THE EFFECT OF TAX ADMINISTRATIVE BURDEN ON ENTREPRENEURSHIP: THE CASE OF THE ASIA-PACIFIC COUNTRIES

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Abstract. The objective of this paper is to analyze how tax administrative burden influences entrepreneurial activity in the eight Asia-Pacific economies during the period 2011–2019. In this study, we use the Principal Component Analysis (PCA) to produce the tax administrative burden which are characterized by the number of tax payments per year and the time to pay taxes in hours per year. By controlling for the effects of macroeconomic conditions, the empirical results indicate that tax burden cost has a significant and negative influence on the Entrepreneurial Intention, Nascent Entrepreneurship rate and Established Business Ownership Rate (EBO) in the Asia-Pacific economies. In other words, when firms have generated revenue, an increase in tax compliance cost is an important factor that hinders business activities, especially at the beginning stages. Notably, the findings indicate that the impact of tax burden varies among different stages of entrepreneurial life cycle. Upon the implications for these countries, we also desire to deliver useful lessons for the future development of entrepreneurial activities in Vietnam, especially in the presence of the Covid-19 pandemic that shakes the world.

Keywords: compliance cost, entrepreneurship, principal component analysis, tax administrative burden

1   Introduction

Entrepreneurial activities draw increasing attention from experts and policymakers in both advanced and less-advanced countries. A greater entry rate of new businesses has become more important in creating occupational opportunities, innovations and well-being of society, fostering competition and stimulating economic growth [1, 2]. Galor and Michalopoulos [3] advise that the development of entrepreneurial activities can help close the development gap between developed and developing economies. Additionally, an increasing rate of unemployment as an aftermath of the recent financial crisis has become a major challenge for government policy. This situation hence determines a rise of entrepreneurs motivated by the necessity of relaunching national economies and solving unemployment issues. Therefore, there is a strong need to investigate how entrepreneurship is driven by economic and institutional indicators.

Also, the nexus between tax structure and business registries is of central interest to OECD governments in implementing tax cut policies [4]. Providing that the globalization phase dramatically changes the business environment with technological advances as well as more competition, the duty of designing an appropriate tax system is even more important in the modern world. Although we acknowledge the legitimate purposes of the tax system, we cannot negate the existence of tax complexity, which could create an entry barrier for nascent businesses and entrepreneurs who tend to start a new firm. Therefore, finding an effect of the tax administrative burden on entrepreneurial entry is an international interest both by academic researchers and by governments.

However, to the best of our knowledge, there are not so many official or well-understood studies on this issue [5–7]. In particular, Djankov et al. [7] did not perform explicitly the role of tax compliance cost in the business entrance, just concluding that a 10% increase in corporate tax rate tends to decrease the start-up rate by 2% to 5%. To deal with such an issue, Braunerhjelm and Eklund [5], and Braunerhjelm et al. [6] also find a negative relationship between compliance costs and entry and different effects throughout the business life cycle. Further, these previous studies just focus on mature markets in the United States, Canada or European Union member countries, while the studies in Asia and the Pacific region have been neglected for a long time. According to a report by Asian Development Bank [8], the Asia-Pacific economy still maintains growth momentum despite trade tension and great business opportunities are expected to encourage a wave of potential and successful entrepreneurs. The Certified Practicing Accountant (CPA) Australia points out that the businesses in this region have to operate under great pressure to achieve social and environmental requirements by customers [9]. On top of that, Guelich and Bosma [9] assert that the entrepreneurial ecosystem in the Asia-Pacific region creates a more suitable environment for entrepreneurial activities compared to the average criteria suggested by the *Global Entrepreneurship Monitor* (GEM).

Our paper's contribution to the literature is threefold. First, this is one of the first studies investigating the relationship between tax administrative burden and entrepreneurship in the Asia-Pacific region. Second, we also consider how the tax burden influence different stages in the entrepreneurial life cycle. Third, we approach the issue at a macro-level, which is not widely considered in previous studies.

The rest of this paper is structured as follows. Section 2 provides a brief literature review on the impact of tax administrative burden on entrepreneurship. Section 3 illustrates the methodology and data collection. We present our main results together with a discussion in Section 4. The main conclusions and policy implications are provided in the last section.

