FINANCIAL CONSTRAINTS, TAX BURDENS, AND FIRM GROWTH: EVIDENCE FROM INDONESIA

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Abstract

Using a subjective measure of the constraints and data from World Bank Enterprise Survey, this paper investigates whether two business constraints, financial constraints and tax burdens, have the same impact on Indonesian firm growth. This paper employs instrumental variable estimation to handle endogeneity problems and finds that among the two business constraints examined in the analyses, only the financial constraint is a binding constraint that has a significantly negative impact on Indonesian firm growth, while taxes have a positive and significant impact on firm growth. Based on size classification, a significant impact is only found on large firms. Financial constraints and tax burdens are likely not to be binding constraints to firm growth for small firms, and the benefits from taxes are also not found on these firms. Further investigation of financial constraints reveals that private firms, manufacturing firms, and young firms are more sensitive to the negative impact of financial constraints.

Keywords: Financial constraint, tax burden, firm growth, Indonesia

JEL Classification: D22, G30, H20

INTRODUCTION

Enterprise performance, especially firm growth, has a strong connection to economic development in a country. Beck et al. (2005) explain that if growth rate of per-capita GDP and investment opportunities in an economy are correlated, there should be a relation between the growth rate of individual firms and the growth rate of the economy. Bishop et al. (2009) give three channels through which firm growth can affect national economic performance. They suggest that firm growth will contribute employment, output, and productivity growth to an individual firm; contribute an aggregate effect on productivity growth from resource reallocation between firms; and contribute spillover effects from employment, output and productivity growth. Some empirical evidence has also been studied to prove the relationship between enterprises performance and economic development (e.g., Rajan & Zingales, 1998; Wong et al., 2005; Kaas et al., 2015).

In the literature, enterprise performance has been widely studied not only in understanding its impact on the economy, but also in investigating its determinants. One of the determinants affecting enterprises performance is business constraints. Enterprises face various constraints that impact their business performance. Some studies find that those constraints can affect enterprises` growth (e.g., Becchetti & Trovato, 2002; Beck et al., 2005; Schiavo & Musso, 2008), innovation (e.g., Savignac, 2008; Gorodnichenko & Schnitzer, 2013; Coad et al., 2016), or investment (e.g., Asiedu & Freeman, 2009; Gomez, 2019; Dejuan-Bitria & Mora-Sanguinetti,

2021). Understanding the constraints and their impact on business performance is not only useful for scholars, but governments can consider them in designing policies or regulations, especially when considering which constraints or enterprises must be prioritized.

This paper then seeks new evidence about the nexus between business constraints and firm growth. Two business constraints, financial constraints and tax burdens, are examined to show their impact on Indonesian firm growth. To our knowledge, compared to cross country analyses, the body of research using a single country in this field is still limited. Single country analysis can reduce serious concern about unobserved heterogeneity across data points (Fisman & Svensson, 2007), and it provides detailed explanation about the experience of a single country in depth. Regarding the impact of taxation on firm growth, the lack of research on this issue is due mainly to the poor quality of taxation data available to researchers (Chauvet & Ferry, 2021).

Financial constraints are often found to be the constraint having the highest impact on growth compared with other business constraints. By using survey data for 80 countries in 1999-2000, Ayyagari et al. (2008) examine 10 business constraints affecting firm growth and found that financial constraint is the most important factor that lowers firm growth, followed by crime, and policy instability. Using more business constraints and recent data, Dinh et al. (2010) find that financial constraint is the most binding constraints among 15 business constraints. In this study, the business constraints analysed are: access to finance, practices of competitors in the informal sector, electricity, corruption, crime, inadequately educated workforce, labour regulations, business licensing and permits, political instability, tax administration, tax rates, transport, customs and trade regulations, courts, and access to land.

In Indonesia financial constraint is a serious problem affecting enterprise growth. The International Labour Organization (ILO, 2019) mentioned that financial constraints, especially the lack of and limited access to financial services, is one of the major constraints faced by enterprises affecting their growth. Even though some programs and regulations such as Indonesia's Guaranteed Microfinance program (KUR), minimum allocation of bank credit to small enterprises regulation, or online collateral registration have been released, they are considered not effective in tackling this constraint.

On the other hand, among business constraint, the tax burden has unique characteristics in affecting growth among business constraints. Even though business constraints normally result in negative impact on firm growth, some studies found that taxes can also help enterprises to develop. When enterprises pay taxes, there are direct and indirect benefits received by those enterprises. Roads, bridges, harbours, airport, or power generation are some of the infrastructures built from taxes that the enterprises can use in developing business. A study from Chauvet and Ferry (2021) in 102 countries also proves that taxation can have a positive impact on firm growth which is also in-line with the study of Aghion et al. (2016).

In Indonesia, there are two types of taxes that must be paid by enterprises. The first type are central government taxes. These taxes consist of income tax, value added tax, and land and building tax for mining, forestry and plantation sectors. In

this first type, the tax rates are generally the same in all Indonesian regions. As a government revenue, these taxes contribute to three-quarters of Indonesia's public revenues (Indonesia Ministry of Finance and World Bank, 2015). On the other hand, the second type are local taxes which can be divided based on the level of local government. Land and building tax in city or village, vehicle tax, hotel and restaurant tax, and signboard tax are some taxes that must be paid to the local government. These tax rates vary depending on local government regulation.

To reduce the burden of taxation, the government has also made regulations and designed its tax structure (tax rate, tax base, direct or indirect tax, progressive or regressive tax) to favor specific businesses or sectors. Some regulations to reduce the tax burden are: a 50% tax rate cut for small firms (2009), a tax rate cut for new firms and listed firms (2009), a 1% final tax income (from annual gross turnover) for small firms (2013), a 0.5% final tax income (from annual gross turnover) for small firms (2018), extending 0% export VAT (2019), and removing the dividend tax (2020). These regulations are all expected to reduce the burden for enterprise tax liabilities.

