



BACKGROUND PAPER

Country-Level Institutional Conditions and Individual-Level Entrepreneurship Dynamics

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1 August 2022

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Introduction

Entrepreneurship, or the creation of new businesses by individuals, is an important catalyst of economic development and growth. In different countries, population-level prevalence rates of active new business creation activity within the adult-age population can range from 1% to more than 20%, with higher self-employment rates usually observed in low-income economies (Levie, Autio, Acs, and Hart 2014). Given that the creation of entrepreneurial businesses requires the allocation of human, financial, and social capital, and that new businesses are launched to pursue a perceived entrepreneurial opportunity, the entrepreneurial dynamic offers the potential of contributing to the total factor productivity (TFP) at the macro level (Acs, Autio, and Szerb 2014b). Entrepreneurship, therefore, merits close policy attention.

Although new business creation by individuals offers important potential to contribute to economic development, it is important to recognize that not all new businesses are equally able to make a positive contribution to their local and national economies. Empirical data shows that new business creation by individuals is a highly heterogeneous activity. In the Global Entrepreneurship Monitor (GEM) dataset, in a subset of Asian countries, only 0.4% of entrepreneurial new businesses have reached the size of 250 employees or more by the time they reached the age of 3.5 years after founding, yet these businesses were responsible for 44% of the total employment by entrepreneurial new businesses (Autio, Fu, and Levie 2019). In contrast, new businesses that employed only two persons or less represented 54% of the population of new entrepreneurial businesses, yet they were responsible for only 9% of the total employment impact of entrepreneurial new businesses. Similarly biased impact distributions have been reported also for other aspects of new businesses, such as new product innovation and international sales, both of which signal the ability of the new business to innovate. Given that more productive and more innovating new businesses are more likely to contribute positively to TFP, it is important, therefore, for policymakers to consider what factors encourage innovative new business activity in their countries.

A country's institutional framework conditions have been recognized as an important regulator of the quality of a country's entrepreneurial dynamic, or the process by which individuals in a given country channel resources towards economic uses through the creation of new businesses (Acs, Szerb, and Autio 2014a; Hwang and Powell 2005; Levie et al. 2014; and Troilo 2011). A country's institutional framework conditions and the quality of its institutions (e.g., its culture, social norms, laws and regulations, rates of corruption, and rule of law) not only regulate who starts new businesses, but also, what choices the

business is likely to make, once started (Autio and Acs 2010; Levie and Autio 2011). By influencing what kinds of individuals decide to start a new business creation activity (e.g., the ones with high human and social capital versus individuals with low human and social capital) and what ambitions they set for the new business once started, a country's institutional framework conditions directly influence the quality of resources allocated through its entrepreneurial dynamic, and therefore, the ability of its entrepreneurs to contribute to the country's TFP (Acs et al. 2014b). Yet, relatively little wide-coverage research exists to inform on the regulating effect of country-level institutional framework conditions on individual-level entrepreneurial behaviors, especially for Asian countries (Autio and Fu 2015).

In this report, we undertake an examination of institutional framework conditions in selected Asian countries on the quality of individual-level activity. So doing we add to the small number of such analyses conducted in this region (Autio and Fu 2015; Autio et al. 2019). We extend previous analyses by expanding the number of years included in the analysis and by considering a novel set of institutional framework conditions. In addition to the new firm start-up procedures explored previously (number of procedures required to start a new business, cost of business registration, and paid-in minimum capital), we explore a set of framework conditions not previously studied (to our knowledge) in the context of Asian emerging economies: the strength of the rule of law and financial development conditions. We study the effects of each on three indicators of the productivity potential of new businesses: (i) product innovation activity; (ii) export activity; and (iii) high-growth expectations of the new business. For the analysis we create a dataset of individual-level entrepreneurial activity using the GEM data and combine it with country-level data on the institutional framework conditions named above.

Next, we lay out our theoretical model, then explain our methodological approach and data, and then present our findings, followed by our conclusions.

Entrepreneurial Resource Allocation Dynamic

Our theorizing on the relationship between entrepreneurship and economic growth builds on several premises. First, we define entrepreneurial activity as an individual-level initiative. It is ultimately individuals who perceive opportunities for the creation of new businesses. This definition emphasises the importance of individual-level capacities and resources, such as the individual's human capital (education and work experience in particular) and their social capital (i.e., professional reputation, networks of contacts, and relationships with resource providers). Although also firm-level entities spot and pursue opportunities, this activity falls under the label of corporate innovation and even corporate entrepreneurship. Our focus in this report is on exploring how country-level framework conditions regulate the harnessing of individual-level talent and capabilities for resource allocation towards economically productive activities.

Second, we treat entrepreneurial activity as fundamentally economic, undertaken with the purpose of creating new economic value. At the individual level, entrepreneurship entails the allocation of the individual's (or teams of individuals) human and social capital towards one occupational pursuit (i.e., the creation and management of a new business operation) over alternatives (i.e., conventional employment for an established organization). This means that the decision to start a new business always involves opportunity costs, as the founder's human, social, and financial capital allocated to new business reduces the availability of those resources to support alternative occupational pursuits (McMullen and Shepherd 2006). We expect that such opportunity costs are regulated by country-level institutional framework conditions. Given that the allocations of human, social, and financial resources to new business creation involve primarily economic trade-offs, the relevant institutional framework conditions that regulate the quality of resource allocations are also economic (Autio and Acs 2010).

