Comparative Economic Research. Central and Eastern Europe
Volume 27, Number 1, 2024
https://doi.org/10.18778/1508-2008.27.05

Financial Constraints on Firm Growth: The Role of Firm Age in the ASEAN–6

Yee Ling Ng https://orcid.org/0000-0001-6463-0827
Universiti Putra Malaysia, School of Business and Economics, Selangor, Malaysia
e-mail: gs56863@student.upm.edu.my

Wei Theng Lau https://orcid.org/0000-0002-1196-5372
Ph.D., Senior Lecturer at Universiti Putra Malaysia, School of Business and Economics, Selangor, Malaysia
e-mail: lwtheng@upm.edu.my

Wei Ni Soh https://orcid.org/0000-0003-3593-1684
Ph.D., Senior Lecturer at Universiti Putra Malaysia, School of Business and Economics, Selangor, Malaysia
e-mail: sohweini@upm.edu.my

Nazrul Hisyam Ab Razak https://orcid.org/0000-0001-7631-2391
Ph.D., Associate Professor at Universiti Putra Malaysia, School of Business and Economics, Selangor, Malaysia
e-mail: nazrul@upm.edu.my

Abstract

The paper assesses the moderating role of firm age in the relationship between financial constraints, as measured by the KZ index, and the WW index on three alternative measures of firm growth (Asset growth, *ROA*, and *ROE*) in the ASEAN–6 region. This study employs a sample of ASEAN–6 listed firms over the period 2009–2019 using Fixed Effects and the System GMM model. Firm age is found to interact positively with financial constraints in their effects on firm growth. The negative impact of financial constraints on firm growth is less severe with older age firms.

Keywords: financial constraint, Fixed Effect Model, System GMM model, ASEAN, KZ index, WW index, firm growth

JEL: C58, D33, L25

Received: 20.03.2023. Verified: 3.08.2023. Accepted: 23.01.2024

Introduction

The Association of Southeast Asian Nations (ASEAN) has emerged as a significant global player through a noteworthy trajectory, underscoring its standing as a promising force within the region. Firm growth is a motivation for firms to stay competitive and progress. The ASEAN countries act as global exporters and a huge potential region; therefore, governments should give them access to an international network to support them and to help them understand the local regulations and corporate governance.

However, growth requires funds to finance growth. Financial problems can bring empire-building expansion before it brings problems of administrative organization. Financing is the greatest growth-constrained obstacle for a firm. The most precise definition of financial constraint is a wedge between the internal and external costs of funds (Kaplan and Zingales 1997). Financial constraints are a hurdle for economic development as constraints limit firms' ability to compete in the market and to have access to external financing for issuing shares and borrowing. The effect of financial constraints on firm growth can be affected by firm age. The older a firm, the more knowledge it has in terms of the crucial aspects of the business (e.g., well-developed supply channels, technologies, customer relationships, access to resources, human capital, and lower financing costs). These abilities and skills inherent in older firms confer a competitive advantage, resulting in superior performance. Consequently, this advantage can contribute to the success of ASEAN's regional economic integration, aligning with their pursuit of long-term objectives.

Firm age is a unique branding element to serve customers that illuminates the histories of each firm. Thus, there must be something special about the businesses that have endured. Firms can experience growth along many dimensions, reflecting varying levels of desirability and attitudes toward growth objectives depending on the characteristics of the firm.

Liability of Newness refers to the tendency of younger firms to have higher failure rates relative to older firms (Stinchcombe 2000). This is because new firms often face the challenges of learning new responsibilities and tasks, incurring significant expenses, establishing networks with clients and supporters, and developing a formalized information structure or normative basis. This suggests that survival is problematic for start-ups when competing with established companies, although young, innovative companies now have more accessible capital than ever before. On the other hand, aging companies might face constraints hat severely limit their ability to adapt to changing conditions (Aldrich and Auster 1986).

The objective of this study is to examine the moderating role of firm age, which can affect the direction and strength of the relationship between financial constraints and firm growth. The moderating role of firm age is operationalized as the length of the initial

public offering (IPO) period during which a firm has been active in business activities. The length of this period can increase or decrease the impact of financial constraints on firm growth. Older firms have the advantages of the strength of accumulated experience and superior performance (Leoncini et al. 2019). However, as firms get older, there is the possibility of bureaucracy, reducing organizational flexibility and the ability to make prompt changes. Thus, this study suggests that the strength of the negative relationship between financial constraints on firm growth depends on the firms' accumulated experience in terms of learning and the source of knowledge.

Our study contributes to the literature in the following ways. First, considering the drawbacks associated with accounting-based financial constraint measures, this study uses the KZ and WW indices with three different firm growth proxies: asset growth, *ROA*, and *ROE*. Secondly, this study employs both fixed effect as the baseline regression and the System GMM Model to act as a robustness check on the results. Thirdly, this study sheds light on firm age as a moderating variable between financial constraint and firm growth in the ASEAN–6 region[1] context, which contributes to the existing literature. The paper is structured as follows: Part 2 contains the literature and theoretical background, Part 3 discusses the data and methodology, Part 4 contains the empirical results, and Part 5 concludes.

Literature review

Nakatani (2021) showed that younger ICT firms contribute more total factor productivity growth than older firms, which is in line with life-cycle theory. The negative relationship between firm age and firm growth was also supported by Arrighetti et al. (2021). Bruderl and Schussler (1990) showed that individual firms face adolescence at the period when mortality is low. After this phase, the death risks jump to a high level, followed by a continuous decline. The length of adolescence varies according to the number of initial resources a firm has. Coad, Segarra, and Teruel (2016) stated that as firms get older, they gain experience and become more routinized. Mature firms, as time goes by, build on previous routines, existing capabilities, accumulated reputations, and the ability to handle uncertainties. According to Leoncini et al. (2019), firm experience appears to play an important role in growth. In their study, firm age has a moderating effect. They found that more mature companies are better equipped with technologies to transform into growth. Secondly, older firms have better access to finance to cope with the cost of eco-innovating. Thirdly, older firms have greater pressure and incentives to renew their aging assets in an eco-sustainable manner.