This paper will provide empirical evidence of how these two constraints affect firm growth in Indonesia, to determine whether both constraints contribute to a lower level of growth of the firms, and whether they merit special attention from the government. It also evaluates the program that have been offered by the government to reduce the constraints or their negative impacts. Many programs focus on small enterprises, and this paper examines whether small enterprises are the only sectors to be prioritized. In addition, other sectors that may deserve government attention in policy reform are examined.

LITERATURE REVIEW

Research that investigates the determinants of firm growth has received much attention in the literature. In 1931, Gibrat's Law states that the rate of growth of a firm is independent of its size and the given rate of growth will be the same for any firm within the same industry. It means that after controlling for industry characteristics, any other variables will not affect the expected rates of growth. By using Gibrat's Law as a theoretical benchmark, many studies then undertake research to test the law and to find other determinants of firm growth (e.g., Mansfield, 1962; Dunne & Hughes, 1994; Wagner, 1992; Becchetti & Trovato, 2002).

In order to examine "growth independence" in Gibrat's law, Becchetti and Trovato (2002) include some variables: the availability of external finance, market rents, and access to foreign markets, in analyzing the determinants of firm growth. By testing around 5,000 Italian manufacturing firms and using leverage, subsidy (dummy), and credit rationing (dummy) as proxies of the availability of external finance variable, they find that "growth independence" does not hold in this study. This is because financial variables included in the test have a significant effect on firm growth, especially for small and medium sized Italian firms, while in Gibrat's law there should be no other variables affecting the expected rates of growth after controlling for industry characteristics. Following this study, Huynh and Petrunia (2010) and Anton (2016) also use leverage as a proxy to emphasize the role of a

financial variable as a determinant of growth on Canadian and Romanian firms, respectively.

Other studies include financial variables in understanding the determinants firm growth, but use different proxies in measuring the variables. Aterido et al. (2011) use three measures of financial variables (access to finance) in analyzing the business environment that affect firm growth in 90 countries. As proxies of access to finance, the share of investment financed externally; the share of working capital financed externally; and the share of sales on credit, are used in the analysis. Unlike the previous studies, even though Aterido et al. (2011) find that access to finance gives a positive impact on firm growth, small firms do not receive the highest impact in this study. Musso and Schiavo (2007) offer another approach to measure the degree of financial constraint faced by French firms to see its impact on firm survival and growth. They use a time varying index derived from seven variables (total assets, profitability, liquidity, solvency, trade credit over total assets, and repaying ability) to measure the existence of financial constraints. They find that the financial constraint increases the probability of exiting the market and reduces their growth. However, in the short run, it increases firm productivity.

Instead of using objective measures of financial constraints, some studies use subjective measures (self-reported answer) taken from surveys to understand the impact of financial constraints on firm growth and to compare its impact with other constraints. Expanding on the Demirguc-Kunt and Maksimovic (1998) study that only uses samples of large firms, Beck et al. (2005) use a size-stratified survey of over 4,000 firms in 54 countries to show the relationship between financial, legal, and corruption obstacles; and firm growth, and to examine whether this relationship varies across firms of different size and different levels of financial and institutional development. The result finds that all of the obstacles have a significant negative impact on firm growth. However, it depends on firm size and the smallest firms experience the highest impact.

In addition, using similar subjective measures of financial constraints, Ayyagari et al. (2008) include more obstacles to find which one is the most constraining. They conclude that from 10 obstacles included in the study, only finance, crime, and policy instability, can be directly associated with firm growth. Meanwhile, seven other obstacles: corruption, infrastructure, taxes and regulations, judicial efficiency, crime, anticompetitive practices, policy instability and uncertainty, and inflation, affect firm growth indirectly through those three direct obstacles. The result also shows that when only including the three direct obstacles in the analysis, the finance variable is the most robust. The similar conclusion is also obtained by Dinh et al. (2010) using 15 obstacles in their analysis.

In recent studies, Ullah (2020) includes subjective and objective measures as proxies for financial constraints. He focuses on small and medium sized enterprises in transition economies to examine the impact of financial constraints and corruption on firm growth. He uses over 10,000 firms from 28 Eastern European and Central Asian (ECA) countries which are considered as an under explored group of countries in regard to this topic. To explain the financial constraints, he uses a subjective measure (self-reported measure) and four dummy variables as its proxy which takes 1 if the firm did not purchase any fixed assets, does not have an overdraft facility,

does not have a line of credit or loan from a financial institution, and does not have an overdraft facility or a line of credit or loan from a financial institution, respectively. He finds that both, subjective and objective measures, give the same conclusion that financially constrained firms have lower growth.

In the literatures, it is still debatable whether the impact of taxes on firm growth is positive, negative, or neutral on firm growth. When including many constraints in the analyses, Ayyagari et al. (2008) and Dinh et al. (2010) find that the tax burden does not impact firm growth. In the study by Ayyagari et al. (2008), when including all 10 obstacles, they find that the tax burden has a negative and significant impact on firm growth. However, when compared with only significant obstacles in the first test, the tax burden loses its significance. Similar with Ayyagari et al. (2008) study, Dinh et al. (2010) find no relationship between tax burden and firm growth when including other 14 business obstacles in the study. These two studies use a subjective measure for tax burden and take the samples of firms from more than 75 countries in the world.

In single country analyses, several studies find that tax burdens lower firm growth. Fisman and Svensson (2007) examine the nexus of taxes, bribery payments, and firm growth by using sample of firms in Uganda. In this study, taxes are measured as a fraction of all types of tax payments on sales. They find that both taxation and bribery have a retarding effect on growth. However, the impact of taxation is smaller than that of bribery. Some research applies a difference-in-differences strategy to estimate the impact of taxation before and after a tax reform. Carroll et al. (2001) examine the impact of entrepreneurs' personal income tax on the growth rate of their firms by comparing before and after the Tax Reform Act of 1986. Meanwhile, Harju and Kosonen (2012) focus on the small business owners tax rate before and after the Finnish tax reform in 1997 and 1998 to show the impact on their firms. Both studies find that that raising income tax rates on business owners discourages the growth of their firms.