At the country level, therefore, the entrepreneurial resource allocation dynamic has the potential to contribute to the economy's TFP either positively or negatively, depending on a myriad of individual-level resource allocation choices (Acs et al. 2014b). We assume that these choices are ultimately made by the individual, who seeks to maximise the return to his or her human capital and other resources. This choice involves the weighing of trade-offs regarding alternative potential uses of those resources. To the extent that the pursuit of a given entrepreneurial opportunity increases the anticipated return to the associated resource allocation, we may expect entrepreneurial activity to materialize.

In this report, we are interested in factors that regulate the trade-offs associated with entrepreneurial resource allocation. In addition to the intrinsic quality of entrepreneurs' resources, we expect that this resource allocation may be influenced by country-level Entrepreneurial Framework Conditions (EFCs) (Levie and Autio 2008). EFCs are country-level factors that condition the allocation and appropriation of returns resulting from economic activity such as entrepreneurial opportunity pursuit (de Soto 2000). Examples of EFCs include, for example, regulations that govern the creation of new firms (Djankov, La Porta, Lopez-de-Silanes, and Shleifer 2002a; Klapper, Laeven, and Rajan 2006), employment regulations (Botero, Djankov, La Porta, Lopez-de-Silanes, and Shleifer 2004), and the quality of the country's political and economic institutions, which may either enhance or undermine the appropriation of economic returns to resource investment in entrepreneurial opportunity pursuit (Autio and Fu 2015; Autio et al. 2019; Djankov, Lieberman, Mukherjee, and Nenova 2002b), such as the country's rule of law regime (Djankov, La Porta, Lopez-de-Silanes, and Shleifer 2003). In previous research, the country's institutional conditions have been shown that more onerous regulations governing new firm creation will dampen the entry of new firms by pushing up the cost of resource allocation to entrepreneurial opportunity pursuit (Djankov et al. 2002a). Onerous entry regulations may also push entrepreneurs to avoid registering their business and choose to operate in the informal sector instead (Autio and Fu 2012, 2015; Djankov et al. 2002b). As firms operating in the informal sector may gain an advantage over registered new businesses, e.g., by avoiding taxes and licensing costs, a high prevalence of informal-sector may inhibit entry and growth aspirations by high-quality formal-sector entrepreneurs (Autio et al. 2019). Onerous employment regulations may inhibit entrepreneurs from seeking to grow their businesses, thereby hampering their productivity potential (Botero et al. 2004). Poor-quality economic and political institutions and associated corruption may similarly dent the confidence of prospective and new entrepreneurs to invest, thereby hampering the productivity potential of the country's entrepreneurial resource allocation dynamic (Autio and Fu 2015; and Djankov et al. 2003).

In this report, our focus is on institutional framework conditions that, to our knowledge, have not been previously explored in Asian countries. Our focus is on rule of law and financial development conditions. We next elaborate on our hypotheses.

Effect of Institutional Conditions on Productive Entrepreneurship

By productive entrepreneurship we refer to entrepreneurial self-employment activity that allocates human capital, social capital, and financial resources towards uses that, on balance, make a positive contribution to the TFP in the country. Not all new business creations contribute positively towards TFP. In situations where the resources allocated towards entrepreneurship would be able to generate a higher economic return in an alternative use, the contribution of the entrepreneurial dynamic to TFP would be negative, as the resources allocated to the new business would have been able to generate a higher economic return elsewhere. Entrepreneurial activity only contributes to TFP when it allocates resources towards the most efficient uses in the economy. It is this fact that explains why the countries with the highest observed self-employment rates are all low-income economies such as Zambia or Peru. In such countries, the economy is unable to generate sufficient amounts of high-quality employment that would allocate the country's human, social, and financial capital towards high-productivity uses.

We think that three sets of institutional framework conditions can be particularly influential in regulating the quality of resource allocation towards entrepreneurship. These are: (i) regulations of new business entry (Djankov et al. 2002a; Klapper et al. 2006); (ii) rule of law (Djankov et al. 2003; Hartog, Stel, and Storey 2010; and Levie and Autio 2011); and (iii) the country's financial institutions (Klapper and Love 2010). We next elaborate on each.

A. Regulation of Entry and Productivity Potential of New, Entrepreneurial Businesses

The regulations concerning the creation of new businesses can exercise an important influence on the quality of new businesses in a country (Klapper et al. 2006). Onerous regulations governing new business entry can inhibit any individual from starting a business by making the registration difficult, lengthy, and expensive. However, the deterring effect of onerous registration procedures may be particularly acute for individuals who face high trade-offs to the allocation of their human, social, and financial capital. Individuals with high human and social capital have access to higher-quality and more lucrative employment opportunities than do individuals with low human and social capital. As individuals with high human and social capital have plenty of attractive employment opportunities available to them, they are likely to be particularly sensitive towards onerous entry regulations. Onerous entry regulations may also push prospective entrepreneurs to avoid registering their business and choose to operate in the informal sector instead (Autio and Fu 2012, 2015; and Djankov et al. 2002b). As firms operating in the informal sector may gain an advantage over registered new businesses, e.g., by

avoiding taxes and licensing costs, a high prevalence of informal-sector may inhibit entry and growth aspirations by high-quality formal-sector entrepreneurs (Autio et al. 2019). Suppressed entry by individuals with high human and social capital will reduce the productivity potential of new, entrepreneurial businesses because human and social capital are important drivers of innovation and growth in new businesses (Autio and Acs 2010; and Davidsson and Honig 2003). We therefore expect:

H1 In countries with onerous entry regulations for the creation of new, entrepreneurial businesses, the populations of new, entrepreneurial businesses will exhibit lower levels of product innovation, employment growth expectations, and international sales.

