Robert Rieg, Justyna Dobroszek, Ewelina Zarzycka

Professionalisation of Family Firms and Accounting Function: Empirical Evidence

Robert Rieg iD

Aalen University, Faculty of Business, Beethovenstraße 1, 73430 Aalen, Germany
corresponding author: robert.rieg@hs-aalen.de

Justyna Dobroszek iD

University of Lodz, Faculty of Management, Jana Matejki 22/26, 90-237 Lodz, Poland

Ewelina Zarzycka iD

University of Lodz, Faculty of Management, Jana Matejki 22/26, 90-237 Lodz, Poland

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Abstract

An increasing influence of families in firms is associated with lower professionalisation. A less professionalized firm might not be able to exploit the benefits of elaborate accounting functions that are fundamental for effective decision-making and control. Yet, it is unclear to date if higher family influence leads to less differentiated and professionalized accounting functions and hence less effective decision-making and control. We test this proposition based on survey data with Bayesian regressions and interaction effects. We find evidence that the impact of family on professionalisation is particularly pronounced in smaller firms, and the effect decreases with the firm's size. This indicates that family influence and professionalisation have more significant impact on the use of accounting instruments and less impact on the differentiaiton of accounting functions, except for smaller family firms.

Keywords

accounting function | empirical evidence | family firms | financial accounting | management accounting

JEL Codes

M21, M41

1. Introduction

Many facets differentiate family firms from non-family firms; such differences are summarized as "professionalization" (Stewart & Hitt, 2012, p. 60). A general notion in the literature, also supported by empirical evidence, is, that the more professional, the more successful firms are (Bloom *et al.*, 2012). Family firms are often seen as less professional than family firms (Stewart and Hitt, 2012), and hence less successful (Bloom *et al.*, 2012; but Chu, 2011; Maury, 2006; Dekker *et al.*, 2015). Poutziouris *et al.* (2015) indicate that lower professionalisation of family firms is due to lower prevalence and use of formal governance, strategic planning, and control. Early studies equated professionalisation with the presence of non-family managers in a firm, which may mean that only external managers could act "professionally" (for a discussion see Hall & Nordqvist, 2008). Yet, the research on family firms recognizes professionalisation as a multidimensional construct (Dekker *et al.*, 2013; Stewart & Hitt, 2012). It includes engaging non-family managers and governance structures, non-family board members, and delegation of control and authority, as well as formal human resources and financial control mechanisms (Hiebl & Mayrleitner, 2019).

What is not discussed in the literature is the professionalisation of the accounting function in family firms. This is surprising, given that professionalisation is manifested, among other aspects, in formal structures, instruments, and specialized staff (Hiebl & Mayrleitner, 2019); all aspects of a professional accounting function are essential for all firms. Mainly, financial accounting provides information for mandatory disclosure,

while management accounting supports decision-making and control in a company (Buriachenko *et al.*, 2020; Hemmer & Labro, 2008). In addition, well-functioning accounting systems contribute to more effective decision-making (Fleischman *et al.*, 2010) and higher performance and competitiveness (Kallunki *et al.*, 2011). Thus, family firms without professional accounting functions might hamper the usefulness of accounting information for managers and family members and impair the long-run success of the family firm (Lopez & Hiebl, 2015).

Family firms are often small and medium-sized firms (Lubatkin *et al.*, 2006). Smaller firms have fewer excess resources and experience resource constraints faster, while often being less complex. Conversely, complexity and formal structures increase with firm size (Buriachenko *et al.*, 2020), leading to more differentiated and professionalized accounting functions. This argument supports the interaction between family influence and firm size regarding the structuring of accounting functions and their professionalisation.

Yet, we lack evidence of whether family firms exert lower degrees of professionalisation in their accounting functions and whether there are interactions between family influence and firm size. To close the research gap, we developed hypotheses presenting distinctive effects of family influence and size on professional accounting functions and referring to socio-emotional wealth (SEW) theory. To test the hypotheses, we surveyed companies of various sizes and various degrees of family influence in Germany and Poland at the turn of the year 2017/2018. Bayesian regressions were used to analyse the collected data. Additional analyses of selected interaction effects complement the study.

As main results, we find that in most accounting functions, firm size dominates, while family influence plays a minor role. Yet, conditioning on the firm size, we find effects of family influence for smaller firms.

We interpret these results as family firms making the same structural decisions on accounting functions as non-family firms, except for smaller family firms. Professionalisation in accounting seems to be manifested not as much as in structures of an accounting function but probably more in the use of instruments (Quinn et al., 2018) or human capital of accounting staff (Hiebl *et al.*, 2012). However, firm size seems to strongly constrain accounting practices

(Chenhall, 2003) and implementation of professional accounting functions (Moores & Mula, 2000).

This paper contributes to the existing literature in two distinct ways. First, we argue that the accounting function is a missing element in the discussion on professionalisation in family firms. Most studies investigated professionalisation related to management and ownership and their organization in a company (Oliveira *et al.*, 2017; Sharma *et al.*, 1997). They show that family firms are less formalized, rational, and standardized in this regard than non-family firms (Stewart and Hitt, 2012, p. 60). Professionalisation involves the formulation of a bureaucracy. It refers to the principle that ownership and management should be separated to enable rationality and impersonality of decisions (Oliveira *et al.*, 2017). But this approach is not seen in family firms. Lack of professionalism in family firms manifests itself, among other things, in not holding family members accountable for poor performance, avoiding decisions that encourage expansion, growth of the company, and less willingness to take risks and make investments (Le Breton-Miller and Miller, 2009; Lubatkin *et al.*, 2006). Considering the professionalisation gap of family firms in this area, organizing the accounting function in the right way can bring these companies closer to being perceived professionally. The accounting (financial and management accounting) function can improve the transparency of governance, control, and the decision-making process. Moreover, it can protect against the bankruptcy of family firms. Business survival rates show that only 12% of all family firms reach the third generation, and only 3% reach the fourth or subsequent generation (Allio, 2004). Thus, our study provides new insights on a missing discussion on accounting functions and their professionalisation in family firms (Hiebl & Mayrleitner, 2019; Quinn *et al.*, 2018).

