

## Foreign Direct Investment and Financial Constraints: Firm-Level Evidence from Cambodia, Lao PDR, and Myanmar

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**Abstract** Financial constraints have been a significant obstacle to firms operating in developing countries. Prior studies show that foreign direct investment (FDI) helps to ease credit constraints for domestic firms. However, they only account for horizontal FDI spillovers. This paper therefore investigates both horizontal and vertical FDI spillovers using firm-level data from Cambodia, Lao PDR, and Myanmar (CLM). The key findings of this paper are threefold. First, FDI inflows lessen the financial constraints faced by local firms through partnership or joint venture. Second, an increasing share of FDI in horizontally and vertically related industries raises higher credit constraints for domestic firms. Third, the crowding-out effect of FDI is not uniform across domestic firms of different sizes. Therefore, policymakers should be aware of these possible negative spillovers and formulate policy to maintain FDI inflows while also ensuring the growth and survival of domestic firms.

**Keywords:** Financial Constraints, Foreign Direct Investment, Horizontal and Vertical Spillovers, Developing Countries, Ordered Probit Model

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### I. Introduction

Previous studies demonstrate the potential role of financial inclusion in the development of a nation (Demirguc-Kunt et al., 2017; Karlan et al., 2016). However, financial inclusion—the extent to which households and firms have access to formal financial services—has been a main concern of policymakers in developing countries including Cambodia, Lao PDR, and Myanmar (CLM). National efforts to facilitate financial access must be made progressively by these countries to boost economic growth and achieve greater regional economic integration (CARD MRI & UNCDF, 2017).<sup>1</sup> According to Loo (2019), the CLM countries ranked the lowest in terms of financial access among Association of Southeast Asian Nations (ASEAN) members in 2017. Based on the latest firm-survey data from the World Bank Enterprise Surveys (WBES), among 15 business environment obstacles, access to finance was cited as a primary

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obstacle by about 20% of the firms in the CLM countries.<sup>2)</sup> A lack of financial access tragically harms firms in the local market, especially the less sufficient ones, for they rely more heavily on external financing to improve their productivity and support and expand their investment activities. As such, financial constraints are a critical barrier for firms' survival, growth, and capability to internationalize.

With regard to the aforementioned financial constraints, foreign direct investment (FDI) is believed to play an essential role in helping domestic firms overcome this barrier. Also, some researchers, such as Asiedu (2002), Harrison and McMillan (2003), and Héricourt and Poncet (2009), suggest that FDI inflows ease local credit constraints as they can bring in scarce capital and improve domestic productivity. This belief prompts some policymakers in developing countries to pursue favorable policies to mitigate restrictions and provide incentives for inward FDI. The CLM countries, in particular, have extensively tried to attract FDI, as suggested by their policy stance (which includes providing tax incentives, duty-free imports, export tax exemptions, investment protection, and 100% foreign ownership).<sup>3)</sup> There is, however, a lack of empirical evidence to confirm whether FDI actually contributes to improving financial access for firms in the CLM countries.

Related empirical and theoretical research has pointed out possible horizontal (intra-industry) and vertical (inter-industry) spillovers from FDI to domestic credit. Some researchers have addressed the fact that positive horizontal spillovers on financial constraints can be observed through technological and capital transfers from FDI to local firms in the same industry, which can increase the productivity, profits, and creditworthiness of local firms (Héricourt & Poncet, 2009; B. Javorcik, 2012; B. S. Javorcik & Spatareanu, 2011; Manole & Spatareanu, 2014; Newman et al., 2015). However, other researchers have also found negative horizontal spillovers, in which FDI inflows generate substantial competitive pressure and financial distress for local firms (Bauerle Danzman, 2020). Increasing competition from foreign firms limits indigenous firms' borrowing capacity and reduces their profits, which ultimately tightens borrowing constraints and decreases capital investment (Wang, 2017). Furthermore, excessive foreign borrowing can crowd local firms out of the domestic capital market (Harrison & McMillan, 2003).

However, most recent empirical studies have focused mainly on horizontal spillovers, while studies on vertical spillovers are scarce and discussed only in the theoretical literature. The

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1) As enumerated in the ASEAN Economic Community (AEC) blueprint, promoting financial inclusion in each member state is a key policy objective for achieving greater regional economic convergence. Financial sector deepening in the region would significantly impact the financial systems of Cambodia, Lao PDR, Myanmar, and Viet Nam (CLMV) since their systems remain fragile and small.

2) Harrison and McMillan (2003) also reported, based on a survey of executives in 20 African countries, that financial constraints have been cited as a significant obstacle by firms in developing countries.

3) Those incentives are listed in the investment law of the CLM countries, which can be accessed using the following links: investment laws of Cambodia, Lao PDR, and Myanmar. By examining the FDI-GDP ratio, these three countries have exhibited improvement over the years, starting in 1985 (Selvarajan & Ab-Rahim, 2020).

theoretical literature has suggested possible vertical spillovers of FDI on the domestic financial constraints. For instance, Luo and Chen (2011) theoretically determined that local firms would have better credibility and potential for obtaining loans if they were connected to foreign-invested firms in upstream or downstream industries. However, engaging with foreign firms entails the likelihood that domestic firms will be involved in a costly upgrading process. In most cases, such intensive capital investment is supported by banks or financial institutions (Manole & Spatareanu, 2014). Moreover, vertical FDI spillovers should exist in the CLM countries, because local businesses are more likely to possess less efficient technology and low levels of internal capital. Thus, a study focusing on both horizontal and vertical spillovers on financial constraints is preferable.

Based on the empirical and theoretical literature mentioned above, the conclusions regarding those spillovers are mixed; they rely on the source of the data, the estimation methods, and the specific country context. To address the limitations of the previous literature and lack of empirical evidence on this issue in the CLM countries, this research performs a cross-sectional analysis to address the relationship between the FDI spillovers and access to finance in the CLM countries using firm-level data from the World Bank Enterprise Survey between 2016 and 2018. Specifically, this research aims to explore whether a foreign presence induces positive or negative horizontal and vertical spillovers on the financial access of domestic firms.

The results of this paper indicate that FDI inflows mitigate the financial constraints for local firms through partnership or joint venture. However, this study documents the negative impact or crowding-out effect on domestic credit constraints that arises from a higher proportion of FDI being present in both horizontal and vertical industries. Although the results for spillovers are not consistent with most previous studies, this research adds a new dimension to understanding the nature of FDI spillovers on domestic financial constraints. Further results show that FDI spillovers vary in terms of the size of domestic firms. For horizontal spillovers, medium-sized firms do not encounter greater financial constraints due to an increasing share of foreign firms and borrowing in the same industry, while small and large ones do. One plausible reason is that medium-sized firms are more financially stable. Regarding backward linkages, only small and medium-sized suppliers face more constraints when the share of FDI in downstream industries rises. It is because those small and medium-sized firms require significant capital investment to fulfill the high standard requirements of foreign firms. Therefore, policymakers in the CLM countries should formulate appropriate policies that attract additional foreign investment while simultaneously ensuring the sustainable growth and survival of domestic firms.

This paper makes three main contributions to the literature. First, this paper is the first to analyze the effect of vertical FDI spillovers on domestic financial constraints. Second, it provides evidence on how the size of a domestic firm might explain the effect of spillovers from foreign investment. Third, this study contributes to a growing body of literature on the relationship

between FDI presence and credit access, concentrating explicitly on CLM firms. Although analysis of the nexus between FDI and financial constraints has received ample attention from researchers, micro-econometric evidence remains scarce, and such micro-level research on firms in the CLM countries does not exist. These three countries, characterized by capital shortages and weak financial institutions, require more in-depth research to gain a better understanding of how FDI-related policies influence the survival and growth of domestic firms.

The remainder of the paper is structured as follows. Section II discusses the related literature on the nexus between FDI and financial constraints and formulates hypotheses. Section III demonstrates the empirical approach, while Section IV describes the data and variables used in the estimation. Section V presents the results. Section VI concludes the study and provides policy implications.

## II. Literature Review

The relationship between FDI and domestic firms' access to finance has been investigated and studied by many researchers. Prior studies by Arbeláez and Echavarría (2002), Harrison and McMillan (2003), and Mickiewicz et al. (2004) suggested that foreign-owned firms encounter less financial constraints than domestic firms in developing economies. Foreign firms tend to have superior knowledge and better technological capability compared to locally operating firms. They are more productive and competitive and are therefore considered more attractive to local banks and financial institutions. This fact holds even for countries in which financial constraints tend to be less severe than the CLM countries; as shown, for example, in a study on firms in the United Kingdom by Guariglia and Mateut (2010). However, Wagner and Weche Gelübcke (2015) discovered that foreign-owned firms encountered slightly more financing restrictions than local firms in Germany, but this contradictory result disappears when the unobservable heterogeneity is controlled.

The literature also mentions the significant benefits of being in a partnership or joint venture with a foreign entity, which can serve to improve local firms' financial situation. For instance, a study by Jung (2020) showed that a foreign presence increased the research and development (R&D) activities of domestic firms in South Korea by helping the domestic firm to construct an external partnership with a foreign alliance for the purpose of R&D activities. In addition, Gomes-Casseres et al. (2006) suggested that joint ventures act as a powerful means for knowledge transfer, and Un and Rodríguez (2018) similarly argued that being in a joint venture with a foreign firm allows the local firm to gain global knowledge directly from its foreign partner. These positive externalities in the context of a partnership or joint venture benefit domestic firms by increasing their overall performance and diminishing their financial barriers.