B. Rule of Law and Productivity Potential of New, Entrepreneurial Businesses

We expect that the quality of legal institutions in the country will exercise an important regulating effect on the productivity potential of entrepreneur-driven resource allocation dynamic in countries. Because of the investment of human and social capital and financial resources with the expectation of subsequent returns to this investment, new business creation always carries a degree of risk (Armour and Cumming 2008; Eckhardt and Shane 2003; Seung-Hyun, Peng, and Barney 2007; Thomas 2000). The higher the value of the resources invested, and the longer the delay between resource investment and subsequent returns (e.g., because of the time required for research and development and product development efforts to bear fruit), the more sensitive prospective entrepreneurs will become to this risk. In countries with poor rule of law, as expressed in, e.g., the strength of the country's property right protection regime and its level of corruption, individuals with high human and social capital will be particularly aware of such risks, as will be individuals who need to invest substantial amounts of funding to develop the value offering of the new business (Djankov et al. 2003; and Levie and Autio 2011). Conversely, individuals with low human and social capital will be less likely to develop innovative value offerings, thereby needing to invest less financial capital in the new business early on. We therefore expect:

H2 In countries with weak rule of law, the populations of new, entrepreneurial businesses will exhibit lower levels of product innovation, employment growth expectations, and international sales.

C. Financial Conditions and Productivity Potential of New, Entrepreneurial Businesses

Finally, we expect that the country's financial conditions, specifically the availability of funding new entrepreneurial businesses, will have a positive impact of the productivity potential of its

entrepreneurial resource allocation dynamic. To develop distinctive value offerings, new ventures typically need to invest time and money. Innovative outputs require investment in developing those outputs. This development activity requires funding. Although some prospective entrepreneurs can rely upon their own financial reserves to fund the development of innovative outputs, many will not have excess financial resources to draw upon. As a rule, the more distinctive outputs the new firm wants to develop, the more time and financial resources it will require to develop those outputs. As distinctiveness in outputs tends to correlate with the innovativeness of those outputs, it is reasonable to expect that new entrepreneurial businesses that require more financial investment will also exhibit higher productivity potential. We therefore expect:

H3 In countries with stronger financial support for new entrepreneurial businesses, the populations of new entrepreneurial businesses will exhibit higher levels of product innovation, employment growth expectations, and international sales.

We next present our data, analytical method, and findings.

Methods

Our theoretical model emphasizes the regulating effect of country-level institutional framework conditions on the productivity potential created by individual-level new business creation activity. We expect that regulation of new business entry, rule of law, and financial conditions will influence the productivity potential of the entrepreneurial resource allocation dynamic in countries. To validate our theoretical reasoning, we therefore need to combine data describing country-level institutional conditions for entrepreneurship with individual-level data on entrepreneurial activity and aspirations.

To validate our theoretical model, we drew on data from multiple sources. Our primary dataset is the GEM dataset (Reynolds, Bosma, and Autio 2005a). GEM is an annual survey that tracks individual-level entrepreneurial attitudes, activities, and aspirations in participating countries. The GEM dataset is composed of population-representative interviews of at least 2 000 individuals per country. GEM applies harmonized data collection methods across the participating countries (Reynolds et al. 2005a). More than 70% of the data have been collected by telephone surveys. The survey questionnaire is standardized across countries and translated to local language(s). In countries where population-representative telephone surveys are not possible, face-to-face interviews are carried out using multistage randomized cluster sampling. Specifically, we use GEM data from 2006 to 2019 for all Asian Development Bank (ADB) regional member economies for which this data is available. The GEM data is further combined with other data sources, such as the World Bank Group Doing Business data, the country-level population and gross domestic product (GDP) data, and the Worldwide Governance Indicators (WGI). To test our theoretical model, we combine GEM data with relevant country-level descriptors of institutional framework conditions that describe the country's framework conditions for new business registration, rule of law, and the availability of financing for new, entrepreneurial businesses.

For the empirical analysis, our GEM dataset covers a total of 232,984 (unweighted) interviews among working-age individuals (16–64 years old) for the following 15 ADB regional member economies: Bangladesh; the People's Republic of China; Georgia; India; Indonesia; Kazakhstan; Malaysia; Pakistan; the Philippines; Singapore; Hong Kong, China; the Republic of Korea; Thailand; Armenia; and Viet Nam. The sizes of economy samples per year are shown in Table 1.