On the other hand, taxation can also encourage growth of firms. Aghion et al. (2016) suggest that the effect of taxation on firm performance can be twofold, as a disincentive to innovate or as public infrastructure financing to support corporate activity, and if the latter condition outweighs the former, the impact of taxation on firm performance will be positive. Chauvet and Ferry (2021) use a country level variable, share of total taxes on GDP, to examine the impact of taxation on firm performance in developed and developing countries. The result shows that taxation appears to be negatively correlated with firm growth in developed economies, but positively correlated in developing countries. It can be explained that in developed countries the level of public infrastructures is already satisfactory, so that the marginal effect of taxation only represents a direct cost for firms. Meanwhile, in developing countries, the development of infrastructure still has an important role in the development of business, so taxes used to finance those public infrastructures will give a positive impact on firm growth. This finding is consistent with Goyette (2015) when examining the nexus between taxation and firm growth using firm-level tax variables in developing countries.

This paper contributes to the body of literature in several ways. Even though financial constraints have been found giving negative impacts on firm growth, which

size of firm that has the highest impact is still inconclusive. On the other hand, regarding the impact of tax burden on firm growth, the impact itself is inconclusive. Several studies find that the impact can be positive, negative or does not exist. This paper therefore gives new evidence about the relationship between financial constraints, tax burdens, and firm growth using a single-country analysis and the subjective measure of the constraints.

In the literature, this paper is closely related with Soedarmono et al. (2019), especially in investigating finance-growth nexus. Using Indonesia as a sample of single-country study, Soedarmono et al. (2019) use an objective measure at province level, while this paper uses a subjective measure at firm level to investigate the impact of finance to firm performance in Indonesia. In investigating tax-growth nexus, this paper is closely related with Fisman and Svensson (2007). Using a developing country in analysis and firm level variables, Fisman and Svensson use an objective measure (share of taxes payment on sales), while this paper uses a subjective measure (self-reported answer) to examine the impact of taxes on firm performance.

This paper also relates the analyses with the actual condition of the constraints and prevailing regulation in Indonesia, and uses classifications given from the regulation to investigate whether size matters to firm growth. Instead of only using size classification in the survey (classification based on number of employee), this paper involves size classifications given by the Indonesian regulation (classification based on sales turnover) in the analysis. Lastly, this paper introduces a new instrumental variable taken from Indonesian tax regulation to handle endogeneity problem arisen from the nexus between tax and firm growth.

METHODOLOGY

This paper largely uses firm-level data provided by the World Bank Enterprise Survey (WBES). The survey is an ongoing project by the World Bank to collect objective data about firms' experiences and their perception of the environment in which they operate. It covers more than 150,000 firms in about 150 countries. In their survey, WBES employs a stratified random sampling method to ensure representativeness of the sample and covers a broad range of business environment topics including access to finance, taxation, corruption, infrastructure, crime, competition, business-government relations, and performance measures.

For the country Indonesia, the WBES surveys were conducted in 2009 and 2015. There was a total of 2,764 Indonesian firms surveyed in these two years. The firm samples are taken from the manufacturing industry, retail service industry, and other service industries located in nine provinces: Bali, Banten, Jakarta, West Java, Central Java, East Java, Lampung, South Sulawesi, and North Sumatera. For size stratification, the survey divides firms into three classifications: small firms (5 to 19 employees), medium firms (20 to 99 employees), and large firms (more than 99 employees) based on the number of permanent full-time workers. In the analysis, this paper excludes observations that have incomplete data in calculating firm growth and incomplete answers to the question about financial constraints and tax burdens.

Various business constraints are considered as either constraints or binding constraints if they have a significant impact on firm growth (Ayyagari et al., 2008). In order to assess them, this paper regresses firm growth on two interest business constraints, financial constraints and tax burdens, with the econometric specification as follows:

$$
\begin{aligned}
FirmGrowth_{ilt} = \alpha &+ \beta_1 FinancialConstraint_{ilt} + \beta_2 TaxBurden_{ilt} \\
&+ \beta_3 Government_{ilt} + \beta_4 Manufacture_{ilt} + \beta_5 Service_{ilt} \\
&+ \beta_6 Export_{ilt} + \beta_7 FirmAge_{ilt} + \beta_8 SmallFirm_{ilt} \\
&+ \beta_8 MediumFirm_{ilt} + \gamma_l + \delta_t + \varepsilon_{ilt},
\end{aligned} \tag{1}
$$

where, FirmGrowth refers to the logarithms of permanent employees' growth over the past three years for firm i in province l at year t. Each year survey provides the information of the number of employees in the year of the survey and in the two-prior year to calculate its growth. The two independent variables, the financial constraint and the tax burden are measured based on the self-reported answers to the following survey questions: "To what degree is access to finance an obstacle to the current operations of this establishment?" and "To what degree is tax rate an obstacle to the current operations of this establishment?". Using subjective measures, FinancialConstraint refers to a dummy variable which equals 1 if access to finance is considered an obstacle, and 0 otherwise. Meanwhile, TaxBurden refers to a dummy variable which equals 1 if the tax rate is considered an obstacle, and 0 otherwise.

Following Beck et al. (2005) and Aterido et al. (2011), this paper includes firm characteristics as control variables: ownership, sector, export activity, age, and size, that may affect firm performance. To control for the impact of firm ownership, this paper adds Government as a dummy variable that takes the value of 1 if the firm is government owned and 0 otherwise. Manufacture and Service are industry sector dummies, which equal 1 if the firm is from the manufacturing industries and retail service industries, respectively, and 0 otherwise. Export is a dummy variable that takes the value of 1 if the firm is an exporting firm and 0 otherwise. Lastly, this paper takes natural logarithms of FirmAge and uses size classification provided by the survey to control for firm size on firm growth. SmallFirm is a dummy variable that equals 1 if firm has 5 to 19 permanent employees and 0 otherwise. Meanwhile, MediumFirm is a dummy variable that equals 1 if the firm has 20 to 99 permanent employees. Beside control variables, the specification includes γ_l, location fixed effect, and δ_t, year fixed effect, to control for unobserved heterogeneity across provinces and time fixed effects.