Regarding horizontal FDI spillover, Harrison and McMillan (2003) found that foreign-owned firms could be more attractive borrowers for local banks and that borrowing by those firms would increase the financial constraints faced by domestic firms in the Ivory Coast. This result signifies that incoming FDI can impose firm pressure on domestic businesses due to increased competition in the capital market. Edjigu and Sim (2019), however, established that FDI presence may ease local firms' financial restrictions using firm-survey data of 36 sub-Saharan African countries between 2006 and 2010. Utilizing the data of 38 countries from the Worldscope database, Harrison et al. (2004) showed an identical result in which FDI inflows reduced domestic financial constraints.

Similarly, Guariglia and Poncet (2008), who investigated the connection between financial distortion and growth, suggested that FDI helped to provide a financing source to domestic firms in China in the form of a joint venture, which could diminish the impediments of financial distortion on economic growth. Chen and Luo (2014) and Héricourt and Poncet (2009) proposed that the presence of FDI helped to reduce the financial barriers encountered by local firms in China by decreasing the information asymmetry between firms and financial institutions. Poncet et al. (2010) provided a similar conclusion for firms operating in China—that the geographical and sectoral presence of FDI eased the credit constraints particularly confronted by private Chinese firms. Interestingly, Rutkowski (2006) did not find evidence on the crowding-out effect of FDI. However, the author suggests that FDI helps reduce foreign subsidiaries' constraints without crowding out local firms.

In terms of vertical FDI spillover, studies have yet to provide the theoretical background regarding its effect on domestic firms' credit access. Luo and Chen (2011) theoretically suggested that firms having upstream or downstream relationships with foreign-invested companies should have better credibility. Therefore, providing loans to these clients is expected to improve the allocation efficiency of financial resources, and, ideally, this connection provides an incentive for banks in making loan decisions. However, previous studies have also demonstrated negative vertical spillover. Ayyagari and Kosova (2006) introduced *the demand creation effect* in their paper. This concept posits that an FDI presence can generate demand for local products and services, bring new or higher-quality inputs, and engender new business opportunities in the local market. This increasing demand stimulates new entries of both domestic and foreign firms. Thus, an FDI increment in upstream or downstream industries indirectly attracts new foreign entrants in vertically related industries, leading to growing competition for domestic firms in those industries.<sup>4)</sup>

This paper investigates the effects of both horizontal and vertical FDI spillovers on financial

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4) Ayyagari and Kosova (2006) added that while trying to prevent loss of proprietary technology to potential competitors within the same industry, foreign firms might promote new listings of suppliers and customers in vertically related industries. This behavior will increase competition for local firms.

constraints. FDI is expected to aggravate credit constraints for domestic firms in the CLM countries for two main reasons. First, given the weak financial systems in these countries, banks and financial institutions will adjust their lending behavior by according foreign firms a higher priority for financing. This behavior will limit access to external financing for domestic firms. Second, most domestic firms do not have sufficient capability to compete with and learn from foreign firms; thus, FDI inflows are more likely to produce adverse effects on local firms' credit constraints. It is also possible that the impact of FDI may differ based on firm size, an idea that has not yet been thoroughly investigated.<sup>5)</sup> According to the ambiguous results from previous literature, this paper aims at testing the following hypotheses:

*H1:* Foreign-owned firms are less financially constrained than local ones.

*H2:* FDI only eases the financial access of local firms through partnership or joint venture.

*H3:* Horizontal and vertical FDI aggravate the financial constraints faced by domestic firms.

*H4:* The negative spillovers of FDI vary depending on firm size.

### III. Methodology

#### A. Model specification

An *ordered probit model* is employed to investigate the effects of FDI on financial access of firms in the CLM countries, given that the latent variable representing firms' perception of access to finance is hierarchically ordered. The following equations present the latent variable of financial constraints ( $AF^*$ ), which is known as an unobserved financial constraint (additional details are described in the next section). Initially, this study starts by testing Hypotheses 1 and 2 using the following equation:

$$AF_{ijc}^* = \beta_0 + \alpha FOREIGN_{ic} + \delta X_{ic} + \mu_{jc} + \epsilon_{ijc} \quad (1)$$

where  $FOREIGN_{ic}$  is the main explanatory variable representing foreign firms. First, this paper utilizes a dummy variable of FDI,  $FDI_{ic}$ , which takes the value of 1 if the share of foreign equity in firm  $i$  is at least 10% or greater, to check Hypothesis 1.<sup>6)</sup> This variable explains whether foreign firms are less financially constrained than their domestic counterparts. Second, this paper introduces *Foreign Share*<sub>ic</sub>, which refers to the share of foreign equity in each firm, to confirm Hypothesis 2. This variable allows the coefficient of *Foreign Share*<sub>ic</sub> to vary based on the degree

5) Small and medium-sized firms are likely to have less access to financing (Beck & Demirguc-Kunt, 2006); thus, with additional pressure from incoming FDI, they would be more severely affected than large domestic firms.

6) According to the definition of "FDI," as defined by the International Monetary Fund (IMF) standard.

of foreign ownership, which captures the within-firm effect of FDI on domestic firms' financial constraints.  $X_{ic}$  is a set of firm-specific variables defined in Section IV, while  $\mu_{ic}$  represents a set of industry and country dummies.

Next, Hypothesis 3 is examined using the following equation:

$$AF_{ijc}^* = \beta_0 + \gamma SPILLOVERS_{jc} + \alpha FOREIGN_{ic} + \delta X_{ic} + \mu_{jc} + \epsilon_{ijc} \quad (2)$$

where  $FOREIGN_{ic}$  is the share of foreign equity in firm  $i$ , which is included to mitigate the within-firm effect of FDI.  $SPILLOVERS_{jc}$  is a vector of FDI spillover measures in industry  $j$  in country  $c$  to capture the crowding-out effects of FDI. The spillover effects are categorized into horizontal (intra-industry) and vertical (inter-industry) spillovers. Horizontal spillovers are then measured using three proxies—the share of foreign borrowing, the proportion of foreign firms, and the share of foreign sales. The proportion of foreign firms and share of foreign sales capture the demonstration effects of FDI on domestic firms' financial constraints. The share of foreign borrowing represents competition in the domestic capital market. Vertical spillovers are classified into *backward* and *forward linkages*. These two variables capture the competitive effects of FDI's presence on domestic firms in upstream and downstream industries.

The choice of horizontal spillover measures is inspired by the studies of Harrison and McMillan (2003) and Héricourt and Poncet (2009) in which they use foreign borrowing and foreign sales at the sectoral level to capture the crowding-out effects. Although it could be the case that the mere presence of foreign firms, regardless of industry, that matters to financing access, Harrison and McMillan (2003) suggest that banks frequently diversify based on sector to mitigate portfolio risk. Their argument relies on Chapter 10 of a book entitled, *Active Bank Risk Management: Enhancing Investment & Credit Portfolio Performance*, which explains that “diversification means avoiding concentration in a single company, industry group or geographic area” (Kramer, 1995, p. 98). This view infers that more foreign borrowing in a particular industry will affect the borrowing opportunities for domestic firms in that sector due to the concept of bank risk management. These rationales replicate the idea that spillover measures at the sectoral level demonstrate the crowding-out effects of FDI in this study.<sup>7)</sup>

This paper regresses each proxy for horizontal spillover separately, as shown in Columns (1)-(3) of Table 6. Then, the regressions of backward and forward linkages are estimated in

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7) As further pointed out by Harrison and McMillan (2003), increased competition could be correlated with the foreign share in domestic borrowing rather than their share in domestic sales, which leads to both lower investment and a decline in profits. In the case of the CLM countries, FDI may be concentrated in particular industries, which may increase the share of foreign borrowing in those industries. From the dataset, the garment industry has the highest number of foreign firms (almost 40% of FDI is concentrated in this industry), and the foreign share in the industry's borrowing (about 17% of all industrial financing) is also the highest compared to other sectors. From these figures, domestic firms in the garment industry are likely to face steep competition.

Column (4) of Table 6, yet only the proxy of horizontal spillovers, *the share of foreign sales*, is included in this regression. The reason is that this proxy is used to calculate vertical spillover variables (to be defined later).

For the last hypothesis, this study estimates the extent to which firm size is correlated with FDI spillovers on access to finance by adding the interaction terms between the spillover variables and firm size. The estimated model is defined by the following equation:

$$AF_{ijc}^* = \beta_0 + \theta SPILLOVERS_{jc} * Size_{ic} + \alpha FOREIGN_{ic} + \delta X_{ic} + \mu_{jc} + \epsilon_{ijc} \quad (3)$$

where  $Size_{ic}$  is a set of dummy variables denoting small, medium, and large firms.

This research utilizes the standard maximum likelihood estimation with heteroskedasticity-robust standard errors. Given the non-linear structure of the model, the coefficients of the explanatory variables do not represent their marginal effects on the outcome variable. They instead signify the causal relationships between those variables.

To ensure that the above models are correctly specified and the estimated coefficients are valid, this paper conducts two post-estimation tests, including the *Link Test* and the *Proportional Odds Assumption Test*.<sup>8)</sup> The results of the *Likelihood Ratio Chi2* and the *Link Test* confirm that the estimated models in this study were correctly specified. The *Proportional Odds Assumption Test* shows that the estimated coefficients do not violate the parallel assumption.

