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Lines of Credit and Family Firms: The Case of an Emerging Market

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Abstract: Lines of credit constitute an integral part of a firm's liquidity policy; however, there is limited research on lines of credit in emerging markets. This study fills this gap by examining firm incentives to access and draw from lines of credit using the context of Jordan, a bank-based emerging market, focusing on the impact of family firms. To account for the endogeneity of family control, this study estimates the probability of accessing a line of credit using seemingly unrelated bivariate probit regression and its usage using treatment effect regression. The article documents that family firms are less likely to obtain a line of credit and their drawdowns are smaller compared to non-family firms. These findings support the agency's view on having and using lines of credit. Other findings are consistent with a substitution effect between internal and external liquidity sources which implies a cost wedge between the two sources of liquidity.

Keywords: lines of credit; liquidity; family firms; bank-based economy; emerging market

1. Introduction

Lines of credit are popular financial instruments that are used extensively by firms to manage their liquidity (Mollagholamali and Rao 2022). Acharya et al. (2020) report that 70% of their US sample firms have access to a line of credit while Lins et al. (2010) report that 94% of their sample firms from 29 countries obtained a line of credit. Lines of credit have been receiving growing attention in the literature in the aftermath of the credit crisis of 2008 because of their role in providing insurance against liquidity risks (Acharya et al. 2014; Campello et al. 2011, 2012; Sufi 2009). Empirical studies examine the role of lines of credit as a source of contingent liquidity (Acharya et al. 2020, 2014; Sufi 2009), their role in financing investments including research and development (Campello et al. 2011; Guney et al. 2017; Lee 2022), their impact on gross profit (Aragón et al. 2020), and their role in reducing financing constraints (Koussis and Martzoukos 2022; Sufi 2009). In addition, some studies examine the determinants of having access to a line of credit (Berrospide et al. 2012; Mollagholamali and Rao 2022) and the usage of line-of-credit facilities (Duran 2017; Jiménez et al. 2009; Lee 2022). This study is closely related to the latter strand of research as it examines the determinants of access and usage of line-of-credit facilities focusing on the impact of family-controlled firms by utilizing the context of Jordan, a bank-based emerging market.

Under perfect capital market conditions, corporate liquidity is irrelevant because firms can raise external financing to meet unexpected changes in their cash flows or investment opportunity sets at zero cost (Demiroglu and James 2011; Denis 2011; Opler et al. 1999). However, when market imperfections exist, liquid resources provide financial flexibility that enables firms to respond in a timely fashion to unexpected changes to their cash flows or set of investment opportunities (Acharya et al. 2014; Almeida et al. 2014). Hence, value-maximizing firms design financial policies such as stockpiling cash and obtaining lines of credit to preserve the financial flexibility required to respond to unexpected needs (Acharya et al. 2014; Denis 2011; Opler et al. 1999; Sufi 2009). Lines of credit are financial

instruments designed to provide liquidity insurance when firms face market frictions that prevent them from investing in valuable projects (Holmström and Tirole 1998; Sufi 2009). Line-of-credit facilities allow firms to withdraw funds when needed up to the pre-approved maximum limit of the credit line. From the firm's perspective, the drawn portion is a debt obligation while the undrawn portion is a source of insured or contingent liquidity (Sufi 2009). Theoretical motivation based on the trade-off and financing hierarchy theories predicts that firms facing higher costs of external financing can be forced out of the line-of-credit services offered by banks (Sufi 2009). Furthermore, agency motives can influence the choice of obtaining lines of credit because of the monitoring, discipline, and transfer of control rights that are associated with bank lending.

However, most studies on the determinants of firm liquidity focus on cash holdings and ignore lines of credit (Mollagholamali and Rao 2022). Although the number of studies on lines of credit is growing, most of them focus on the contexts of the US and to a lesser degree on other developing countries (Duran 2017; Jiménez et al. 2009; Lee 2022). However, the study of emerging economies is interesting because these economies, unlike developing economies, are predominantly bank-based (Tayem 2022a). In bank-based economies, bank debt plays a prominent role in the provision of external finance. For example, external financing of corporate Jordan is dominated by bank debt with lines of credit being the main lending vehicle (Tayem 2022a). In addition, to the best of the authors' knowledge, previous literature did not examine the impact of firm-level ownership patterns, such as firm identity, on the access and usage of lines of credit. This is an important issue to examine given that there is a strong agency motive that influences firm decisions regarding liquid resources (Dittmar et al. 2003; Mollagholamali and Rao 2022; Seifert and Gonenc 2018; Tayem et al. 2019).

Therefore, this study attempts to fill this gap in the literature by examining the determinants of having access to a line-of-credit facility and the usage of that facility utilizing the case of the emerging market of Jordan. In addition, this study examines for the first time the impact of firm identity on the probability of having access to a line-of-credit facility and its usage. Specifically, this study poses the following questions: What are the firm-level determinants of obtaining a line of credit? What are the firm-level determinants of the amount drawn from a line-of-credit facility? Do family firms have a higher (lower) probability of obtaining a line of credit compared to non-family firms? Do family firms draw more (less) funds from a line-of-credit facility compared to non-family firms? To answer the study questions, this article builds on the literature on firm liquidity choices and the determinants of lines of credit. This study examines the impact of two sets of variables on the probability of obtaining a line-of-credit facility and the usage of that facility. The first set is concerned with firm characteristics that are associated with agency costs, namely firm identity. The second set deals with firm characteristics associated with high costs of external financing due to transaction and information costs. These variables include firm cash flows, volatility, growth opportunities, firm size and age, and asset tangibility (Berrospide et al. 2012; Duran 2017; Jiménez et al. 2009; Lee 2022; Mollagholamali and Rao 2022).