In examining the nexus between business constraints and firm growth, endogeneity problems have become a concern in many previous studies (e.g., Ayyagari et al., 2008; Aterido et al., 2011; Ullah, 2020; Fisman & Svensson, 2007). These problems arise from reverse causality, measurement errors, or omitted variables and may bias the ordinary least square (OLS) estimation. In the case of reverse causality, instead of affecting firm growth, the two business constraints can be affected by firm growth. The information of firm growth is usually used by banks or creditors as a consideration in giving credit to a firm, and it can affect taxes paid by firms because firm growth can indicate business income used in tax calculation.

Moreover, measurement errors are likely to happen in self-reported measures of financial constraints and tax burdens. Lastly, the model may not capture all of the possible determinant of firm growth because of data limitation, and they may correlate with two business constraints in the model. To account for these endogeneity issues, this paper also employs an instrumental variable (IV) estimation methods, instead of only using OLS methods, and construct a dummy variable, Audit, as an instrument based on firms' responses to the survey question: "In the last fiscal year, did this establishment have its annual financial statement checked and certified by an external auditor?" This dummy variable will take the value of 1 if the financial statements were checked and certified by an external auditor and 0 otherwise.

The instrumental variable, Audit, used in this paper follows Ullah (2020) in examining the relationship between financial constraints and firm growth. As a valid instrument for financial constraints, the instrument must be correlated with financial constraints, but must be uncorrelated with firm growth. In Indonesia, firms' decisions to audit their financial statement can influence the financial constraints. It is because the financial statement often becomes one of the requirements to be analyzed by creditors or banks when giving credit to firms. However, firms' decision to audit their financial statement are not necessarily linked independently to firms' growth rates. Ayyagari et al. (2008) also uses a similar instrument related to financial statements when investigating finance-growth nexus at the firm level. They construct the instrument based on firm responses to the survey question of whether the firm adopt international accounting standards. In this paper, Audit is also employed as an instrument in showing the nexus between tax burdens and firm growth. Indonesian tax regulation obligates firms that have been audited to calculate their tax liabilities based on the audited financial statement, which will affect the amount of taxable income, the tax rates that have to be used, and the taxes that have to be paid by firms. The summary statistics for all variables are shown in Table 1. The table also provides the mean comparison between 2009 data and 2015 data to show its change in two years surveyed.

Table 1 Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max	Mean (2009)	Mean (2015)
FirmGrowth	2,683	0.0225	0.1872	-1.1513	1.6290	0.0456	-0.0022
FinancialConstraint	2,622	0.5946	0.4911	0	1	0.6164	0.5726
TaxBurden	2,603	0.4326	0.4955	0	1	0.3455	0.5179
Government	2,764	0.0072	0.0848	0	1	0.0055	0.0091
Manufacture	2,764	0.8122	0.3906	0	1	0.8144	0.8098
Service	2,764	0.0970	0.2960	0	1	0.0942	0.1000
Export	2,760	0.0884	0.2839	0	1	0.1104	0.0644
FirmAge	2,726	2.7501	0.6595	0.6931	4.5747	2.6317	2.8767
SmallFirm	2,764	0.4497	0.4976	0	1	0.5443	0.3462

MediumFirm	2,764	0.3010	0.4588	0	1	0.2590	0.3470
Audit	2,730	0.2033	0.4025	0	1	0.1505	0.2601

Source: Stata output, Author

RESULT AND DISCUSSION

Descriptive analyses

Based on the summary statistics presented in Table 1, financial constraints are considered more severe than tax burdens. Almost 60% of firms surveyed report financial constraints as an obstacle. Then, even though firms reported less severe financial constraints in 2015's survey, it is not a big difference compared to 2009's survey. These survey results can be associated with the programs that are still not effective in reducing financial constraints. ILO (2019) gives an example: in the Guaranteed Microfinance Programme (KUR) introduced in 2007, even though the government suggests that no collateral is needed to access the program, many banks still require collateral from the clients before giving credit. These practices may hinder enterprises, especially micro and small enterprises, which lack the required collateral to obtain finance. In addition, ILO also mention that many banks still do not meet the minimum requirement of putting 20% (or its interim targets) of their financing into small businesses.

On the other hand, around 43% of firms consider the tax burden as an obstacle. If we compare tax burdens in the two years surveyed, there is a significant increase, around 50% in 2015 compared to 2009. This increase may relate to the change of tax rates imposed on firms. Before 2009, the tax rates imposed on firms were progressive tax rates with tariffs of: 10% for taxable income up to 50 million rupiah, 15% for the next 50 million rupiah of taxable income, and 30% for all taxable income over 100 million rupiah. Meanwhile, from 2010, these tax rates were changed into a single tax rate of 25%, on all taxable income. This change is likely to be more of a burden for firms, especially for those that previously paid a 10% or 15% tax rate for their taxable income. In 2013, the Indonesian Government also introduced a single tax provision of income tax based on annual sales turnovers. In this provision, small firms which have a sales turnover of up to 4.8 billion rupiah pay an income tax tariff of 1% on their annual sales turnover, instead of a 25% rate on net income. Even though this provision may simplify tax calculations and reduce the tax burden, it is now possible to impose income tax on firms, even when they report a loss instead of a profit, as long as they have some sales.

Estimation results

To investigate the nexus between financial constraints, tax burdens, and firm growth, this paper firstly applies the ordinary least square method. The regression results are presented in Table 2 and divided into three specifications based on the fixed effects included in the model: column (1) reports the estimation results without including location and time fixed effects, column (2) reports the results with location fixed effect, and column (3) reports the results with both fixed effects, time and location fixed effects.

