bank credit to finance growth (Degryse *et al.*, 2012). Thus, equity instruments that suit the needs and motives of FF (especially the maintenance of decisional control) have to be fostered and made attractive to the small firm community so that these businesses may pursue growth activities and keep debt levels low at the same time. All involved parties should contribute to create a more equity-friendly environment in Austria and other countries, also by finding ways to decrease the asymmetric information and agency costs with external equity and promote instruments like angel finance, mezzanine and venture capital, crowdfunding, etc. While seeking new forms of finance and ways is surely fruitful, SMEs (have to) rely on their intense relationships with banks, which should, therefore, be retained and improved. Current literature suggests that the buildup of trust (Serrasqueiro *et al.*, 2012; Moro and Fink, 2013) and voluntary disclosure of information (Moro *et al.*, 2014) represent promising ways to do this. Public policy should also take a closer look at the effects of banking sector consolidation, new lending technologies and aggregate influences on SME finance (Berger and Udell, 1998). By attending all these implications and recommendations, small firms should be able to become safer and to regain management flexibility, which is important for the whole

economy due to their tremendous importance for employment, growth and innovation. Academic research should take part in this process as well and merge the efforts from the related strands of literature.

Further proposals for future research arise from the limitations of this paper, whose results are drawn from regional data. It seems important to examine more and broader samples of small, NFF in similar environments, also for longer periods, to improve our understanding of these firms' dynamic decision-making and the problems they face. This may also shed light on why our results differ from those of López-Gracia and Sánchez-Andújar (2007), especially with respect to the huge adjustment parameter they find for FF. Potential explanations might include lower adjustment costs, greater flexibility due to relatively low indebtedness of Spanish FF (in the pre-crisis years) and estimation bias. Another concern calls for more detailed data, e.g. to discriminate between short- and long-term debt (Cassar and Holmes, 2003; Degryse *et al.*, 2012; Serrasqueiro *et al.*, 2012). Furthermore, there is an obvious need to complement and merge econometric studies with data from surveys of FF, as this and similar studies lack detailed information on family characteristics and structure, the firm – family connection and the actual motives that drive family managers' financial decisions. Such information would very much help to clarify how informative financial theories like the POT really are and how the supply-and-demand interplay between firms and capital providers actually shapes debt outcomes.

Notes

1. Jordan *et al.* (1998) and Michaelas *et al.* (1999) argue that the literature has identified leverage as a notable cause of small firms' decline and failure.
2. Furthermore, López-Gracia and Sogorb-Mira (2008) find that standard capital structure determinants affect the debt ratios of SMEs and large firms differently.
3. Mishra and McConaughy (1999, p. 54) argue that FFCFs are a common type of firm organizations even in the USA, and also that "most medium-sized German and Austrian firms are FFCFs".
4. Serrasqueiro *et al.* (2011) is the working paper version of Serrasqueiro *et al.* (2012). We report from the former, as the part on total debt was left out in the final published version.
5. A fourth, the market timing theory (Baker and Wurgler, 2002), is not applicable, as small firms typically have no access to capital markets. According to Huang and Ritter (2009), it cannot be expected that a single theory exhaustively describes all the empirically observed capital structure patterns.
6. Schmid (2013) speaks of "convergence of interest" between shareholders and managers from the same family. Others argue that family ownership could lead to more agency-related conflicts when minority shareholders are not part of the family (Villalonga and Amit, 2006). It should be noted, however, that the typical Austrian SME/FF has no outside shareholders.
7. Debt holders want to ensure that the firm survives "long enough" and is sufficiently profitable to meet its debt obligations (Gama and Galvão, 2012), and the aligned interests form the basis of tight bank – customer relationships.
8. In the literature, the term control risk is often used for the risk of losing control due to bankruptcy which points to lower debt levels (Ampenberger *et al.*, 2013; Gama and Galvão, 2012; Mishra and McConaughy, 1999). These relations, however, are covered by the

risk-reduction hypothesis in this paper, and "control considerations" only refer to situations without financial distress.

9. For a detailed discussion on age as a determinant of SMEs' financing decisions, see Serrasqueiro and Nunes (2012).
10. Further estimates are provided by, for example, Lemmon *et al.* (2008) or Huang and Ritter (2009). Antoniou *et al.* (2008) report SOA estimates for the G5 countries ranging from 11-40 per cent and conclude that capital structure is heavily influenced by country-specific factors.
11. A measure of profit variability to proxy financial distress costs is also applied by, for example, López-Gracia and Sánchez-Andújar (2007).
12. Dividing earnings volatility by negative mean earnings results in a negative coefficient of variation, which would rank those firms at the lower end of the risk spectrum (even more so with more earnings volatility). Multiplying the inverse variation coefficient by minus one restores that more volatile earnings show up in higher values for the risk variable.
13. As can be observed from Table I, there are observations with a debt ratio above 100 per cent (29 cases in the full sample). Although the dependent variable is, therefore, not truly fractional, the DPF estimator remains unbiased (Elsas and Florysiak, 2010). Censoring or dropping the observations mentioned above leaves our results virtually unchanged.
14. The base group is manufacturing, binary variables are applied for construction, wholesale and retail trade, transportation and storage (sections C, F, G and H of the NACE Rev. 2 industry classification). Further dummies are present for the group of other manufacturing industries (agriculture, foresting and fishing; mining and quarrying; electricity, gas, steam and air-conditioning supply; water supply, sewerage, waste management and remediation) as well as for the group of service industries.
15. No within-average can be applied for the risk variable, as it is already constructed as a time-invariant measure.
16. Both tests (for differences in parameters estimated in Tables IV and V) show up with a p-value below 0.01.

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