CREDIT CONSTRAINTS, INSTITUTIONAL QUALITY, AND GROWTH POSSIBILITIES OF PRIVATE SMALL AND MEDIUM ENTERPRISES

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ABSTRACT

The study's objective was to investigate the impact of credit constraints and institutional quality, as measured by the provincial competitiveness index, on the growth of 2,057 private-sector small and medium-sized enterprises (SMEs) in 10 provinces in Vietnam. The data covered three years – 2011, 2013, and 2015 – and the Bayesian method was used. In addition to credit constraints and institutional quality, the paper considered the influence of macro and internal environmental factors on the growth of privately owned SMEs. The findings of the study showed that credit constraints are regarded as a major impediment to the development of private SMEs. Moreover, institutional quality not only has a direct supporting effect on this activity but also has an indirect effect by reducing credit constraints for these enterprises. Additionally, the findings demonstrate the impact of foreign direct investment inflows on the growth of private SMEs. Furthermore, the study emphasizes the importance of innovation and creativity in helping to enhance enterprises' products and services to meet customers' needs, thereby increasing enterprise revenue in a stable and long-term manner. Finally, the authors propose policies to improve transparency at all levels of government, reduce administrative procedures, boost provinces' competitiveness index, reduce credit constraints, and review control regulations to help SMEs. These changes would contribute to the competitiveness of private sector enterprises and create a solid foundation for the country's economic development.

Contribution/Originality: The study confirms the role of credit access in the development of SMEs. In addition, the results show that institutional quality and foreign direct investment (FDI) inflows have important effects on SMEs. The findings can help policymakers create policies to support the development of this business sector, which is important to an emerging market.

1. INTRODUCTION

Currently, the private sector is thought to play an important role in developing countries, where it accounts for over 85% of the Gross domestic product (GDP).[1] Khan and Reinhart (1990) also noted that the private sector is

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[1]Detemining the appropriate roles and position of private sector and FDI, *People's Deputies Online Newspaper* https://www.daibieunhandan.vn/bai-4-xac-dinh-dung-vai-tro-vi-the-cua-kinh-te-tu-nhan-va-fdi-bj8cc4eerm-56825

essential in ensuring a country's stable and sustainable development. However, in developing countries, this sector faces many difficulties, due to which it cannot play its full role in economic growth. According to The White Book on Vietnamese Businesses (2020), private enterprises account for 96.8% of all enterprises and attract about 85% of Vietnam's labor force. Nevertheless, they contribute only about 40% of GDP and 30% of the total budget revenue, demonstrating that the private sector has not yet realized its potential and made the expected contribution to the economy of Vietnam. A major limitation of private enterprises is "slow growth." According to statistics, most of Vietnam's private enterprises are small and medium-sized enterprises (SMEs); Vietnam currently has about 800 thousand enterprises, 97% of which are on a micro, small, or medium scale. The growth rate of private enterprises is considered low as it takes 10 to 20 years to grow from small to medium,[2] a fact that limits the role of private enterprises in Vietnam's economic development.

Many researchers worldwide have confirmed the critical role of business growth in laying the foundation for a country's macroeconomic stability (see (Bekaert, Harvey, & Lundblad, 2005; Levine & Zervos, 1998)). According to Ullah (2020), SMEs are an important part of the economic system, and the economic growth rate of many countries depends significantly on the growth of SMEs. For this reason, governments and policymakers often try to improve the business environment for SMEs by easing market constraints and improving institutional quality. Many researchers have delved into the role of the business environment in promoting or inhibiting the growth of enterprises, especially SMEs (see (Thorsten Beck, Demirgüç-Kunt, & Maksimovic, 2005; Beck...., Demirguc-Kunt, Laeven, & Levine, 2008)). The institutional effectiveness of a country is seen as the key to mitigating business growth constraints, especially financial ones (Beck, Demirgüç-Kunt, Laeven, & Maksimovic, 2006; Hafiz, Salleh, Garba, & Rashid, 2022).

SMEs often face significantly higher growth constraints in the business environment than large enterprises (Beck & Demirguc-Kunt, 2006). These constraints are often related to finance, taxes, regulations, the legal environment, and other factors; among these, financial constraints can be regarded as the most significant impediment to SME development. Several studies have analyzed financial constraints on business growth (e.g., (Bond & Van Reenen, 1999; Hubbard, 1998)). Moreover, empirical evidence also confirms the importance of access to finance for enterprise growth (e.g., (Deakins, North, Baldock, & Whittam, 2008; Malhotra et al., 2007)). In addition, some studies have also provided evidence that institutional quality and macroeconomic environment play a key role in easing financial constraints for businesses, especially SMEs (e.g., (Beck, Maksimovic, & Demirgüç-Kunt, 2003; Beck & Demirguc-Kunt, 2006)).