As shown in column (1) of Table 2, even though financial constraints and tax burdens are negatively related to firm growth, their relationships are not statistically significant. Then, after including the location fixed effect in column (2), the estimated coefficient of financial constraints is now negative and statistically significant at the 5% level, while the tax burden is still insignificant. These results also persist when two fixed effects, location and time fixed effects, are included in the estimation in column (3). These findings are in line with those of Ayyagari et al. (2008) and Dinh et al. (2010) suggesting that among two business constraints examined simultaneously in the analyses: the financial constraint and the tax burden, only the former is a binding constraint contributing to a lower level of firm growth. These also imply that the availability of financial access is very important for developing Indonesian firms, while taxes are not likely to affect Indonesian firms in developing their businesses.

Regarding control variables, the results suggest that small and young firms are likely to grow faster at the 1% significance level in all specifications. These results are consistent with the study of Yasuda (2005), Navaretti et al. (2014), and Jovanovic (1982) suggesting that small and young firms which survive in the industry have high efficiency, while inefficient firms will decline and exit the industry. In addition, young firms are likely to be more innovative and productive by exploiting new technology or marketing opportunities and employing more qualified workforce.

Then, the significantly positive impact of government ownership on firm performance is in line with Ang and Ding (2006) and Abdallah and Ismail (2017), which suggest that government ownership provides better protection and corporate governance, and more opportunities to make profits. Lastly, in the second specification, exporting firms are likely to have a higher firm growth. Grazzi and Moschella (2017) suggest that the export status can be associated with higher productivity which then relates to firm growth.

Table 2 Basic Estimation Results

Dependent Variable	Firm Growth		
	(1)	(2)	(3)
FinancialConstraint	-0.002	-0.020**	-0.023**
	(0.009)	(0.010)	(0.010)
TaxBurden	-0.002	-0.009	-0.004
	(0.008)	(0.008)	(0.008)
Government	0.100***	0.103***	0.100***
	(0.030)	(0.031)	(0.032)
Manufacture	0.016	0.013	0.012
	(0.011)	(0.011)	(0.011)
Service	0.009	0.010	0.009
	(0.013)	(0.013)	(0.013)
Export	0.018	0.0240**	0.016
	(0.012)	(0.012)	(0.012)
FirmAge	-0.024***	-0.027***	-0.023***

	(1)	(2)	(3)
	(0.007)	(0.007)	(0.007)
SmallFirm	0.047***	0.036***	0.032***
	(0.011)	(0.010)	(0.010)
MediumFirm	-0.012	-0.016*	-0.018*
	(0.009)	(0.009)	(0.009)
Constant	0.055**	0.076***	0.082***
	(0.024)	(0.025)	(0.025)
Location FE	No	Yes	Yes
Year FE	No	No	Yes
Observation	2439	2439	2439
R-squared	0.03	0.067	0.072

Robust standard errors in parentheses

*, **, and *** denote the significance at the 10, 5, and 1% levels, respectively

Instrumental variable estimation results

To handle endogeneity problems, this paper also examines the model with the instrumental variable (IV) estimation method, and the results are presented in Table 3 and Table 4 for the first-stage and second-stage estimation results, respectively. In these tables, each column is different based on the fixed effects used in the estimation and the instrumental variable applied in two business constraints. In the column (1) to (3), the instrumental variable is applied to financial constraints, and in the column (4) to (6) it is applied to tax burdens.

Table 3 IV First-stage Estimation Results

Dependent Variable	*FinancialConstraint*			*TaxBurden*		
	(1)	(2)	(3)	(4)	(5)	(6)
Audit	-0.087***	-0.114***	-0.110***	0.098***	0.091***	0.081***
	(0.024)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
TaxBurden	0.381***	0.298***	0.309***	-	-	-
	(0.018)	(0.019)	(0.019)	-	-	-
FinancialConstraint	-	-	-	0.382***	0.323***	0.327***
	-	-	-	(0.018)	(0.020)	(0.020)
Government	0.071	0.096	0.087	-0.064	-0.063	-0.042
	(0.118)	(0.125)	(0.124)	(0.118)	(0.117)	(0.123)
Manufacture	0.154***	0.134***	0.131***	-0.049	-0.051	-0.043
	(0.034)	(0.032)	(0.032)	(0.033)	(0.033)	(0.032)
Service	-0.026	-0.017	-0.020	0.051	0.055	0.0598
	(0.043)	(0.041)	0.041	(0.042)	(0.041)	(0.041)
Export	-0.012	-0.035	-0.054	0.017	0.01	0.0523
	(0.034)	(0.034)	(0.034)	(0.033)	(0.033)	(0.034)

FirmAge	-0.002	-0.008	0.002	0.035**	0.035**	0.0135
	(0.016)	(0.015)	(0.016)	(0.016)	(0.160)	(0.016)
SmallFirm	0.131***	0.06**	0.048*	-0.183***	-0.223***	-0.197***
	(0.027)	(0.026)	(0.026)	(0.027)	(0.027)	(0.027)
MediumFirm	0.043*	0.019	0.017	-0.098***	-0.112***	-0.103***
	(0.026)	(0.024)	(0.024)	(0.026)	(0.025)	(0.025)
Constant	0.262***	0.479***	0.489***	0.226***	0.324***	0.287***
	(0.060)	(0.061)	(0.061)	(0.059)	(0.063)	(0.062)
Location FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	No	Yes	No	No	Yes
Adj R-squared	0.16	0.25	0.26	0.17	0.20	0.23
Observation	2426	2426	2426	2426	2426	2426