1 Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

Firm age has significant and negative effects on job creation (firm growth) (Yang 2018). As firms age, the productivity of newly created jobs in the firm could decline. The negative relationship is due to the organizational inertia that constrains the firm's ability to change (Coad, Segarra, and Teruel 2016). This idea was also supported by Coad and Tamvada (2012), who showed that age has a retarding effect on firm growth in India. They found that young firms grow faster than old firms, and growth becomes less dependent on firm age for old firms. The result is similar to Cowling, Liu, and Zhang (2018), who studied young firms. They found that they had the highest share of growth after the global financial crisis in 2008 in the UK. Cowling, Liu, and Zhang (2018) found that a negative relationship between firm age and growth persists. In the aftermath of the 2010 recession, younger firms, particularly those with younger owners, exhibited a stronger inclination towards short-term growth, as indicated by employment and sales growth. Older firms have lower firm growth when the proxy for firm growth is employment growth. This indicates that when the economic environment improves, the sensitivity of firm age to employment growth (firm growth) becomes stronger.

Barba Navaretti, Castellani, and Pieri (2014) showed that age has a negative sign from 25% of the conditional growth rate distribution. However, at the lowest growth rates, age has a positive relationship with firm growth, indicating that aging is associated with lower growth. Based on the evidence from French, Italian and Spanish manufacturing firms from 2001–2008, they found that young firms grow faster than old firms, especially in the highest growth quantiles with a robust inclusion of firm characteristics indicated by labor productivity, capital intensity, and financial structure. They also showed that younger firms' high growth is managed by younger CEOs, who play a significant role in driving job creation. Fast-growing firms have also been shown to be more productive and have easier access to credit.

Data and methodology

Data description

This firm-level study covers the period from 2009 to It excludes all financial institutions and real estate sectors, as they are treated as special due to their different role in the payment system and intermediation functions. This study considers the ASEAN–6 region: Indonesia, Malaysia, Singapore, Philippines, Thailand, and Vietnam. All variables are winsorized at the 5% and 95% levels to mitigate the impact of outliers using STATA software. The choice of proxies for each variable is as follows:

Table 1. Variable Definitions

	Variable	Proxies	Variable Definitions	Unit	Source
Dependent Variable	Firm Growth	Asset Growth	$Asset_{t+1}$ – $Asset_t$ / $Asset_{t+1}$	Percentage	McFaddin & Clouse (1993)
		Return of Equity	Net income after taxes / total equity	Percentage	Dopierała et al. (2022)
		Return of Asset	Net income after taxes / Average total assets this year and the previous year's	Percentage	Dopierała et al. (2022)
Independent Variable	Financial Constraint	WW Index	–0.091*Cash Flow / Total Assets–0.062*Dividend Dummy+0.021*Long Term Liabilities / Total Assets–0.044 Log Total Assets+0.102 Industry Sales Growth–0.035 Sales Growth	Index	Whited and Wu (2006)
		KZ Index	–1.001909*Cash Flows / Total Assets+ 0.2826389* TobinQ+3.139193*Debt / Total Capital–39.368*Dividends / Total Assets–1.315*Cash / Total Assets	Index	Kaplan and Zingales (1997)
Moderating Variable	Firm Age	Date of IPO	Respective Period Year – IPO Year	Percentage	Coad (2018)
Control Variables	Firm Size	Market Capitalization	Total Market Capitalization	Absolute Value	Haran et al. (2021)
	Profitability	Gross Profit Margin	Gross Income / Net Sales	Percentage	Çoban (2014)
	Working Capital	Working Capital	Total Working Capital	Absolute Value	Regasa et al. (2019)

Sources: McFaddin and Clouse 1993; Kaplan and Zingales 1997; Whited and Wu 2006; Çoban 2014; Coad 2018; Regasa et al. 2019; Haran et al. 2021; Dopierała et al. 2022.

This study explores the moderating effect of firm age, which is incorporated into the following formula for analysis:

$$FirmGrowth_{it} = \beta_0 + \beta_{1b}\log FC_{it} + \beta_{2b}\log Age_{it} + \beta_{3b}(\log FC_{it} * \log Age_{it}) + \\ + \beta_{4b}\log Age_{it} + \beta_{5b}\log marketcap_{it} + \beta_{6b} profit_{it} + \beta_{7b}\log workingcap_{it} + \varepsilon_{it}, \quad (1)$$

where:

$FirmGrowth_{it}$ – The relative change in assets from the previous year,

$\log FC_{it}$ – Log of financial constraint index proxied by KZ index and WW index,

$\log Age_{it}$ – Log of firm age,

$\log marketcap_{it}$ – Log of market capitalization,

$profit_{it}$ – Gross profit margin,

$\log workingcap_{it}$ – Log of working capital,

ε_{it} – Error term.

This study uses asset growth, *ROE*, and *ROA* as the proxies for firm performance (Dopierała et al. 2022; Egorova, Grishunin, and Karminsky 2022). The dependent variable, firm growth, is measured using three different proxies in accordance with firm growth literature: Firstly, asset growth is used as the firm growth proxy, as firms grow by first acquiring assets (Lefebvre 2023), and assets bring in profits from increased sales volume (Theodore and Lindberg 1978). *ROE* and *ROA* are the indicators that show the effectiveness of a firm (Tran, Nguyen, and Tran 2019). Thus, this study considers different proxies for different roles of growth motivation and attitude toward growth.