2   Literature Review

As discussed earlier, taxation is a potential policy instrument that generates meaningful changes in entrepreneurial activity and therefore economic development. Thus, it is understandable why there is a great deal of attention in the economic literature focusing on the nexus between tax policy and new dynamic enterprises. A variety of both theoretical and empirical studies have been conducted to find the direct effects of taxation on entrepreneurship, but the indirect effects related to tax compliance have been hidden in these analyses.

2.1   Direct impacts of taxation on entrepreneurship

Theoretical literature has not reached a consensus on how one country's tax system affects entrepreneurship. Generally, the bulk of theoretical discussion points to a negative relationship between tax structure and entrepreneurship. In particular, Keuschnigg and Nielsen [10] show that tax progressivity deters entrepreneurs from starting and expanding innovative industries. Employing an augmented standard Bewley model, Kitao [11] also conclude that a reduction of taxes takes away a burden on capital formation and then increases the ability of entrepreneurial investment but raises the opportunity cost of non-entrepreneurial investment. In different conclusions, Domar and Musgrave [12] and Long [13] show a positive effect of tax on entrepreneurial activity. This direction can be partly explained in Feldstein and Slemrod [14], Gordon [15], and Gordon and Cullen [16]. Regarding the tax system in the US, these authors indicate that above a certain level, corporate taxation would yield a lower taxable amount than the personal tax system, hence motivating firm entry.

On the other hand, some studies suggest that the tax system of one country can exert an ambiguous impact on the entry decision of entrepreneurs concerning the impact of risk-taking. First, if the entrepreneur is risk-averse, a progressive tax acting as an insurance scheme will encourage start-ups [12]. Second, given that entrepreneurs are risk-neutral, a proportional income tax with full loss offset does not influence the decision of whether or not to become self-employment*ed* [17]. Another case for risk-neutral entrepreneurs was also provided by Gentry and

Hubbard [17], stating that a "success" tax with imperfect loss offset might prevent him/her from starting a new business.

Unlike the theoretical framework, most of the recent empirical studies show a negative link between taxation and the incorporation decision [7, 18, 19, 20, 21, 22, 23, 24]. There are three main reasons used to support this argument. First, paying taxes does lead firms to engage in activities generating lower income to avoid paying high taxes on high profits [4, 25]. Second, tax dispossesses a portion of the start-up's income from innovation [26]. Third, it reduces the benefits of social safety net which determine a nation's level of innovative entrepreneurship [27].

2.2   Indirect impacts of taxation on entrepreneurship: Tax compliance costs

Most of the previous economic analyses focus on the effect of various tax rates such as corporate income tax but skip researching the indirect effects of a tax system which is significant in policy implementation [5]. One of the indirect effects should be tax compliance costs which are navigated as a precondition of business entry. According to Watson and Kaeding [28], regulatory costs determine entrepreneurs' decision to go into or quit a business if the costs are compared with the expected return or if other opportunities bring higher returns. Scant research has been conducted to indicate the measurement of compliance costs and examine their impacts on entrepreneurship, except for Djankov et al. [7], Braunerhjelm and Eklund [5] and Braunerhjelm et al. [6]. However, Djankov et al. [7] just used tax administration as a control variable and gave a conclusion on the relationship between corporate tax rate and start-up decision, but not the effect of tax administration.

To measure business entry in the 2014 research, Braunerhjelm and Eklund [5] compile the number of new firm registrations per 1,000 inhabitants from World Bank Group Entrepreneurship Snapshots (WBGES). Exploiting available data from Doing Business of World Bank, Braunerhjelm et al. [6] broken tax administrative burden into two components such as the time (hours per year) and the costs (the number of payments) that taxpayers spend on paying taxes as proxies to tax administrative burdens. There are several ways to measure legal complexity, but they believe that these indicators would be useful in cross-country research and express the quantitative content of tax legislation. Further, in the latter research, these authors also explore the effect of the tax administrative burden on five different stages of the entrepreneurial life cycle based on GEM classification.

Their finding is that the higher the tax administrative burden imposed, the lower chance that entrepreneurs tend to enter an industry and undertake the entrepreneurial activity. Moreover, based on the empirical results, the impact of tax compliance costs varies over the business life cycle. In particular, a decrease in the tax burden of 10% would rise about 1.3% total entrepreneurial activity and 3.9% new business ownership rate, while they did not indicate any significant impact of the tax burden in three other stages. Although the results show strong

support for the negative effects, both studies [5, 6] did not suggest meaningful implications to fill up policy gaps for policymakers.