The findings of this study contribute to the extant literature in several ways. They contribute to the research that examines the determinants of lines of credit (Duran 2017; Jiménez et al. 2009; Lee 2022) by investigating the impact of family-controlled firms on the probability of obtaining a line of credit and drawing funds from the credit facility. To the best of the authors' knowledge, this is the first study to examine this issue. In addition, the results regarding firm identity documented in this article expand our understanding of the influence of agency motives on firm liquidity choices (Dittmar et al. 2003; Mollagholamali and Rao 2022; Tayem et al. 2019). Furthermore, this study contributes to the literature on corporate liquidity, especially the literature on the role played by lines of credit in providing financial flexibility (Acharya et al. 2014; Campello et al. 2011; Guney et al. 2017; Lee 2022) by examining the determinants of lines of credit using an emerging market setting.

The rest of this article is organized as follows. The next section discusses the literature review and hypothesis development. Section 3 presents the research methodology including the model, estimation methods, sample, data source, and descriptive statistics. The results and their discussions are presented in Section 4 and Section 5, respectively, while Section 6 concludes this study.

2. Literature Review and Hypothesis Development

2.1. Determinants of Lines of Credit

In this section, we review the determinates of the access and use of lines of credit suggested by the relevant literature based on the transaction and precautionary motives for obtaining insured liquidity as predicted by the trade-off and financing hierarchy views. We also discuss the impact of covenant-based restrictions on these determinants.

2.1.1. Cash Holdings

Cash holdings can provide valuable financial flexibility to the firm due to the transaction and information costs associated with external financing (Demiroglu and James 2011; Denis 2011; Opler et al. 1999). On the other hand, lines of credit are financial products designed to provide liquidity insurance to help the firm to invest in valuable projects (Holmström and Tirole 1998; Sufi 2009). Therefore, cash holdings and lines of credit provide liquidity to the firm in case of sudden liquidity shortages, hence substituting each other. However, it is important to note that lines of credit and cash are not perfect substitutes which attenuates the negative impact of cash on the access and use of lines of credit. For example, lines of credit are renegotiated or ceased precisely when firms face liquidity shocks because these shocks are likely to cause a breach of the covenants of the line-of-credit agreement (Acharya et al. 2020; Duran 2017; Sufi 2009). The evidence shows that cash is negatively related to the probability of obtaining a line-of-credit facility and the drawn amount from the facility (Berrospide et al. 2012; Lee 2022). Hence, this study predicts that cash holdings are negatively associated with the presence and usage of lines of credit.

2.1.2. Cash Flows and Their Volatility

In his seminal work, Sufi (2009) shows that cash flows are expected to be positively related to the probability of obtaining a line of credit. Banks are concerned with firms' ability to generate cash flows which increases the likelihood of repaying their financial obligations; hence, banks attach performance-based covenants to line-of-credit agreements (Acharya et al. 2020; Duran 2017; Sufi 2009). The breach of these covenants can lead to the termination of the agreement, causing a positive association between firm performance and the likelihood of obtaining a line of credit (Mollagholamali and Rao 2022; Sufi 2009). However, in terms of credit facility usage, the expected relationship is negative because firms with abundant cash flows can use their funds to finance their liquidity needs instead of drawing down their line-of-credit facilities (Berrospide et al. 2012).

In terms of the volatility of cash flows, firms with volatile cash flows face larger costs of external financing because they are subject to a frequent number of states with sudden losses (Bates et al. 2009). Thus, firms with more volatile cash flows are expected to keep large liquidity reserves to reduce the costs of sudden liquidity shortages (Bates et al. 2018; Goodell et al. 2021); hence, they are less likely to obtain lines of credit. The evidence reported in Mollagholamali and Rao (2022) supports this argument and documents a negative relationship between lines of credit and volatility.

2.1.3. Growth Opportunities

Adverse selection costs make information-sensitive securities expensive, and hence firms prefer internal financing over information-sensitive external financing in the presence of information asymmetries (Myers and Majluf 1984). Because firms with large growth opportunities are subject to greater information asymmetry which can result in a premium for external financing, a firm with a large set of growth opportunities has incentives to

fund their liquidity needs from liquid assets, not lines of credit (Sufi 2009). The empirical evidence shows that growth opportunities are negatively related to obtaining lines of credit and to their usage (Duran 2017; Lee 2022; Mollagholamali and Rao 2022). Therefore, this study expects a negative relation between growth opportunities and lines of credit.

2.1.4. Firm Size and Age

Small firms are likely to be financially constrained because they are subject to greater information asymmetry compared to large firms; hence, small firms can find it difficult to have access to lines of credit (Sufi 2009). In addition, lines of credit are associated with issuing costs; hence, small firms can avoid these costs by accumulating liquid assets instead of obtaining lines of credit. The empirical evidence reports a positive impact of firm size on obtaining lines of credit and their usage (Lee 2022; Mollagholamali and Rao 2022). However, small firms have incentives to build lending relationships, and given that lines of credit allow firms and banks to develop these relationships (Berger and Udell 1995; Zhao 2021), small firms can have frequent access to and usage of lines of credit.

In addition, a firm's age is a proxy of information asymmetry as it measures how much the market knows about the firm because old firms are expected to be more known to the market in comparison to small firms (Tayem et al. 2019). The empirical evidence reports a positive impact of firm age on obtaining lines of credit (Mollagholamali and Rao 2022) but a negative impact of the age of the firm on drawing from the facility as a proportion of the size of that facility (Jiménez et al. 2009).