First, as verified from the perspective of financing constraints, measurements are not directly observable. Based on the literature review, the KZ and WW indices are used. In studies that use those indices, the KZ index demonstrates that firms that are classified as a constraint are associated with external finance constraints. Those firms with high debt-to-capital ratios appear to invest at a low rate despite good investment opportunities. The WW index considers both internal and external financing considerations (exogenous). According to Whited and Wu (2006), the WW index considers both quantitative data on exogenous firm characteristics (i.e., external financial constraints) and internal characteristics (endogenous). This is different from the KZ index, which focuses on endogenous characteristics using the Generalized Method of Moments (GMM). The higher the KZ and WW indices, the greater the financial constraint (Hadlock and Pierce 2010; Chang and Song 2013; Guariglia and Yang 2016).

IPO date was chosen as the proxy for firm age as it marks the inception of the company's existence under new ownership. Figure 1 presents the age distribution for firms from 0 (new-born companies) to 117 years old. Firm age in this study sample exhibits a positively skewed distribution. Young firms are the most numerous, and above the mode, the number of firms steadily decreases with age in a way that might resemble exponential decay, which would be an acceptable representation of empirical distributions. Therefore, this study draws the reader's attention to the likely under-representation of very old firms in our data, which can be expected to have implications for how our results should be interpreted. To compress the scale, log transformation is applied.

This study controls several variables, such as firm size, profit, and working capital. In the Managerialism view, firm growth is attributed to firm size. This study tests whether larger firms

become more competent over time or if further improvement declines in terms of growth. Profit margin is controlled as, according to the neoclassical theory of firms, the goal of the firm is to maximize profit in the long term. This study aims to determine whether profitability is a measure of fitness, with profitable firms growing through the discovery of cost-reduction innovations or imitation, with less profitable ones losing their market share, which aligns with Evolutionary Theory. It may also have an adverse relationship with firm growth due to profitability focusing on short-term results and postponing long-term growth (Machek and Machek 2014). The study also controls working capital since it affects firm performance (Laghari and Chengang 2019; Regasa, Fielding, and Roberts 2019).

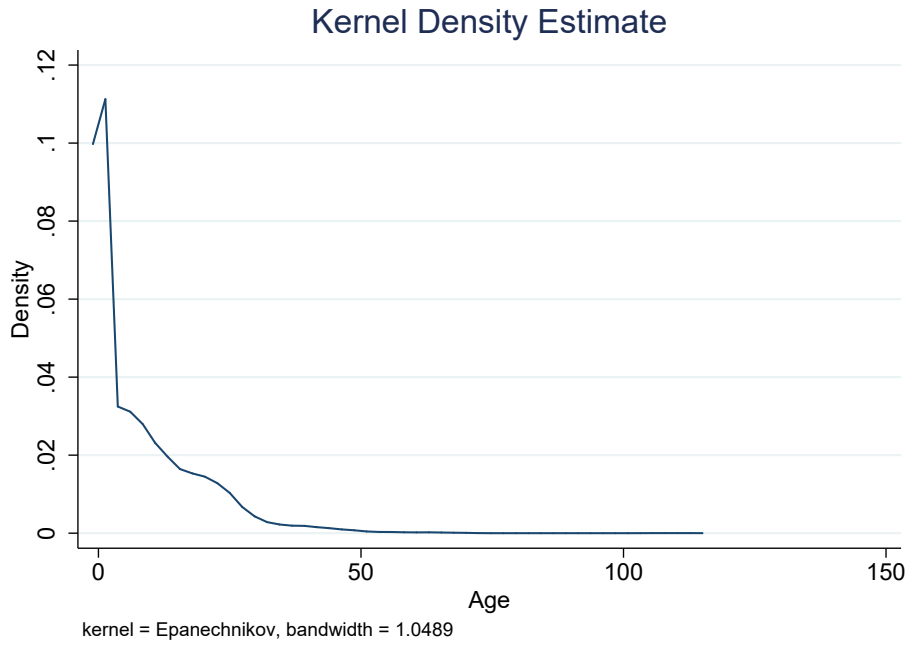

Figure 1. Firm Age of ASEAN–6 from 2009–2019

Source: own elaboration.

Model specification

The fixed effect model is used to test the moderating effect of firm age and financial constraints. However, the panel data structure may be an issue. To measure the effects of unobserved variables on firm performance, fixed or random effect models are employed. To choose between the fixed-effects model and the random-effects model, the Hausman test with the hypothesis: $H_0 = Random\ Effects\ and\ H_a = Fixed\ Effects$ is used to determine the exogeneity of the unobserved errors. The p-value is significant at the 5% level; thus, H_0 is rejected. Therefore, this study favors the fixed effect model to eliminate the influence of unobservable and time-independent factors. The fixed-effect model can reduce unobserved firm-level heterogeneity, but other firm-related, time-varying

unobserved factors might lead to endogeneity. This study takes an instrumental variable approach and uses the lagged value of service transitions. Thus, for related and unrelated service transitions, we use predicted values lagged by one year as instruments. Additionally, system GMM is applied as a robustness check to test the motion of financial variables and to resolve potential endogenous problems and autocorrelation among the errors.

Empirical results

Table 2 shows descriptive statistics for all variables in the ASEAN–6 from 2009 to 2019 before examining the regression results. This average firm growth in ASEAN over the ten years shows an increase of 0.046. *ROA* and *ROE* are measured one year in advance, which shows 0.037% and 0.038%, respectively. The KZ and WW financial constraint indices show mean values of 0.144% and 5.222%, respectively. The firm age is the natural logarithm of the respective period year minus the IPO date, which in ASEAN firms is, on average, 1.836 years old. ASEAN–6 firms experience an increase in profit, with a mean value profit margin of 0.281%. The market capitalization and working capital were, on average, 18.395% and 11.231%.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Asset Growth	44,237	0.046	0.422	−0.671	1.192
ROA	43,012	0.037	0.072	−0.124	0.181
ROE	39,436	0.081	0.144	−0.269	0.363
KZ	42,566	0.144	1.035	−1.965	1.581
WW	37,871	5.222	9.659	−0.466	22.258
KZ*Age	42,566	0.276	2.782	−7.981	6.419
WW*Age	37,871	7.012	19.029	−1.892	80.285
Age	56,001	1.836	1.577	0.000	4.061
Marketcap	37,569	18.395	1.911	15.146	22.201
Profit	39,774	0.281	0.205	0.024	0.772
Workingcap	39,339	11.231	12.563	−16.636	20.080

The table reports the summary statistics for all variables (mean, standard deviation denoted as Std. Dev., minimum value denoted as Min, maximum value denoted as Max). The study observations range from 2009 to 2019. All variables are taken from the Thomas Refinitiv database. Growth rates are based on annual changes. All variables are winsorized at the 5% and 95% levels.
Source: own calculation using data from Thomas Refinitiv (2023).