Second, the paper contributes to accounting research in family firms. Although there are studies on accounting in family firms (Carrera, 2017; Hiebl *et al.*, 2013; Salvato & Moores, 2010), we shed additional light on the interactions among accounting function, family influence, and firm size. When we consider accounting functions in our research, we mean both financial accounting and managerial accounting supported by technology. Previous studies have generally analysed accounting from different perspectives in family firms. However, this earlier research has focused mainly on a single accounting function, i.e., financial accounting (e.g. Bardhan *et al.*, 2015; Chen *et al.*, 2008; Greco *et al.*, 2015) or managerial

accounting (Cesaroni & Sentuti, 2016; Songini & Gnan, 2015). Moreover, previous research on this topic has presented results mainly in the context of developed Western European countries or Anglo-Saxon countries or a single country (see in Carrera, 2017). In our study, the accounting function considers family firms located in two economies subordinated to other parts of Europe, i.e., Germany-Western Europe and Poland-Central and Eastern Europe. Therefore, the paper directly responds to the call for research on how accounting is organized in family firms (Helsen *et al.*, 2017; Salvato & Moores, 2010; Songini *et al.*, 2018).

The paper is structured as follows: the second section reviews relevant literature, defines the research gap, and develops hypotheses. The third section describes research methods and sampling, followed by section four on results. Finally, the last section discusses the results and concludes the paper.

2. Role of Accounting in Family Firms

2.1. Family Firms and Professionalisation

While the literature agrees on the prevalence and importance of family firms for the economy and society (Carrera, 2017) what constitutes family firms is still being debated (Prencipe *et al.*, 2014). The more significant involvement of a small number of owners, often members of families, is seen as leading to distinct differences from firms without this condition: family firms seem to be more oriented in their goals for the long term, which often include non-financial goals like long-term existence and keeping the business in the hands of the family; also trust, bonding, and other emotions between family members and also between them and employees seem to play a more significant role (Dawson & Mussolino, 2014; Stewart & Hitt, 2012).

Along with this is a view that family firms are less professional but should be more so (Songini & Gnan, 2015; Stewart & Hitt, 2012). Professionalisation is seen in the context of organizational development as the implementation of more sophisticated management and organizational instruments, systems, functions and employing more trained and experienced people (Dekker *et al.*, 2013). Professionalisation is relevant for firms because it is linked to performance outcomes.

The family firms with their overall lower level of professionalisation seem to perform poorly (Dekker *et al.*, 2013; Dekker *et al.*, 2015; Stewart & Hitt, 2012), but the evidence is still under debate (Hansen *et al.*, 2020; Wagner *et al.*, 2015). Family firms may be reluctant to professionalize because that could increase agency costs and lower their SEW (Fang *et al.*, 2012, p. 12; Polat, 2021).

2.2. Accounting Function and Professionalisation

Professionalisation is a multidimensional construct (Stewart & Hitt, 2012). Dekker et al. (2013) derived five dimensions from factor analysis: 1) financial control systems, 2) non-financial involvement in management and board, 3) human resource processes, 4) decentralization of tasks and decision-making, and 5) activeness of top management and board (see also Polat, 2021; Camfield & Franco, 2019).

These dimensions need accounting information as inputs: business decisions, targets and variances in incentive systems, and management control. The accounting function establishes the systems and services to ensure reliable and timely accounting information. It means that professionalisation manifests itself in firms' institutionalization of accounting functions. Due to mandatory disclosure requirements of accounting standards, most firms establish financial accounting functions, except for very small firms, which might rely on external support by bookkeepers and tax advisors (Everaert *et al.*, 2010). Management accounting functions aim at supporting management with information relevant for decision-making and control (Lopez & Hiebl, 2015). The decision to establish a management accounting function is discretionary. Yet, we generally find an increase in firm size, which is a reaction to the increasing complexity and diversity of business operations. However, family firms are more reluctant to implement management accounting functions (Hiebl *et al.*, 2012; Neubauer *et al.*, 2012). In today's businesses, establishing organizational structures is not limited to hiring personnel and forming departments. It also includes using information technology as an essential tool and complementing organizational processes (Zammuto *et al.*, 2007; Dewett & Jones, 2001). Despite the relevance of accounting topics for family business research, this topic is generally understudied (Helsen *et al.*, 2017; Salvato & Moores, 2010; Songini *et al.*, 2013; Songini *et al.*, 2018). In particular, the situation is not different regarding accounting functions and family firms. A few studies

exist that focus primarily on management accounting functions and family firms. They report that family firms establish management accounting functions less often and use management accounting instruments and knowledge to a lesser degree (Hiebl *et al.*, 2012; Neubauer *et al.*, 2012). Alattar *et al.*, 2009 and García Pérez de Lema & Duréndez, 2007 argue that family firms lack training and knowledge of their owner/managers to implement management accounting, while Neubauer *et al.*, 2012 argue that the reason for this lies in lower agency problems of family firms.