2.1.5. Asset Tangibility

Banks in developed countries are concerned with the ability of firms to pay their debt from cash generated by their operations; hence, they focus on the design of performance-based covenants (Acharya et al. 2020; Sufi 2009). The empirical evidence reports a negative relationship between lines of credit and tangibility (Duran 2017; Mollagholamali and Rao 2022). However, Jordanian banks are focused on collateral and tangible assets as repayment methods (Tayem 2022a). Therefore, given the specific nature of the Jordanian market, the impact of tangibility on the probability of obtaining a line of credit and its usage is determined empirically.

2.2. Firm Identity: Family versus Non-Family Firms

There are two competing hypotheses regarding the impact of family-controlled firms on obtaining and using lines of credit. The first hypothesis predicts that family control has a negative impact on the probability of obtaining a line-of-credit facility and on drawing funds from that facility. The rationale behind this hypothesis originates from the agency framework. In the case of listed Jordanian family firms, and not different from the case of family firms in general, family owners are the controller of the firm as they are represented in the board of directors (BoD) and they form strong ties with other members of the board (based on family, mutual business ties, etc.). In addition, they usually assume the positions of the Chairman and the CEO, and in the case of the appointment of a professional manager, they have the power and discretion to dismiss the manager. Controlling family shareholders are likely to adopt firm policies and plans and invest firm resources that favor their family's interests at the expense of other shareholders (Chrisman et al. 2013) thus creating a conflict between family and non-family shareholders. Liquid assets allow great discretion to entrenched managers and controlling shareholders and allow them to avoid the scrutiny and discipline of capital markets (Jensen 1986). In addition, it is less costly to turn liquid assets into private benefits compared to other assets (Myers and Rajan 1998). Accordingly, family-controlled firms are likely to overinvest in liquid assets instead of obtaining insured liquidity in the form of lines of credit. In addition, line-of-credit agreements attach covenants that are continually monitored by banks periodically (Acharya et al. 2020; Duran 2017; Sufi 2009). For example, Acharya et al. (2014) provide a model that considers lines of credit as a form of monitored insurance that controls the behavior

of firms through bank monitoring. Consequently, family-controlled firms have incentives to avoid bank frequent monitoring to increase their family discretion over firm resources and avoid lines of credit to evade capital market discipline. Therefore, family firms are expected to be less likely to obtain lines of credit and to use the facility less extensively. The first hypothesis of this study is as follows:

H1a. *Family firms are less likely to have access to a line of credit, and they draw smaller amounts from their line-of-credit facilities, compared to non-family firms.*

However, the competing hypothesis predicts that family control has a positive impact on both the probability of obtaining a line-of-credit facility and on drawing funds from that facility. The rationale supporting this hypothesis relates to the type of economy and the role of the banking sector and its services, especially in terms of establishing lending relationships. Jordan is a bank-based economy where banks are the main providers of external finance, and the issuance of stocks and bonds is almost non-existent (Tayem 2022a). The empirical evidence shows that in bank-based economies, family businesses have good access to bank debt financing (Croci et al. 2011; Hernández-Cánovas and Martínez-Solano 2010; Thiele and Wendt 2017). Banks develop long-term lending relationships with family firms because of the continuity of ownership within the family and the resultant management stability (Dyer 1988; Magrelli et al. 2022). These long-lasting relationships allow banks to possess comprehensive and valuable information about the family businesses which enables those banks to enhance access to funds and lower the risk premium (Croci et al. 2011). The literature contends that lines of credit are important financial instruments that allow firms and banks to develop relationship lending, especially in the context of an emerging market (Berger and Udell 1995; Zhao 2021). Hence, the competing hypothesis predicts that family-controlled firms are more likely to obtain a line of credit and use it more extensively. H1b is formulated as follows:

H1b. *Family firms are more likely to have access to a line of credit, and they draw larger amounts from their line-of-credit facilities, compared to non-family firms.*

3. Research Methodology

3.1. Model Specifications and Variables

This study develops two models based on the literature and specifies them in Equations (1) and (2). Equation (1) examines the determinants of the probability of obtaining a line of credit (Mollagholamali and Rao 2022) and is specified as follows:

$$CreditLine_{it} = \alpha + \sum \beta_j X_{jit} + \lambda Family_{it} + \varepsilon_{it} \tag{1}$$

Equation (2) examines the determinants of the amount drawn of the line of credit (Berrospide et al. 2012; Lee 2022) and is specified as follows:

$$Drawn_{it} = \alpha + \sum \beta_j X_{jit} + \lambda Family_{it} + \varepsilon_{it} \tag{2}$$

CreditLine is an indicator variable that takes the value of one if a firm has a line of credit and zero otherwise (Berrospide et al. 2012; Mollagholamali and Rao 2022). *Drawn* is defined as the ratio of the end-of-year balance of the drawn amount used of the line of credit divided by total assets (Lee 2022). It is worth noting that this study could not construct ratios based on the size of the line-of-credit facilities because firms do not consistently disclose the size of these facilities. Although this data limitation affects the capture of the contingent nature of these facilities in full, it does not affect the interpretation of our results regarding the firm's use of lines of credit, a point that is discussed in Section 6. *Family* is an indicator variable that takes the value of one if the firm is ultimately controlled by a family or an individual and zero otherwise (Claessens et al. 2000; La Porta et al. 1999). The identification of family-controlled firms follows Tayem (2022b) which considers the direct ownership and indirect ownership (through pyramids and crossholdings) of all owners above the 1% threshold. A