Figures 2 and 3 illustrate the association between each dimension of the financial constraint indices, which are proxied by the KZ index and WW index, with firm growth proxied by asset growth, *ROA* and *ROE*. While the KZ index is negatively correlated with firm growth in Figure 1, the WW index is positively correlated with firm growth in Figure These differences underscore the importance of carefully clarifying the results by investigating how these structural elements interact with each other using econometric analysis.

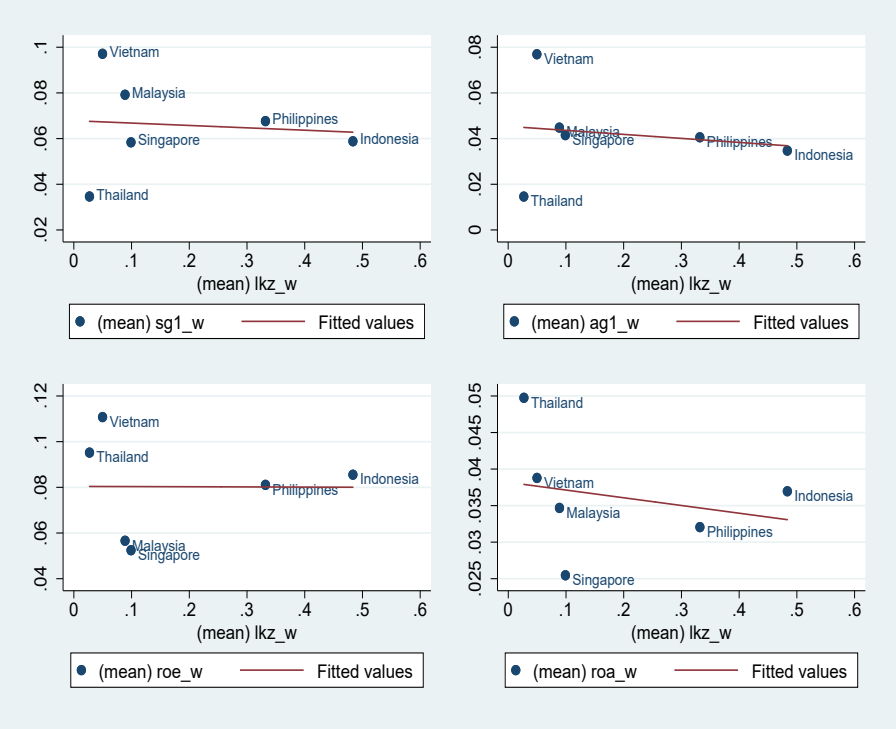

Figure 2. Financial Constraint KZ Index and Firm Growth, 2009–2019

Notes: Horizontal axis = lkz_w = log of the KZ index; Vertical axis = sg1_w: Sales growth; ag1_w: Asset growth; roe_w = Return of equity; roa_w = Return of asset
Source: own elaboration.

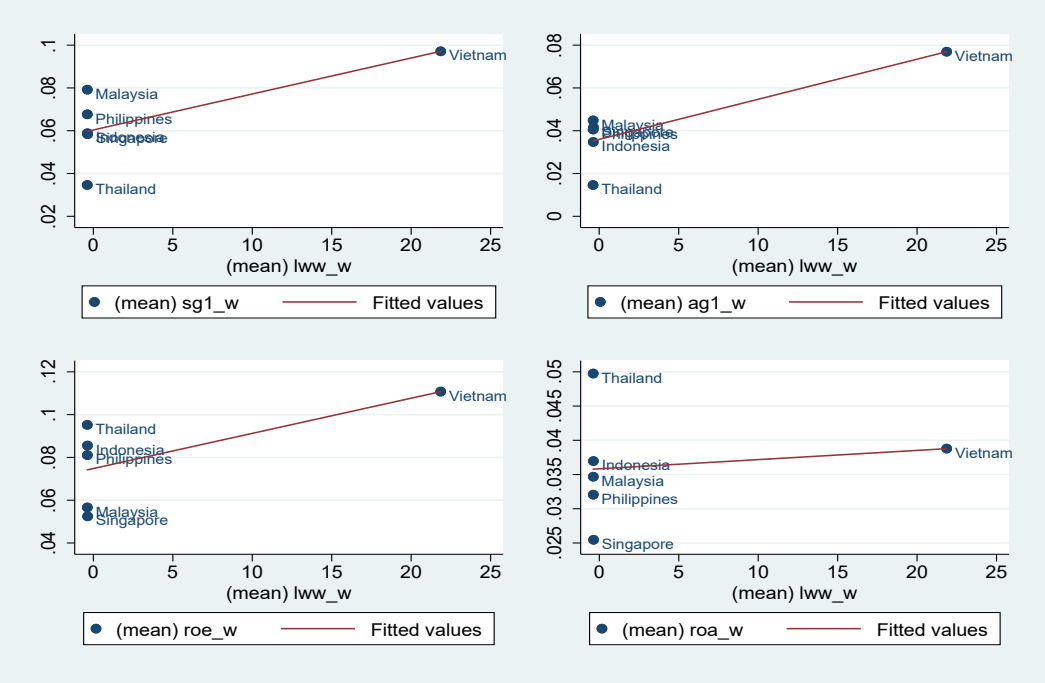

Figure 3. Financial Constraint WW index and firm growth, 2009–2019

Notes: Horizontal axis = lww_w = log of the WW index; Vertical axis = sg1_w: Sales growth; ag1_w: Asset growth; roe_w = Return of equity; roa_w = Return of asset
Source: own elaboration.