Table 1: ADB Economy-Year Samples in the Dataset

ADB Economy	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total	% of total
Malaysia	2,005			2,002	2,010	2,053	2,006	2,000	2,000	2,000	2,005	2,033			20,114	8.63%
Indonesia	2,000							4,500	5,520	5,620	3,480	2,500	3,090		26,710	11.46%
Philippines	2,000							2,500	2,000	2,000					8,500	3.65%
Singapore	4,011					2,000	2,001	2,000	2,006						12,018	5.16%
Thailand	2,000	2,000				2,000	3,000	2,362	2,059	3,000	3,000	2,000	2,060		23,481	10.08%
Republic of Korea			2,000	2,000	2,001	2,001	2,000	2,000		2,000	2,000	2,000	2,000	2,000	22,002	9.44%
Viet Nam								2,000	2,000	2,000		2,118			8,118	3.48%
People's Republic of China	2,399	2,666		3,608	3,677	3,690	3,684	3,634	3,647	3,822	3,974	3,911	3,828	3,841	46,381	19.91%
India	1,999	1,662	2,032				2,700	3,000	3,360	3,413	3,400	4,000	4,165	3,398	33,129	14.22%
Pakistan					2,007	2,002	2,000							2,000	8,009	3.44%
Armenia														2,000	2,000	0.86%
Kazakhstan		2,000							2,099	2,106	2,100	2,100			10,405	4.47%
Hong Kong, China		2,058		2,000							2,027				6,085	2.61%
Bangladesh						2,000									2,000	0.86%
Georgia									2,016		2,016				4,032	1.73%
Total	16,414	10,386	4,032	9,610	9,695	15,746	17,391	23,996	26,707	25,961	24,002	20,662	15,143	13,239	232,984	100.%

ADB = Asian Development Bank.

Source: Authors

GEM defines entrepreneurship as any attempt to create a new business, by individuals, including self-employment (Reynolds, Bosma, and Autio 2005b). More specifically, GEM defines an individual a ‘new entrepreneur’ if the person is an owner-manager of a new business that has paid salaries for at least some employees (including the owner-manager(s)) for longer than 3 months but no longer than 42 months. In the current report, we define the businesses started by new entrepreneurs as “baby businesses”. Further, GEM qualifies a person as an “established entrepreneur” if the person is an active owner-manager in an independent business that has paid salaries for someone for longer than 42 months. We call the businesses started by established entrepreneurs “established businesses”. The numbers of baby businesses and established businesses for each country in the sample are shown in Table 2. Our analyses were based on the samples of baby businesses defined above. We excluded from the analysis the established businesses and nascent entrepreneurs who, according to the GEM definition, were still trying to start a new business but had not paid any salaries.

Table 2: Distribution of Baby Businesses in the Sample of 15 ADB Member Economies

ADB Economy	Baby businesses	% of total
People’s Republic of China	3,824	23.2
Indonesia	2,992	18.1
Thailand	2,603	15.8
India	1,392	8.4
Republic of Korea	1,183	7.2
Viet Nam	1,146	6.9
Philippines	931	5.6
Malaysia	785	4.8
Kazakhstan	429	2.6
Singapore	404	2.4
Hong Kong, China	198	1.2
Pakistan	195	1.2
Armenia	144	0.9
Bangladesh	133	0.8
Georgia	131	0.8
Total	16,490	100

ADB = Asian Development Bank.

Source: Authors.

A. Variables and Measures

We examined the influence of country-level institutional conditions on the productivity potential of new entrepreneurial businesses in the country. By productivity potential we refer to the potential ability of

the entrepreneurial business to contribute to the TFP in the economy. Conceptually, TFP is the amount of economic output that cannot be explained by the use of inputs (Bournakis and Mallick 2018; Gal 2013; and Van Beveren 2012). Thus, at the firm level, it represents the efficiency with which the firm uses its resources to create economic value added. As we cannot directly measure this efficiency, we use firm-level proxies that are indicative of firm performance. Specifically, we measure the firm's product innovation activity, on the assumption that innovative products represent higher firm-level value added. We also measure the firm's export activity, on the assumption that more efficiently produced outputs will be more competitive outside national borders. Third, we measure the firm's employment growth expectations, on the assumption that more efficient firms will be able to outcompete less efficient ones, which should positively impact growth expectations. All three measures of firm-level productivity potential were taken from the GEM dataset.

New product introduction was measured by a dummy variable which took value "1" if at least some customers of the firm considered the firm's product or service as new – i.e., not previously available in the market. The variable took value "0" if none of the firms' customers considered their product or service as new.

Export activity was measured by a dummy variable which took value "1" if the firm had customers who lived outside of the country and "0" otherwise.

High-growth expectations were measured by a dummy variable which took value "1" if the business expected to employ more than 20 employees in 5 years' time, and "0" otherwise.

Proxies of the country-level institutional conditions were taken from several different sources. **Entry regulations** were measured with three measures. First, the number of procedures required to register and launch a new business proxied the difficulty of launching a new business in the country. Second, the cost of new business registration (as percentage of GDP per capita purchasing power parity [PPP]) measured the cost of new firm registration process. Third, the required minimum paid-in capital for new business registration (as percentage of GDP per capita PPP) measured the financial capital requirement of new business registration. All three measures were taken from the World Bank's Doing Business database (Djankov, La Porta, Lopez-de-Silanes, and Shleifer 2002b). A procedure is defined as any interaction with external parties during the new business registration process (e.g., government agencies, lawyers, auditors, or notaries). The cost of registration covers all official fees and fees for legal or professional services if required by law. Paid-in minimum capital is the amount that the entrepreneur

needs to deposit in a bank or with a notary before registration and up to 3 months following incorporation. We also factored in any gender differences in the number of registration procedures and cost of business registration and measured the two variables for male and female individuals separately if any differences existed in the country.