firm is considered a family-controlled firm if the ultimate owner with the largest direct and indirect ownership is an individual or a family. Although not specified in Equations (1) and (2), the model also controls for other firm identities including state-controlled firms (*State*), and foreign-controlled firms of non-Arab origins (*ForeignNonArab*). X_j is a vector of control variables identified in the literature as determinants of access to a line of credit (Berrospide et al. 2012; Mollagholamali and Rao 2022) and the usage of line-of-credit facilities (Duran 2017; Jiménez et al. 2009; Lee 2022). The control variables include firm cash balances (*Cash*), firm cash flows (*CashFlow*), cash flow volatility (*Volatility*), growth opportunities (*MTB*), firm size (*Size*), firm age (*Age*), and asset tangibility (*Tangibility*). *Cash* is defined as total cash holdings divided by total assets (Berrospide et al. 2012; Lee 2022). *CashFlow* is defined as earnings before interest, taxes, and depreciation divided by total assets (Berrospide et al. 2012; Mollagholamali and Rao 2022). *Volatility* is defined as the standard deviation of cash flows over the past four years (Mollagholamali and Rao 2022; Sufi 2009). Growth opportunities are measured by the market-to-book value ratio (*MTB*) which is defined as the market value of equity plus the book value of assets minus the book value of equity divided by total assets (Lee 2022; Mollagholamali and Rao 2022). Firm size (*Size*) is defined as the natural logarithm of total assets (Berrospide et al. 2012; Lee 2022; Mollagholamali and Rao 2022), and firm Age (*Age*) is defined as the natural logarithm of one plus the number of years since the firm's inception (Jiménez et al. 2009; Mollagholamali and Rao 2022). The operational definitions of the variables and their expected signs are summarized in Table 1.

Table 1. Summary of variable definitions.

Variable	Proxy	Predicted Sign
Family-controlled firm (*Family*)	An indicator variable that takes the value of one if the firm is ultimately controlled by a family or an individual and zero otherwise.	CreditLine and Drawn: + (Agency) − (Relationship lending)
Cash flows (*CashFlow*)	Earnings before interest, tax, and depreciation divided by total assets.	CreditLine:+ (Covenant-based) Drawn: − (Financing hierarchy)
Cash flow volatility (*Volatility*)	The standard deviation of cash flows over a four-year period.	CreditLine and Drawn: − (Financing hierarchy)
Growth opportunities (*MTB*)	The market-to-book value ratio (MTB) and is defined as the market value of equity plus the book value of assets minus the book value of equity divided by total assets.	CreditLine and Drawn: − (Financing hierarchy)
Firm size (*Size*)	The natural logarithm of total assets.	CreditLine and Drawn: + (Financing hierarchy) − (Relationship lending)
Firm age (*Age*)	The natural logarithm of one plus the number of years since the firm's inception.	CreditLine and Drawn: + (Information asymmetry)
Asset tangibility (*Tangibility*)	The ratio of fixed assets divided by total assets.	CreditLine and Drawn: +/− (Covenant-based)

Table 1 summarizes variable operational definitions and their expected sign.

3.2. Estimation Methods

The main challenge in estimating Equations (1) and (2) is accounting for the selection bias that can be caused by the non-random selection of family control. If the selection bias is not corrected, this will lead to inconsistent and biased coefficients. Equation (1) is a binary outcome variable with an endogenous binary regressor variable, i.e., the *Family* variable; hence, estimating Equation (1) applying probit can result in biased and inconsistent coefficients. Therefore, this study applies a seemingly unrelated bivariate probit estimation which is used when two equations are to be estimated and the dependent variable of one of them is an explanatory variable in the other (Greene 2012). To estimate Equation (2), this study applies a treatment effect estimation, which is a Heckman-type model. In the treatment effect procedure, the selection bias is modeled by estimating the probability of the treatment, i.e., the probability a firm will be family-controlled. Based on the probit

results, the inverse Mill's ratios are calculated and included in the second step estimations as an additional independent variable that controls for the unobserved selection bias of the family control choice (Guo and Fraser 2014).

3.3. Sample and Data

The sample consists of industrial Jordanian companies publicly traded on the Amman Stock Exchange (ASE) over the period 2013–2020. The data on lines of credit are collected from the annual reports of the sample firms. The notes to the financial statements disclose the drawn amount of the lines of credit, but they do not disclose the size of the facility consistently; hence, it is not possible to compute measures based on the total size of the facility or the drawn amount. This study identifies the firm's ultimate owner based on data gathered from the Securities Depository Centre (SDC) which reports the names, nationalities, and ownership of shareholders with a percentage ownership of 1% and above (Tayem 2022b). If the SDC reports ownership of a private company or a foreign company, the ownership of that company is traced from the registry of the Company Controller (which is a department of the Ministry of Manufacturing and Commerce) and in case it is a foreign owner or by conducting a web search (Tayem 2022b). Notably, the sample firm does not include firms that are widely held or that are controlled by widely held corporations or widely held financial institutions. The financial data are collected from the ASE's Company Guides, which compile financial data items obtained from the financial statements of firms listed in the ASE and are published by the ASE each year. The final sample consists of 377 observations representing 54 industrial firms. Table 2 presents descriptive statistics of the key variables of this study.

Table 2. Summary statistics.