## B. Possible estimation issues

### 1. Omitted variables

Although this study included significant firm-specific variables in the model, omitted variables that affect foreign firms' investment decisions and the financial system in each country may still be a concern. This research expects the political and business environments to affect a firm's ability to obtain external financing; therefore, introducing additional control variables is required to capture those effects.<sup>9)</sup> By adding those variables, the unobservable heterogeneity can also be controlled, in addition to industry and country dummies. The details on the additional controls are described in Section IV.

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8) The *Link test* is used to check the model fit based on the linear predicted value squared, while the *Proportional Odds Assumption Test* checks whether the relationship between each pair of outcome groups is the same (Cameron & Trivedi, 2009). A non-significant result is expected from both tests.

9) As mentioned by Claessens and Tzioumis (2006), the factors affecting firms' ability to obtain external financing are related not only to their characteristics, but also to the constraints posed by the country's degree of financial development as well as its political and institutional environment.

## 2. Multicollinearity

Prior to the ordered probit model estimation, correlation analysis and a variance inflation factor (VIF) test were conducted to detect the threat of multicollinearity in the model. Table A1 shows that the correlation among variables in each model does not signal any concern for each estimation. The correlation value between *Foreign Share* and *FDI* is relatively high at 0.963; the correlation value between *Foreign Sales Share* and *Foreign Firm Proportion* is 0.624. However, these variables will be estimated separately, and the correlation values of other variables are relatively low, which enables this study to conduct the analyses without worrying about the collinearity issue. The highest VIF scores for all of the regressions are below 3, except for the scores of two variables (7.69 and 9.61 for medium and large firm dummies, respectively) in the regression in Column (4) of Table 6. However, based on the rule of thumb, these values are still below 10. In addition, a high VIF score for some control variables should not affect the main results. Therefore, multicollinearity is not an issue for the analyses conducted in this paper.

## IV. Data

This empirical study relies on firm-level data from the World Bank Enterprise Surveys. In particular, it utilizes the data from a 2016 survey for Cambodia and Myanmar and a 2018 survey for Lao PDR. The primary benefit of using these surveys is that the World Bank employs the stratified random sampling method to select the representative sample firms, which reduces the selection bias of the analysis.<sup>10)</sup> This study does not consider micro-sized firms (i.e., firms with fewer than five employees). Therefore, the combined dataset consists of 1,246 small, medium, and large firms.

### A. Variables

#### 1. Access to finance

As indicated in a study by Beck et al. (2004), the literature on corporate finance has applied various methods for inferring whether firms are financially constrained, which are considered as indirect measures of financial constraint. Fazzari et al. (1987) inferred that firms with low dividends were financially constrained. However, Rajan and Zingales (1996) used the external financing patterns of United States (US) firms as a benchmark to determine the degree of constraint

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10) An explanation of this methodology can be found in Scheaffer et al. (2011). In addition, the reasons why a stratified random sampling method is preferable to a simple random sampling method are detailed in a study by Cochran (1977).

that firms faced. Demirgüç-Kunt and Maksimovic (1998) utilized a different method relying on a financial planning model, while Wang (2017) used investment-cash flow sensitivity to identify the constraints.

This paper uses a direct measure of financial constraint following the work of Beck et al. (2004).<sup>11)</sup> It is the perception-based assessment of financial constraint in which firms were asked to reply to a question: “To what degree is access to finance an obstacle to the current operations of this establishment?” Firms could respond either 0 (No obstacle), 1 (Minor obstacle), 2 (Moderate obstacle), 3 (Major obstacle), or 4 (Very severe obstacle).

## 2. Construction of FDI spillover variables

As previously mentioned, horizontal spillovers are measured using three proxies—the share of foreign borrowing, the proportion of foreign firms, and the share of foreign sales in industry  $j$  in country  $c$ . This paper constructs those proxies as defined in Equations 4, 5, and 6, respectively.

$$\text{Foreign Borrowing Share}_{jc} = \left( \frac{\sum_{i \in j} \text{Borrowing}_{ic} * \text{Foreign Share}_{ic}}{\sum_{i \in j} \text{Borrowing}_{ic}} \right) \quad (4)$$

where  $\text{Foreign Share}_{ic}$  is the share of foreign equity in firm  $i$ , while  $\text{Borrowing}_{ic}$  denotes the percentage of firm  $i$ 's working capital borrowed from banks and non-bank financial institutions in country  $c$ .

$$\text{Foreign Firm Proportion}_{jc} = \left( \frac{\sum_{i \in j} \text{FDI}_{ic}}{\text{Total Firms}_{jc}} \right) * 100 \quad (5)$$

where  $\text{FDI}_{ic}$  denotes a dummy variable for foreign firm  $i$  in country  $c$ .  $\text{Total Firms}_{jc}$  represents the total number of firms in industry  $j$  in country  $c$ . This variable is converted to a percentage by multiplying it by 100 to ensure that all horizontal measures are consistent.

$$\text{Foreign Sales Share}_{jc} = \left( \frac{\sum_{i \in j} \text{Sales}_{ic} * \text{FDI}_{ic}}{\sum_{i \in j} \text{Sales}_{ic}} \right) * 100 \quad (6)$$

where  $\text{Sales}_{ic}$  represents the last year's sales of firm  $i$  in country  $c$ . Initially, the sale values are reported in the local currency. Therefore, to make those values comparable across countries, they are converted into US dollars using the exchange rate from the World Bank's World

11) Although the use of self-reporting financial measures may lead to concerns that firms would respond differently in a different institutional and cultural environment, the survey nature of the data should not distort the results. Additional details are mentioned in Beck et al. (2004).

Development Indicators (WDI).

Following Arnold et al. (2007), Orlic et al. (2018), and Smarzynska Javorcik (2004), the backward and forward linkages used in this paper are calculated as follows.

$$\text{Backward Linkages}_{jc} = \sum_{j \neq k} \gamma_{jkc} * \text{Horizontal Spillovers}_{kc} \quad (7)$$

$$\text{Forward Linkages}_{jc} = \sum_{j \neq k} \delta_{jkc} * \text{Horizontal Spillovers}_{kc} \quad (8)$$

where  $\gamma_{jkc}$  is the share of industry  $j$ 's outputs supplied to industry  $k$ , while  $\delta_{jkc}$  is the percentage of industry  $j$ 's inputs purchased from industry  $k$  in country  $c$ . The technical coefficients,  $\gamma_{jkc}$  and  $\delta_{jkc}$ , are obtained from the input-output (I-O) tables of the Eora multi-regional input-output tables (Eora MRIO). Specifically, this study extracts the data from the 2015 I-O table for each country.<sup>12)</sup> They are the latest I-O tables for the CLM countries. *Horizontal Spillovers<sub>kc</sub>* refers to *Foreign Sales Share<sub>jc</sub>*, as defined in Equation 6.

### 3. Firm-specific variables

Prior firm-level studies typically have emphasized the importance of firm-level characteristics for firms' access to finance (Asiedu et al., 2013; Aterido et al., 2013; Beck & Demirguc-Kunt, 2006; Hansen & Rand, 2014; Leitner & Stehrer, 2013; Wagner & Weche Gelübcke, 2015). Based on those studies, this paper considers different variables that may affect firms' access to finance. Those firm-specific variables include firm age, size, export behavior, legal status, the experience of top management, financing status, product innovation, and technological capacity. This study also includes a new variable that may relate to firms' ability to obtain external funds, that is, *Land Ownership*. Owning land, either partly or wholly, may increase the chance of obtaining loan approval since land can be used as collateral. Detailed definitions of these variables are reported in Table 1.

### 4. Political and business variables

The CLM countries are least developed nations with weak legal institutions, a high level of corruption, and an unstable political and economic environment. These consequences negatively affect the domestic capital market and lending behavior. As Dai and Zhang (2019) mentioned, uncertainty is a crucial channel through which political factors influence financial markets. The uncertainty related to possible changes in government policy and the macro-environment may dramatically increase the risk perception of capital market participants (Pástor & Veronesi, 2013).

12) The 2015 input-output (I-O) tables contain the latest available data from the Eora MARIO.