Table 3 shows a preliminary estimate of pairwise correlation coefficients, which examines the association between each pair of indicators for all kinds of industry firms (excluding financial institutions and real estate sectors) in the ASEAN–6. All dependent variables have a one-year lead, except for sales growth and asset growth. Firstly, the log KZ index has a negative correlation with all firm growth proxies (asset growth, *ROA*, and *ROE*). By contrast, the log WW index shows the opposite sign on all firm growth compared to the KZ index. The highest correlation coefficient of the KZ index on firm growth proxies is *ROA* (–0.2904), indicating that the log KZ index is associated with 0.0843% of the variance in *ROA* ($R^2 = \left(-0.2904^2\right) = 0.0843$). Secondly, the interaction between financial constraint for both indices on firm growth shows opposite results with firm growth. Thirdly, almost all correlation coefficients are statistically significant at the 1% and 5% levels. Fourthly, firm age has a negative correlation with all firm growth proxies at a 1% level of significance. A useful association between variables is obtained thereby. However, the coefficients have some limitations: they capture only linear relationships, they do not imply causality, and there is a possibility of spurious regression. Thus, the subsequent analysis uses a regression model to analyze the moderating role of firm age between financial constraints and firm growth.

Table 3. Pairwise Correlation

	Asset Growth	ROA	ROE	KZ	WW	KZ*Age	WW*Age	Age	Marketcap	Profit	Working-cap
Asset Growth	1										
ROA	–0.0121**	1									
ROE	–0.0124**	0.6984***	1								
KZ	–0.0039	–0.2904***	–0.2257***	1							
WW	0.0487***	0.0103*	0.1041***	–0.0525***	1						
KZ*Age	–0.0049	–0.3082***	–0.2305***	0.8501***	–0.0782***	1					
WW*Age	0.0350***	0.0224***	0.0822***	–0.0866***	0.7290***	–0.0698***	1				
Age	–0.0173***	–0.0920***	–0.1581***	–0.0443***	–0.3873***	0.0755***	–0.0137***	1			
Marketcap	–0.0319***	0.1876***	0.2219***	–0.0728***	–0.4296***	–0.0630***	–0.3234***	–0.2572***	1		
Profit	–0.0058	–0.0054	0.1482***	0.1172***	–0.1899***	–0.2037***	–0.1575***	–0.1574***	0.0321***	0.2848***	1
Workingcap	0.0088*	0.0073	0.1116***	0.0532***	–0.2871***	–0.0288***	–0.2231***	–0.0037	0.0924***	0.1468***	0.0351***

The Pairwise Correlation presents the relationship between financial constraint indices, the KZ and WW indices, with different measures of growth in all sectors, except for financial institutions and real estate sectors. In the models, the dependent variable of firm growth is measured as asset growth, *ROA*, and *ROE*. Firm age is a moderating variable between financial constraint and firm growth. This study controls log market capitalization, gross profit margin, and working capital. Parentheses *, **, *** denote p-values of 0.10, 0.05, and 0.01, respectively.
Source: own calculation using data from Thomas Refinitiv (2023).

Table 4 presents the results obtained from estimating a static model using Fixed Effect regression. The interpretation starts with the constant, as usual, which represents the predicted value for those observations that have 0 values on all independent variables in the model: In columns (1), (3), and (5) with financial constraint as KZ index in the model, the estimated asset growth, *ROA*, and *ROE* of average firm age are 0.291%, 0.0103%, and 0.0325%. On the other hand, columns (2), (4), and (6) with financial constraint as WW index in the model, the estimated asset growth, *ROA*, and *ROE* of average firm age are 3.984%, 0.122%, and 0.0791%.

The fixed effect model is reported here as it gives estimates that are of the same sign and similar. For the financial constraints, the KZ and WW indices are used to explore the impact on three alternative firm growth proxies: asset growth, *ROA*, and *ROE*. Table 4 shows that the finance–growth relationship depends on firm age. Estimations in models (2), (4), (5), and (6) display constant results on positive firm age as a moderator between financial constraints on all three firm growth proxies (asset growth, *ROA*, and *ROE*) at the 1% level of significance. This shows that going public can relax financial constraints and increase the availability of capital for growth. The longer the IPO period, the more firms are able to gain access to new financial resources, as by reducing information asymmetry, they signal the firm's value to the public. This result emphasizes the importance of entrepreneurial fundraising in the growth process.

As Table 4 shows, the impact of financial constraint on *ROA* and *ROE* shows consistent results. The simple effect of financial constraint on *ROE* is –0.0282%, and the interaction term (KZ*Age) has a positive impact on *ROE* of 0.00693%. For a unit increase in age, the strength of the negative impact of financial constraint on firm growth is weakened by the size of the interaction term (–0.0282 + 0.00693 = –0.0213). In other words, the coefficient on the interaction term between financial constraint and firm growth shows that for each unit increase in age, the negative impact of the financial constraint on *ROE* becomes weaker, decreasing by 0.00693% (column 5).

On the other hand, when the KZ index is replaced with the WW index, for every unit increase in age, the negative impact of financial constraint on *ROE* becomes weaker, decreasing by 0.00118% (column 6). This suggests that the negative impact of financial constraints on firm growth is weakened by the presence of older firms compared to younger ones. This may be due to less information asymmetry and the higher ability to meet creditors' collateral requirements for older firms due to their credit track record, reputation, and established networks, which result in greater bargaining power and better access to finance.

Thus, the result shows that the differences in financing decisions that lead to growth are likely due to the role of firm characteristics, i.e., firm age. This is consistent with the resource-based view approach to the corporate life cycle, whereby younger firms have resource scarcity and are in the process of discovering reliable structures and routines. In other words, firms would need to translate their financial constraint into securing an IPO, which can build their reputation and improve their firm's growth.