	Mean	**Median**	**SD**	**Min**	**Max**
CreditLine	0.544	1	0.499	0	1
Drawn	0.052	0.003	0.085	0	0.586
Family	0.623	1	0.485	0	1
Cash	0.070	0.022	0.124	0	0.810
CashFlow	0.041	0.051	0.114	−0.852	0.435
Volatility	0.055	0.034	0.085	0.001	0.878
MTB	1.143	0.947	0.783	0.207	6.212
Size	16.829	16.666	1.429	12.677	20.915
Age	3.328	3.296	0.555	1.609	4.22
Tangibility	0.305	0.289	0.189	0	0.821

Table 2 reports descriptive statistics for a sample of industrial Jordanian firms listed in the ASE over the period 2013–2020. The variables under investigation are *CreditLine*, which is an indicator variable that takes the value of one if a firm has a line of credit and zero otherwise, and *Drawn*, defined as the ratio of the end-of-year balance of the drawn amount used of the line of credit divided by total assets. Variables are defined in Table 1.

As Table 2 shows, more than half of the sample firms have access to a line-of-credit facility. The average drawn amount of the facility to total assets for the sample firms and for firms with lines of credit is 5.2% and 9.6% (not reported). The figures also indicate that some firms draw extensive amounts from their facilities; for example, the maximum value of the drawn amount reaches 58.6% of total assets. Family-controlled firms represent 62.3% of the sample firms while state-controlled, foreign Arab, and foreign non-Arab firms represent 24.4%, 6.9%, and 6.4%, respectively (not reported). The distribution of ownership identity is consistent with the evidence reported by Tayem (2022b). Other reported sample statistics are comparable to the ones reported in the literature utilizing the Jordanian case (Afifa et al. 2021; Tayem et al. 2019). Table 3 reports the test results of the difference in means.

Table 3. Firm characteristics by access to a line of credit and by family control.

	Without a Line of Credit	**With a Line of Credit**	**Difference**	*t*-**Test**
Family	0.657	0.595	0.062	1.234
Cash	0.106	0.039	0.067 ***	5.386
Cash Flow	0.047	0.036	0.011	0.958
Volatility	0.051	0.058	−0.007	−0.76
MTB	1.153	1.135	0.018	0.217
Size	16.579	17.038	−0.460 ***	−3.148
Age	3.326	3.33	−0.004	−0.074
Tangibility	0.298	0.311	−0.013	−0.683
Observations	172	205		
	Non-Family	**Family**		
CreditLine	0.585	0.519	0.065	1.234
Drawn	0.055	0.051	0.003	0.376
Cash	0.049	0.083	−0.034 ***	−2.585
Cash Flow	0.043	0.039	0.004	0.339
Volatility	0.048	0.059	−0.011	−1.265
MTB	1.009	1.225	−0.216 ***	−2.617
Size	17.54	16.399	1.142 ***	8.146
Age	3.36	3.309	0.052	0.873
Tangibility	0.296	0.31	−0.015	−0.728
Observations	142	235		

Table 3 reports the means of the study variables for firms with and without lines of credit and the results of the *t*-test equality of means in the first panel and the means of the study variables for family and non-family firms and the results of the *t*-test equality of means in the second panel. The variables under investigation are *CreditLine*, which is an indicator variable that takes the value of one if a firm has a line of credit and zero otherwise, and *Drawn*, defined as the ratio of the end-of-year balance of the drawn amount used of the line of credit divided by total assets. Variables are defined in Table 1. *** indicate significance at the 1%.

The first panel in Table 3 reports the means of the study variables for firms with and without lines of credit and the results of the *t*-test equality of means. The results show that firms with lines of credit are significantly larger with smaller cash holdings. In addition, family firms constitute 65.7% of firms without lines of credit and only 59.5% of firms with lines of credit, but the difference is insignificant. The second panel in Table 3 reports the means of the study variables for family and non-family firms and the results of the *t*-test equality of means. The results show that family firms are significantly smaller with larger growth opportunities and larger cash balances. In addition, the results show that only 51.9% of family firms have access to a line-of-credit facility while 58.5% of non-family firms do not. Further, family-controlled firms draw an average of 5.1% of their facilities compared to 5.5% drawn by non-family firms. However, these differences are not statistically different. Table 4 presents the correlation coefficients between the variables of this study. Focusing on the correlation coefficients between *CreditLine* and *Drawn* and their expected determinants, most variables carry their expected signs.

Table 4. Correlation matrix.

	CreditLine	Drawn	Family	Cash	CashFlow	Volatility	MTB	Size	Age
Drawn	0.564								
	(0.00)								
Family	−0.064	−0.019							
	(0.218)	(0.707)							
Cash	−0.268	−0.219	0.132						
	(0.00)	(0.00)	(0.01)						
CashFlow	−0.049	−0.219	−0.018	0.192					
	(0.339)	(0.00)	(0.735)	(0.00)					
Volatility	0.039	0.161	0.065	−0.069	−0.374				
	(0.448)	(0.002)	(0.207)	(0.18)	(0.00)				
MTB	−0.011	0.019	0.134	0.192	−0.014	0.344			
	(0.829)	(0.709)	(0.009)	(0.00)	(0.782)	(0.00)			
Size	0.161	−0.006	−0.388	−0.081	0.305	−0.322	−0.146		
	(0.002)	(0.903)	(0.00)	(0.116)	(0.00)	(0.00)	(0.005)		
Age	0.004	−0.003	−0.045	−0.036	−0.015	0.056	−0.03	0.082	
	(0.941)	(0.957)	(0.383)	(0.482)	(0.775)	(0.275)	(0.568)	(0.114)	
Tangibility	0.035	0.103	0.038	−0.239	−0.186	−0.051	−0.044	0.003	−0.072
	(0.495)	(0.046)	(0.467)	(0.00)	(0.00)	(0.328)	(0.397)	(0.949)	(0.161)

Table 4 shows the correlation between the variables used in this study. The variables under investigation are *CreditLine*, which is an indicator variable that takes the value of one if a firm has a line of credit and zero otherwise, and *Drawn*, defined as the ratio of the end-of-year balance of the drawn amount used of the line of credit divided by total assets. Variables are defined in Table 1. *p*-values are in parentheses.