The strength of the country's **rule of law** was measured with a multi-component variable using the principal component analysis. The two components are: property rights protection and control of corruption. *Property rights protection* captures the ability of individuals to accumulate private property, secured by laws that are fully enforced by the state. It also assesses the risk that private property will be expropriated, the independence of the judiciary, and the existence of corruption within the judiciary. We used the index for protection of property rights from the Economic Freedom of the World Index, reported annually by the Fraser Institute (Gwartney, Lawson, and Hall 2012). The index ranges from 0 to 10, with higher values indicating stronger property protection. *Control of corruption* captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, and the "capture" of the state by elites and private interests. This variable was measured based on the "control of corruption" component from the WGI. The WGI reports on six dimensions of governance for more than 200 countries and regions over the period 1996-2020, including Voice and Accountability, Political Stability and Absence of Violence and Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. These two components loaded on one factor with Eigenvalue over 1. The value of Cronbach alpha was 0.94, suggesting a high level of internal consistency and reliability of the construct.

The quality of the country's **financial framework conditions** was proxied with two variables: financial development and private credit ratio. *Financial development* was measured based on the International Monetary Fund's Financial Development Indicator Database. This is an aggregated index that consists of nine indexes that assess the development of the country's financial institutions and financial markets along three dimensions: depth (size and liquidity), access (ability of individuals and firms to access financial services), and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues, and the level of activity of capital markets). These indexes are then aggregated into an overall index of financial development (Svirydzenka 2016). The index ranges from 0 to 1, with higher values indicating higher levels of financial development. We also adopted an alternative measure for financial development, the private credit ratio, which was measured by the domestic credit for

private sectors as percentage of the country's GDP (Arcand, Berkes, and Panizza 2012; Dabla-Norris and Srivisal 2013).

As **control variables**, we controlled for different factors at both the individual and country levels of analysis. At the individual level, we controlled the entrepreneur's demographical characteristics including **age**, measured as a continuous variable measured in years. **Gender** was coded as a dummy variable, with a value of 1 for males and 0 for females. **Household income** was measured by a categorical variable with three categories. Value 1 of this variable indicated that the individual's household belonged to the lowest household income tier in the population, value 2 indicated middle income tier, and value 3 indicated top income tier. The individual's level of **education** was also captured by a categorical variable with values from 1 to 5. Values 1 to 5, in an ascending order, indicated that the individual had received no education (1), primary education (2), secondary degree (3), post-secondary education (4), and graduate education (5). The individual's **fear of failure** dummy (1=yes) indicated whether interviewee had responded affirmatively to the question of whether fear of failure would prevent them from starting up a business. The individual's **entrepreneurial self-efficacy** was captured by a dummy variable (1=yes) indicating whether the individual believed they possessed the required skills and knowledge to start a new business.

At the economy level, we controlled for the **rate of business formation** within an economy each year, as the prevalence of business entries in a country may affect individuals' decision to engage in entrepreneurial activities. The businesses considered here include both early-stage entrepreneurial ventures and more established firms, and this proxy was taken from the GEM dataset. We also controlled for country's **population size** and **population growth** which were measured by the total population of the country (in millions) and by the population's annual percentage growth rate. The country's economic growth rate and general level of development has been shown to be positively associated with the entry of new firms (Kawai and Urata 2002 and Lee, Yamakawa, Peng, and Barney 2011). We therefore controlled for the country's **GDP per capita**, adjusted for PPP. Because of high levels of correlation with some key institutional variables, it was coded into five quintiles with the lowest quintile as the base. We also controlled for **GDP growth**, which was measured by the annual GDP growth rate. Both variables were taken from the World Bank data. We also controlled for time fixed effects by including **year** dummies in the analysis.

B. Econometric Analyses

We conducted cross-level analyses (country-level effects on individual-level entrepreneurial behaviors) to estimate the effect of country-level institutional conditions on the quality of its entrepreneurial resource allocation dynamic. Our data has a hierarchical structure: the individuals were nested within each country. To account for potential within-country interdependence of the observations and to factor in individual-level and country-level impacts simultaneously, we adopted multilevel modelling techniques to estimate the proposed hypotheses.

To control for potential unobserved heterogeneity because of self-selection of individuals to entrepreneurship, we adopted a two-stage Heckman selection model (Heckman 1979) to control any self-selection bias in the estimation. The first-stage selection model estimated the probability of an individual qualifying as an early-stage entrepreneur as a function of individual-level demographics that are commonly associated with entrepreneurial entry, e.g., age, education, household income, fear of failure, familiarity ties with other entrepreneurs, and entrepreneurial self-efficacy and controlling for country-level population size, population growth, GDP per capita, GDP growth, and the key institutional variables including the number of procedures required to start a business, cost of business registration, paid-in minimum capital, rule of law, and financial development conditions. The second-stage model or the outcome model estimated the impact of the country's institutional framework conditions on the productivity potential of its entrepreneurial businesses controlling for any unobserved heterogeneity in the self-selection of entrepreneurs (the Inverse Mills Ratio computed from the first-stage model), in addition to the controls for age, gender, education, household income, fear of failure, rate of established businesses, GDP per capital, GDP growth, population size. To facilitate model identification, acquaintance with other entrepreneurs was excluded from the second-stage outcome model.

The econometric models were specified as two-level models with random intercepts, which accounted for the variation in outcome variables across the countries every year. The model specification allowed both individual-level and country-level variables to affect the prevalence of product innovation, export activities, and employment growth expectations of individual entrepreneurs. We used maximum likelihood algorithms to fit the models. In the regression models, the continuous independent variables were all standardized to have a mean of zero and a standard deviation of 1 for better comparability of the estimated coefficients. The key institutional variables were entered the regression models separately to avoid potential issues of multicollinearity among the country-level institutional factors.