**Table 1.** Definition and Descriptive Statistics

Variables	Definition	Obs.	Mean	Std. Dev.	Min	Max
<i>Dependent Variable</i>						
Access to Finance	Firm's perception of Access to Finance as an obstacle from 0 (no obstacle) to 4 (very severe obstacle)	1,209	1.10	1.19	0	4
<i>Main Explanatory Variables</i>						
FDI	Take unity if at least 10 percent of firm's equity owned by a foreign individual or company	1,246	0.07	0.25	0	1
Foreign Share	Share of foreign equity in a firm	1,245	6.01	22.90	0	100
Foreign Borrowing Share	Share of foreign borrowing in each industry	1,243	1.66	4.23	0	16.67
Foreign Firm Proportion	Share of foreign firms in each industry	1,246	6.90	10.14	0	42.00
Foreign Sales Share	Share of foreign sales in total industry sales	1,246	26.36	30.13	0	93.60
Backward Linkages	Spillovers of FDI on upstream industries	1,246	12.01	7.84	0.79	36.00
Forward Linkages	Spillovers of FDI on downstream industries	1,246	6.13	3.28	0.39	13.54
<i>Firm-specific Variables</i>						
Age	Years which a firm has been in operation	1,234	14.49	10.22	1	81
Medium Firm	Take unity if the firm has 20 - 99 employees	1,246	0.28	0.45	0	1
Large Firm	Take unity if the firm has over 99 employees	1,246	0.13	0.34	0	1
Exporter	Take unity if the firm exports its product(s)	1,245	0.12	0.33	0	1
Sole Proprietorship	Take unity if the firm is owned by 1 person	1,244	0.91	0.28	0	1
Manager's Experience	Years of working experience the top manager has	1,214	14.26	9.31	1	51
Loan	Take unity if the firm has a line of credit or loan from a financial institution	1,201	0.21	0.41	0	1
Overdraft Facility	Take unity if the firm has an overdraft facility	1,201	0.08	0.27	0	1
Informal Credit	Percentage of the firm's working capital borrowed from informal lenders (moneylenders, friends, or relatives)	1,232	2.56	11.00	0	100
Fixed Asset	Take unity if the firm purchased any kind of fixed asset within the last fiscal year	1,207	0.45	0.50	0	1
Product Innovation	Take unity if the firm introduced new or significantly improved products or services in the last three years	1,224	0.21	0.41	0	1
Technological Capacity	Take unity if the firm owns a website	1,232	0.24	0.43	0	1
Land Ownership	Percentage of land owned by the firm	1,243	70.46	44.96	0	100
<i>Political and Business Environment Variables</i>						
Political Instability	Firm's view of Political Instability as an obstacle from 0 (no obstacle) to 4 (very severe obstacle)	1,193	1.21	1.20	0	4
Corruption	Firm's view of Corruption as an obstacle from 0 (no obstacle) to 4 (very severe obstacle)	1,165	0.92	1.04	0	4
Inadequately Educated Workforce	Firm's view of Low Skilled Workforce as an obstacle from 0 (no obstacle) to 4 (very severe obstacle)	1,229	0.97	1.12	0	4
Unfavorable Interest Rate	Take unity if the firm did not apply for any line of credit due to unfavorable interest rate	1,228	0.06	0.23	0	1
High Collateral Requirement	Take unity if the firm did not apply for any line of credit due to high collateral requirement	1,228	0.03	0.17	0	1

This idea demonstrates the possible indirect linkage between political instability and financial access.

The possible adverse effect of corruption on financial constraints cannot be neglected, as confirmed in a study by Ullah (2020). The labor force problem could demonstrate an indirect connection to greater financial constraints if firms lack the human capital required to effectively perform their operations. Additionally, unfavorable interest rates and high collateral requirements are common problems for firms in deciding whether they should obtain a loan from a bank or another financial institution. They are highly related to financial access and firm growth (Guariglia et al., 2016). However, since actual figures for the interest rate and collateral requirements are not available, this paper utilizes perception-based indicators to measure how they affect firms' access to finance.

Therefore, it is essential to check the possible links between these channels and local firms' financial constraints. The control variables were selected based on the related theoretical and empirical literature. Specifically, those variables include *Political Instability*, *Corruption*, *Inadequately Educated Workforce*, *Unfavorable Interest Rate*, and *High Collateral Requirement*. Further details about these variables are reported in Table 1.

## B. Definition of variables and descriptive statistics

Table 1 provides the definitions and statistics for all of the variables used in this study. These variables contain some missing values in cases such as firms not knowing the answer or not wanting to respond to a particular question. Therefore, it is necessary to be aware that the number of observations in each regression may differ accordingly.

Based on the survey data for this study, Table 2 shows that 18.14% of the firms in the sample consider a lack of access to finance as the most significant obstacle for their business. Similarly, a majority of domestic firms (18.97%) viewed a lack of access to finance as their biggest constraint. Competition turns out to be the second major obstacle for local firms, followed by a lack of skilled labor. Foreign firms do not consider access to finance as their biggest obstacle. Instead, 18.60, 13.95, and 11.63% of foreign firms rated labor regulations, political instability, and tax rates as their top obstacle, respectively. These figures demonstrate that domestic firms are currently facing more financial obstacles than foreign ones.

In Table 3, a significant proportion of foreign firms (52.50%) reported that access to finance was not an issue for their current operations. Fewer domestic firms considered access to finance as no obstacle or a minor obstacle. In contrast, the proportion of domestic firms that considered access to finance as a moderate, major, or very severe obstacle is higher than that of foreign ones.

Table 4 reports the proportion of firms' working capital financed by the formal financial sector across different sizes. It shows that 20.87% of medium-sized firms and 23.49% of large

firms can obtain loans of up to 50% of their working capital from the formal financing sector, which is greater than that of small firms. Similarly, the proportion of medium and large firms that can borrow more than 50% of their working capital from the formal financial sector is greater than that of small firms (6.38% and 6.02% of medium and large firms, respectively). These figures indicate that a higher proportion of medium-sized firms can obtain loans from the formal financial sector.

**Table 2.** *Obstacle Rating across Ownership Types*

Constraint	Domestic Firms	Foreign Firms	All Firms
Access to finance	<b>18.97%</b>	6.98%	<b>18.14%</b>
Practices of competitor	13.19%	4.65%	12.60%
Inadequately educated labor	12.24%	6.98%	11.88%
Electricity	10.34%	8.14%	10.19%
Political Instability	9.83%	13.95%	10.11%
Access to land	6.90%	5.81%	6.82%
Tax rates	5.43%	11.63%	5.86%
Transport	5.86%	4.65%	5.78%
No response	4.31%	8.14%	4.57%
Customs and trade regulations	3.19%	4.65%	3.29%
Labor regulations	1.47%	<b>18.60%</b>	2.65%
Business licensing and permits	2.59%	1.16%	2.49%
Corruption	2.59%	1.16%	2.49%
Tax administration	1.72%	1.16%	1.69%
Crime, theft and disorder	1.03%	2.33%	1.12%
Courts	0.34%	0.00%	0.32%

**Table 3.** *Financial Constrained Firms across Ownership Types*

Financial Obstacle Categories	Proportion of Domestic Firms	Proportion of Foreign Firms
No obstacle	43.22%	52.50%
Minor obstacle	21.52%	26.25%
Moderate obstacle	19.75%	13.75%
Major obstacle	11.25%	6.25%
Very severe obstacle	4.25%	1.25%

**Table 4.** *Proportion of Working Capital Financed from Bank and Financial Institutions by Firm Size*

Percentage of Borrowing	Small Firms	Medium Firms	Large Firms	Total
0 percent	81.41%	70.72%	70.48%	76.95%
Up to 50 percent	12.90%	<b>20.87%</b>	<b>23.49%</b>	16.56%
More than 50 percent	5.69%	<b>6.38%</b>	<b>6.02%</b>	5.93%

## V. Results and Discussion

### A. Baseline results

Based on the results from Columns (1) and (2) of Table 5, the coefficient of *FDI* is negative and statistically significant at a 5% confidence interval (CI), which supports Hypothesis 1.

**Table 5.** *FDI vs. Domestic, Within-Firm Effect of FDI*

Explanatory Variables	FDI vs. Domestic		Within-Firm Effect	
	(1)	(2)	(3)	(4)
FDI	-0.375** (0.155)	-0.411** (0.160)		
Foreign Share			-0.005*** (0.002)	-0.005*** (0.002)
Age	-0.007* (0.004)	-0.008* (0.004)	-0.007* (0.004)	-0.008* (0.004)
Medium Firm	-0.129* (0.078)	-0.111 (0.079)	-0.128* (0.078)	-0.110 (0.079)
Large Firm	-0.153 (0.112)	-0.156 (0.124)	-0.137 (0.112)	-0.144 (0.124)
Exporter	0.258** (0.117)	0.202 (0.123)	0.281** (0.118)	0.223* (0.123)
Sole Proprietorship	0.081 (0.122)	0.088 (0.124)	0.118 (0.121)	0.126 (0.123)
Manager's Experience	0.001 (0.004)	0.000 (0.004)	0.001 (0.004)	0.000 (0.004)
Loan	0.554*** (0.084)	0.535*** (0.086)	0.554*** (0.084)	0.535*** (0.086)
Overdraft Facility	-0.240* (0.127)	-0.236* (0.128)	-0.242* (0.127)	-0.238* (0.129)
Informal Credit	0.017*** (0.003)	0.017*** (0.004)	0.017*** (0.003)	0.017*** (0.004)
Fixed Asset	0.295*** (0.071)	0.337*** (0.073)	0.301*** (0.071)	0.343*** (0.073)
Product Innovation	0.193** (0.083)	0.197** (0.084)	0.192** (0.083)	0.195** (0.084)
Technological Capacity	-0.081 (0.085)	-0.092 (0.087)	-0.087 (0.085)	-0.098 (0.087)
Land Ownership	-0.001* (0.001)	-0.002* (0.001)	-0.002* (0.001)	-0.002* (0.001)
Industry and Country Dummies	No	Yes	No	Yes
Observations	1,108	1,108	1,108	1,108
<i>Pseudo R2</i>	0.044	0.050	0.045	0.051
<i>LR chi2</i>	128.88	163.29	130.71	164.68
<i>Log Likelihood</i>	-1460.42	-1451.16	-1459.30	-1449.90

*Note:* The Ordered Probit Regression is used for the estimation. Dependent variable: Access to Finance. Robust standard errors are reported in parentheses. \*\*\*, \*\*, and \* indicate the significance levels at 1%, 5%, and 10%, respectively.