To summarize, the burden imposed by tax policy builds a barrier to entry for entrepreneurs, which has been neglected in previous studies. Additionally, most of the prior studies used macro-data in their analysis rather than micro-level data. Also, according to Meyer [29], the problem of endogeneity can be successfully tackled by employing panel data. To the best of our knowledge, this is the first study that investigates the relationship between tax administrative burden and entrepreneurship in the Asia-Pacific at the macro level. Also, apart from constructing economic models, we expect this study will contribute some feasible suggestions to simplify and minimize tax burdens which are additional impediments to self-employment. We then propose the hypothesis as follows:

Hypothesis 1: *A larger tax administrative burden will decrease the percentage of the population who are entrepreneurs.*

Hypothesis 2: *The influence of tax administrative burden is different among five stages of the entrepreneurial life cycle.*

3   Data and Methodology

3.1   Data Description

The data cover the period from 2011 to 2019. Typically, the term Asia and Pacific region comprises much of East Asia, Southeast Asia, South Asia and Oceania. In this study, we select the group of countries upon the classification by *Global Entrepreneurship Monitor (GEM)*. GEM is the most extensive study focusing on entrepreneurship and determinants of the nature and levels of entrepreneurship, hence proposing appropriate suggestions for enhancing entrepreneurial activities within an economy. GEM takes a comprehensive socio-economic approach and also considers the degree of entrepreneurial activity in a specific economy. It also identifies different types and phases of entrepreneurship and documents how entrepreneurship is affected by national conditions. Based on the availability of datasets, we then select eight countriesfrom different continents: India (South Asia); Indonesia, Malaysia, Thailand and Viet Nam (Southeast Asia); China and the Republic of Korea (East Asia); and Australia (Oceania). This group of countries were also picked by the Youth Co: Lab[1] in investigating the entrepreneurship ecosystem in Asia and the Pacific, since it represents a broad range of countries in the region [9].

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[1] Youth Co: Lab was developed by the United Nations Development Program (UNDP) and the Citi Foundation in 2017, aiming to empower youth, entrepreneurial activities and innovation in Asia-Pacific countries toward the Sustainable Development Goals.

In this research, entrepreneurship is considered as the dependent variable and measured by five indicators characterising the entrepreneurial life cycle. According to Bosma et al. [30], with a special focus on the individual entrepreneurs, differences in entrepreneurial activities, as well as attitudes and aspirations, can be discovered. The first stage is named *entrepreneurial intention*, indicating the proportion of the population aged 18-64 years old who intend to start a business in less than 3 years. The second phase in the entrepreneurial process represents the *nascent entrepreneurship rate* (0–3 months), denoting the share of the population in the 18-64 age group who have currently owned either a new business or a nascent entrepreneur. The next stage refers to the percentage of the population in the 18-64 age group who are currently running a new business from 3 to 42 months, named as *new business ownership rate* (NBO). Additionally, we also involve an aggregate proxy of entrepreneurial activity, namely *total entrepreneurial activity* (TEA). This indicator depicts the share of the population (age 18–64) who are either nascent entrepreneurs or new business owners. The last stage in the entrepreneurial life cycle denotes the percentage of the working-age population who are currently owner-manager of a new enterprise that has paid wages or payments to the owners for more than 3.5 years old, *established business ownership rate* (EBO). The existing phase is regularly excluded in previous studies as entrepreneurs might exit at any stage of the business life cycle. These proxies of entrepreneurship are akin to previous studies [4, 6, 31, 32]. The source of entrepreneurship data is the Adult Population Survey of GEM.

The main independent variable is the tax administrative burden which is measured at the country level. This study builds up a composite index for tax administrative burden by a linear combination of two variables, which are the time to pay taxes in hours per year and the number of tax payments per year. To construct such an aggregate variable, we adopt the Principal Component Analysis (PCA), which was initiated by Pearson [33] and then developed by Hotelling [34]. The PCA is considered a widely-used method for dimensionality reduction, aiming to transform the original dataset into a set of uncorrelated factors. The underlying idea of PCA is to obtain the maximum variance among the set of initial variables. For instance, PCA would get the maximum variance among two variables including the time to pay taxes and the number of tax payments. The principal components are then classified in descending order of their correspondent variances. In other words, the first component accounts for the most variation in the original variables and so on. According to Saltelli et al. [35] and Vyas and Kumaranayake [36], the advantage of the PCA method is the convenient calculation and the avoidance of problems related to normalization or non-linear relationships. The variance of each principal component is indicated by the magnitude of the eigenvalue associated with the corresponding eigenvector.