4. Results

Table 5 presents the main results containing estimates of Equation (1). Columns (1) and (2) present the estimation of the probability of having a line of credit by implementing a seemingly unrelated bivariate probit estimation. The Wald test of the exogeneity of the instrumented variables rejects the null hypothesis of no endogeneity which supports the use of a seemingly unrelated bivariate probit estimation. The specifications include time effects to control for macroeconomic conditions and industry effects to control for industry variations. Column (1) reports the estimation results of the impact of family firms against non-family firms. Column (2) reports the estimation results with two added variables, *State* and *ForeignNonArab*; hence, the results show the impact of family firms against foreign firms of Arab origins. Table 5 shows that the main variable of interest, *Family*, is negatively and significantly related to *CreditLine* at the 1% significance level in the two specifications. The reported results confirm H1a that family firms are less likely to obtain a line of credit compared to non-family firms.

Table 6 presents the estimation of Equation (2) that examines the determinants of the amount drawn from the credit facility implementing a treatment effect estimation. The Wald test rejects the null hypothesis of no endogeneity which supports the use of the treatment effect estimation. Year and industry effects are included as regressors in the full sample to control for macroeconomic conditions and industry variations, respectively. Similar to the specifications in Table 5, column (1) presents the estimation results with *Family*, while in column (2), the estimation adds the *State* and *ForeignNonArab* variables. Finally, columns (3) and (4) employ the same specification used in columns (1) and (2), respectively, but utilize the sub-sample of firms with lines of credit. Table 5 shows that the main variable of interest, *Family*, is negatively and significantly related to Drawn at the 1% significance level in all specifications. The results reported in Table 5 support H1a which proposes that family firms draw lower amounts from their line-of-credit facilities compared to non-family firms. Finally, it is worth noting that state-controlled firms, *State*, are positively and significantly related to the probability of obtaining a line of credit and to the drawn amount of the facility at the 5% level.

Table 5. The estimation results of the probability of accessing a line of credit.

	Model (1)	**Model (2)**
Family	−1.013 ***	−0.959 ***
	(−4.04)	(−3.34)
State	−	0.741 **
	−	(2.34)
ForeignNonArab	−	−0.259
	−	(−0.72)
Cash	−3.237 ***	−3.371 ***
	(−3.31)	(−3.02)
CashFlow	0.506	0.332
	(0.74)	(0.50)
Volatility	0.359	0.138
	(0.40)	(0.15)
MTB	0.094	0.066
	(0.89)	(0.61)
Size	−0.0001	−0.011
	(−0.00)	(−0.14)
Age	0.008 *	0.008 *
	(1.75)	(1.87)
Tangibility	0.413	0.451
	(1.01)	(1.12)
Observations	377	377
Groups	54	54
Wald Test	14.282 ***	8.838 ***

Table 5 reports the estimation results of the probability of having a line of credit, a binary outcome variable that takes the value one if the firm has a line of credit and zero otherwise, implementing a seemingly unrelated bivariate probit estimation. The sample consists of industrial Jordanian firms listed in the ASE over the period 2013–2020. Variables are defined in Table 1. z-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively.

In terms of the other determinants of the probability of having access to a line of credit, the results reported in Table 5 show that *Cash* is significantly and negatively related to *CreditLine* at the 1% level. This result indicates that the larger the cash holdings, the less likely the firm is to obtain a line of credit, and it is consistent with the view that cash holdings and lines of credit are partial substitutes as they provide the liquidity required to support financial flexibility (Sufi 2009). Firms with cash balances are less likely to obtain lines of credit for precautionary reasons as they can take advantage of their liquid assets to sustain their liquidity needs. This result is also consistent with the evidence documented by Berrospide et al. (2012) which reports that firms with large cash holdings are less likely to have a credit line. In addition, the results indicate that firm age, *Age*, is significantly and negatively related to the probability of having a line of credit at the 10% level. This result is consistent with the view that firms subject to information asymmetry are less likely to obtain lines of credit. However, other variables are not significantly related to the probability of access to a line of credit, which is discussed in the next section.

The results regarding the determinants of the drawn amount of the credit facility show that in the full sample, *Cash* is significantly negatively related to *Drawn*. However, the evidence weakens when the analysis conditions the estimation of firms having a line of credit. The results show that *Cash* is significantly related to *CreditLine* but at the 10% level as reported in column (3) but insignificantly related to *CreditLine* as reported in column (4). This finding lends partial support to the argument that firms with large cash balances significantly draw lower amounts from their line-of-credit facilities. This evidence suggests that firms view cash holdings and lines of credit as substitutes, however, the substitution between the two sources of liquidity diminishes when firms have ready access to a line-of-credit facility. This result is consistent with the evidence reported by Lee (2022), which reports a significant negative relationship between firm cash holdings and the drawn funds of a line-of-credit facility. Further, the results show that *CashFlow* is significantly

negatively related to *Drawn* in all models. Firms with large cash flows significantly draw lower amounts from their lines of credit. This suggests that firms with abundant cash flows can use their own funds to finance their needs instead of using their line-of-credit facilities. This result is consistent with the empirical evidence in Duran (2017) and Lee (2022). In addition, the results show that *Size* is significantly negatively related to *Drawn*, except in model (1), indicating that small firms draw lower amounts of their lines of credit. This finding suggests that small firms have incentives to build lending relationships through extensive use of lines of credit. Finally, the results indicate that *Tangibility* is significantly and positively related to *CreditLine* and suggests that tangible assets are considered in the design of lines of credit agreements.