Regarding the control variables, market capitalization is significantly negatively correlated with asset growth but significantly positively correlated with *ROA* and *ROE*. ASEAN firms show profit-led growth at a rate of 1% in terms of *ROA* and *ROE*. In the ASEAN–6 region, working capital shows inconsistent results with firm growth proxies.

Table 4. Fixed Effect Estimations – Interaction Term between Firm Age and Financial Constraint (KZ and WW Indices) and Firm Growth

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Asset Growth	Asset Growth	ROA	ROA	ROE	ROE
KZ	0.00308		−0.00869***		−0.0282***	
	(0.010)		(0.001)		(0.003)	
KZ*Age	−0.00262		0.000482		0.00693***	
	(0.003)		(0.000)		(0.001)	
WW		−0.702***		−0.0226***		−0.0150**
		(0.029)		(0.004)		(0.007)
WW*Age		0.00133**		0.00109***		0.00118***
		(0.001)		(0.000)		(0.000)
Age	0.00011	0.00969	−0.00833***	−0.0203***	−0.0134***	−0.0261***
	(0.006)	(0.009)	(0.001)	(0.001)	(0.002)	(0.002)
Marketcap	−0.0140***	−0.0149***	0.00180***	0.00285***	0.00425***	0.00541***
	(0.005)	(0.005)	(0.001)	(0.001)	(0.001)	(0.001)
Gross profit	0.0416	0.0276	0.0545***	0.0601***	0.107***	0.110***
	(0.032)	(0.032)	(0.004)	(0.004)	(0.008)	(0.008)
Workingcap	−0.0000169	0.0000479	0.0000524	0.000143***	−0.000312***	−0.000158*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.291***	3.984***	0.0103	0.122***	0.00325	0.0791*
	(0.091)	(0.176)	(0.011)	(0.020)	(0.022)	(0.042)
Observations	27,127	26,911	28,960	25,652	28,247	25,439
R-squared	0.000	0.026	0.026	0.032	0.019	0.016
Number of ids	3,780	3,684	3,771	3,613	3,577	3,475
Hausman Test	5.53	617.83	517.4	417.34	482.16	367.51
	(0.478)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
VIF	2.290	2.66	2.40	2.53	2.45	2.55
Heterosce-dasticity	2.30*10^36	1.20*10^35	424.17	394.462	306.681	222.616
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Asset Growth	Asset Growth	ROA	ROA	ROE	ROE
Serial Correlation	121.236	83.899	424.17	394.462	306.681	222.616
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Note: The Fixed Effect Model examines the relationship between two different financial constraint indices, namely the KZ and WW indices, and three different growth-oriented measures: Asset Growth, *ROE*, and *ROA*. This analysis is conducted across all sectors, excluding financial institutions and the real estate sector, with firm age as a moderating variable between financial constraint and firm growth. This study controls market capitalization, gross profit margin, and working capital. Standard errors are in parentheses. *, **, *** denote p-values of 0.10, 0.05, and 0.01, respectively.
Source: own calculations using data from Thomas Refinitiv (2023).

Robustness checking

The System GMM regression is employed to explore an alternative method for obtaining robust results. First, this study implies an alternative estimation method by reworking equation (1), the static Fixed Effect panel model turned into System GMM. The results are reported in Table. The sign of the results consistently indicates a positive moderating effect of firm age on firm growth in the presence of financial constraints, which remains unchanged when considering the WW index. This supports the theory that older firms, according to the resource-based view, weaken the negative relationship between financial constraint on firm growth.

In sum, *ROA* and *ROE* as measures of firm growth do provide a stable picture. As shown in Table 4 and 5, the coefficients for financial constraint KZ and WW indices on firm growth proxies are negative, indicating that limited financial resources restrict firms' operations. Consequently, firms may be compelled to scale down their investment projects, resulting in lower performance and growth that aligns with the available funding. However, the control variables are not consistent with Table 4.

Table 5. Robustness Check System GMM – Interaction Term between Firm Age and Financial Constraint (KZ and WW Indices) on Firm Growth

VARIABLES	Asset Growth	Asset Growth	ROA	ROA	ROE	ROE
L.sg1_w	–0.194***	–0.202***	0.531***	0.624***	0.474***	0.486***
	(0.008)	(0.008)	(0.015)	(0.022)	(0.015)	(0.016)
lkz_w	0.0027		–0.00323*		–0.00026	
	(0.016)		(0.002)		(0.005)	

VARIABLES	Asset Growth	Asset Growth	ROA	ROA	ROE	ROE
lkz_wlage_w	0.000356		0.00440***		0.0102***	
	(0.006)		(0.001)		(0.002)	
lww_w		−0.00988***		−0.00546***		−0.00583***
		(0.002)		(0.001)		(0.001)
lww_ wlage_w		−0.00067		6.50E−05		0.000317
		(0.001)		(0.000)		(0.000)
lage_w	0.000957	−0.0261**	−0.00682***	−0.00455***	−0.00855***	−0.0105***
	(0.008)	(0.011)	(0.001)	(0.002)	(0.002)	(0.003)
lmarket-cap_w	−0.0105	−0.0309***	−0.0131***	−0.0150***	−0.0247***	−0.0247***
	(0.008)	(0.009)	(0.001)	(0.001)	(0.003)	(0.003)
profit_w	0.00922	−0.0247	−0.0640***	−0.0738***	−0.126***	−0.149***
	(0.066)	(0.066)	(0.008)	(0.009)	(0.017)	(0.018)
lworking-cap_w	0.000415	0.000213	−0.000197***	−0.000295***	−0.000591***	−0.000855***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.227	0.742***	0.293***	0.350***	0.553***	0.595***
	(0.140)	(0.167)	(0.024)	(0.026)	(0.047)	(0.051)
Observations	26,126	26,096	28,104	24,917	27,282	24,657
Number of id	3,744	3,739	3,753	3,612	3,530	3,467

Note: The System GMM Model examines the relationship between two different financial constraint indices, the KZ and WW indices, and three different growth-oriented measures: Asset Growth, *ROE*, and *ROA* in all sectors, excluding financial institutions and the real estate sector. Firm age serves as a moderating variable between financial constraint and firm growth. Additionally, this study controls market capitalizations, gross profit margin, and working capital. Standard errors are in parentheses. *, **, and *** denote p-values of 0.10, 0.05, and 0.01, respectively.
Source: own calculations using data from Thomas Refinitiv (2023).