Similar to the study of Braunerhjelm et al. [6], we proxy corporate tax by using total the corporate tax rate as a percentage of profits. The data on taxes is also assembled by the World Bank Doing Business Project. We also control for entry barriers by including the start-up cost relevant to entrepreneurial activities. Data on entry cost is also collected from the World Bank Database, which is measured by the percentage of Gross National Income per capita. We expect that start-up cost and tax variables would negatively influence entrepreneurial activities, which is akin to Braunerhjelm et al. [6].

To control for an overestimation of the effect, we also adopt the annual growth rate in GDP per capita by adding the GDP per capita (named GDPPC Growth) and domestic credit to GDP (named Credit to GDP) as proxies for the overall business environment. Data are collected from the World Bank Database. These two control variables are major macroeconomic factors that can influence entrepreneurial activity. According to Aparicio, Urbano and Audretsch [37], Vidal-Suñé and López-Panisello [38], an increase in income will boost the demand for goods and services, encouraging new dynamic enterprises to step into the market. Nevertheless, several studies indicate that the influence of income per capita on entrepreneurship is determined by the level of economic growth in each country [39, 40]. From this standpoint, less developed countries are prone to witness a negative impact of GDP per capita growth on entrepreneurial activity, as the low-income situation will stimulate new firm creation to offer more job opportunities [32]. Domestic credit to the private sector as a share in GDP refers to a source of external financing to the private sector. This variable is expected to positively correlate with entrepreneurship as ease of finance would stimulate the creation of new business start-ups [41, 42]. In addition, the natural logarithm is used to transform the original variables t into a more normalized dataset, except for GDPPC growth rate and domestic credit.

1.2 Estimation technique

The regression equation adopted in this study is given as follows:

$$lnEntrepreneurship_{it} = \beta_0 TaxBurden_{i,t} + \beta X'_{i,t} + \alpha_i + \varepsilon_{it}$$

In which, sub index i and t denote country and time, respectively (t = 2011, …, 2019). Entrepreneurship indicators are the five measures of the entrepreneurial life cycle which are denoted previously. The key explanatory variable is $TaxBurden_{it}$ in country i at time t. Vector X signifies the control variables in the model, including corporate tax, entry barrier, GDP per capita growth and domestic credit to GDP. Additionally, we use the lags of 1 year for growth rate and domestic credit, as the impact of macroeconomic variables usually occurs after a while. α_i captures country's stable characteristics (or country fixed effects), which is also used to remove unobserved heterogeneity. ε_{it} refers to the error term.

Similar to previous work [24, 32] to estimate the regression coefficients, we adopt the panel fixed-effect method which could help remove the disparities between countries. The reason for choosing this method is further detailed as follows. It is important to note that a crucial assumption of the panel fixed effect is that the time-invariant characteristics are unique to each individual, which are uncorrelated with the characteristics of other individuals [43]. In other words, individuals and error terms do not correlate over time [44]. Additionally, observations are allowed to be variated individually [45]. However, the random-effect model assumes that individual-specific effects are uncorrelated with the independent variables [44]. This assumption is too strong [46], which is more conservative and might yield wider confidence intervals than a fixed effect. Additionally, if there is a correlation between individual effects and covariates, the random-effect approach would lead to biased coefficient estimates [46]. Hence, an estimator using fixed effect is a reasonable and potential way to apply with panel data analysis in this case. Regarding Pooled-OLS estimation, this method is inconsistent in studying panel data if the unobservable effects are correlated with included variables [47].

Based on these rationales and our research objectives, the fixed effect model with the assumption of homogeneity is the most appropriate method in this case. Similarly, Braunerhjelm et al. [6] select the fixed-effect regression in their study on the relationship between tax burden and entrepreneurship for the same reason. Furthermore, the standard errors were also clustered at the country level to control for the heteroskedasticity within nations.

4   Result and Discussion

Table 1 summarizes the descriptive statistics of dependent and explanatory variables. The Entrepreneurial intention rate changes over time in each of the eight countries, with a minimum rate of 4.9% in Malaysia in 2016. The percentage of nascent entrepreneurs in the Asia-Pacific region stands at an average rate of 5.5% and does not fluctuate much in each country, except Malaysia. The New business ownership rate varies across different countries, from the lowest of 2.3% in Malaysia in 2015 to the highest of 20.8% in Vietnam in 2017. This wide variation can be explained by different macroeconomic conditions, the regulation of business by each government or the ability of owners in each country (e.g. educational level, leadership skills, etc.). The average TEA and EBO rates are quite similar, which means entrepreneurs in the region have maintained their business activities sustainably for over 3.5 years.