Table 6. The estimation results of the usage of a line of credit.

	All Sample Firms		Firms with a Line of Credit	
Family	−0.067 ***	−0.048 ***	−0.137 ***	−0.157 ***
	(−3.91)	(−2.58)	(−4.47)	(−4.73)
State	−	0.053 **	−	−0.017
	−	(2.53)	−	(−0.60)
ForeignNonArab	−	0.030	−	−0.035
	−	(1.28)	−	(−1.26)
Cash	−0.086 ***	−0.097 **	−0.205 *	−0.188
	(−2.23)	(−2.53)	(−1.77)	(−1.59)
CashFlow	−0.071 *	−0.079 *	−0.206 ***	−0.189 **
	(−1.65)	(−1.85)	(−2.67)	(−2.32)
Volatility	0.043	0.011	0.015	0.021
	(0.71)	(0.17)	(0.18)	(0.24)
MTB	0.012 *	0.013 *	−0.008	−0.006
	(1.65)	(1.72)	(−0.62)	(−0.44)
Size	−0.006	−0.008 *	−0.021 ***	−0.019 ***
	(−1.30)	(−1.66)	(−2.92)	(−2.69)
Age	0.006	0.001	−0.0004	0.005
	(0.65)	(0.12)	(−0.03)	(0.32)
Tangibility	0.025	0.016	0.080 *	0.086 **
	(0.86)	(0.56)	(1.93)	(2.03)
Observations	377	377	205	205
Groups	54	54	41	41
Wald Test	46.38 ***	46.74 ***	17.09 ***	19.78 ***

Table 6 reports the estimation results of the usage of a line of credit, *Drawn*, defined as the end-of-year amount of drawdowns divided by total assets, implementing the treatment effect estimation. The sample consists of industrial Jordanian firms listed in the ASE over the period 2013–2020. Variables are defined in Table 1. *z*-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively.

Finally, as a robustness test, this study controls the impact of various governance indicators. Starting from 2017, the ASE required listed Jordanian firms to disclose detailed information on their governance practices such as the independence of board members and the audit committee members. This study takes advantage of these disclosures and tests the robustness of its results to the inclusion of the following governance indicators: the size of the board (*Board*), the size of the audit committee (*Audit*), the ratio of the number of independent board members to the total number of board members (*IndependentBoard*), the ratio of the number of independent audit committee members to the total number of the audit committee members (*IndependentAudit*), and whether a firm's financial statements are audited by a Big Four auditing firm (*BigFour*). All sample firms disclose that there is no duality of the CEO and Chairman positions after 2017. Table 7 reports findings and show that the main results concerning the impact of family firms support H1a that family firms are less likely to obtain a line-of-credit facility and they draw less amount from the facility than non-family firms.

Table 7. The estimation results with governance indicators.

	CreditLine	Drawn
Family	−1.130 ***	−0.126 ***
	(−4.81)	(−4.88)
Board	0.115	0.010 **
	(1.55)	(2.28)
Audit	0.163	−0.009
	(0.86)	(−0.68)
IndependentBoard	0.588	0.132 ***
	(1.17)	(3.17)
IndependentAudit	−1.199 **	−0.072 **
	(−2.55)	(−2.31)
BigFour	−0.078	−0.011
	(−0.27)	(−0.58)
Cash	−5.859 ***	−0.090
	(−3.02)	(−1.08)
CashFlow	−1.443	−0.196 **
	(−0.95)	(−2.29)
Volatility	−6.297 *	−0.268
	(−1.77)	(−1.41)
MTB	1.042 ***	0.030
	(2.68)	(1.31)
Size	−0.077	−0.018 **
	(−0.70)	(−2.24)
Age	0.001	0.020
	(0.08)	(1.07)
Tangibility	−1.457 *	0.043
	(−1.96)	(0.79)
Observations	144	144
Groups	36	36
Wald Test	9.04 ***	11.52 ***

Table 7 reports the estimation results of Equations (1) and (2) with governance indicators implementing the seemingly unrelated bivariate probit estimation and the treatment effect estimation, respectively. The sample consists of industrial Jordanian firms listed in the ASE over the period 2017–2020. Variables are defined in Table 1. z-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively.

5. Discussion of the Results

The main two findings of this study show that, compared to non-family firms, family firms are (i) less likely to obtain a line-of-credit facility, and (ii) they draw a lower amount from the facility. The theoretical underpinning of these findings is rooted in the agency framework. Previous studies on liquidity identify the agency motives for maintaining liquidity; however, the focus of those studies is on cash holdings, especially in an international setting (Dittmar et al. 2003; Seifert and Gonenc 2018). This literature proposes that cash holdings are a source of agency conflicts between managers and shareholders as cash provides ample discretion to managers and allows them to avoid capital market monitoring (Jensen 1986).

Lines of credit, on the other hand, provide financial flexibility similar to cash holdings but can be more efficient in providing liquidity safeguards compared to cash holdings (Mollagholamali and Rao 2022). One important source of this efficiency which is relevant to this study is that lines of credit mitigate agency costs associated with holding cash. Lines of credit impose restrictions on firm behavior through covenants, whether performance- or asset-based, and frequent monitoring (Acharya et al. 2014). Lines of credit are continually monitored by banks and the breach of their attached covenants triggers technical default which can lead to the renegotiation of the agreement (Acharya et al. 2020; Duran 2017; Sufi 2009). Consequently, agency motives are likely to influence the choice of and demand for lines of credit.