We see here a research gap in several aspects: implementing accounting functions supports the professionalisation of family firms, but we lack evidence of whether firms with stronger family influence implement them. Furthermore, it is unclear which aspects of accounting functions (financial accounting, management accounting, information technology aspects) are implemented and whether larger family influence makes a difference. Finally, as previous research suggests (Salvato & Moores, 2010), family influence and firm size might interact here.

3. Hypotheses

Family firm managerial decisions are influenced by the desire to preserve family control over generations and succession apart from efficiency and economic effects, which is at the core of SEW theory (Gomez-Mejia *et al.*, 2011). SEW theory relates to financial and management accounting as well. Concerning financial accounting, Chen et al. (2008) state that family ownership results in a relatively conservative approach to financial reporting, especially when the company's founder is not in the CEO position. As a result, family firms are less likely to engage in real earnings management and provide more honest reporting to the public. Preserving SEW by maintaining a good reputation seems more critical to owners than achieving financial goals. If bad practices are disclosed, the possible loss of image or reputation outweighs the economic advantages (Gomez-Mejia *et al.*, 2011). Hence, a lower professionalisation in family firms is explained by SEW theory (Berrone *et al.*, 2012).

SEW theory states that lower formalization and professionalisation regarding management accounting are connected with the different control philosophies in family firms. They rely more on reciprocal trust and clan controls than on bureaucratic forms of control, as well as more intuitive and experiential decision-

making (Moores & Mula, 2000; Pimentel *et al.*, 2018). This explains a reluctance of institutionalizing management accounting functions, as evidenced by Neubauer *et al.*, 2012; Hiebl *et al.*, 2012).

However, this situation changes when a business becomes complex and when a family firm hires non-family managers. In such cases, firms need to implement more formal control through accounting (Giovannoni *et al.*, 2011). Thus, the larger a family firm becomes, the greater the need to establish or elaborate accounting functions (Carrera, 2017; Cassia *et al.*, 2005; Eierle & Haller, 2009). It means that the organization of accounting in family firms is also influenced by the size and complexity of their organization. For example, if a family firm is larger and more complex, it relies more on professional accounting and formal control tools (Hiebl et al., 2012). The latter indicates an interaction between "familiness" and firm size. Hence both factors, family impact and size, will interact in the opposite direction. It leads to three hypotheses, the first two with distinctive effects of family influence and size and the third regarding the interactions between size and family influence.

> *H1. An increase in family influence impacts professionalisation and differentiation of accounting negatively.*
>
> *H2. An increase in firm size impacts professionalisation and differentiation of accounting function in the company positively.*
>
> *H3. Family influence and firm size interact in opposite directions.*

The accounting functions of firms come in different shapes, and it does not seem very easy to classify them to test hypotheses at first glance. However, viewed from mandatory financial accounting as the starting point, we can perceive the diversity of organizing accounting as a stepwise differentiation towards management accounting (Neubauer *et al.*, 2012). At first, management accounting tasks might be assigned to financial accountants who then perform financial and management accounting, which we might call "hybrid accountants" (following Caglio, 2003). The next step is a specialization on the employee level, leading to separate staff for financial and management accounting, but within one department (Hiebl *et al.*, 2012). Increasing needs for additional information and decision support not available from financial accounting leads to separate departments, which will
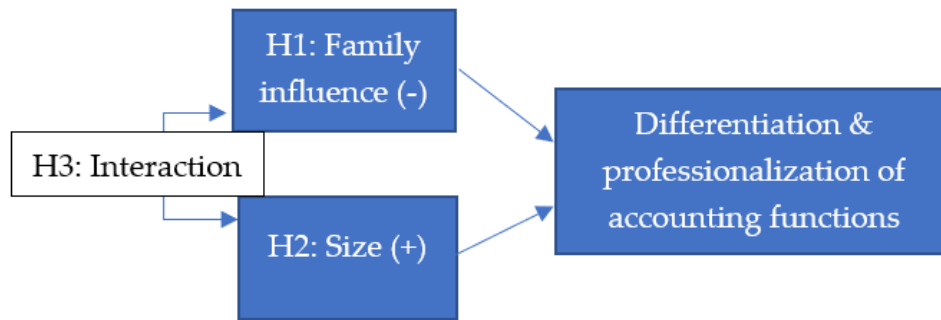
Figure 1. Research Model

still cooperate (Ikäheimo & Taipaleenmäki, 2010; Taipaleenmäki & Ikäheimo, 2013).

The discussion above showed that we would expect family firms to establish fewer organizational structures for management accounting and use less sophisticated management accounting instruments, which would favour hybrid accountants and less existence of differently specialized accountants (financial accountant/bookkeeper, and management accountant) in the same department or separate departments (financial accounting department, management accounting department). On the other hand, increasing firm size with accompanying business complexity will be linked to fewer hybrid accountants, more specialization, and more separate departments.

Furthermore, accounting functions nowadays operate in a socio-technical environment that enables task integration or separation between financial and management accounting (Caglio, 2003; Taipaleenmäki & Ikäheimo, 2013). Traditionally financial accounting data, necessary for management accounting analyses, are stored as raw data in the transaction-oriented accounting information system and transferred directly or via a dedicated interface to management accounting (Weißenberger & Angelkort, 2011). With increasing professionalisation, more advanced technology and software are used, and managers reaping their benefits achieve higher firm performance. Both accounting functions (financial and management accounting) are integrated through enterprise resource planning (ERP) systems. Such systems support the standardization of reporting (Goretzki *et al.*, 2013) and enable the delegation of responsibilities to professional managers. However, family firms and small- and medium sized enterprises (SMEs) are reluctant to introduce new IT systems due to financial burdens and high investments related to them (Bruque, S., & Moyano, J., 2007). Figure 1 presents the research model.