It shows that foreign-owned firms are less financially constrained than their domestic counterparts. It is plausible that foreign firms can obtain financial support from their parent companies (Love & Mylenko, 2003). Furthermore, they have better knowledge and technology, enabling them to compete with indigenous firms and earn their share in the domestic market. This finding also aligns with that of the previous literature mentioned in Section II.

Moreover, the results in Columns (3) and (4) suggest that having a greater foreign share of a domestic firm's capital could reduce the financial barriers of that particular firm, as indicated by the negative and statistically significant coefficient of *Foreign Share*. This variable signifies that the effect of direct FDI on a domestic firm can exist in the form of a partnership or joint venture, confirming Hypothesis 2.

There are three possibilities in which the within-firm effect can happen. First, foreign investors may directly bring in foreign capital to support their business partners. Second, they bring along new technologies that enhance their alliances' efficiency, productivity, and profits. Third, this direct connection with foreign companies increases domestic firms' creditworthiness and their chance for a successful loan application, since banks and financial institutions tend to provide loans to joint venture firms to lower their default risk.

The negative and significant coefficient of *Age* shows that older firms face fewer financial constraints, which is aligned with previous studies (i.e., Beck & Demirguc-Kunt, 2006). The result of *Exporter* reveals that exporting firms face higher financial constraints than non-exporting ones,<sup>13)</sup> which contradicts the findings of Greenaway et al. (2007) and Silva et al. (2011). They suggested that firms entering export markets experience significant improvements in their financial health; thus, financial constraints should be less evident to those exporters.

In this case, the exporting firms may be involved in a larger-scale production with higher-quality standards to supply their products to international markets. They need high and long-term capital investments to support their operations; thus, they tend to face higher constraints than non-exporting ones. However, the coefficient of *Exporter* becomes insignificant in Column (2) or less significant in Column (4) when the industry and country dummies are controlled. Also, in Column (4) of Table 6, it becomes insignificant when the vertical spillover variables are included. This finding illustrates that a higher foreign presence in vertically related industries is more significant for explaining a firm's financial distress than being a direct exporter, *per se*.

The financial structure and position of firms also explain the degree of difficulty in accessing external capital from domestic banks and non-bank financial institutions. Establishments that have already received a line of credit or loan face higher constraints to acquire additional capital, as suggested by the significant coefficient of *Loan*. However, the negative coefficient of *Overdraft Facility* demonstrates that prespecified and readily available overdrafts help local

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13) Further details on why exporters may face higher financial constraints than non-exporters are addressed in a study by Leitner and Stehrer (2013).

**Table 6.** *Spillover Effects of FDI on Access to Finance*

Explanatory Variables	(1)	(2)	(3)	(4)
Foreign Borrowing Share	0.027*** (0.010)			
Foreign Firm Proportion		0.031*** (0.011)		
Foreign Sales Share			0.004** (0.002)	0.005*** (0.002)
Backward Linkages				0.017*** (0.006)
Forward Linkages				0.081*** (0.017)
Foreign Share	-0.006*** (0.002)	-0.006*** (0.002)	-0.006*** (0.002)	-0.006*** (0.002)
Age	-0.008* (0.004)	-0.008* (0.004)	-0.008* (0.004)	-0.009** (0.004)
Medium Firm	-0.102 (0.079)	-0.094 (0.079)	-0.113 (0.079)	-0.105 (0.079)
Large Firm	-0.149 (0.124)	-0.161 (0.123)	-0.167 (0.125)	-0.158 (0.126)
Exporter	0.238* (0.123)	0.223* (0.122)	0.230* (0.122)	0.183 (0.124)
Sole Proprietorship	0.119 (0.124)	0.097 (0.124)	0.118 (0.123)	0.117 (0.124)
Manager's Experience	0.001 (0.004)	0.001 (0.004)	0.001 (0.004)	0.003 (0.004)
Loan	0.550*** (0.086)	0.533*** (0.086)	0.541*** (0.086)	0.580*** (0.087)
Overdraft Facility	-0.267** (0.127)	-0.260** (0.130)	-0.257** (0.128)	-0.309** (0.128)
Informal Credit	0.017*** (0.004)	0.017*** (0.004)	0.017*** (0.003)	0.018*** (0.004)
Fixed Asset	0.350*** (0.073)	0.362*** (0.075)	0.359*** (0.074)	0.396*** (0.075)
Product Innovation	0.197** (0.084)	0.188** (0.084)	0.183** (0.084)	0.185** (0.084)
Technological Capacity	-0.094 (0.087)	-0.109 (0.087)	-0.100 (0.087)	-0.130 (0.088)
Land Ownership	-0.002* (0.001)	-0.002** (0.001)	-0.002** (0.001)	-0.002** (0.001)
Industry and Country Dummies	Yes	Yes	Yes	Yes
Observations	1,106	1,108	1,108	1,108
Pseudo R2	0.053	0.054	0.053	0.061
LR chi2	182.16	170.18	165.34	209.48
Log Likelihood	-1444.82	-1445.85	-1447.21	-1434.41

Note: The Ordered Probit Regression is used for the estimation. Dependent variable: Access to Finance. Robust standard errors are reported in parentheses. \*\*\*, \*\*, and \* indicate the significance levels at 1%, 5%, and 10%, respectively.

firms raise external funds since they can overcome funding bottlenecks (Leitner & Stehrer, 2013). The coefficient of *Informal Credit* indicates that firms with a higher proportion of their working capital funded by informal lenders have trouble securing funds from formal financing institutions.

Table 5 also indicates a positive relationship between a firm's purchasing activities and its need for external funds, given the positive and significant coefficient of *Fixed Assets*. Usually, fixed investments would involve long-term debt, which has a greater impact on firms than working capital investments. Furthermore, lenders tend to be more conservative and set higher standards for long-term fixed asset loans to reduce their own risk (Seidman, 2005). This particular case is plausible for firms in the CLM countries due to the imperfections in their domestic financial markets.

Innovative firms (i.e., firms that have introduced new or improved products or services over the last three years) face more financial constraints than non-innovative ones. Two possible reasons explain this result. First, innovative firms are supposed to have a higher demand for external capital to maintain their innovation progress (Lee et al., 2015). Second, the greater financial constraints for innovative firms are associated with the credit market's structural issues and the risk-averse behavior of the domestic banking sector. Banks and financial institutions would prefer to provide loans for purposes other than their R&D activity (Berger & Udell, 2002; Lee et al., 2015; Ughetto, 2008). Holding other variables constant, the coefficient of *Land Ownership* is negative and statistically significant. This result indicates that owning land can reduce firms' financial constraints. In particular, firms may reduce their rent expenses if they operate their business on their own land or use their land as collateral to secure loans.

This study further reveals the spillovers of FDI on access to finance for domestic firms in the CLM countries in Table 6. The three proxies for horizontal spillovers have positive and significant coefficients, proving the existence of the crowding-out effect of FDI, which corresponds to Hypothesis 3. Domestic firms face more significant constraints when the share of FDI presence in the same industry increases. Notably, in Column (1) of Table 6, the result for *Foreign Borrowing Share* reveals the crowding-out effect of an FDI presence, in which an increasing share of foreign borrowing causes higher constraints for domestic competitors in the same industry. According to the literature, local banks and financial institutions tend to prefer cooperating with foreign-owned firms to lower their loss risk, and they also try to avoid too high a lending concentration in any particular industry.

In Column (2) of Table 6, if the proportion of foreign firms in the same industry increases, domestic firms would suffer higher financial constraints, as indicated by the positive and statistically significant coefficient of *Foreign Firm Proportion*. This positive coefficient can suggest a possible competitive effect. A rising number of foreign firms in the same industry increases domestic competition, and it would be even worse if those foreign firms were more

productive and equipped with better technology and knowledge of their current market. Furthermore, they have every incentive to restrict the leakage of their technology and knowledge to local competitors, limiting the spillover (Moran et al., 2005; Smarzynska Javorcik, 2004).

The last proxy for horizontal spillovers, *Foreign Sales Share*, also signifies its positive relationship to financing access, as shown in Columns (3) and (4) of Table 6. This result intimates that inward FDI would take the share of local firms' sales in the domestic market. The loss of market share will reduce their profitability, which requires them to improve their productivity and bring in new technology to compete with foreign firms, or else they will be forced to exit the market. The process of improving productivity and product quality requires substantial capital investment. Therefore, it will be burdensome for domestic firms to request this kind of loan.

With respect to identifying vertical FDI spillovers, it is challenging to provide an equally clear-cut conclusion, for vertical spillovers are unobservable through the direct competition effect (Kokko & Thang, 2014). This study, however, finds a positive relationship between the coefficients of vertical spillovers and access to finance. Specifically, in Columns (4) and (5) of Table 6, both *Backward* and *Forward Linkages* have positive and statistically significant coefficients, which signifies the crowding-out effect of foreign firms in either upstream or downstream industries.