From the descriptive table, we can witness the variation of the domestic credits granted by banks to the private sectors in the Asia-Pacific region, for the period of nine years, from 2011 to 2019. While the highest value of this factor was registered in China with a rate of 157.8% GDP in 2019, the smallest value of 27.25% was reported in Indonesia in 2011. The differences in domestic credits to private sectors can be partially explained by the level of financial development in each market and regulations of each government. For instance, the Chinese financial system has been

Table 1. Descriptive statistics of variables

Variable	Mean	Std. Dev.	Min	Max
Entrepreneurial intention (%)	19.211	8.314	4.9	42.8
Nascent entrepreneurship rate (%)	5.467	2.743	0.8	15.4
New business ownership rate (%) - NBO	7.878	4.366	2.3	20.8
Total entrepreneurship activity (%) - TEA	12.951	5.338	2.9	25.5
Established business ownership rate (%) - EBO	12.309	7.607	3.1	33.1
Number of tax payments (times)	21.063	14.029	7	53
Time to pay taxes (hours)	278.937	215.419	105	941
Entry cost (%)	8.950	7.284	0.7	41.5
Credit to GDP (%)	107.595	39.797	27.253	157.812
GDPPC Growth (%)	4.192	2.134	0.357	10.103
Corporate Tax (%)	41.344	11.592	26	68.8

dominated by a large banking sector. Additionally, the high credit-to-GDP ratio in China is induced by the official decision[2] of the central bank to extend loans for private sectors since the late 1990s [48].

Another macroeconomic indicator is GDP per capita which is expressed as annual percentage growth. In general, the Asia-Pacific economies in our study witnessed a fairly stable development during 2011-2019, except for a significant reduction of growth in Thailand in 2011. This variable recorded a minimum value of 0.36% in Thailand (the year 2011) and a maximum in China, around 10.1% in 2012.

The important indicator that records the disparities among these countries was the total corporate tax rate. In particular, corporate tax varied between 26% of commercial profit in Thailand in 2015 to about 69% in China in 2014. As literature points out the hindrances that tax can bring to entrepreneurship, the very high value of corporate tax rate in China is then considered a serious impediment to the development of entrepreneurship.

The correlations between variables in this study are reported in Table 2. It is worth noting noted that there is a fairly high correlation between different phases of the entrepreneurial life cycle in the Asia-Pacific region. However, this does not matter as these five measures of entrepreneurship are separated in different regression. Also, TEA is a combination of nascent entrepreneurship and EBO, hence resulting in highly-correlated coefficients. In short, we did not identify the existence of severe multicollinearity between explanatory variables.

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[2] The Resolution on Financial System Reform, for instance the policy of relending in 1993, the Commercial Bank Law in 1995, etc.

Table 2. Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Intention	1									
(2) Nascent	0.37*	1								
(3) NBO	0.65*	0.21	1							
(4) TEA	0.71*	0.64*	0.86*	1						
(5) EBO	0.57*	0.12	0.76*	0.64*	1					
(6) Tax Burden	0.37*	-0.22	0.52*	0.37*	0.47*	1				
(7) Entry cost	0.1	-0.16	-0.04	-0.12	0.08	0.41*	1			
(8) Credit/GDP	-0.1	0.08	0.04	0.01	0.03	-0.47*	-0.50*	1		
(9) GDPPC Growth	0.14	-0.06	0.04	0.02	-0.16	0.39*	0.22	-0.19	1	
(10) Tax/Profit	-0.24	0.12	-0.33*	-0.13	-0.55*	-0.26*	-0.52*	0.06	0.36*	1

Note: * denotes that coefficients are significant at a 5% level

As mentioned earlier, we take the natural logarithm of entrepreneurship and tax variables to stabilize the spread or remove skewness. Concerning the tax administrative burden, we produce this variable using the principal component analysis. As stated previously, the two input variables for PCA analysis are the number of tax payments per year and the time to pay taxes in hours per year. There are two components that are then extracted after the first step of factor analysis. We then base on the Kaiser's criterion or the eigenvalue rule to decide which component should be retained. This rule suggests that the components with an eigenvalue (the variances extracted by the components) of 1.0 or higher are reserved. Applying this criterion, our data revealed one component, which later is named tax administrative burden. Regression results are shown in Table 3 below. Cluster-robust standard errors are used in regression to consider the problem of serial correlation, resulting in more efficient estimates [49].