Robust standard errors in parentheses

*, **, and *** denote the significance at the 10, 5, and 1% levels, respectively

Table 4 IV Second-stage Estimation Results

Dependent Variable	Firm Growth					
	(1)	(2)	(3)	(4)	(5)	(6)
FinancialConstraint	-0.213*	-0.219**	-0.244**	-0.072*	-0.100**	-0.120**
	(0.127)	(0.100)	(0.106)	(0.043)	(0.043)	(0.053)
TaxBurden	0.079	0.050	0.064*	0.185*	0.243*	0.300*
	(0.050)	(0.031)	(0.034)	(0.110)	(0.131)	(0.158)
Government	0.106***	0.113***	0.109**	0.103***	0.109**	0.103*
	(0.039)	(0.043)	(0.046)	(0.039)	(0.046)	(0.055)
Manufacture	0.050**	0.042**	0.042**	0.027*	0.027*	0.027
	(0.025)	(0.019)	(0.020)	(0.014)	(0.015)	(0.016)
Service	0.003	0.007	0.005	-0.001	-0.004	-0.009
	(0.016)	(0.016)	(0.017)	(0.016)	(0.018)	(0.020)
Export	0.012	0.014	0.001	0.012	0.018	-0.003
	(0.014)	(0.015)	(0.017)	(0.014)	(0.015)	(0.019)
FirmAge	-0.025***	-0.029***	-0.023***	-0.031***	-0.036***	-0.028***
	(0.008)	(0.008)	(0.008)	(0.009)	(0.010)	(0.009)
SmallFirm	0.083***	0.057***	0.053***	0.089***	0.102***	0.102***
	(0.026)	(0.016)	(0.016)	(0.028)	(0.037)	(0.039)
MediumFirm	0.002	-0.007	-0.008	0.011	0.018	0.020
	(0.014)	(0.012)	(0.012)	(0.017)	(0.021)	(0.023)

Constant	0.102***	0.163***	0.181***	0.004	-0.016	-0.015
	(0.039)	(0.050)	(0.054)	(0.040)	(0.056)	(0.060)
Location FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	No	Yes	No	No	Yes
IV Applied to	FinanConst	FinanConst	FinanConst	TaxBurden	TaxBurden	TaxBurden
First-stage F-stat	12.70	21.07	19.66	16.05	12.73	10.03
Observation	2426	2426	2426	2426	2426	2426

Robust standard errors in parentheses

*, **, and *** denote the significance at the 10, 5, and 1% levels, respectively

As shown in Table 3, in the first-stage estimations this paper finds that the instrumental variable, Audit, gives opposite impact on financial constraints and tax burdens. A negative and significant impact of audit on financial constraints suggests that firms' decisions to audit their financial statement can reduce financial constraints. It may be not surprising because the financial statement is often required when firms apply for bank loans to be analyzed by banks when giving credit to the firms, and the availability of audited financial statement will give more credible information, so that the firms have more chances to get the credit.

Meanwhile, a positive and significant impact of audit on tax burdens suggests that the audited financial statement increases the tax burden of Indonesian firms. This result may relate to the tax system used in Indonesia. In Indonesia, firms are basically trusted to calculate, pay, and report their own taxes in accordance with the prevailing regulations. In this self-assessment system, there is still possibility that firms do not follow accounting standards in reporting their business transaction or underreport their taxes calculation, so that their tax payments are lower. However, if the firms have audited their financial statements, they are required by the regulation to calculate their own taxes based on the audited financial statement. The availability of audited financial statement may eliminate the possibility of lowering the tax calculation because firm's transactions and their reports have been checked by the auditor.

Regarding the nexus between financial constraints, tax burdens, and firm growth in Table 4, this paper finds that among these two business constraints, only the financial constraint is a binding constraint which have a negative impact on firm growth. The significantly negative impact of financial constraints on firm growth suggests that Indonesian firm have difficulties in growing because of financial constraints, especially of their limited access of finance, and it is consistent with most of the previous researches (e.g., Becchetti & Trovato, 2002; Beck et al., 2005; Ayyagari et al., 2008; Aterido, 2011; Ullah, 2020). Compared to the estimation results of the preceding sub-section, the estimated coefficients for financial constraints in the IV estimation are much higher than those in the least square estimation suggesting that endogeneity may bias the basic estimations.

On the other hand, the impact of tax burdens on firm growth now become positively significant at the 10% level, especially when the tax burdens variable is instrumented. This finding suggests that the tax burden is not a binding constraint for Indonesian firms contributing to a lower level of growth. In addition, the positive and

significant impact of tax burdens on firm growth suggest that the benefit from taxation received by Indonesian firms is higher than its drawback. This positive impact may occur because theoretically, even though taxes are seen as a disincentive for firms to innovate and invest, they are also essential for financing public goods and services that are needed to support corporate activities. Then, the overall effect of taxation on firm performance will depend on the relative weight of these two opposing effects. This finding is also in line with the finding of Chauvet and Ferry (2021), Aghion et al. (2016), and Goyette (2015), suggesting that negative impact of taxation is highly likely to happen in advanced economies with adequate and proper infrastructure, so that the burden of taxation falls most heavily on firms and then outweighs the benefits of taxes. On the other hand, in developing countries such as Indonesia, when poor infrastructures still hinder firms in developing businesses, taxes may have a large positive effect on firms' performance through the financing of public infrastructure or other public goods and services, so that the benefit of taxes can outweigh its burden.

Robustness checks

In this section, this paper constructs new measures for the dependent variable and two independent variables and adds control variables at the province level to check the robustness of the previous estimations. The estimation results for these robustness checks are presented in Table 5. For a new measure of the dependent variable, in column (1) and (2), employment growth is changed to sales growth. In column (3) and (4), instead of using a dummy variable, the two constraint variables will be the response scales of the survey question regarding those constraints: 0 for no obstacle, 1 for minor obstacle, 2 for moderate obstacle, 3 for major obstacle, and 4 for very severe obstacle. Based on the results in column (1) to (4) of Table 5, this paper finds the similar results that financial constraints faced by the firms negatively affect firm growth, while tax burdens result in positive impact on firm growth in almost all specifications. These results confirm that the previous findings of IV estimation are not driven by firm growth or business constraints measurement.