In this study, which utilizes survey data of Vietnam's SMEs in 2011, 2013, and 2015, we examine the impact of credit constraints and institutional quality in the business environment on the growth of SMEs. Previous research shows that credit constraints are one of the key factors limiting the development of SMEs. In addition, the study emphasizes the role of institutional quality in supporting SME growth and reducing constraints on SMEs' access to formal credit.

2. LITERATURE REVIEW

Many recent studies have confirmed the importance of the business environment to start-up activities, business performance, and business growth (for example, (Cull & Xu, 2005; Djankov, Miguel, Qian, Roland, & Zhuravskaya, 2005; Johnson, McMillan, & Woodruff, 2002)). Based on data from the World Business Environment Survey (WBES) in 54 countries, Bekaert et al. (2005) analyzed the relationship between different constraints – finance, laws, and corruption – and SME growth. They found that SMEs are the most constrained and confirmed that financial and institutional development can alleviate these effects and that SMEs would be the greatest beneficiaries

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[2] Why are SMEs of private sector still 'growing slowly'? *VOV Online Newspaper*, https://vov.vn/ Kinh-te/vi-sao-doanh-nghiep-tu-nhan-nho-va-vua-van-cham-lon-813413.vov.

of such development. Demirgüç-Kunt and Maksimovic (1998) also emphasized the critical role of the financial system and law enforcement in loosening financial constraints on enterprises. Bottazzi, Secchi, and Tamagni (2014) asserted that financial constraints weaken the average growth of firms. Also using data from the WBES survey, Ayyagari, Demirgüç-Kunt, and Maksimovic (2008) examined the role of the business environment in 80 countries in promoting and inhibiting the sales growth of SMEs. They found that only constraints related to finance, crime, and policy uncertainty hurt business sales.

Of all the business environment constraints affecting business growth, financial constraints have been identified as one of the most serious growth impediments. In addition, studies have also shown that the macroeconomic situation and institutional quality play key roles in reducing credit constraints for businesses, especially SMEs (see (Beck et al., 2006; Clarke, Cull, & Martinez Peria, 2001)). Demirgüç-Kunt and Maksimovic (1998) found that enterprises' barriers to finance access are lower in countries with more efficient legal systems. Love (2003) showed that financial development at the national level reduces the effect of financial constraints on investment. Fauceglia (2015) affirmed the importance of financial development in reducing credit constraints to business investment in 17 developing countries. Laeven (2003) found that financial liberalization helps ease the financial constraints of enterprises, especially SMEs. Research by Beck, Demirgüç-Kunt, and Martinez Peria (2008) showed the importance of national institutional improvement for SMEs' access to external finance. Beck et al. (2006) indicated that older, more significant firms, as well as those that benefit from foreign direct investment (FDI), are less likely to face financial constraints. Institutional development is another factor that explains the difference in enterprises' financial constraints across countries.

Theoretical and experimental studies have both confirmed that a well-functioning banking system facilitates the transfer of savings funds to promising projects, ensuring an efficient allocation of capital and thereby promoting sustainable economic growth (Levine, 2005). However, unhealthy institutional quality is a potential threat to the effectiveness of this capital allocation mechanism. SMEs will be more adversely affected by a lack of institutional integrity and transparency in the lending process. Credit constraints force SMEs to forgo profitable investment opportunities, leading to lower growth rates (Beck et al., 2005). Corruption redirects the allocation of bank capital from standard projects to bad ones, reducing the quality of private investments and thus eroding economic growth (Park, 2012). In a non-transparent lending environment, enterprises with high-level banking relationships have easier access to credit, which can lead to heavy losses, not only for banks but also for the economy, when banks' lending decisions are not entirely based on considerations of the enterprise's capital efficiency (Charumilind, Kali, & Wiwattanakantang, 2006). In summary, institutional quality improves the business environment and reduces SMEs' credit access constraints.

3. METHODOLOGY

Based on the review of previous studies, we propose the following hypotheses:

Hypothesis 1: Credit constraints limit the growth potential of SMEs in the private sector.

Hypothesis 2: Institutional quality enhances the growth potential of SMEs in the private sector.

Besides institutional quality, government spending is another macro factor affecting SMEs' growth in the private sector. According to Keynes (1936) the government can effectively stimulate demand growth through budget expenditure, such as financial subsidies, or the implementation of investment projects, boosting consumption and production and thereby creating an impetus for economic growth. Based on this argument, we propose hypothesis 3 as follows:

Hypothesis 3: Budget expenditure promotes the growth of SMEs in the private sector.

In addition to institutional quality and budget expenditure, FDI inflows are also expected to positively impact the development of SMEs in the private sector. Granstrand, Håkanson, and Sjölander (1993) argued that FDI can

help enterprises in the host country access management skills and scientific and technological knowledge, thereby improving these enterprises' competitiveness. Therefore, we propose the following hypothesis:

Hypothesis 4: FDI inflows improve the growth potential of SMEs in the private sector.