4. Methodology, Data, and Sample

4.1. Measurement

Dependent variable. INTEGRATION: First, since organizational differentiation can come in many shapes, we measure five items for organizational integration and infer that a lower degree of integration is an indicator of differentiation. Second, as explained below, we combine these five items into a count variable, INTEGRATION.

Given the mandatory nature of financial accounting, we structure organizational aspects of financial and management accounting as an increasing separation of management accounting from financial accounting. The first aspect concerns accountants whose tasks include managerial and financial accounting, represented by a variable "HYBRID" (following Caglio, 2003). A second organizational option is to allocate financial and management accounting to the same function or department, which we call "SAME_DEPT." If separate functions for financial and management accounting exist, close cooperation can benefit managerial support, so we termed that variable "COOPERATE." These variables are measured on an ordinal scale from 1= do not agree to 7 = do fully agree.

We measure the integration of information technology for accounting with two items. One concerns the use of integrated information systems (IT_INTEGR), again on an ordinal scale from 1= do not agree to 7 = do fully agree. The second item asks for the use of at least one database used for both financial and management accounting (SAME_DB). Again, this is measured as an ordinal scale from 1= do not agree to 7 = do fully agree.

To detect the effects of the items more pointedly and in an aggregated fashion, we use only the highest expressions (5...7) as indicators, thus creating dichotomous variables and combining them into a count variable INTEGRATION. Although the dichotomization of ordinal variables is sometimes criticized in the literature (Osborne, 2013), in the present case and given the highly skewed distribution of answers, it allows for more precise identification of effects (DeCoster *et al.*, 2011). The variable INTEGRATION counts the occurrence of integrated organizational and technical aspects in accounting and ranges from zero to five. A side effect of this procedure is a distribution with many zeros, which requires a specific statistical approach, i.e., zero-inflated regression (Loeys *et al.*, 2012).

Independent variables. Firm size (SIZE) is often measured by the number of employees as is employed for example, in economics (Bloom *et al.*, 2012), finance (Beck *et al.*, 2005), and accounting (Hiebl *et al.*, 2015) To understand different effects of smaller, medium, and larger firms, we categorize firm sizes into several classes similar to Speckbacher & Wentges, 2012 who employ four categories based on the previous literature as well as size categories of the European Union. This leads to four dichotomous variables: SIZE_99: the smallest firms (n = 108), which serves as reference category; SIZE_100_249, if the firm has 100 to 249 employees (n = 56); SIZE_250_499 for firms with 250 to 499 employees (n = 45); and SIZE_LARGE for firms with 500 and more employees (n = 21).

How to measure family influence is still debated in the literature (Dawson and Mussolino, 2014; Dienemann & Stubner, 2014; Rau *et al.*, 2018). The involvement of family owners in businesses is multidimensional. It encompasses several subscales (e.g. Frank *et al.*, 2017), yet, for this study, it seems appropriate to focus on organizational and structural components of "familiness." Following Hiebl et al. (2015), we employ the FPEC-P scale. This is a subscale of the Klein *et al.*, 2005 measurement concept, which initially consists of power, experience, and cultural dimensions. The power dimension measures a family business's governance and control structure through ownership of equity and the composition of management and supervisory boards. In line with Hiebl et al. (2015), we believe that the power dimension is the main factor influencing structuring financial and management accounting decisions.

Control variables. While contingency studies show that size and family influence are the main factors impacting accounting (Chenhall, 2003; Hiebl, 2013), other variables might also influence firms' accounting functions. For example, the company's age, measured as the number of years since its founding, influences the organization in several ways. On the one hand, learning effects are evident through the accumulation of resources, experience, and proven management practices (Levitt & March, 1988). Second, formalization is thought to increase as companies age (Davila, 2005; Giovannoni *et al.*, 2011). Age is measured as the number of years since foundation up to the year 2018, the year the survey took place. We use the log 10 values (logAGE), given its skewed distribution. Another factor determining accounting systems is the sector or industry (Williams & Seaman, 2001). We ask for industry based on the EU classification and defined, similar to Williams and Seaman, 2001, two groups, manufacturing industries (INDUSTRY) and service industries (SERVICES). Both are dichotomous variables.

Another factor affecting accounting functions is the standards applied. While national accounting standards apply in European firms (Rieg *et al.*, 2021), firms may report additionally according to international financial reporting standards (IFRS), mandatory or voluntary, which requires significantly more resources and professionalisation (Fox *et al.*, 2013). Therefore, we include a control variable IFRS which is "1" for firms reporting additionally according to IFRS. Finally, given that this study includes sampling in Germany and Poland (see next section), we try to understand possible differences for accounting functions, size, and family influence through adding a control variable (PL) which is "1" for Polish respondents. The reference category is Germany (i.e., PL = 0).

4.2. Sampling Procedure

To obtain the data, we developed a questionnaire. The online questionnaire has been divided into five parts. The first one deals with the characteristics of the enterprise, respondents, and data on family members on the board of directors and the supervisory board. The second part included questions on financial accounting and management accounting. The third part of the survey refers to integrating financial and management accounting. Finally, the last two parts of the study asked about accounting tasks performed by the studied organizations and aspects of their environment.