There are three main reasons underlying the evidence regarding negative backward linkages. First, with direct linkages, foreign firms may hold more bargaining power during contract negotiations with domestic suppliers, which causes them to lose profits and leads to a loss in measured productivity (Girma et al., 2008; Newman et al., 2015). Second, foreign firms in downstream industries may import intermediates rather than utilize local inputs due to foreign firms' preference or the quality and unavailability of specific inputs. If this is the case, domestic upstream suppliers will face higher competition from imports, thus lowering their profits and productivity (Newman et al., 2015). Third, the inflows of foreign upstream customers lead to significant changes in technological standards and quality requirements for domestic suppliers as those customers inevitably seek high quality and standard inputs to comply with international market requirements. The upgrading process for domestic suppliers to satisfy their customers' needs would increase their financial constraints. Overall, both direct and indirect backward linkages impact domestic firms' profitability and productivity negatively, and these impacts confirm the empirical finding of this paper—that domestic upstream suppliers will be less creditworthy and face more financial constraints when the share of foreign presence in downstream industries increases.

There are also two explanations for negative forward linkages. First, as mentioned by Newman et al. (2015), the entry of FDI into upstream industries does not always produce positive forward linkages. With a majority of the market share held by foreign firms, domestic upstream firms may not be able to compete, and downstream domestic firms will end up paying a higher price for inputs or buying lower quality inputs. This issue consequently leads to the loss of

profits and lower productivity for domestic customers. Second, the availability of new and high-quality inputs resulting from the increasing number of foreign suppliers raises local demand for inputs and encourages the new entry of both domestic and foreign firms in downstream industries (Ayyagari & Kosová, 2006). It is possible that foreign suppliers may have an incentive to raise the price of their outputs or to supply to new foreign customers, which negatively impacts domestic customers' profitability and financial status.

## B. Does firm size matter?

Based on Hypothesis 4, the spillover effects of FDI may vary across different firm sizes. Therefore, additional estimations were conducted to check whether this assumption could be empirically proven. Table 7 provides the estimation results of the interaction terms between spillover variables and firm size. The results in Columns (1) and (2) show that medium-sized firms are not affected by the rising share of foreign borrowing or the increasing number of foreign firms. One plausible reason is that medium-sized firms tend to be more financially stable. This statement means that medium-sized firms are more stable, competitive, and productive than small firms, and they require less external funds to support their daily operations than large firms. These criteria enable them to obtain loans more easily than small and large firms. Table 4 shows that 6.38% of medium-sized firms were able to obtain over 50% of their working capital from banks and financial institutions, which is greater than small and large firms.

The coefficients of the interaction terms between *Foreign Sales Shares* and *Small Firm* become significant when backward and forward linkages are added in Column (4) of Table 7. Econometrically, one possible explanation is that the exclusion of vertical linkages for the regression in Column (3) makes the unexplained variability large and weak, resulting in a non-significant result. This result suggests that the effects of vertical spillover are more robust in explaining the financial constraints of small domestic firms than horizontal spillover in terms of sales competition.

Backward linkages from the increasing number of foreign customers are positively correlated with access to finance for small and medium suppliers, not large ones. These small and medium suppliers may have less bargaining power than their customers, may lose their market share to new competitors, or require tremendous capital investment to upgrade their production, resulting in additional financial constraints.

Forward linkages from the increasing number of foreign suppliers negatively affect all domestic firms regardless of size. A plausible reason for this finding is that although domestic customers can obtain better quality inputs (or perhaps lower quality inputs, as mentioned in the previous subsection) from their foreign suppliers, they may encounter higher input costs. This consequence can also be harmful to their profitability.

**Table 7.** Spillover Effects of FDI and Firm Size

Interaction Terms		(1)	(2)	(3)	(4)
Foreign Borrowing Share	× Small Firm	0.029*			
		(0.016)			
	× Medium Firm	-0.017			
		(0.020)			
	× Large Firm	0.041***			
		(0.013)			
Foreign Firm Proportion	× Small Firm		0.028**		
			(0.012)		
	× Medium Firm		0.019		
			(0.013)		
	× Large Firm		0.043***		
			(0.012)		
Foreign Sales Share	× Small Firm			0.002	0.004*
				(0.002)	(0.002)
	× Medium Firm			0.005**	0.007***
				(0.002)	(0.003)
	× Large Firm			0.010***	0.011***
				(0.003)	(0.003)
Backward Linkages	× Small Firm				0.020***
					(0.007)
	× Medium Firm				0.016*
					(0.008)
	× Large Firm				0.001
					(0.012)
Forward Linkages	× Small Firm				0.078***
					(0.020)
	× Medium Firm				0.079***
					(0.023)
	× Large Firm				0.072**
					(0.031)
Industry and Country Dummies		Yes	Yes	Yes	Yes
Observations		1,106	1,108	1,108	1,108
Pseudo R2		0.055	0.056	0.054	0.063
LR chi2		190.46	181.62	172.92	215.80
Log-Likelihood		-1441.95	-1442.60	-1444.71	-1432.12

*Note:* The underlying model is obtained from Equation 3. The interaction terms between spillover variables and the dummies of firm size have been used to estimate the spillover effects on firms of different sizes. The coefficients of other control variables are not reported since they are almost identical to those shown in Table 6. The results for control variables for this estimation, however, are available upon request. The Ordered Probit Regression is used for the estimation. Dependent variable: Access to Finance. Robust standard errors are reported in parentheses. \*\*\*, \*\*, and \* indicate the significance levels at 1%, 5%, and 10%, respectively.

This study performed robustness checks on the results from Tables 5-7 using an ordinary least squares (OLS) regression model with robust standard errors. The OLS regression results are reported in Tables B1-B3, and they are identical in terms of sign and significance level to those from the ordered probit regression. Therefore, the output of the robustness tests confirms the validity of the model's inference and that the above results are robust.

### C. Additional analyses with political and business controls

This section provides additional analyses on whether political and business environment conditions may affect domestic firms' credit access in the CLM countries. However, the problems related to interest rates and collateral requirements may often be more severe for small and medium-sized enterprises (SMEs) rather than large ones. From the literature, SMEs, especially small firms, are adversely affected by a lack of collateral, lower cash flows, a short credit history, high interest rates, the need for a special connection with banks, and high risk premiums to receive commercial bank loans (Mateev et al., 2013). However, these obstacles do not affect large firms (Beck et al., 2005). Therefore, firms of various sizes may report obstacles differently. The interaction terms are included to control for this variation.

The findings in Tables 8 and 9 indicate the positive relationship between the additional control variables and financial access. The results for those variables are identical across all

**Table 8.** *Additional Political and Business Environment Controls on Equation 1*

Explanatory Variables	FDI vs. Domestic		Within-Firm Effect	
	(1)	(2)	(3)	(4)
FDI	-0.467*** (0.170)	-0.465*** (0.169)		
Foreign Share			-0.006*** (0.002)	-0.006*** (0.002)
Age	-0.012*** (0.004)	-0.011*** (0.004)	-0.012*** (0.004)	-0.011*** (0.004)
Medium Firm	-0.199** (0.083)	-0.171* (0.088)	-0.198** (0.083)	-0.170* (0.088)
Large Firm	-0.212 (0.133)	-0.152 (0.138)	-0.207 (0.133)	-0.140 (0.139)
Exporter	0.246* (0.127)	0.258** (0.126)	0.263** (0.128)	0.278** (0.127)
Sole Proprietorship	0.102 (0.132)	0.079 (0.132)	0.145 (0.131)	0.121 (0.131)
Manager's Experience	-0.002 (0.005)	-0.001 (0.005)	-0.002 (0.005)	-0.002 (0.005)
Loan	0.511*** (0.090)	0.502*** (0.090)	0.512*** (0.090)	0.503*** (0.090)

**Table 8.** *Continued*

Explanatory Variables	FDI vs. Domestic		Within-Firm Effect	
	(1)	(2)	(3)	(4)
Overdraft Facility	-0.251*	-0.269*	-0.252*	-0.271*
	(0.139)	(0.139)	(0.139)	(0.139)
Informal Credit	0.016***	0.017***	0.016***	0.017***
	(0.003)	(0.003)	(0.003)	(0.003)
Fixed Asset	0.296***	0.283***	0.304***	0.290***
	(0.077)	(0.077)	(0.077)	(0.077)
Product Innovation	0.205**	0.206**	0.202**	0.203**
	(0.089)	(0.089)	(0.088)	(0.089)
Technological Capacity	-0.102	-0.095	-0.110	-0.102
	(0.088)	(0.088)	(0.088)	(0.088)
Land Ownership	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Political Instability	0.114***	0.110***	0.114***	0.111***
	(0.033)	(0.033)	(0.033)	(0.033)
Corruption	0.103**	0.105***	0.102**	0.105***
	(0.040)	(0.040)	(0.040)	(0.040)
Inadequately Educated Workforce	0.116***	0.114***	0.115***	0.114***
	(0.035)	(0.035)	(0.035)	(0.035)
Unfavorable Interest Rate	0.461***		0.452***	
	(0.148)		(0.148)	
× Small Firm		0.530**		0.523**
		(0.235)		(0.235)
× Medium Firm		0.607***		0.611***
		(0.207)		(0.208)
× Large Firm		-0.192		-0.245
		(0.351)		(0.341)
High Collateral Requirement	0.621***		0.612***	
	(0.212)		(0.212)	
× Small Firm		1.009***		1.010***
		(0.278)		(0.278)
× Medium Firm		0.226		0.214
		(0.340)		(0.341)
× Large Firm		0.442**		0.373**
		(0.204)		(0.188)
Industry and Country Dummies	Yes	Yes	Yes	Yes
Observations	1,021	1,021	1,021	1,021
Pseudo R2	0.075	0.075	0.076	0.078
LR chi2	232.29	247.59	232.89	248.03
Log Likelihood	-1300.83	-1297.19	-1300.01	-1296.06

*Note:* Political and business environment controls are added to the underlying model in Equation 1. The Ordered Probit Regression is used for the estimation. Dependent variable: Access to Finance. Robust standard errors are reported in parentheses. \*\*\*, \*\*, and \* indicate the significance levels at 1%, 5%, and 10%, respectively.