Aside from macro factors, we also consider the role of enterprises' internal factors in the growth of private SMEs. The internal factors of various enterprises are considered in this study, including enterprises with official websites, enterprises with import and export activities, enterprises with creative activities, and enterprises with e-commerce activities.

According to Lu and Beamish (2006) exports clearly contribute to firm growth through increased sales. By selling goods in new markets, businesses can achieve higher sales volumes. Higher sales allow the firms to expand production to meet market demand. Thus, hypothesis 5 is as follows:

Hypothesis 5: SMEs in the private sector with import-export activities have higher growth potential.

Lunati (2000) believed that the Internet would enable businesses to access a wider market and increase their number of customers. Costello and Tuchen (1998) asserted that businesses that publish product information on their websites will reach more customers and more easily receive customer feedback, allowing them to improve products to meet the customers' needs. Regarding internet applications, Sevtian (2011) argued that e-commerce would help businesses buy, sell, and provide products and services more conveniently, thereby improving their sales. Hypotheses 6 and 7 are based on these arguments:

Hypothesis 6: SMEs in the private sector with e-commerce activities have higher growth potential.

Hypothesis 7: SMEs in the private sector with an official website have higher growth potential.

Schumpeter and Backhaus (2003) asserted that innovation activities help improve the competitiveness of enterprises. Rosenbusch, Brinckmann, and Bausch (2011) argued that introducing new innovative products and services drives the enterprises' growth thanks to the new demand-setting mechanism. Thus, the final hypothesis is:

Hypothesis 8: Innovation activities promote the growth of SMEs in the private sector.

Thus, the research model is:

$$SALEG = \alpha_1 \text{OBSCRE} + \alpha_2 EXP + \alpha_3 INO + \alpha_4 ECON + \alpha_5 WEB + \alpha_6 GOV + \alpha_7 PCI + \alpha_8 FDI + \varepsilon \qquad (1)$$

$$EMPG = \beta_1 \text{OBSCRE} + \beta_2 EXP + \beta_3 INO + \beta_4 ECON + \beta_5 WEB + \beta_6 GOV + \beta_7 PCI + \beta_8 FDI + \varepsilon \qquad (2)$$

In which OBSCRE, EXP, INO, ECOM, WEB, GOV, PCI, and FDI are defined in Table 1; ε is the error term for the firm i in year t.

$$SALEG = \frac{\text{Sales}_{\text{year t}} - \text{Sales}_{\text{year t}-1}}{\text{Sales}_{\text{year t}-1}}$$

$$EMPG = \frac{\text{Employment}_{\text{year t}} - \text{Employment}_{\text{year t}-1}}{\text{Employment}_{\text{year t}-1}}$$

In which SALEG is sales growth, and EMPG is employment growth of SMEs of the private sector.

Research data was collected from the SME survey conducted by the Central Institute for Economic Management (CIEM) under the direct authority of the Ministry of Planning and Investment of Vietnam, the Institute of Labour Science and Social Affairs under the Ministry of Labour, Invalids and Social Affairs of Vietnam, and the Relationship Index of the Development Economics Research Group (DERG) of the University of Copenhagen, Denmark in 2011, 2013, 2015, with a total of 7,608 SMEs surveyed in those 3 years. However, in this study, we only considered private sector enterprises that applied for bank loans. Those with sales growth above 100% or below -100% were considered outliers and excluded from the sample. Hence, the number of observations remaining in the sample was 2,057 enterprises. Moreover, a priori information was not available because the majority of earlier research was conducted using a frequency technique. Nevertheless, since the number of observations in the sample was 2,057, which is a considerable number, the lack of a priori information did not affect the posterior distribution too much. In this case, Block, Peter, and Danny (2011) proposed using a standard

Gaussian distribution with different a priori information (simulation of a priori information) and conducting a Bayesian factor analysis to choose the simulation with the best a priori information.

Table 1. Description of variables in the research model.

Variables	Description	Expected sign
Dependent variables		
SALEG	Sales growth	
EMPG	Employment growth	
Independent variables		
OBSCRE	Credit constraints; takes the value '1' if SMEs in the private sector have difficulties accessing bank loans and '0' otherwise.	-
EXP	Export; takes the value '1' if SMEs in the private sector have export activity and '0' otherwise.	+
INO	Innovative activity; takes the value '1' if SMEs in the private sector are involved in product improvement or the introduction of new products or processes in the last 3 years and '0' otherwise.	+
ECOM	E-commerce; takes the value '1' if SMEs in the private sector have e-commerce activity and '0' otherwise.	+
WEB	Website; takes the value '1' if SMEs in the private sector have a website and '0' otherwise.	+
GOV	Government spending as percent of GDP	+
PCI	Natural Logarithm of Provincial Competitiveness Index	+
FDI	Natural Logarithm of FDI	+

The simulations in Table 2 indicate reducing levels of a priori knowledge, with simulation 1 showing the highest knowledge and simulation 5 the lowest.