Table 1. Descriptive Statistics for Sample

Variables	Subset Germany n = 113		Subset Poland n = 118		Total sample n = 231	
year of foundation						
mean	1959.19		1997.85		1978.94	
min	1817		1947		1817	
max	2013		2016		2016	
Position of respondents*						
staff management accounting	21	17%	8	7%	29	12%
head of management accounting	40	32%	0	0%	40	17%
staff financial accounting	6	5%	31	28%	37	16%
head of financial accounting	27	22%	68	62%	95	41%
owner of firm	10	8%	2	2%	12	5%
manager	20	16%	1	1%	21	9%
subtotal	124	100%	110	100%	234	100%
		*multiple answers possible				
Type of industry						
missing	9	8%	0	0%	9	4%
manufacturing	36	32%	21	18%	57	25%
mining, utilities	1	1%	5	4%	6	3%
construction	3	3%	14	12%	17	7%
retail	14	12%	30	25%	44	19%
transportation, logistics	3	3%	10	8%	13	6%
media, communication	9	8%	3	3%	12	5%
financial services	2	2%	3	3%	5	2%
other services	25	22%	18	15%	43	19%
real estate	1	1%	3	3%	4	2%
health & social services	6	5%	9	8%	15	6%
others	4	4%	2	2%	6	3%
subtotal	113	100%	118	100%	231	100%
Legal form						
missing	9	8%	0	0%	9	4%
sole proprietorship	4	4%	5	4%	9	4%
limited partnership	2	2%	4	3%	6	3%
private company (GmbH&Co KG)	32	28%	14	12%	46	20%
limited liability company	44	39%	70	59%	114	49%
corporation	11	10%	4	3%	15	6%
others	11	10%	21	18%	32	14%
subtotal	113	100%	118	100%	231	100%
Group affiliation						
yes	39	35%	39	33%	78	34%
no	74	65%	79	67%	153	66%
subtotal	113	100%	118	100%	231	100%
if yes						
parent company	15	38%	12	31%	27	35%
subsidiary	22	56%	22	56%	44	56%
joint venture	1	3%	3	8%	4	5%
associated (at equity)	1	3%	1	3%	2	3%
special purpose entity	0	0%	1	3%	1	1%
subtotal	39	100%	39	100%	78	100%

The questionnaire was pretested with practitioners as recommended by Hulland *et al.*, 2018. We conducted surveys over the turn of the years 2017/2018 among enterprises operating in Germany and Poland. Germany and Poland are at different levels of economic development, but they have many business relations. The territorial proximity to Germany affects the level of trade and cooperation between German companies and companies from Poland, as many subsidiaries of German companies are located in this country. This economic relationship with Germany has an impact on accounting practices in Poland. Another similarity is related to family businesses. Most of the firms in both countries are family firms. The vast majority of

Table 2. Descriptive Statistics for Variables Used in Regressions

descriptive statistics		dependent variable	... consists of dichotomized values of ...					independent variables	
		INTEGRATION	HYBRID	SAMEDEPT	COOPERATE	IT_INTEGR	SAME_DB	Size	F_PEC_P
		count variable	Accountant for FA and MA	Work in the same department	MA and FA co-operate closely	Integrated IT systems	Use of same database		
N	Valid	231	231	230	231	230	230	230	231
	Missing	0	0	1	0	1	1	1	0
Mean		2.411	3.459	3.609	3.870	4.139	4.122	226.26	1.029
Median		3	4	4	4	5	5	108.50	1
Std. Deviation		2.083	2.200	2.328	2.305	2.195	2.261	401.11	0.727
Minimum		0	1	1	1	1	1	1	0
Maximum		5	7	7	7	7	7	3500	3
		control variables							
		logAGE	INDUSTRY	SERVICES	IFRS	PL			
N	Valid	231	231	231	231	231			
	Missing	0	0	0	0	0			
Mean		1.441	0.346	0.506	0.203	0.511			
Median		1.415	0	1	0	1			
Std. Deviation		0.364	0.477	0.501	0.403	0.501			
Minimum		0.301	0	0	0	0			
Maximum		2.303	1	1	1	1			

Polish family businesses are small and medium-sized enterprises, mainly micro-civil partnerships (over 80%), while in Germany, there is more diversification in this (Herr & Nettekoven, 2018). The survey group consisted mainly of small and medium-sized enterprises. A total of 10.383 email addresses were selected at random from a database on firms, and from that, 2,416 could not be forwarded, which reduced the number of emails to 7,967. From that, 231 usable questionnaires were collected, which led to a response rate of 2.9%.

The total sample of n = 231 cases consists of 118 respondents from Poland and 113 from Germany. The following table depicts several characteristics of the respondents and their firms.

4.3. Statistical Inference

Given that the dependent variable INTEGRATION is a count variable with a significant frequency of values with zeros, we employ zero-inflated Poisson regression (Loeys *et al.*, 2012). A convenient effect type for count regression is the incidence rate ratio (IRR). For dichotomous variables like IFRS, this is the ratio of estimated counts if IFRS = 1 compared to if IFRS = 0. In other words, the effect of more or fewer items (= counts) of INTEGRATION if IFRS is applied. For continuous or ordinal variables, it is the effect on counts from a one-unit increase of this variable. If the IRR is 1, there is no difference and, hence, no effect of an independent variable.