We find that tax administrative burden has a negative and significant impact on entrepreneurial intention, nascent entrepreneurship and established business ownership rate. The reason for this is straightforward and consistent with the predictions of theoretical research. A higher tax burden would decrease profits received by businesses, hence reducing the incentives of starting, owning and managing a running business in the long term. This result is in line with previous empirical analyses [4, 50]. Remarkably, it is worth noting that at the beginning phase, potential entrepreneurs would carefully take into account the tax administrative cost of running a business. Hence, the individuals having intentions to start a business are significantly affected by tax administrative cost and corporate tax. Differed from the study of Braunerhjelm et al. [6] in OECD countries, we find a negative effect of the tax burden on nascent entrepreneurs in the Asia-Pacific region. This can in part be explained that in the very first stages, entrepreneurs in this

Table 3. Fixed-effect panel regression with country fixed effects at the country level with different stages of entrepreneurial life cycle

VARIABLES	(1)	(2)	(4)	(5)	(6)
	Intention	*Nascent*	*NBO*	*TEA*	*EBO*
Tax Burden	-0.506**	-0.686***	0.166	-0.247	-0.339*
	(0.205)	(0.147)	(0.218)	(0.169)	(0.148)
Entry cost	-0.0713	0.640	-0.100	0.140	-0.132
	(0.175)	(0.375)	(0.193)	(0.180)	(0.230)
Corporate Tax	-0.818**	0.760	0.292	0.466	-0.155
	(0.305)	(0.986)	(0.346)	(0.257)	(0.363)
Credit/GDP	-0.005	-0.007	0.007	0.000	-0.009
	(0.007)	(0.010)	(0.008)	(0.006)	(0.006)
GDPPC growth	0.015	-0.043	0.002	-0.019	0.004
	(0.034)	(0.054)	(0.035)	(0.040)	(0.027)
Constant	6.432**	-1.412	0.227	0.523	4.082*
	(1.872)	(4.658)	(2.008)	(1.274)	(1.814)
Country fixed-effect	Yes	Yes	Yes	Yes	Yes
Observations	50	49	49	50	50
R-squared	0.154	0.247	0.033	0.059	0.118
Number of country	8	8	8	8	8

Robust standard errors in parentheses. *, ** and *** denote that coefficients are significant at the 10%, 5% and 1% level respectively

region take time to get acquainted with tax obedience cost. Nevertheless, when business activities are kept in a stable state, entrepreneurs might not cautiously consider the cost and benefit of running a business rather than the tax burden only. That is the reason why the tax administrative cost exerts trivial impacts on TEA and EBO rates. The magnitude of the tax effect is also negative but less significant for the established business ownership. This finding is akin to Braunerhjelm et al. [6], implying that the tax burden is less important for entrepreneurs over time. The size of the tax burden impact varies among the entrepreneurial intention, nascent entrepreneurship and established business ownership phases. These results support the two hypotheses stated earlier.

GDP per capita growth rate imposes an unimportant effect on entrepreneurial activities in the Asia-Pacific region. Additionally, we did not find any clue that the domestic credit to the private sector affects entrepreneurial activities. One possible explanation is a tightening in credit terms did not discourage business activities, as there are other financing resources for private sectors to access such as government grants for business or foreign direct investments. Specifically, there are numerous Startup Business Grants in India funded by Indian governments,

for example, the NASSCOM program was initiated in 2013 focusing on healthcare, and education across the country. Recently the Malaysian government has kicked start various financial schemes such as Young Entrepreneur Fund, SME Emergency Fund, Business Startup Fund, etc. to flourish the small business. Furthermore, entry cost does not seem to affect entrepreneurship in the Asia-Pacific region. The reason is, as the fixed-effect method is adopted in the regression, the country heterogeneity that might be related to entry cost is consequently removed.

After performing these regressions, we check if the models work well for the data at hand by diagnostic analysis. We found no autocorrelation in the idiosyncratic error term and no cross-sectional dependence in panels, whereby there exists correlation among all units in the same cross-section. We also perform the robustness check for the regression model (1), (2) and (6) by adding one additional variable at a time, starting with the tax administrative burden. The findings are quite similar to the baseline regression. Results are reported in Tables 4, 5, and 6 as follows.