For example, family-controlled firms prefer more discretion over the firm resources to enable them to pursue their family interests (Chrisman et al. 2013); hence, they are

likely to avoid lines of credit, their attached covenants, and subsequent monitoring. The incentive of Jordanian firms to increase discretion over firm resources and avoid bank monitoring is not surprising given that the controlling family holds large ownership stakes (Alkhataybeh et al. 2022) and actively participates in the management of the firm (Tayem et al. 2019). In addition, Jordanian firms operate in an economy with low investor protection, and hence there is a large scope for controlling shareholders to derive substantial private benefits of control at the expense of other investors (Tayem et al. 2019). The empirical evidence utilizing the context of Jordan shows that there is a significant positive association between large shareholders and cash balances for cash-rich firms (Tayem et al. 2019). The findings of this study complement this evidence.

In terms of other results, the findings show that firms with large cash balances choose not to obtain a line of credit which suggests that firms with sufficient internal funds are not likely to have a line of credit. This finding implies a cost wedge between the internal and external sources of liquidity (Berrospide et al. 2012). However, other variables are not significantly related to the probability of obtaining a line of credit except for the firm age which is positively related to the probability of obtaining a line of credit. One possible explanation is that the sample firms are all traded companies. These companies have steady performance and are large with a sizeable base of tangible assets that can be used to repay the outstanding balances in case of default. Hence, the sample firms have realized the threshold in terms of performance and assets required to obtain a line of credit. Thus, the decision to obtain a line of credit rests mainly on firm identity and the availability of cash. However, in terms of the usage of credit lines, the findings are more informative. The findings show that smaller firms draw fewer funds from their line-of-credit facilities. This suggests that, conditional on having a line of credit, small firms have incentives to draw more funds, a behavior consistent with having a lending relationship. In addition, firms with more cash on hand and higher cash flows drew lower amounts of funds from their credit lines. In other words, cash flows and cash holdings both lead to smaller drawdowns which is consistent with a substitution effect between internal and external liquidity sources (Berrospide et al. 2012).

Regarding policy implications, the findings of this paper have implications for the design of governance rules by the ASE. The reluctance of family-controlled firms to obtain and use lines of credit, coupled with the findings in Tayem et al. (2019) of a positive impact of ownership on cash holdings in cash-rich firms, calls for the need of rigorous corporate governance rules set by the ASE to resolve potential conflicts of interest arising from the deployment of cash holdings. Second, policymakers can find the findings of this article useful as understanding credit line behavior is important in assessing firm credit constraints and thereby the reasons for missed investment opportunities.

Finally, it is useful to discuss some caveats to the analysis. First, the negative impact of family control over the access and usage of lines of credit does not rule out that those family-control firms pursue lending relationships given the evidence on the positive relationship between family businesses and bank financing (Croci et al. 2011; Hernández-Cánovas and Martínez-Solano 2010; Thiele and Wendt 2017). In other words, the evidence presented in this paper is best interpreted as one motive (the agency) dominating another motive (the lending relationship) rather than dismissing the existence of a lending relationship motive. Second, this article only studies publicly traded firms, which are larger and less financially constrained than privately held firms. Hence, the findings may overstate credit availability and underestimate the influence of the precautionary and transaction motives of obtaining and using lines of credit.

Third, due to data limitation, this study could not construct ratios based on the size of the facility of the line of credit and hence did not fully capture the contingent nature of these facilities. However, this does not affect the interpretation of the results regarding the firm's use of lines of credit. This is because, according to multiple interviews conducted with personnel from Jordanian banks and the Central Bank of Jordan, Jordanian banks' policy is to provide a facility size proportionate to the firm's asset size; hence, the variation

in the drawdowns relative to the size of the facility across firms is expected to be similar to the variation in the drawdowns relative to their total assets. Nonetheless, this caveat has implications regarding the disclosure of data as policymakers could mandate stringent disclosure rules that will enhance the quality of data available to investors and researchers. Finally, Jordan is a dual-banking system where conventional and Islamic banks offer various liquidity insurance products; however, future research could focus on the experiences of countries that explicitly follow Sharia Law and their impact on the firm incentives to obtain liquidity insurance products.

6. Conclusions

External financing is associated with costs arising from agency, transaction, and information problems; hence, liquidity can provide valuable financial flexibility to the firm. Nonetheless, most studies examine cash holdings with little attention paid to lines of credit, especially in the context of emerging markets. This is puzzling given that line-of-credit facilities are popular financial instruments among firms. This is because of their contingent feature as they provide liquidity in exchange for a fee, hence creating a source of insured liquidity. In addition, lines of credit are important instruments that facilitate the creation of relationship lending. Therefore, this study addresses this gap by examining the determinants of access to and the usage of line-of-credit facilities in the context of a bank-based emerging market. In addition, this study examines the impact of firm identity on the probability of obtaining a line-of-credit facility and the drawdowns from that facility. The main findings of this study show that, compared to non-family firms, family firms are less likely to obtain a line-of-credit facility, and they draw a lower amount from the facility. These findings imply that agency motives influence firm demand for lines of credit and their usage. In addition, the findings show that cash and cash flows are negatively related to obtaining and using lines of credit. These findings are consistent with a substitution effect between internal and external liquidity sources which implies a cost wedge between the two sources of liquidity. Further, the negative association between firm size and using lines of credit suggests that small firms maintain their lending relationships using drawdowns.

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