Still, many studies base statistical inference on the null hypothesis significance tests (NHSTs) framework despite the fact that this approach has come under severe criticism (Fanelli and Ioannidis, 2013; Ioannidis, 2005). The American Statistical Association recommends going beyond NHST (Wasserstein *et al.*, 2019; Wasserstein & Lazar, 2016). A proposed way beyond is to apply a Bayesian approach that estimates the probability of hypotheses being true given the data at hand instead of the probability of getting the data if the null hypothesis is correct. The latter is not what researchers want to know (Kruschke & Liddell, 2018).

**Table 3.** Correlations between Variables

Bayes Factor Inference on Pairwise Correlations		INTEGRATION	logSIZE	F_PEC_P	logAGE	INDUSTRY	SERVICES	IFRS	PL
INTEGRATION	Pearson Correlation	1	-0.131	0.097	0.144	0.035	0.004	-0.090	-0.027
	Bayes Factor		2.714	6.487	1.763	16.576	19.103	7.623	17.584
	N		230	231	231	231	231	231	231
logSIZE	Pearson Correlation		1	-0.217	0.241	0.179	-0.141	0.206	0.010
	Bayes Factor			0.078	0.022	0.464	1.962	0.136	18.883
	N			230	230	230	230	230	230
F_PEC_P	Pearson Correlation			1	-0.001	0.080	0.004	-0.027	0.053
	Bayes Factor				19.130	9.215	19.103	17.576	13.852
	N				231	231	231	231	231
logAGE	Pearson Correlation				1	0.208	-0.155	0.062	-0.554
	Bayes Factor					0.125	1.197	12.342	0.000
	N					231	231	231	231
INDUSTRY	Pearson Correlation					1	-0.737	0.197	-0.016
	Bayes Factor						0.000	0.208	18.598
	N						231	231	231
SERVICES	Pearson Correlation						1	-0.125	0.073
	Bayes Factor							3.189	10.345
	N							231	231
IFRS	Pearson Correlation							1	0.064
	Bayes Factor								11.921
	N								231
PL	Pearson Correlation								1.000
	Bayes Factor								
	N								231

Bayes factor: Null versus alternative hypothesis.

Given that the Bayes theorem formally estimates the following structure "posterior estimate = likelihood based on data * prior estimate," the result depends on the collected data and the previous probability of the hypothesis and calculations (Kruschke, 2015). It is recommended to use either weakly informative priors or priors for applied statistics based on previous knowledge. A weakly informative prior is the first choice, since there is no combined knowledge on effect sizes for this particular research question. Since statistical methods usually deliver a point estimate and repeated measurement could result in different point estimates, it is an excellent statistical practice to report confidence intervals of effect sizes in NHSTs. For Bayesian analyses, credible intervals are used.

Credible intervals (CIs) represent the uncertainty of the estimated parameter given the data and prior probability, while a confidence interval represents the uncertainty of the interval itself. Credible intervals are estimated using highest posterior density (HPD) regions (Roever, 2018, p. 17). Bayesian approaches use variants of Markov chain Monte Carlo simulation procedures for estimation. We use 2,000 draws for simulation with four independent chains while discarding the first 1,000 simulations to achieve more robust results (Kruschke, 2015).

The employed tests depend on the scales of the dependent variables. The dependent variable of our hypothesis is a count variable, and we employ Bayesian zero-inflated Poisson regression. Additional
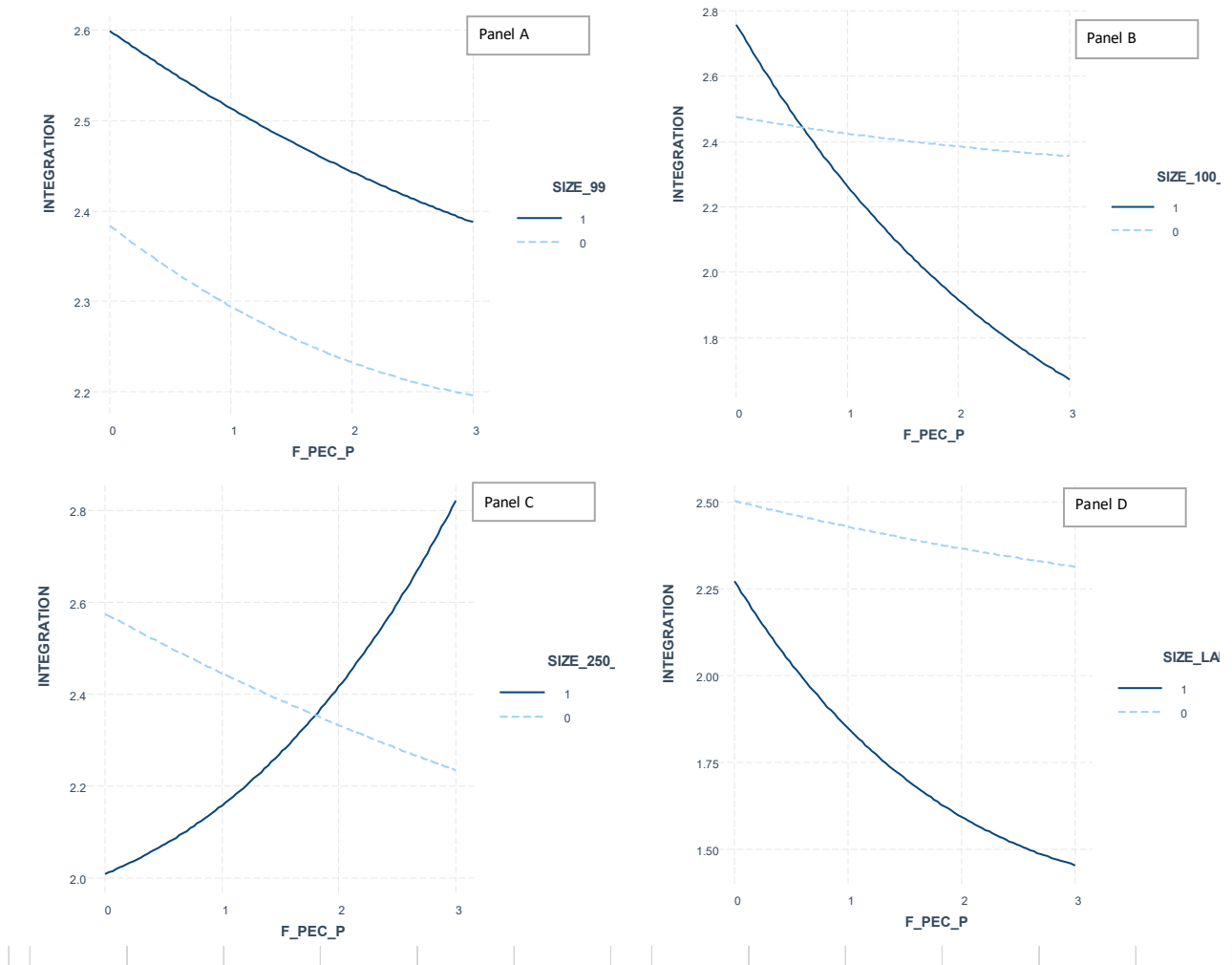
Figure 2. Interaction Plots for F-PEC-P and Firm Size Categories