Table 4. Entrepreneurial intention and tax administrative burden with country fixed effects and alternative specifications

VARIABLES	(1) Intention	(2) Intention	(3) Intention	(4) Intention	(5) Intention
Tax Burden	-0.478*	-0.457*	-0.449*	-0.497**	-0.506**
	(0.236)	(0.209)	(0.211)	(0.204)	(0.205)
Entry cost		-0.078	-0.070	-0.073	-0.071
		(0.178)	(0.171)	(0.175)	(0.175)
Corporate Tax			-0.632	-0.774*	-0.818**
			(0.496)	(0.379)	(0.305)
Credit/GDP				-0.005	-0.005
				(0.006)	(0.007)
GDP growth					0.015
					(0.034)
Constant	2.796***	2.935***	5.258**	6.389**	6.432**
	(0.011)	(0.308)	(1.822)	(1.923)	(1.872)
Country fixed-effect	Yes	Yes	Yes	Yes	Yes
Observations	50	50	50	50	50
R-squared	0.122	0.126	0.140	0.151	0.154
Number of country	8	8	8	8	8

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5. Nascent entrepreneurship and tax administrative burden with country fixed effects and alternative specifications

VARIABLES	(1) Nascent	(2) Nascent	(3) Nascent	(4) Nascent	(5) Nascent
Tax Burden	-0.465**	-0.647**	-0.660**	-0.709***	-0.686***
	(0.183)	(0.242)	(0.243)	(0.169)	(0.147)
Entry cost		0.657*	0.652	0.644	0.640
		(0.343)	(0.375)	(0.366)	(0.375)
Corporate Tax			0.796	0.623	0.760
			(0.733)	(0.975)	(0.986)
Credit/GDP				-0.006	-0.007
				(0.010)	(0.010)
GDP growth					-0.043
					(0.054)
Constant	1.519***	0.374	-2.563	-1.259	-1.412
	(0.005)	(0.599)	(2.964)	(4.887)	(4.658)
Country fixed-effect	Yes	Yes	Yes	Yes	Yes
Observations	49	49	49	49	49
R-squared	0.070	0.215	0.228	0.236	0.247
Number of country	8	8	8	8	8

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6. Established business ownership and tax administrative burden with country fixed effects and alternative specifications

VARIABLES	(1) EBO	(2) EBO	(3) EBO	(4) EBO	(5) EBO
Tax Burden	-0.288	-0.254	-0.255	-0.337*	-0.339*
	(0.185)	(0.173)	(0.176)	(0.153)	(0.148)
Entry cost		-0.127	-0.128	-0.133	-0.132
		(0.231)	(0.229)	(0.228)	(0.230)
Corporate Tax			0.098	-0.142	-0.155
			(0.575)	(0.354)	(0.363)
Credit/GDP				-0.009*	-0.009
				(0.005)	(0.006)
GDP growth					0.004
					(0.027)
Constant	2.299***	2.522***	2.164	4.068*	4.082*
	(0.008)	(0.405)	(2.324)	(1.831)	(1.814)
Country fixed-effect	Yes	Yes	Yes	Yes	Yes
Observations	50	50	50	50	50
R-squared	0.062	0.075	0.075	0.118	0.118
Number of country	8	8	8	8	8

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

5   Conclusion and Implication

Entrepreneurship plays a vital role in the dynamism of the market economy. Enhancing and reinforcing entrepreneurship will significantly lead to greater economic growth, formal business participation and better governance in a country. This paper demonstrates a significant relationship between administrative tax burden and entrepreneurial activity in the Asia-Pacific countries. By cross-country evidence, we present an adverse effect of the tax administrative cost and entrepreneurial intention, nascent entrepreneurship and established business ownership. Additionally, the impact size varies among different stages of the entrepreneurial life cycle. While the influence of tax administrative cost is strongest on nascent entrepreneurs, its impact on the established business ownership is trivial. Furthermore, individuals who have intentions of starting a business are strongly affected by the corporate tax rate. Due to the discontinuous periods of GEM's survey, one limitation of our research is the small number of observations, somehow adversely affecting the reliability of the estimates.