We also created five simulations, simulation 6 to simulation 10, which were nearly identical to model 2, with simulation 6 having the highest level of a priori information ($\beta_i \sim N$ (0,1)) and Simulation 10 having the lowest level ($\beta_i \sim N$ (0,10000).

Table 2. Description of a priori information.

Rational function	$SALEG \sim N(\mu, \sigma)$
A priori distribution	
Simulation 1	$\alpha \sim N(0,1)$ $\sigma^2 \sim Invgamma(0.01, 0.01)$
Simulation 2	$\alpha \sim N(0,10)$ $\sigma^2 \sim Invgamma(0.01, 0.01)$
Simulation 3	$\alpha \sim N(0,100)$ $\sigma^2 \sim Invgamma(0.01, 0.01)$
Simulation 4	$\alpha \sim N(0,1000)$ $\sigma^2 \sim Invgamma(0.01, 0.01)$
Simulation 5	$\alpha \sim N(0,10000)$ $\sigma^2 \sim Invgamma(0.01, 0.01)$

Next, we carried out Bayesian regression for the above simulations and performed Bayes Factors analyses and Bayes posterior tests (bayestest model). These are the techniques proposed by Stata Corp (2019) to select the simulation with the best a priori information. In essence, the Bayes factors provide a tool to compare the ratio of the probability of a particular hypothesis occurring (a priori information) with the probability of another one. It can be understood as a measure of the strength of evidence in favor of a theory among competing (a priori information) theories. Accordingly, Bayesian analysis provides average Log BF (Bayes Factor), Log ML (Marginal Likelihood), and average DIC (Deviance Information Criterion). The Bayes posterior test helps compare the posterior probability of the simulations with different a priori information; accordingly, based on the research data combined with the proposed a priori information, we chose the simulation with the largest posterior probability P(M|y).

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In summary, in this study, we built 5 simulations with 5 different a priori information levels, and Bayes factor analysis and Bayes posterior tests helped select the simulation with the appropriate a priori information. The selected simulation was that with the largest average Log BF, the largest average Log ML, the lowest average DIC, and the largest P(M|y).

Table 3. Bayes factor analysis results.

Model 1					
Variables	**Chains**	**Avg DIC**	**Avg log (ML)**	**Log (BF)**	**P (M|y)**
SALEG1	3	-401.6229	162.3858	.	0.9999
SALEG2	3	-401.0596	152.8422	-9.5436	0.0001
SALEG3	3	-401.0722	142.6421	-19.7437	0
SALEG4	3	-401.0449	132.4378	-29.9479	0
SALEG5	3	-400.9896	121.8904	-40.4954	0
Model 2					
Variables	**Chains**	**Avg DIC**	**Avg log (ML)**	**Log (BF)**	**P (M|y)**
EMPG1	3	-544.904	234.3737	.	0.9999
EMPG2	3	-544.4492	224.6313	-9.7424	0.0001
EMPG3	3	-545.2438	213.9115	-20.4622	0
EMPG4	3	-544.8136	203.7932	-30.5805	0
EMPG5	3	-544.8484	193.3141	-41.0596	0

Note: SALEG is Sales growth; EMPG is Employment growth.