Table 5. Robustness Checks

Dependent Variable	Sales Growth		Employment Growth		Employment Growth	
	(1)	(2)	(3)	(4)	(5)	(6)
FinancialConstraint	-0.987*	-0.484*			-0.225**	-0.092**
	(0.556)	(0.292)			(0.111)	(0.041)
TaxBurden	0.256	1.256			0.056	0.226*
	(0.186)	(0.845)			(0.035)	(0.128)
FinancialConstraint			-0.117**	-0.063**		
(0-4 scale)			(0.053)	(0.030)		
TaxBurden			0.046*	0.153*		
(0-4 scale)			(0.024)	(0.082)		
Firm-level control	Yes	Yes	Yes	Yes	Yes	Yes
Province-level control	No	No	No	No	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

IV Applied to	FinanConst	TaxBurden	FinanConst	TaxBurden	FinanConst	TaxBurden
First-stage F-stat	16.79	8.70	17.68	9.60	17.12	12.51
Observation	2229	2229	2426	2426	2426	2426

Robust standard errors in parentheses

*, **, and *** denote the significance at the 10, 5, and 1% levels, respectively

This paper also includes the logarithms of regional GDP, the logarithms of population, and inflation as control variables in column (5) and (6) of Table 5. The data for these variables are taken from Indonesia Statistics (Badan Pusat Statistik/BPS) and follow Beck et. al., (2005) when examining the nexus between business constraints and firm growth in cross country analyses. However, while Beck et al. (2005) use country-level data, this paper uses province-level data for GDP, population, and inflation. These three variables are calculated based on their average over the past three years. As shown in these last two specifications of Table 5, even with these additional control variables the impact of financial constraints and tax burdens on firm growth are still consistent with the IV estimation suggesting that only financial constraints are binding constraints contributing to the lower growth, while tax burdens give benefit to Indonesian firms.

Firm size classification

In reducing financial constraints and tax burdens, the Indonesian Government often uses firm size classification provided by the related regulations to determine the main focus of the program. In this section, to investigate whether the size of firms matters to the results of the nexus between financial constraints, tax burdens, and firm growth, this paper re-estimates the model using various subsamples which differentiate firms by their size based on the survey and Indonesian regulations. The results are presented in Table 6.

In Panel A of Table 6, this paper uses the size classification provided in the WBES survey. In this survey, firms with less than 20 employees are classified as small firms, while those with 20 and more employees are classified as medium and large firms. In Panel B, the size classification is based on the Law Number 20 Year 2008 which relates to financial constraints. In this regulation firms which have a sales turnover of up to 2.5 billion rupiah are classified as micro and small firms, while those which have a sales turnover of more than 2.5 billion rupiah are classified as medium and large firms. Lastly, In Panel C, the size classification is based on the Law Number 46 Year 2013 which relates to tax burdens. In this regulation firms which have a sales turnover of up to 4.8 billion rupiah are classified as small firms, while those which have a sales turnover of more than 4.8 billion rupiah are classified as non-small firms. In each specification, this paper applies instrumental variable estimations: in column (1) and (2) the instrumental variable is applied on financial constraints, while in column (3) and (4) the instrumental variable is applied on tax burdens.

As shown in column (1) and (2) of Table 6, only large firms have a negative and significant impact of financial constraints on firm growth. These results suggest that financial constraints are a binding constraint only for large firms, while for small firms the constraints have no impact on their growth. These findings are also in line with previous studies suggesting that small firms, especially micro firms, may have

little willingness or capabilities to grow their firms, so that financial constraints are not an essential factor of firm growth (Aterido, 2011). On the other hand, the positive and significant impact of taxes is also only found in large firms. The rationale for this is that the large firms may have business operations across a broader area, so that the infrastructure development financed by taxes will have an important role in their businesses, while small firms may only operate in a local or small area which does not rely on infrastructure development. In column (3) and (4) of Table 6, the significant results are only found in the first size classification using the WBES survey classification. In this classification, the findings are similar to results in column (1) and (2) of Table 6 where small firms receive no impact of financial constraints or tax burdens on their growth, while large firms suffer a significantly negative impact from financial constraints and get a significantly positive impact from tax burdens on firm growth.

Table 6. Firm Size Classification

Panel A (Based on survey - Number of employees)				
Dependent Variable	Firm Growth			
	Small (<20 emp)	Large (≥20 emp)	Small (<20 emp)	Large (≥20 emp)
	(1)	(2)	(3)	(4)
FinancialConstraint	0.083	-0.199**	-0.005	-0.096**
	(1.259)	(0.080)	(0.113)	(0.057)
TaxBurden	-0.029	0.065**	-0.030	0.221**
	(0.362)	(0.026)	(0.391)	(0.161)
Firm-level control and FE	Yes	Yes	Yes	Yes
IV Applied to	FinanConst	FinanConst	TaxBurden	TaxBurden
Observation	1029	1397	1029	1397
Panel B (Based on Law 20/2008 - Number of sales)				
Dependent Variable	Firm Growth			
	Small (≤2.5) billion)	Large (>2.5 billion)	Small (≤2.5) billion)	Large (>2.5 billion)
	(1)	(2)	(3)	(4)
FinancialConstraint	-0.585	-0.193**	-0.095	-0.160
	(0.934)	(0.088)	(0.082)	(0.113)
TaxBurden	0.175	0.056*	0.165	0.505
	(0.311)	(0.029)	(0.220)	(0.384)
Firm-level control and FE	Yes	Yes	Yes	Yes
IV Applied to	FinanConst	FinanConst	TaxBurden	TaxBurden
Observation	1400	1026	1400	1026
Panel C (Based on Law 46/2013 - Number of sales)				
Dependent Variable	Firm Growth			
	Small (≤4.8 billion)	Large (>4.8 billion)	Small (≤4.8 billion)	Large (>4.8 billion)
	(1)	(2)	(3)	(4)
FinancialConstraint	-0.390	-0.165*	-0.084	-0.149
	(0.583)	(0.084)	(0.078)	(0.117)

TaxBurden	0.111	0.048*	0.143	0.478
	(0.194)	(0.028)	(0.211)	(0.411)
Firm-level control and FE	Yes	Yes	Yes	Yes
IV Applied to	FinanConst	FinanConst	TaxBurden	TaxBurden
Observation	1567	859	1567	859

Robust standard errors in parentheses

*, **, and *** denote the significance at the 10, 5, and 1% levels, respectively

Exploring financial constrained sectors

The previous subsections provide empirical evidence that between the two business constraints, financial constraints and tax burdens, only the former is a binding constraint that contributes to a lower level of firm growth, and based on firm size classification, large firms are the most constrained sectors. In this section, this paper observes which other sectors suffer more impact of financial constraints on firm growth by separating the firms by their ownership, industry, and age. Knowing such sectors are impacted can be useful for the government to determine which sectors should be a priority in reducing financial constraints. The OLS and IV methods are applied in the estimation, and the results are reported in Table 7.