Findings

A. Institutional Framework Conditions and Product Innovation Activity in Entrepreneurial Businesses

First, we analyze the effects of the country's institutional framework conditions on the prevalence of product innovation activities by entrepreneurial businesses in the country. Table 3 presents the descriptive statistics for the product innovation analysis of baby businesses. Tables A1 in Appendix present the correlation matrix of all variables in the product innovation analyses for baby businesses. In Table A1, we can see some strong correlations between different institutional variables (e.g., rule of law and financial development). Such correlations are expected, since the quality of different institutional framework conditions tends to co-vary, and richer countries tend to feature higher-quality institutions. There is also a high correlation between the financial development index and private credit ratio. Such correlations are expected as they are alternative measures for a country's financial development conditions. For this reason, we introduce the financial development index and private credit ratio separately in all analyses that follow. In all regressions, we control for GDP per capita to control for the fact that richer countries tend to feature higher-quality institutions. Otherwise, there was little concern of multicollinearity among independent variables in the regression analyses.

Table 3: Descriptive Statistics for Baby Businesses' Product Innovation Analysis

Variable	Observation	Mean	Std. Dev.	Min.	Max.
New product (yes=1)	14,076	0.51	0.50	0	1
Gender (male=1; female=0)	14,076	0.53	0.50	0	1
Age	14,076	37.14	11.03	18	64
Household income	14,076	2.14	0.81	1	3
Education	14,076	3.01	1.01	1	5
Fear of failure (yes=1)	14,076	0.39	0.49	0	1
Business formation rate (%)	14,076	0.29	0.11	0.05	0.51
Population size (millions)	14,076	460.89	554.10	2.96	1397.72
Population growth (%)	14,076	0.93	0.50	0.05	3.13
GDP per capita PPP (5 quintiles)	14,076	2.91	1.42	1	5
GDP growth (%)	14,076	5.76	2.49	-2.46	14.23
Number of procedures	14,076	10.06	3.53	2	17
Registration cost (% per capita income)	14,076	14.27	15.10	0.30	102.03
Paid-in minimum capital (% per capita income)	14,076	36.77	67.67	0	352.07
Rule of law	14,076	-0.43	0.61	-1.83	2.28
Financial development index	14,076	0.51	0.16	0.20	0.84
Private credit ratio	14,076	95.39	47.21	16.94	214.31
Year	14,076	2013.26	3.48	2006	2019

GDP = gross domestic product, Max. = maximum, Min. = minimum, PPP = purchasing power parity, Std. Dev. = standard deviation.

Source: Authors.

Tables 4 shows the results of country-level institutional framework conditions on product innovation activity in baby businesses. In Table 4, Model 1 is the baseline model, including only the controls variables. Model 2 tests influences of the country's institutional conditions on the likelihood of baby businesses' product innovation.

Of the different measures of entry regulations, only the cost of registration is shown as a significant influence, with higher cost of registering a new business associated with lower level of product innovation activity in baby businesses (-0.23, $p < 0.05$). This is consistent with hypothesis H1: more onerous and costly procedures to register a new business will lower the likelihood that individuals with high human and social capital (i.e., those who would be more likely to product innovate) will become entrepreneurs. Note, however, that no effect was shown for the required paid-in minimum capital. Contrary to our expectation, the number of procedures required to register a new business exhibited a positive association with the likelihood of product innovation of baby businesses.

Model 2 of Tables 4 also shows the effect of rule of law on the likelihood of product innovation in baby businesses. We can see that the rule of law has a positive association with baby businesses' product innovation: the stronger the rule of law, the more likely entrepreneurial businesses will be to introduce products that are new to at least some of their customers (0.23, $p < 0.001$). Countries with stronger rule of law will see entrepreneurial businesses product innovate more, consistent with hypothesis H2.

Country's financial development conditions were measured by two alternative variables: the financial development index and the private credit ratio, the impact of which was tested in Model 2 and Model 3 respectively. As shown in Model 2, the financial development has a positive association with baby businesses' product innovation (0.179, $p < 0.1$). Similarly, the private credit ratio is positively associated with baby businesses' product innovation (0.251, $p < 0.5$), suggesting that in countries where private credit is more widely available, entrepreneurs may be more likely to innovate. Combined, models 2 and 3 show strong support for our hypothesis H3: that stronger financial institutions should exhibit a positive association with the productivity potential of the country's entrepreneurial resource allocation dynamic.

Our statistical models used logistic regressions to estimate the impact of the country's institutional framework conditions on the productivity potential of entrepreneurial businesses. This means that the coefficients shown in Tables 4 (for product innovation), 7 (for export activity), and 10 (for employment growth expectations) are in the form of log odds. Thus, a one-unit increase in an independent variable would result in the amount of change in the log of the odds ratio indicated by the coefficient, i.e., $\log(p/1-p)$ or $\text{logit}(p)$ ¹. For example, the coefficient of registration cost was -0.23, meaning that a one standard-deviation increase in the registration cost is associated with a 0.23 reduction in the log of the odds ratio. To interpret the results intuitively, we obtained the coefficients in probability scale by calculating the *average marginal effects* of the predictors. The marginal effect is the average value of the predicted effects evaluated at each observation in the sample.