4. RESULTS AND DISCUSSION

Table 3 shows that simulation 1 met the criteria as the most suitable a priori information simulation. Furthermore, the posterior test results demonstrated that simulation 1 outperformed the other simulations; therefore, simulation 1 with a priori information N (0, 1) was chosen. Likewise, simulation 6 with a priori N (0, 1) was the best fit for model 2. Because Bayesian research is represented using Markov Chain Monte Carlo (MCMC), the MCMC must coincide to ensure the stability of the Bayesian regression, which means that the MCMC must ensure stationary. Stata Corp (2019) suggests running the MCMC convergence test using the convergence diagnostic chart. According to Stata Corp (2019) the MCMC convergence diagnostic plot includes a trace plot, histogram, autocorrelation chart, and density plot. The trace plot helps track the historical display of a parameter value over the iterations of the series. Figure 1 shows that the trace plot fluctuates around the mean; thus, the MCMC is stationary, reaching convergence conditions. Additionally, the plot's autocorrelation chart only fluctuates around the level below 0.02, showing that it is suitable for the distribution simulation density and reflects all the lags within the effective limits, according to the criteria of Stata Corp (2019). In addition, the histogram and density plot show that if the shape simulation of the normal distribution of the parameters and the shape charts are the same, it can be concluded that Bayesian regression ensures stability. Hence, Figure 1 shows that the MCMC meets the convergence condition. We obtained similar results for model 2. In addition to graphical convergence diagnostics, Stata Corp (2019) also recommends testing be means of the average acceptance rate, minimum average efficiency, and maximum Gelman-Rubin Rc. The minimum efficiency of the model, as shown in Table 4, was 0.94, far exceeding the permitted level of 0.01; in addition, the maximum Rc value of the coefficients was 1. Gelman and Rubin (1992) suggested that any coefficient of the model with a diagnostic value of Rc greater than 1.2 should be regarded as non-convergent. Consequently, the results in Table 4 demonstrate that the model's MCMC series complied with the convergence conditions. Unlike the frequency method, the regression results table shows the regression coefficients. In the Bayesian approach, through the Metropolis-Hastings (MH) algorithm, the regression model is simulated 10,000 times. Each time we obtain a regression coefficient, the regression results table shows the mean and median of the regression coefficients after 10,000 simulations. Bayes regression also provides a probability distribution density (Equal-tailed 95% Cred. Interval), providing a series for a parameter, and the probability that the parameter is in this series is 95%.
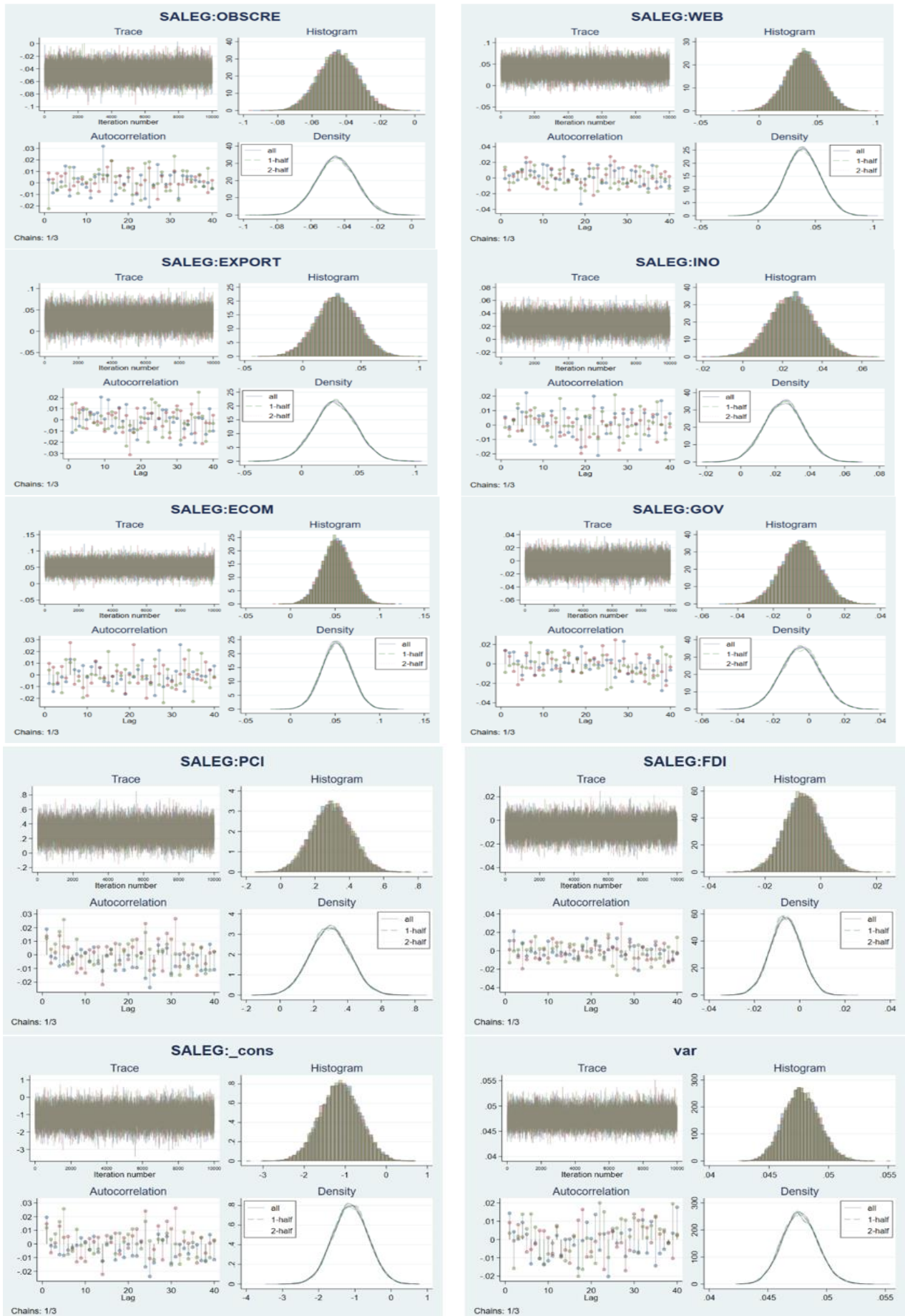
Figure 1. Convergence diagnostic plots.