Table 7. Financial Constrained Sectors

Ownership				
Dependent Variable	*Firm Growth*			
	Private	*Gov&Foreign*	*Private*	*Gov&Foreign*
	(1) OLS	*(2) OLS*	*(3) IV*	*(4) IV*
FinancialConstraint	-0.023**	-0.001	-0.497*	-0.025
	(0.010)	(0.029)	(0.270)	(0.193)
Firm-level control and FE	Yes	Yes	Yes	Yes
Observation	2035	403	2024	403
Adj. R-squared	0.06	0.15	-	-

Industry				
Dependent Variable	*Firm Growth*			
	Manufacture	*Service*	*Manufacture*	*Service*
	(1) OLS	*(2) OLS*	*(3) IV*	*(4) IV*
FinancialConstraint	-0.031***	-0.0003	-0.393**	0.0104
	(0.012)	(0.015)	(0.171)	(0.114)
Firm-level control and FE	Yes	Yes	Yes	Yes
Observation	1972	467	1960	466
Adj. R-squared	0.08	0.06	-	-

Age				
Dependent Variable	*Firm Growth*			
	Young	*Old*	*Young*	*Old*
	(1) OLS	*(2) OLS*	*(3) IV*	*(4) IV*
FinancialConstraint	-0.032**	-0.018	-0.275**	-0.207
	(0.015)	(0.013)	(0.135)	(0.144)
Firm-level control and FE	Yes	Yes	Yes	Yes
Observation	1102	1337	1097	1329
Adj. R-squared	0.10	0.04	-	-

Robust standard errors in parentheses

*, **, and *** denote the significance at the 10, 5, and 1% levels, respectively

First, this paper re-estimates the model separately for private firms and government or foreign firms. As shown in Table 7, this paper finds that the negative impact of financial constraints on firm growth is only found to affect private firms. This result suggests that private firms are highly likely to rely on business finances from the credit market, while both government and foreign firms may get support from the government or foreign parent companies to develop businesses. Regarding the industry sectors, the firms are separated by manufacturing and service. This paper finds that manufacturing firms are more likely to suffer from financial constraints than firms in the service sector. It may happen because manufacturing firms usually need more financing for constructing physical production site. Lastly, firms with ages up to 15 years old are classified as young firms, while those with ages more than 15 years old are regarded as old firms. Based on this age classification, this paper finds that young firms rather than old firms are more sensitive to the impact of financial constraints on firm growth. The rationale for this result is that young firms may not be able to rely only on their internal financing sources, such as their profit from business activity, so that external financing sources are still needed to finance firm activities.

CONCLUSION

This paper investigates whether two business constraints, financial constraints and tax burdens, affect Indonesian firm growth, and whether they are binding constraints that contribute to a lower level of firm growth. In the literature, even though most studies find that financial constraints are highly likely to give negative impacts on firm growth, what size of firm is most impacted is still inconclusive. Then, regarding the impact of tax burdens on firm growth, it is still debatable as to whether taxes have a positive, negative, or neutral impact on firm growth.

Using the World Bank Enterprise Survey (WBES) data of 2,764 firms in Indonesia and a subjective measure of the constraints, this paper shows that among the two constraints examined in the analyses, only financial constraints are a binding constraint that has a significantly negative impact on Indonesian firm growth, while tax burdens can have positive impact on firm growth. The negative impact of financial constraints on firm growth suggests that Indonesian firms have difficulty growing because of financial constraints, especially because of their limited access to finance. On the other hand, the positive impact of tax burdens on firm growth suggests that the benefit from taxation received by Indonesian firms is higher than its drawback. It can be as expected in developing countries that when poor infrastructure still hinders firms in developing businesses, taxes may have a large positive effect on firms' performance through the financing of public infrastructure, so that the benefit of taxation can outweigh its burden. These results are quite robust when this paper uses alternative measures of dependent and independent variables and adds several control variables at the province level.

Based on firm size classification, this paper finds that only larger firms are significantly impacted by results: a negative impact of financial constraints and a positive impact of tax burdens on firm growth. Financial constraints and tax burdens are likely not to be binding constraint for small firms to negatively impact their

growth. In addition, these small firms also do not get benefits from taxes. Then, further investigation of financial constraints reveals that private firms, manufacturing firms, and young firms are more sensitive to the negative impact of financial constraints.

There are several policy implications based on these findings. Financial market development is very important because its constraints hamper Indonesian firms in developing. Not only small firms, programs or policies in reducing financial constraints should also consider larger firms. To determine classifications used as focus of the programs or policies, instead of only using number of sales or assets, the Indonesian Government can consider other size classification (e.g., number of employees) or other sector classification based on firm ownership, industry, or age. On the other hand, reforms in tax policies should focus not only on reducing tax burdens, but also on maximizing tax benefits for all enterprises, both small and large. Further empirical testing on larger and different samples is still required in this topic. The use of larger samples would be useful to investigate more sectors that need attention from government in policy reform. Possible determinants of financial constraints and possible channels by which taxes lead to a higher level of firm growth in Indonesia are also appropriate to be investigated to help government reducing financial constraints and maximizing tax benefits for enterprises. Lastly, other business constraints can be examined to understand whether they can become binding constraints which contribute to a lower level of Indonesian firm growth, so that they also merit special attention from the government.

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