Table 9. Continued

Explanatory Variables	Intra- and Inter-industry Spillovers							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Corruption	0.102** (0.040)	0.105*** (0.040)	0.099** (0.040)	0.102** (0.040)	0.101** (0.040)	0.104*** (0.040)	0.101** (0.040)	0.104*** (0.040)
Inadequately Educated Workforce	0.113*** (0.035)	0.112*** (0.035)	0.113*** (0.035)	0.112*** (0.035)	0.118*** (0.034)	0.116*** (0.034)	0.116*** (0.034)	0.114*** (0.034)
Unfavorable Interest Rate	0.439*** (0.147)		0.435*** (0.150)		0.428*** (0.146)		0.415*** (0.146)	
× Small Firm		0.492** (0.235)		0.519** (0.236)		0.499** (0.233)		0.447* (0.231)
× Medium Firm		0.612*** (0.209)		0.590*** (0.213)		0.583*** (0.206)		0.599*** (0.208)
× Large Firm		-0.230 (0.337)		-0.296 (0.335)		-0.255 (0.339)		-0.208 (0.341)
High Collateral Requirement	0.604*** (0.211)		0.625*** (0.211)		0.593*** (0.212)		0.548*** (0.208)	
× Small Firm		0.990*** (0.278)		0.998*** (0.281)		0.969*** (0.281)		0.907*** (0.271)
× Medium Firm		0.228 (0.340)		0.274 (0.339)		0.228 (0.340)		0.206 (0.341)
× Large Firm		0.313* (0.163)		0.252 (0.184)		0.309 (0.193)		0.214 (0.173)
Industry and Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,019	1,019	1,021	1,021	1,021	1,021	1,021	1,021
Pseudo R2	0.076	0.079	0.078	0.081	0.078	0.081	0.085	0.087
LR chi2	238.75	255.99	237.54	251.72	233.77	248.86	256.36	280.21
Log Likelihood	-1296.83	-1293.14	-1296.76	-1292.96	-1296.60	-1293.00	-1287.32	-1284.09

Note: Political and business environment controls are added to the underlying model in Equation 2. The Ordered Probit Regression is used for the estimation. Dependent variable: Access to Finance. Robust standard errors are reported in parentheses. \*\*\*, \*\*, and \* indicate the significance levels at 1%, 5%, and 10%, respectively.

regressions, including the sign and significance level. *Political Instability* indicates a significant adverse impact on access to finance for firms operating in the CLM countries, which is aligned with the findings of Herrala and Ariss (2013) regarding the negative effect of political upheaval on credit constraints in the Middle East and North Africa (MENA). Moreover, the coefficient of *Corruption* demonstrates that a higher corruption level is associated with greater obstacles to accessing external finance. Scarce skilled labor (*Inadequately Educated Workforce*) for business operations also induces additional financing obstacles for domestic firms.

This research additionally demonstrates that an unfavorable interest rate induces significant constraints on access to finance for SMEs, but not for large firms. This result aligns with

that of Mateev et al. (2013). High collateral requirements lead to higher financial constraints for only small and large firms. A possible explanation for this result is that medium-sized firms tend to be more financially stable, as mentioned previously.

Finally, Tables 8 and 9 indicate that the results for horizontal and vertical spillovers on financial constraints are robust regardless of the changes in the model specifications and that Hypotheses 1-3 still hold. The coefficient of *Medium Firm* becomes significant at either a 1% or 5% significance level in every regression. This change in the significance level suggests that the insignificant coefficients of *Medium Firm* in Tables 5 and 6 are correlated with the omitted variables. This result confirms that medium-sized firms are less financially constrained than small ones. The coefficient of *Land Ownership* also turns out to be insignificant. In this case, external factors such as political and investment conditions are significant to access to finance for domestic firms in the CLM countries, not land ownership.

## VI. Conclusions and Policy Implications

Until recently, no empirical evidence has existed supporting whether a foreign presence helps improve the financial issues faced by domestic firms in the CLM countries, although policymakers have encouraged more FDI inflows. Although many researchers have conducted previous studies on the association between FDI and financial constraints in other countries, especially developing countries, their conclusions tended to depend on the type of data, the methodology used, and the specifics of the sample countries. In addition, empirical studies have focused only on horizontal spillover while neglecting possible vertical spillover.

To address the above issues, this research employed the latest firm-level data from the World Bank Enterprise Surveys for the CLM countries. This study found that FDI only helps reduce the financial constraints faced by domestic firms through partnership or joint venture. Furthermore, an increasing number of foreign firms in horizontal and vertical industries induces greater credit constraints for domestic firms. The results on horizontal spillovers did not align with most results obtained by previous studies, yet this research expected these negative results given the CLM's underdeveloped financial sector and less competitive domestic firms. This study provided new evidence that spillovers are not uniform for firms of different sizes. Specifically, the financial constraints for small and large firms become severe when foreign firms borrow more from the capital market. The spillovers through backward linkages negatively affect small and medium firms, while those through forward linkages increase financial constraints for all domestic firms, regardless of size.

The surveys used in this research contain useful information regarding firms' perspectives on each country's business environment, allowing this study to further investigate the effects

of political and business conditions on domestic financial access. This inclusion was done to check the robustness of the estimation of the main explanatory variables (FDI and spillover variables) and to stress the significant relationship between country specifics and domestic access to finance. The results indicate that better political and business factors play an essential role in easing access to financing for firms in the CLM countries.

Therefore, this paper provides specific policy implications, such that (1) policymakers in the CLM countries must ensure that their investment policies should promote FDI inflows without harming local firms, especially small and fragile ones, by encouraging more foreign investment in the form of partnerships and joint ventures; (2) the governments of the CLM countries should focus on improving their current financial regimes, and support and reduce the information asymmetry between lenders and borrowers to ensure the sustainable growth and survival of the domestic firms; and (3) the governments should strive to provide substantial investment and political conditions that promote financial access for businesses.

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## Appendix

### A. Correlation matrix

**Table A1.** *Correlation Matrix*

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. AF	1.000												
2. FDI	-0.071	1.000											
3. FS	-0.074	0.963	1.000										
4. FBS	0.030	0.192	0.210	1.000									
5. FFP	0.010	0.400	0.423	0.481	1.000								
6. FSS	0.028	0.249	0.253	0.359	0.624	1.000							
7. BL	0.046	0.027	0.011	0.009	0.067	0.127	1.000						
8. FL	0.054	0.051	0.057	0.118	0.127	-0.161	0.048	1.000					
9. A	-0.060	-0.060	-0.075	-0.076	-0.062	-0.054	0.090	0.091	1.000				
10. MF	-0.021	-0.065	-0.071	-0.071	-0.056	-0.090	-0.027	0.018	0.008	1.000			
11. LF	-0.048	0.430	0.418	0.192	0.391	0.212	-0.038	-0.014	-0.020	-0.247	1.000		
12. E	0.030	0.348	0.376	0.153	0.392	0.189	-0.031	0.076	-0.040	-0.020	0.357	1.000	
13. SP	0.025	-0.239	-0.139	0.040	0.011	0.013	0.010	0.025	0.033	-0.076	-0.208	-0.097	1.000
14. ME	-0.001	-0.045	-0.057	-0.070	-0.039	-0.074	0.004	0.045	0.524	0.031	-0.018	0.035	-0.011
15. L	0.186	-0.062	-0.067	-0.021	-0.028	-0.034	0.020	-0.004	0.063	0.074	0.050	-0.023	-0.011
16. OF	-0.059	0.029	0.017	0.032	0.034	0.045	0.081	-0.002	0.066	0.086	0.126	0.057	-0.050
17. IC	0.188	-0.054	-0.056	-0.073	-0.064	-0.087	-0.006	0.013	-0.082	-0.011	-0.043	-0.008	0.034
18. FA	0.167	0.046	0.064	-0.037	-0.036	-0.115	-0.067	0.023	0.037	0.054	0.123	0.043	-0.074
19. PI	0.084	0.076	0.062	-0.04	0.001	0.043	0.060	0.059	0.077	0.025	0.054	0.039	-0.081
20. TC	-0.035	0.146	0.115	-0.000	0.058	0.026	0.043	0.061	-0.028	0.087	0.216	0.116	-0.168
21. LO	-0.050	-0.308	-0.320	-0.010	-0.145	-0.069	0.027	-0.006	0.224	0.016	-0.131	-0.165	0.194
22. POL	0.146	0.081	0.078	-0.051	0.056	-0.008	-0.018	-0.002	0.070	0.034	0.112	0.036	-0.033
23. CR	0.141	0.062	0.056	-0.008	0.051	0.031	0.014	-0.054	0.033	0.060	0.118	0.068	-0.055
24. IEW	0.148	0.156	0.152	0.106	0.154	0.056	-0.025	-0.014	0.032	0.061	0.162	0.112	-0.040
25. UIR	0.102	-0.012	-0.027	0.027	0.008	0.037	0.002	-0.047	0.059	0.031	-0.006	0.000	0.004
26. HCR	0.094	-0.009	-0.022	0.017	-0.004	0.033	0.002	0.040	-0.051	0.062	-0.040	0.021	-0.098
Variables	14	15	16	17	18	19	20	21	22	23	24	25	26
14. ME	1.000												
15. L	0.142	1.000											
16. OF	0.019	0.191	1.000										
17. IC	-0.041	-0.072	-0.043	1.000									
18. FA	0.067	0.110	-0.039	0.038	1.000								
19. PI	0.023	0.064	0.005	-0.001	0.141	1.000							
20. TC	-0.057	0.059	0.143	-0.047	0.050	0.155	1.000						
21. LO	0.160	0.175	0.052	-0.129	-0.128	-0.072	-0.140	1.000					