The Bayesian regression results table also includes the Monte-Carlo Standard Error (MCSE), which indicates the stability of the MCMC series, in addition to the standard deviation (Std. Dev) of the regression coefficient. Flegal, Haran, and Jones (2008) found that the strength of the MCMC series increases as the MCSE approaches zero; an MCSE with less than 6.5% standard deviation is considered acceptable, and less than 5% standard deviation approaches the ideal level. According to the findings in Table 4, the MCSE value is at the ideal level.

Table 4. Bayesian simulation outcomes.

Variables	Mean	Std. Dev.	MCSE	Median	Equal-tailed [95% Cred. Interval]	
SALEG						
OBSCRE	–0.045	0.012	0.000	–0.045	–0.068	–0.022
WEB	0.039	0.016	0.000	0.039	0.008	0.069
EXP	0.029	0.018	0.000	0.029	–0.007	0.066
INO	0.025	0.011	0.000	0.025	0.002	0.047
ECOM	0.052	0.016	0.000	0.051	0.019	0.084
GOV	–0.005	0.011	0.000	–0.005	–0.026	0.017
PCI	0.297	0.118	0.001	0.297	0.067	0.527
FDI	–0.006	0.007	0.000	–0.006	–0.020	0.007
_cons	–1.124	0.488	0.003	–1.123	–2.077	–0.170
var	0.048	0.002	0.000	0.048	0.045	0.051
Avg acceptance rate	1.000					
Avg efficiency: min	0.968					
Max Gelman-Rubin RC	1.000					
EMPG						
OBSCRE	–0.028	0.011	0.000	–0.028	–0.050	–0.006
WEB	–0.003	0.015	0.000	–0.003	–0.032	0.027
EXP	–0.005	0.018	0.000	–0.005	–0.040	0.031
INO	0.021	0.011	0.000	0.021	0.000	0.042
ECOM	0.028	0.016	0.000	0.028	–0.003	0.059
GOV	0.013	0.011	0.000	0.013	–0.009	0.034
PCI	0.219	0.116	0.001	0.219	–0.005	0.447
FDI	–0.002	0.007	0.000	–0.002	–0.016	0.011
_cons	–0.932	0.480	0.003	–0.933	–1.882	0.000
var	0.044	0.001	0.000	0.044	0.042	0.047
Avg acceptance rate	1.000					
Avg efficiency: min	0.989					
Max Gelman-Rubin Rc	1.000					

Note: SALEG is Sales growth; EMPG is Employment growth; OBSCRE is Credit constraints, taking the value '1' if SMEs in the private sector have difficulties in accessing bank loans and '0' otherwise; EXP is Export, taking the value '1' if SMEs in the private sector have export activity and '0' otherwise; INO is Innovative activity, taking the value '1' if SMEs in the private sector are involved in product improvement and the introduction of new products or processes in the last 3 years and '0' otherwise; ECOM is E-commerce, taking the value '1' if SMEs in the private sector have e-commerce activity and '0' otherwise; WEB is Website, taking the value '1' if SMEs in the private sector have websites and '0' otherwise; GOV is Government spending as percent of GDP; PCI is the natural logarithm of the Provincial Competitiveness Index; FDI is the natural logarithm of Foreign direct investment.

The regression results in Table 4 reveal that credit constraints (OBSCRE) and FDI have a negative impact on sales growth (SALEG) and employment growth (EMPG), while innovative activity (INO), E-commerce (ECOM), and PCI all have positive effects on SALEG and EMPG. However, whether the company has a website (WEB) and the export (EXP) variable both positively affect SALEG but negatively affect EMPG, meaning that these two variables must be analyzed more carefully. Unlike the frequency method, the statistical results are tested using the null hypothesis. For example, we set the null hypothesis as H_0: credit constraints (OBSCRE) have no negative effect on the sales growth (SALEG) of SMEs in the private sector. Then we calculate the p-value, which is the conditional probability, i.e., the probability of the observation that credit constraints have no negative impact on SMEs' sales growth under the condition that hypothesis H_0 is true. After calculating the p-value, we reject hypothesis H_0 and conclude that credit constraints have a negative impact on the sales growth of SMEs in the private sector (if the p-

value is less than 5% or 10%); otherwise, we accept the hypothesis H₀ that credit constraints do not affect the sales growth of these enterprises. However, using this method, we do not calculate the probability that credit constraints have a negative impact on the sales growth of private SMEs. Meanwhile, using the Bayesian method, we can calculate the occurring probability of these trends, which is considered to be the unique advantage of the Bayesian method over the frequency method.

Table 5 shows that the negative impact of credit constraints on the growth of SMEs in the private sector is clear, as the probability of the variable OBSCRE having a negative impact on SALEG and EMPG is 100% and 99.2%, respectively. This result is consistent with the original hypothesis. Private SMEs that do not have access to credit face many difficulties when implementing investment and business plans or cannot conduct innovative activities due to financial constraints, which reduces their competitiveness and directly affects the growth of these enterprises.

Table 5. Posterior probability.