Table 5 shows the average marginal effects for the explanatory variables that exhibited a statistically significant influence upon product innovation in baby businesses. We can see that for a one standard-deviation increase in registration cost, the likelihood of the baby business engaging in product innovation was reduced by 4.1 percentage points – i.e., the average marginal effect was -0.041. A one standard-deviation increase in rule of law was positively associated with an increase in the likelihood of

¹ "p" is the probability of "success" (dependent variable takes value "1"), such as an entrepreneurial venture engaging in exporting activities, or being innovative, or having a high-growth aspiration, "1-p" is the probability of failing to do so (dependent variable takes value "0").

product innovation in baby businesses by 5.4%. The average marginal effect of financial development and private credit ration conditions was 3.9% and 4.8%, respectively.

Table 4: Effects of Institutional Conditions on Entrepreneurs' Product Innovation in Baby Businesses

VARIABLES	Model 1	Model 2	Model 3
Number of Procedures		0.195+ (0.115)	0.262* (0.115)
Registration Cost		-0.230* (0.091)	-0.190* (0.085)
Paid-in Minimum Capital		-0.055 (0.108)	-0.042 (0.109)
Rule of law		0.230** (0.075)	0.251*** (0.070)
Financial Development		0.179+ (0.102)	
Private Credit Ratio			0.224* (0.103)
Gender (Male=1)	-0.017 (0.047)	-0.017 (0.047)	-0.015 (0.047)
Age	-0.072** (0.023)	-0.073** (0.023)	-0.072** (0.023)
Income (middle tier)	-0.023 (0.082)	-0.024 (0.082)	-0.025 (0.082)
Income (upper tier)	0.141 (0.099)	0.140 (0.098)	0.138 (0.098)
Education1 (some secondary)	-0.025 (0.095)	-0.023 (0.095)	-0.024 (0.095)
Education2 (secondary)	0.149 (0.094)	0.148 (0.095)	0.147 (0.095)
Education3 (post-secondary)	0.373*** (0.108)	0.369*** (0.108)	0.368*** (0.108)
Education4 (graduate experience)	0.755*** (0.160)	0.740*** (0.157)	0.741*** (0.158)
Fear of failure (yes=1)	0.187** (0.062)	0.189** (0.062)	0.189** (0.062)
Rate of business formation	-0.128+ (0.074)	-0.059 (0.085)	-0.071 (0.081)
Population size	0.497*** (0.100)	0.623*** (0.171)	0.611*** (0.168)
Population growth (%)	-0.176** (0.066)	-0.138+ (0.072)	-0.125+ (0.075)
GDP per capita PPP (2nd quintile)	0.123 (0.244)	-0.094 (0.233)	-0.051 (0.218)
GDP per capita PPP (3rd quintile)	0.176 (0.188)	-0.220 (0.176)	-0.182 (0.182)
GDP per capita PPP (4th quintile)	0.220 (0.235)	-0.366 (0.255)	-0.306 (0.222)
GDP per capita PPP (5th quintile)	0.419 (0.264)	-0.189 (0.346)	-0.030 (0.273)
GDP growth (%)	-0.023 (0.094)	-0.183 (0.117)	-0.212+ (0.118)

Year dummies	Yes	Yes	Yes
Inverse Mills ratio	0.450*** (0.087)	0.453*** (0.087)	0.452*** (0.087)
Constant	-1.214*** (0.315)	-1.024* (0.465)	-1.002* (0.458)
Observations	14,076	14,076	14,076
Number of groups	90	90	90
Pseudo-R2	0.1880	0.1891	0.1892
Log likelihood	-8882.2268	-8867.3554	-8866.39
Degrees of Freedom	31	36	36
Wald chi2	433.79	420.04	457.2

GDP = gross domestic product, PPP = purchasing power parity, *** p<0.001, ** p<0.01, * p<0.05, + p<0.10.

Note: Robust standard errors are in parentheses.

Source: Authors.

Table 5: Average Marginal Effects of Institutional Variables on Entrepreneurs' Product Innovation

Product Innovation of Baby Businesses	Average marginal effect	Standard error	Z
Number of procedures	0.057*	0.025	2.3
Registration cost (% per capita income)	-0.041*	0.018	-2.25
Rule of law	0.054***	0.015	3.67
Financial development	0.039+	0.022	1.76
Private credit ratio	0.048*	0.02	2.18

GDP = gross domestic product, PPP = purchasing power parity, *** p<0.001, ** p<0.01, * p<0.05, + p<0.10.

Note: Robust standard errors are in parentheses.

Source: Authors

B. Institutional Framework Conditions and Export Activity in Entrepreneurial Businesses

Table 6 presents the descriptive statistics for the analysis of firms' export activity. Tables A3 in the Appendix present the correlation matrix of all variables in the export activity analyses for baby businesses. Tables 7 show the regression results of the institutional influences on the likelihood that entrepreneurial businesses in the country engage in export activity. The average marginal effects of the significant institutional variables are shown in Table 8.

Model 1 in Tables 7 is the baseline model, including the control variables only. Model 2 in Table 7 is the main effect model. It does not show any effect of our proxies for entry regulations and financial institutions on export activity in baby businesses. However, we again see strong positive association between our proxy for the rule of law (Models 2 and 3) and baby businesses' export activities. . One standard-deviation increase in the strength of the country's rule of law was associated with an increase in the likelihood of export activity in baby businesses by 3,6 % (or 3.4% as shown in Model 3). Thus, hypothesis H2 received good support: that countries with stronger rule of law should feature more entrepreneurial businesses engaged in export activity.