analyses of selected interaction effects are performed accordingly. All regressions are performed using the packages "brms" and "interactions" in R.

Larger firms are less under the influence of families (r = -.217), older (r = .214), and report also under IFRS (r = .206).

5. Results

5.1. Descriptive Results

Table 2 depicts descriptive statistics for all dependent and independent variables. The sample includes many smaller and medium-sized firms and family firms, which indicates an appropriate sample structure for our study.

Table 3 reports correlation coefficients for variables used in the regression analyses. We find firms in Poland are younger on average (r = -.554). Firms in service industries are also younger (r = -.155).

5.2. Regression Results

We conduct Poisson regressions for the dependent variable INTEGRATION. All regressions applied Hamiltonian Monte Carlo simulation with a no-U-turn sampler (Hoffman and Gelman, 2014) with 2,000 runs in four chains and converged. Convergence statistics are shown in Table 4 as Rhat. Model fit was evaluated with leave-one-out cross validation (Vehtari *et al.*, 2017), which in every case resulted in good model fits (not printed).

The effects on the dependent variable INTEGRATION is depicted in Table 4. The variable F-PEC-P has an incidence rate ratio below

Table 4. Results for Poisson Regression, DV = INTEGRATION

	incidence rate ratio	90% CI lower bound	upper bound	pd	p value one-sided	ROPE [-0.1, 0.1] % in ROPE	Rhat	ESS
(Intercept)	2.044	1.22	3.35	98.83%	1.17%	0.00%	1.000	3596
F_PEC_P	0.963	0.88	1.06	74.12%	25.88%	87.06%	1.001	5172
SIZE_100_249	0.921	0.77	1.11	76.98%	23.02%	54.49%	1.000	3997
SIZE_250_499	0.875	0.70	1.09	83.93%	16.07%	38.49%	1.000	3920
SIZE_LARGE	0.785	0.57	1.13	87.40%	12.60%	22.52%	1.001	3848
logAGE	1.366	1.02	1.77	96.70%	3.30%	8.34%	1.000	3439
INDUSTRY	1.096	0.86	1.42	72.12%	27.88%	44.78%	0.999	3023
SERVICES	1.018	0.80	1.28	53.97%	46.03%	52.93%	0.999	3266
IFRS	0.998	0.81	1.25	50.28%	49.72%	59.38%	1.000	5589
PL	1.451	1.21	1.75	99.92%	0.08%	0.00%	1.000	4059

incidence rate ratio IRR: comparing counts with/without effect, if no effect IRR = 1, reported is mean effect size

90 % CI = 90 % credible interval

pd = probability of direction

p value: probability of getting the data if null hypothesis is true

ROPE = region of practical equivalence, if effect is practically significant %ROPE should be small

Rhat = convergence diagnostic, should be < 1.1

ESS = effective sample size = efficiency of sampling, should be >> 1000

1, which means that there is only a small and not very accurately estimated effect in the data, so the regression results do not support H1. In contrast, we see decreasing incidence rate ratios for organizational integration with increasing size categories. A decrease in the variable INTEGRATION is interpreted as more organizational differentiation. Hence, this result supports hypothesis 2. Regarding control variables, firm age has a positive effect on INTEGRATION, and the same is for the subsample of Poland (PL=1), which indicates that organizational differentiation is lower in Polish firms.

Next, we estimate interaction effects for all size categories with F-PEC-P. Figure 2 shows the interaction effects on the dependent variable INTEGRATION. While the overall impact of F-PEC-P nearly does not exist, the interaction plots reveal a more differentiated picture, depending on size categories. Family influence does not change the overall effect for the smallest firms up to 99 employees (SIZE_99) in panel A. Still, the level of organizational integration is higher for smaller firms than all other firm sizes. For example, in the following size category of firms between 100 and 249 (panel B), family influence deepens integration, leading to more

differentiated accounting organizations than all firm sizes. In the size category of 250 to 499 employees (panel C), this effect reverses: more family influence leads to less organizational differentiation than all other firms. The results for the largest size category (panel D) resemble those from panel C.