Variables	Mean	Std. Dev.	MCSE
SALEG			
prob {SALEG: OBSCRE} <0	1.000	0.017	0.000
prob {SALEG: WEB} >0	1.000	0.000	0.000
prob {SALEG: EXP} >0	0.996	0.064	0.001
prob {SALEG: INO} >0	0.990	0.098	0.001
prob {EMPG: ECOM} >0	0.732	0.443	0.003
prob {SALEG:GOV}<0	0.723	0.448	0.004
prob {SALEG: FDI} <0	0.777	0.417	0.004
prob {SALEG: PCI} >0	0.992	0.089	0.001
EMPG			
prob {EMPG: OBSCRE}<0	0.992	0.092	0.001
prob {EMPG: WEB} <0	0.696	0.460	0.003
prob {EMPG: EXP} <0	0.611	0.487	0.003
prob {EMPG: INO} >0	0.978	0.147	0.001
prob {EMPG: ECOM} >0	0.974	0.160	0.001
prob {EMPG: GOV} >0	0.862	0.345	0.002
prob {EMPG: FDI} <0	0.610	0.488	0.003
prob {EMPG: PCI} >0	0.966	0.181	0.001

Note: SALEG is Sales growth; EMPG is Employment growth; OBSCRE is Credit constraints, taking the value '1' if SMEs in the private sector have difficulties in accessing bank loans and '0' otherwise; EXP is Export, taking the value '1' if SMEs in the private sector have export activity and '0' otherwise; INO is Innovative activity, taking the value '1' if SMEs in the private sector are involved in product improvement and the introduction of new products or processes in the last 3 years and '0' otherwise; ECOM is E-commerce, taking the value '1' if SMEs in the private sector have e-commerce activity and '0' otherwise; WEB is Website, taking the value '1' if SMEs in the private sector have websites and '0' otherwise; GOV is Government spending as percent of GDP; PCI is the natural logarithm of the Provincial Competitiveness Index; FDI is the natural logarithm of Foreign direct investment.

Although the WEB and EXP variables have a negative impact on the employment growth (EMPG) of private SMEs, the probability of their impact is very low at only 69.6% and 61.1%, respectively. Therefore, there is not enough evidence to confirm the impact of these two factors on EMPG. Meanwhile, the positive impact of WEB and EXP on sales growth (SALEG) is very clear, with an impact probability of 99.6% and 99%, respectively, which is consistent with the original hypothesis. Enterprises with a website can publish their product information on the Internet, making it much easier to reach consumers and receive customer feedback to improve the quality of products and services. Similarly, enterprises that conduct e-commerce activities make buying and selling products and services more convenient for customers, thereby attaining a higher growth rate than enterprises without this activity.

Enterprises with export activities are able to access a larger market than enterprises that only supply products to the domestic market. In addition, to be able to export their products, these enterprises need to regularly improve their products to meet the standards of export markets, so the quality of their products also tends to evolve. This

helps them improve their competitiveness in the domestic market, allowing them to maintain a stable sales growth rate.

Innovation is considered an important factor for enterprise growth; the positive impact probability of the variable INO on SALEG and EMPG is 99% and 97.8%, respectively. This result is consistent with previous empirical studies (Rosenbusch et al., 2011; Schumpeter & Backhaus, 2003).

As for the macro factors, we have insufficient evidence to assess the direct impact of government spending and FDI inflows on the growth of SMEs because the probability of their impact is not large enough. However, we can indirectly assess the effects of these two factors on the growth of enterprises through the credit access channel. The provincial competitiveness index (PCI) has an obvious positive effect on the growth of private SMEs; the probability of its impact on SALEG and EMPG is 99.2% and 99.6%, respectively. Many studies have highlighted the role of institutional quality in the development of enterprises in general and SMEs in particular (see (Cull & Xu, 2005; Johnson et al., 2002)). Institutional quality not only has a direct impact on the growth of SMEs in the private sector, but it also has an indirect impact by reducing the constraints these enterprises encounter when accessing credit capital.

To assess the impact of macro factors on credit constraints, we conducted a Logit Bayes regression with the binary variable OBSCRE as the dependent variable and, as the independent variables, the variables associated with the macro factors, including GOV, FDI, and PCI. Since a priori information for this model is not available, in the case of a Bayes Logit regression, Andrew Gelman, Jakulin, Pittau, and Su (2008) suggested using Cauchy (0, 2.5) for the regression coefficients and Cauchy (0,10) for constants.

Table 6. Regression results concerning the impact of macro factors on private SMEs' credit constraints.

OBSCRE	Mean	Std. Dev.	MCSE	Median	Equal-tailed [95% Cred. Interval]	
FDI	0.461	0.079	0.008	0.455	0.303	0.611
GOV	-0.353	0.121	0.013	-0.365	-0.560	-0.110
PCI	-2.754	1.567	0.185	-2.536	-6.272	-0.439
_cons	10.267	6.512	0.775	9.412	0.619	24.668
Avg acceptance rate	0.169					
Avg efficiency: min	0.047					
Max Gelman-Rubin Rc	1.073					

Note: GOV is Government spending as percent of GDP; PCI is the natural logarithm of the Provincial Competitiveness Index; FDI is the natural logarithm of Foreign direct investment.