Conclusions

The results demonstrate the growth-related trends in the ASEAN–6 from 2009 to 2019, which are associated with firm growth in terms of asset growth, *ROA*, and *ROE*. The positive moderating role of firm age in the relationship between financial constraint and firm

growth is confirmed by robustness check using i) both fixed effect and system GMM models, and ii) different measures for firm growth and financial constraint.

Both methodologies show that the negative relationship between financial constraint and firm growth weakens when the firm age is older. This article addresses the research gap by investigating the combined effects of age and financial constraint, revealing their impact and direction. The results suggest solutions that older firms, despite their complexity and novelty, can exploit productive opportunities for growth. This is made possible due to their accumulated reputation, experience, and networks with supporters and clients, as well as economies of scale, which allows the firm to channel the reallocation of financial resources when generating income. ASEAN firms must avoid screening out too many growth ideas and opt instead to invest in a portfolio of growth experiments. Going public (the IPO) serves as a useful external enabler of entrepreneurship activities, fostering growth.

A growth crisis often happens due to a government's chronic failure to encourage ambitious entrepreneurs. Firm growth should remain at the heart of government strategy as it is the basic engine of ASEAN's transformation. There is no evidence that working capital contributes to growth for ASEAN firms. There is profit-led growth in terms of *ROA* and *ROE*.

The findings make significant contributions to the financial constraint literature. First, financial constraint is a barrier to expanding growth. Secondly, from a theoretical point of view, this study contributes to Stinchcombe's (2000) theory of "Liability of Newness". Firm age has a role that might be more interesting than simply focusing on age itself as a factor. The positive interaction term between firm age and financial constraint in this study shows that older firms experience less severe financial constraints on firm growth. Governments should harness the significant potential of these older firms within the ASEAN–6 to bolster a robust economic system, build trust and confidence among foreign investors, and strengthen the business cycle.

These findings also have implications for management in practice. First, companies often face competing interests from a wide range of stakeholders. Corporate practitioners should have a clear understanding of their growth objectives, and management decisions should align with these objectives. It's important to acknowledge that different firms have varying different desires and attitudes toward growth. Firms should take specific actions that align with their growth vision and expansion goals, ensuring their ability to survive and stay true to the purpose of the business. It is essential to maintain a long-term perspective and adapt to the changing world around us. Secondly, they should take advantage of the age of the company, which can act as a form of inertia, to transform the organizational structure to implement growth. Older firms have better equipment and technology, better access to finance, and greater pressure and incentives to adapt their strategies to changing market

conditions. It is important to take advantage of accumulated business experience, as it should mitigate financial constraints on firm growth. Thirdly, the ASEAN–6 should proactively explore business opportunities with higher profitability and allocate a larger portion of their total profits towards growth initiatives, as the results show a significant positive relationship with firm growth.

This study has some limitations. The first is that the sample used in this study only comprises ASEAN firms. Second, a "one-size-fits-all" taxonomy is not regarded as the best solution for ASEAN since each country has a different economic level with different main economic activities and objectives across many different sectors. Thus, the results of this study cannot be applied to other countries or industries. Third, the study has taken a static view of the moderating role of firm age between financial constraint and firm growth. A dynamic view would yield additional insights by examining the lag effect of time.

References

Aldrich, H.E., Auster, E.R. (1986), *Even Dwarfs Started Small: Liabilities of Age and Size and Their Strategic Implications*, "Research in Organizational Behavior", 8, pp. 165–198.

Arrighetti, A., Cattani, L., Landini, F., Lasagni, A. (2021), *Work flexibility and firm growth: Evidence from LEED data on the Emilia-Romagna region*, "Industrial and Corporate Change", 30 (6), pp. 1516–1538, https://doi.org/10.1093/icc/dtab028

Barba Navaretti, G., Castellani, D., Pieri, F. (2014), *Age and firm growth: evidence from three European countries*, "Small Business Economics", 43 (4), pp. 823–837, https://doi.org/10.1007/s11187-014-9564-6

Bruderl, J., Schussler, R. (1990), *Organizational Mortality: The Liabilities of Newness and Adolescence*, "Administrative Science Quarterly", 35 (3), 530, https://doi.org/10.2307/2393316

Chang, H., Song, F.M. (2013), *Testing the Pecking Order Theory with Financial Constraints*, "SSRN Electronic Journal", https://doi.org/10.2139/ssrn.2200847

Coad, A. (2018), *Firm age: A survey*, "Journal of Evolutionary Economics", 28 (1), pp. 13–43, https://doi.org/10.1007/s00191-016-0486-0

Coad, A., Tamvada, J.P. (2012), *Firm growth and barriers to growth among small firms in India*, "Small Business Economics", 39 (2), pp. 383–400, https://doi.org/10.1007/s11187-011-9318-7

Coad, A., Segarra, A., Teruel, M. (2016), *Innovation and firm growth: Does firm age play a role?*, "Research Policy", 45 (2), pp. 387–400, https://doi.org/10.1016/j.respol.2015.10.015

Çoban, S. (2014), *The Interaction between Firm Growth and Profitablity: Evidence from Turkish (Listed) Manufacturing Firms*, "The Journal of Knowledge Economy & Knowledge Management", 9, pp. 73–82.