6. Conclusion

SEW theory predicts that family firms are less professionalized in terms of managerial practices, organization, knowledge, and also accounting (Hiebl & Mayrleitner, 2019). Accounting provides information that is crucial for financial measurement, management, and control processes as well as decision-making (Buriachenko *et al.*, 2020; Hemmer & Labro, 2008). However, firms with a higher level of family influence seem to rely more often on informal control mechanisms and less on professional accounting functions (Hiebl *et al.*, 2015; Moores & Mula, 2000). As Berrone et al. (2010, p. 87) point out, "the value of social-emotional wealth for the family is more intrinsic, its preservation becomes an end in itself and is anchored at a deep psychological level among

family owners whose identity is inextricably linked to the organization." For family members, business is a part of their lives, which is not the case in non-family firms. Thus, our study aims to enhance our knowledge on professional accounting functions in family firms, including mainly SMEs based on SEW theory.

In our study, the accounting function is expressed through its organization in the company, i.e., the presence of a hybrid accountant and one department performing tasks in financial and management accounting. In addition, the use of an integrated IT system and a shared database in the area of financial and non-financial accounting is considered. Although the former studies indicate the lower professionalisation in family firms, resulting from the use of informal control tools, a lower propensity to risk and invest, and the lack of responsibility for the performance of family members (Gomez-Mejia *et al.*, 2014; Hiebl & Mayrleitner, 2019), our study does not confirm that the increase in family influence impacts professionalisation and differentiation of accounting function negatively. Although family firms are conditioned by the SEW approach, this does not imply a lack of professionalisation and differentiation of the accounting function (Anderson & Reeb, 2003; Le Breton-Miller & Miller, 2009). However, the study confirms that the increase in the company's size impacts the professionalisation of the accounting function. It means that larger organizations more frequently hire professional management and financial accountants and create separate departments for financial and management accounting functions. As firms grow and become more complex, the demand for accounting information increases, and thus they rely more on professional accounting and control instruments (Carrera, 2017; Giovannoni *et al.*, 2011; Hiebl *et al.*, 2012). This, in turn, requires more cooperation between financial and management accountants (Ikäheimo & Taipaleenmäki, 2010; Taipaleenmäki & Ikäheimo, 2013) as well as more integration of information systems and the use of the same databases for both accounting functions.

Studying the interaction between the family and size provides more detailed evidence on the professionalisation of the accounting function. For the smallest firms (up to 99 employees), the level of organizational integration of the accounting function is higher than for other firms, and the financial and management accounting function is performed by the same specialist or served in the same unit, which is consistent with earlier studies of Hiebl *et al.*, 2013;

Speckbacher & Wentges, 2012). In the companies hiring from 100 to 249 employees, the influence of the family impacts the effect of integration, leading to a more diversified accounting function. More significant differentiation and business complexity affect the separation of financial and management accounting organizations, which requires increased cooperation and joint IT systems (Hiebl *et al.*, 2013). The effect of interference between the two variables is different for the largest enterprises, where greater family influence leads to less organizational differentiation than in other searched companies, due to the introduction of international IFRS regulations, which influence the integration of financial and management accounting (Weißenberger & Angelkort, 2011).

The findings show the dominance of firm size over family influence in decisions on establishing accounting functions. In other words, the decisions on organizational structures and functions in accounting seem to be more determined by resource constraints and complexity of businesses that change with firm size (Moores & Yuen, 2001) than by ownership structure and family influence. (in contrast to Quinn *et al.*, 2018)), there are no significant differences in accounting functions of searched family firms and non-family firms. We assume that family exerts influence on accounting to a lesser degree on a structural level but more on tools and use of accounting information. The latter is well documented in the literature (Quinn *et al.*, 2018) and indicates a higher explanatory power of SEW theory for those aspects than for structural decisions of accounting functions.

Our study contributes to knowledge on accounting functions in family firms (Helsen *et al.*, 2017; Salvato & Moores, 2010; Songini *et al.*, 2013). Mainly, we add a missing element on interactions of firm size and family influence on accounting functions. The findings improve the understanding of accounting function in such firms (Lopez & Hiebl, 2015; Salvato & Moores, 2010) and may have implications for practitioners developing accounting systems, in particular management accounting functions, to achieve a higher level of professionalism, also considering the fact that most family firms are SMEs (Nandan, 2010). Generally, the previous studies on family firms and accounting mainly showed the impact of selected accounting tools and methods on the measurement and management of performance (Salvato & Moores, 2010). Our study focuses on the accounting function, considering both financial and management accounting.

Furthermore, the study indicates limited explanatory power of SEW theory (Gomez-Mejia *et al.*, 2007) regarding structural decisions. We find that family and non-family firms adapt their accounting functions mainly due to business complexity and resource availability.

The contribution of our research is visible in the applied research method. Therefore, we use Bayesian regression analysis to test our hypotheses. So far, this method has been rarely used in management research (Doh & Hahn, 2008).

Our study has some limitations. First, we searched a static relation, not a process of accounting professionalisation, which could have given us additional insights (Cruz *et al.*, 2009; Rizza & Ruggeri, 2018). A replication with more data could enable the generalization of the results and a meta-analytic combination of study results. Moreover, we employ the FPEC-P scale, a subscale of the measurement concept of Klein *et al.*, 2005, consisting of dimensions of power, experience, and culture. It does not measure all aspects of family influence that may impact accounting. Thus, we see some direction for future research in the analysed area, as combining the investigation with long-term field studies (case studies) in different family firms would be worthwhile.

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