The regression results in Table 6 show that FDI inflows increase credit constraints for private SMEs, while government spending (GOV) and provincial competitiveness index (PCI) reduce these constraints. To be more certain about the sign of the regression coefficients, we conducted a posterior Bayesian analysis.

Table 7. Posterior probability results concerning the impact of macro factors on SMEs' credit constraints.

Variables	Mean	Std. Dev.	MCSE
Prob {{OBSCRE: FDI} >0	1.000	0.000	0.000
Prob {OBSCRE:GOV} <0	0.997	0.058	0.000
Prob {EMPG: PCI}<0	0.956	0.205	0.031

Note: OBSCRE is Credit constraints, taking the value '1' if SMEs in the private sector have difficulties accessing bank loans and '0' otherwise; EMPG is Employment growth; GOV is Government spending as percent of GDP; PCI is the natural logarithm of the Provincial Competitiveness Index; FDI is the natural logarithm of Foreign direct investment.

Table 7 shows that FDI increases the probability of credit constraints for private SMEs by up to 100%. FDI creates capital inflows for the host country, but this capital flow is still under the control of FDI enterprises. If FDI enterprises are in the banking sector, they can improve access to capital for firms and consumers (Akbar & McBride, 2004). However, if FDI enterprises are in other sectors, they can increase credit demand in the domestic financial

market. This need for loans may be one of the reasons FDI causes credit constraints for enterprises in the host country; FDI enterprises may "crowd out" domestic ones (Rutkowski, 2005). Harrison and McMillan (2003) noted that FDI enterprises can increase competition in the domestic market and thereby reduce the profitability of domestic enterprises. The results in Table 6 also show that though the impact probability is unclear, the variable FDI also tends to negatively impact SALEG and EMPG. In addition, Akbar and McBride (2004) argued that in transition economies and developing countries, FDI enterprises often have an advantage in accessing credit because they have more transparent documents and guarantees from their parent company, so their credit risk is lower.

Government spending (GOV) and the Provincial Competitiveness Index (PCI) help reduce credit constraints with probabilities of 99.7% and 95.6%, respectively. Beck et al. (2008) asserted that an improved institutional environment helps improve transparency and the development of financial markets, thereby improving the access of actors in the economy to capital. Additionally, by promoting investment activities, local governments help promote economic growth; for banks, this can also be a signal to loosen macroeconomic policies to support economic growth, meaning that banks tend to expand their lending activities and make it easier for private SMEs to access credit capital.

5. CONCLUSIONS AND POLICY IMPLICATIONS

This study examined the effects of credit constraints and institutional quality on the development of SMEs in 10 Vietnamese provinces. In addition to credit constraints and institutional quality, we considered the impact of certain internal and macro-environmental elements on the growth of privately owned SMEs.

The research results show that credit constraints are a major hindrance to the development of private SMEs. Meanwhile, the competitiveness index not only has a direct supportive effect on the growth of these enterprises but also has an indirect impact on this growth by reducing credit constraints for these enterprises. The results of this study confirm the findings of previous studies on the roles of credit capital and institutional quality. To encourage a strong private SME system as a foundation for the economy, in addition to improving transparency at all levels of government, reducing administrative procedures, and improving the province's competitiveness index, it is necessary to reduce credit constraints and review regulations to facilitate SMEs' access to loans, as well as develop support funds, such as credit guarantee funds, for private SMEs.

E-commerce is another important driving force for the development of enterprises. This is especially evident under the complicated circumstances of the Covid-19 pandemic. E-commerce can be an extremely useful solution to help enterprises overcome pandemic-associated difficulties. The research also emphasized the importance of innovation and creativity, which help enterprises improve their products and services to meet the demands of customers, thereby increasing sales in a stable and sustainable way.

The research results also showed the crowding-out effect FDI enterprises have on private SMEs, which implies that provinces and cities should not focus too much on increasing the number of FDI enterprises, as it may have unintended negative impacts on domestic businesses in particular and the overall economy in general. To reduce this risk, provinces and cities must focus on the quality of FDI inflows. They should only accept projects that align with the local development strategy and those with high technology. It is also necessary to strengthen the connections between FDI manufacturers and domestic manufacturing enterprises to ensure that FDI inflows drive the development of the domestic enterprise system instead of crowding out the growth of these enterprises. Finally, to get the national economy out of a potential imbalance when it is too dependent on a certain area, such as in this study, the FDI sector, the private sector should assume its inherently important position. It is necessary to minimize policies that are biased toward FDI enterprises, create a fair and healthy business environment, and contribute to improving the competitiveness of enterprises in the private sector; together, this will create a solid foundation for national economic development.

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