Cowling, M., Liu, W., Zhang, N. (2018), *Did firm age, experience, and access to finance count? SME performance after the global financial crisis*, "Journal of Evolutionary Economics", 28 (1), pp. 77–100, https://doi.org/10.1007/s00191-017-0502-z

Dopierała, Ł., Mosionek-Schweda, M., Laskowicz, T., Ilczuk, D. (2022), *Financial performance of renewable energy producers: A panel data analysis from the Baltic Sea Region*, "Energy Reports", 8, pp. 11492–11503, https://doi.org/10.1016/j.egyr.2022.09.009

Egorova, A.A., Grishunin, S.V., Karminsky, A.M. (2022), *The Impact of ESG factors on the performance of Information Technology Companies*, "Procedia Computer Science", 199, pp. 339–345, https://doi.org/10.1016/j.procs.2022.01.041

Guariglia, A., Yang, J. (2016), *A balancing act: Managing financial constraints and agency costs to minimize investment inefficiency in the Chinese market*, "Journal of Corporate Finance", 36, pp. 111–130, https://doi.org/10.1016/j.jcorpfin.2015.10.006

Hadlock, C.J., Pierce, J.R. (2010), *New Evidence on Measuring Financial Constraints: Moving Beyond the KZ Index*, "Review of Financial Studies", 23 (5), pp. 1909–1940, https://doi.org/10.1093/rfs/hhq009

Haran, M.E., Lo, D., McCord, M., Davis, P., Lim, L.C. (2021), *Impact of firm-level attributes on listed real estate company performance*, "Journal of Property Investment & Finance", 39 (4), pp. 323–348, https://doi.org/10.1108/JPIF-03-2020-0030

Kaplan, S.N., Zingales, L. (1997), *Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?*, "The Quarterly Journal of Economics", 112 (1), pp. 169–215, https://doi.org/10.1162/003355397555163

Laghari, F., Chengang, Y. (2019), *Investment in working capital and financial constraints: Empirical evidence on corporate performance*, "International Journal of Managerial Finance", 15 (2), pp. 164–190, https://doi.org/10.1108/IJMF-10-2017-0236

Lefebvre, V. (2023), *The growth process of IPO firms*, "Journal of Business Venturing Insights", 19, e00377, https://doi.org/10.1016/j.jbvi.2023.e00377

Leoncini, R., Marzucchi, A., Montresor, S., Rentocchini, F., Rizzo, U. (2019), *Better late than never": The interplay between green technology and age for firm growth*, "Small Business Economics", 52 (4), pp. 891–904, https://doi.org/10.1007/s11187-017-9939-6

Machek, O., Machek, M. (2014), *Factors of Business Growth: A Decomposition of Sales Growth into Multiple Factors*, "WSEAS Transactions on Business and Economics", 11 (35), pp. 380–38511.

McFaddin, S., Clouse, M. (1993), *A new model for sustainable growth in the energy industry*, "Energy Economics", 15 (1), pp. 3–7, https://doi.org/10.1016/0140-9883(93)90036-Q

Nakatani, R. (2021), *Total factor productivity enablers in the ICT industry: A cross-country firm-level analysis*, "Telecommunications Policy", 45 (9), 102188, https://doi.org/10.1016/j.telpol.2021.102188

Regasa, D., Fielding, D., Roberts, H. (2019), *Sources of Financing and Firm Growth: Evidence from Ethiopia*, "Journal of African Economies", 29 (1), pp. 26–45, https://doi.org/10.1093/jae/ejz012

Stinchcombe, A.L. (2000), *Social structure and organizations*, "Advances in Strategic Management", 17, pp. 222–259, https://doi.org/10.1016/S0742-3322(00)17019-6

Theodore, C., Lindberg, R.A. (1978), *Survival & Growth: Management Strategies of the Small Firm*, American Management Association, New York.

Thomas Refinitiv (2023), *Screener App Database*, https://eikon.thomsonreuters.com/index.html (accessed: 1.01.2023).

Tran, V.T., Nguyen, T.T., Tran, N.T.M. (2019), *Gender difference in access to local finance and firm performance: Evidence from a panel survey in Vietnam*, "Economic Analysis and Policy", 63, pp. 150–164, https://doi.org/10.1016/j.eap.2019.05.004

Whited, T.M., Wu, G.W. (2006), *Financial Constraints Risk*, "The Review of Financial Studies", 19 (2), pp. 531–559, https://doi.org/10.1093/rfs/hhj012

Yang, L. (2018), *Firm Age, Size, and Employment Dynamics: Evidence from Japanese firms*, RIETI Discussion Paper Series 18-E–006.

Zhang, D., Lucey, B.M. (2022), *Sustainable Behaviors and Firm Performance: The Role of Financial Constraints" Alleviation*, "Economic Analysis and Policy", 74, pp. 220–223, https://doi.org/10.1016/j.eap.2022.02.003

Ograniczenia finansowe rozwoju firmy: rola wieku firmy w krajach ASEAN–6

W artykule oceniono wpływ wieku firmy na relację między ograniczeniami finansowymi, mierzonymi wskaźnikami KZ i WW, a trzema alternatywnymi miarami wzrostu firm (wzrost aktywów, *ROA* i *ROE*) w regionie ASEAN–6. W niniejszym badaniu wykorzystano próbę obejmującą firmy notowane na giełdzie regionu ASEAN–6 w latach 2009–2019 przy użyciu metody efektów stałych (Fixed Effects) i systemowej uogólnionej metody momentów (System GMM). Stwierdzono, że wiek firmy łącznie z ograniczeniami finansowymi wpływa pozytywnie na rozwój firmy. Negatywny wpływ ograniczeń finansowych na wzrost firm jest mniej dotkliwy w przypadku firm starszych.

Słowa kluczowe: ograniczenia finansowe, metoda efektów stałych, systemowa uogólniona metoda momentów, ASEAN, wskaźnik KZ, wskaźnik WW, wzrost firmy