**Table A1.** *Continued*

Variables	14	15	16	17	18	19	20	21	22	23	24	25	26
22. POL	0.022	0.039	-0.005	0.012	0.120	0.04	-0.001	-0.076	1.000				
23. CR	-0.009	0.009	-0.009	0.013	0.091	0.037	0.063	-0.058	0.383	1.000			
24. IEW	0.026	0.038	0.052	0.005	0.104	0.067	0.022	-0.074	0.180	0.248	1.000		
25. UIR	0.009	0.020	-0.047	0.003	-0.005	0.039	-0.013	0.024	-0.005	0.047	0.004	1.000	
26. HCR	-0.001	-0.020	0.038	0.037	0.017	0.004	-0.016	-0.108	-0.030	-0.011	0.027	-0.043	1.00

*Note:* AF = Access to Finance, FDI = FDI Dummy, FS = Foreign Share, FSS = Foreign Sales Share, FFP = Foreign Firm Proportion, FBS = Foreign Borrowing Share, BL = Backward Linkages, FL = Forward Linkages, A = Age, MF = Medium Firm, LF = Large Firm, E = Exporter, SP = Sole Proprietorship, ME = Manager's Experience, L = Loan, OF = Overdraft Facility, IC = Informal Credit, FA = Fixed Asset, PI = Product Innovation, TC = Technological Capacity, LO = Land Ownership, POL = Political Instability, CR = Corruption, IEW = Inadequately Educated Workforce, UIR = Unfavorable Interest Rate, and HCR = High Collateral Requirement.

**B. Robustness checks****Table B1.** *Robustness: FDI vs. Domestic, Within-Firm Effect of FDI*

Explanatory Variables	FDI vs. Domestic		Within-Firm Effect	
	(1)	(2)	(3)	(4)
FDI	-0.367** (0.146)	-0.403*** (0.149)		
Foreign Share			-0.005*** (0.002)	-0.005*** (0.002)
Age	-0.007* (0.004)	-0.007* (0.004)	-0.007* (0.004)	-0.007* (0.004)
Medium Firm	-0.155* (0.080)	-0.124 (0.081)	-0.153* (0.080)	-0.123 (0.081)
Large Firm	-0.210* (0.114)	-0.190 (0.125)	-0.192* (0.114)	-0.176 (0.125)
Exporter	0.267** (0.125)	0.208 (0.131)	0.291** (0.126)	0.230* (0.132)
Sole Proprietorship	0.057 (0.121)	0.056 (0.123)	0.093 (0.120)	0.094 (0.120)
Manager's Experience	0.001 (0.004)	-0.000 (0.004)	0.001 (0.004)	-0.000 (0.004)
Loan	0.607*** (0.094)	0.578*** (0.094)	0.605*** (0.094)	0.577*** (0.094)
Overdraft Facility	-0.272** (0.122)	-0.263** (0.122)	-0.276** (0.122)	-0.266** (0.122)
Informal Credit	0.019*** (0.004)	0.019*** (0.004)	0.019*** (0.004)	0.019*** (0.004)
Fixed Asset	0.313*** (0.073)	0.348*** (0.075)	0.317*** (0.073)	0.354*** (0.075)
Product Innovation	0.217** (0.090)	0.217** (0.091)	0.216** (0.090)	0.216** (0.090)
Technological Capacity	-0.081 (0.086)	-0.102 (0.088)	-0.087 (0.086)	-0.108 (0.088)
Land Ownership	-0.001 (0.001)	-0.002* (0.001)	-0.002* (0.001)	-0.002* (0.001)
Constant	0.959*** (0.146)	0.852*** (0.177)	0.939*** (0.143)	0.826*** (0.174)
Industry and Country Dummies	No	Yes	No	Yes
Observations	1,108	1,108	1,108	1,108
R2	0.125	0.139	0.127	0.141

*Note:* The Ordinary Least Squares method is used for the estimation. Dependent variable: Access to Finance. Robust standard errors are reported in parentheses. \*\*\*, \*\*, and \* indicate the significance levels at 1%, 5%, and 10%, respectively.

**Table B2.** *Robustness: Spillover Effects of FDI on Access to Finance*

Explanatory Variables	(1)	(2)	(3)	(4)
Foreign Borrowing Share	0.024** (0.010)			
Foreign Firm Proportion		0.028*** (0.011)		
Foreign Sales Share			0.004** (0.002)	0.005** (0.002)
Backward Linkages				0.014** (0.006)
Forward Linkages				0.066*** (0.016)
Foreign Share	-0.006*** (0.002)	-0.006*** (0.002)	-0.005*** (0.002)	-0.005*** (0.002)
Age	-0.007* (0.004)	-0.007* (0.004)	-0.007* (0.004)	-0.008** (0.004)
Medium Firm	-0.115 (0.081)	-0.107 (0.081)	-0.124 (0.081)	-0.112 (0.080)
Large Firm	-0.179 (0.125)	-0.184 (0.124)	-0.196 (0.126)	-0.187 (0.126)
Exporter	0.245* (0.132)	0.235* (0.131)	0.239* (0.131)	0.202 (0.132)
Sole Proprietorship	0.090 (0.121)	0.068 (0.121)	0.089 (0.120)	0.082 (0.119)
Manager's Experience	0.001 (0.004)	0.001 (0.004)	0.001 (0.004)	0.002 (0.004)
Loan	0.588*** (0.095)	0.572*** (0.094)	0.581*** (0.094)	0.608*** (0.095)
Overdraft Facility	-0.289** (0.121)	-0.288** (0.124)	-0.280** (0.122)	-0.315*** (0.120)
Informal Credit	0.019*** (0.004)	0.019*** (0.004)	0.020*** (0.004)	0.020*** (0.004)
Fixed Asset	0.359*** (0.075)	0.368*** (0.075)	0.367*** (0.075)	0.394*** (0.075)
Product Innovation	0.215** (0.090)	0.209** (0.090)	0.205** (0.090)	0.204** (0.089)
Technological Capacity	-0.104 (0.088)	-0.119 (0.088)	-0.111 (0.088)	-0.137 (0.088)
Land Ownership	-0.002* (0.001)	-0.002** (0.001)	-0.002** (0.001)	-0.002** (0.001)
Constant	0.705*** (0.180)	0.827*** (0.175)	0.795*** (0.176)	0.357* (0.192)
Industry and Country Dummies	Yes	Yes	Yes	Yes
Observations	1,106	1,108	1,108	1,108
R2	0.144	0.146	0.144	0.159

Note: The Ordinary Least Squares method is used for the estimation. Dependent variable: Access to Finance. Robust standard errors are reported in parentheses. \*\*\*, \*\*, and \* indicate the significance levels at 1%, 5%, and 10%, respectively.

**Table B3.** Robustness: Spillover Effects of FDI and Firm Size

Interaction Terms		(1)	(2)	(3)	(4)
Foreign Borrowing Share	× Small Firm	0.028*			
		(0.016)			
	× Medium Firm	-0.020			
		(0.018)			
	× Large Firm	0.036***			
		(0.013)			
Foreign Firm Proportion	× Small Firm		0.025**		
			(0.011)		
	× Medium Firm		0.017		
			(0.013)		
	× Large Firm		0.041***		
			(0.012)		
Foreign Sales Share	× Small Firm			0.002	0.003
				(0.002)	(0.002)
	× Medium Firm			0.005*	0.006**
				(0.003)	(0.003)
	× Large Firm			0.009***	0.009***
				(0.003)	(0.003)
Backward Linkages	× Small Firm				0.017**
					(0.008)
	× Medium Firm				0.014*
					(0.008)
	× Large Firm				-0.001
					(0.011)
Forward Linkages	× Small Firm				0.062***
					(0.019)
	× Medium Firm				0.067***
					(0.022)
	× Large Firm				0.065**
					(0.028)
Industry and Country Dummies		Yes	Yes	Yes	Yes
Observations		1,106	1,108	1,108	1,108
R2		0.149	0.151	0.147	0.162

Note: The underlying model is obtained from Equation 3. The interaction terms between spillover variables and the dummies of firm size have been used to estimate the spillover effects on firms of different sizes. The coefficients of other control variables are not reported. The results for control variables for this estimation, however, are available upon request. The Ordinary Least Squares method is used for the estimation. Dependent variable: Access to Finance. Robust standard errors are reported in parentheses. \*\*\*, \*\*, and \* indicate the significance levels at 1%, 5%, and 10%, respectively.