Three implications for the Asian-Pacific countries can be extracted from our findings. First, the governments should consider and build up fiscal policies to reduce negative effects of tax administrative burden via tax cuts, simplicity and transparency for nascent entrepreneurs. However, both Bhattarai et al. [51] and Haughton et al. [52] state that there are two inevitable negative-side impacts coupled with the proposal. The first is rising income gap between rich and poor households, and the second is creating a serious budget deficit on economic health. To narrow down the income gap, lawmakers must balance between the revenue productivity of such taxes and the equity issue. To counter the budget deficit, governors ought to relax ordinances and lower corporate taxes to stimulate start-ups and then increase Treasury inflows from taxes. Second, the governments should implement mechanisms and policies to encourage both researchers and businessmen to research, apply and develop science and technology, especially high technology which is a vital factor in the industrial revolution 4.0. In fact, technology is a typical feature of a product from a startup and also a useful instrument to transfer breakthrough ideas to high applicable products. Davila [53] argues that for a startup, the breakthrough is essentially required. Startups can create unprecedented things in the market or create better value than what is available. Although, even if the product does not rely significantly on technology, start-up businesses also need to apply technology to achieve business goals and growth ambitions. Third, governors could enforce high-quality accounting standards to promote entrepreneurial activities. This suggestion is derived from the results of empirical studies which find a negative effect of corporate tax cuts on promoting entrepreneurship is more effective in countries having higher-qualified accounting standards [19, 31]. In particular, a corporate tax rate is imposed on the taxable income of a firm so that if a country has a low-quality of accounting standard, a proposed tax reduction could be ineffective as firms can hide their income more easily.

In short, to some extent, tax reduction only stimulates business registries below a certain tax rate, it is thus the tactic of policymakers to combine adequate public policies. Moreover, instead of only changing tax rates, governors should consider simplifying or minimizing reporting procedures to alleviate annoyances for taxpayers. As we look forward to the future, a country designed with entrepreneurial facilitation and appropriate policies would witness an expansion of formal sectors and sustainable economic development. Future studies can also investigate more in business ecology, aiming to answer the questions such as which sectors would contribute more to the economic development, and which type of new business creation is easy to incorporate given entrepreneurial challenges in one certain market.

Lessons to Vietnam

In Vietnam, the document of the 12th Congress of the Communist Party of Vietnam [54] affirmed that Vietnam's socialist-oriented market economy has many forms of ownership as well as many economic sectors, in which, the state economy plays a leading role and the private economy

works as a vital factor. The Central Conference 5 (course XII) issued Resolution 10-NQ/TW dated June 3, 2017 on the development of the private economy to become an important driving force of the socialist-oriented market economy. And the Prime Minister announced Decision No.844/QD-TTg dated May 18, 2016 [55] approving the Project "Supporting the ecosystem of national innovative entrepreneurship to 2025". As a result, encouraging entrepreneurship in the private sector has become the right direction for Vietnam's growth.

Based on the results of this study and our own knowledge, we would like to propose some suggestions to help Vietnamese start-ups entering safely into the industry but also not going far away from tax regulations. First, the government should supplement provisions of the corporate tax schedule for start-up businesses. In fact, Vietnam does not have a separate corporate tax schedule for start-up businesses. Law on Corporate Income Tax No.14/2008/QH12 [56] of the National Assembly only stipulates preferential corporate income tax rates and effective time for all enterprises having new investment projects related to high-tech, supporting industries, energy-saving industries, and so on. Thus, it is not fair for start-ups to receive similar tax incentives as other enterprises while they have to suffer more financial difficulties in the early stages of starting a business.

Second, under the strong impact of the Covid-19 pandemic, the Vietnamese government should extend the tax deferral period to support capital and cash flow for start-up businesses. According to the Law on Tax Administration, the duration for tax deferral is up to 2 years, so the government can extend the tax deferral under its jurisdiction, or report to the National Assembly to get their agreement. Since the pandemic is still unforeseen and can last until next year, the government may consider extending the tax deferral up to 9 months or 1 year to adapt to the requirements of the contemporary situation in Vietnam, instead of just a 5-month extension as in Decree No. 41/2020/ND-CP [57] for extension of time limit for tax payments and land tax.

Like other young Vietnamese researchers, we always desire to contribute our empirical results in building and developing sustainable policies to Vietnam. For Vietnamese start-ups, these lessons are expected to be helpful in the context of globalization and digitization, especially when the economy is subjected to exogenous shocks such as the Covid-19 pandemic.

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