Table 6: Descriptive Statistics for Entrepreneurs' Export Activity Analysis

Variable	Observation	Mean	Std. Dev.	Min.	Max.
Export (yes=1)	13,963	0.23	0.42	0	1
Gender (male=1; female=0)	13,963	0.53	0.50	0	1
Age	13,963	37.17	11.01	18	64
Household income	13,963	2.14	0.81	1	3
Education	13,963	3.01	1.01	1	5
Fear of failure (yes=1)	13,963	0.39	0.49	0	1
Business formation rate (%)	13,963	0.29	0.11	0.05	0.51
Population size (millions)	13,963	465.81	555.69	2.96	1397.72
Population growth (%)	13,963	0.93	0.50	0.05	3.13
GDP per capita PPP (5 quintiles)	13,376	2.93	1.40	1	5
GDP growth (%)	13,963	5.83	2.49	-2.46	14.23
Number of procedures	13,963	10.12	3.48	2	17
Registration cost (% per capita income)	13,963	14.01	14.75	0.30	102.03
Paid-in minimum capital (% per capita income)	13,963	37.97	67.31	0	352.07
Rule of law	13,963	-0.44	0.61	-1.83	2.28
Financial development index	13,963	0.51	0.16	0.2	0.84
Private credit ratio	13,963	96.28	46.96	16.94	214.31
Year	13,963	2013.16	3.39	2006	2019

GDP = gross domestic product, Max. = maximum, Min. = minimum, PPP = purchasing power parity, Std. Dev. = standard deviation.

Source: Authors

Table 7: Effects of Institutional Conditions on Entrepreneurs' Export Activity in Baby Businesses

VARIABLES	Model 1	Model 2	Model 3
Number of procedures		-0.048 (0.164)	0.038 (0.171)
Registration cost		-0.212 (0.151)	-0.172 (0.146)
Paid-in minimum capital		-0.032 (0.099)	-0.009 (0.096)
Rule of law		0.361** (0.137)	0.341** (0.113)
Financial development		0.112 (0.206)	
Private credit ratio			0.264 (0.161)
Gender (male=1)	0.032 (0.077)	0.029 (0.077)	0.031 (0.077)
Age	-0.028 (0.031)	-0.030 (0.031)	-0.029 (0.031)
Income (middle tier)	-0.094 (0.097)	-0.097 (0.097)	-0.098 (0.097)
Income (upper tier)	0.379** (0.122)	0.375** (0.122)	0.374** (0.122)
Education1 (some secondary)	-0.242 (0.202)	-0.249 (0.201)	-0.249 (0.201)
Education2 (secondary)	0.035 (0.217)	0.027 (0.216)	0.027 (0.217)
Education3 (post-secondary)	0.361 (0.224)	0.352 (0.222)	0.352 (0.223)
Education4 (graduate experience)	0.651* (0.279)	0.634* (0.279)	0.636* (0.279)
Fear of failure (yes=1)	-0.018 (0.086)	-0.014 (0.086)	-0.014 (0.086)
Rate of business formation	-0.611*** (0.109)	-0.418** (0.140)	-0.470*** (0.134)
Population size	-0.373* (0.149)	0.000 (0.234)	-0.073 (0.219)
Population growth (%)	0.020 (0.099)	0.192 (0.127)	0.217+ (0.118)
GDP per capita PPP(2nd quintile)	-0.155 (0.416)	-0.368 (0.398)	-0.358 (0.383)
GDP per capita PPP (3rd quintile)	-1.516*** (0.381)	-1.964*** (0.370)	-1.940*** (0.367)
GDP per capita PPP (4th quintile)	-0.176 (0.309)	-0.865* (0.389)	-0.920** (0.309)
GDP per capita PPP (5th quintile)	-0.111 (0.325)	-0.802 (0.537)	-0.829* (0.331)
GDP growth (%)	0.308* (0.121)	0.061 (0.127)	0.038 (0.124)

Year dummies	Yes	Yes	Yes
Inverse Mills Ratio	0.199 (0.143)	0.204 (0.144)	0.204 (0.144)
Constant	1.419* (0.654)	1.563+ (0.799)	1.615* (0.795)
Observations	13,963	13,963	13,963
Number of groups	90	90	90
Pseudo-R2	0.3941	0.3952	0.3959
Log likelihood	-5951.1422	-5939.9411	-5938.8246
Degrees of Freedom	31	36	36
Wald chi2	206.68	294.2	305.66

GDP = gross domestic product, PPP = purchasing power parity,

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10.

Note: Robust standard errors are in parentheses.

Source: Authors.

Table 8: Average Marginal Effects of Institutional Variables on Entrepreneurs' Export Activity

Export of Baby Businesses	Average marginal effect	Standard error	Z
Rule of law	0.045**	0.015	2.99

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Source: Authors

C. Institutional Framework Conditions and Employment Growth Expectations in Entrepreneurial Businesses

Table 9 presents the descriptive statistics for the analysis of firms' high-growth expectation. Table A4 in the Appendix present the correlation matrix of all variables in the high-growth expectation analyses for baby businesses. Tables 10, together with Table 11 show the effect of the country's institutional framework conditions on its entrepreneurs' employment growth expectations. Remember that employment growth expectations were measured with a dummy that indicated whether the business expected to employ 20 or more employees in five years' time, which is quite a high bar.

When considering regulation of entry, we found the number of procedures required to register a business to exhibit a negative association with employment growth expectations in baby businesses (-0.559, p<0.05). We also found that the cost of registering a new business was negatively associated with baby business employment expectations (-0.477, p<0.05). Thus, onerous entry regulations were associated with reduced employment growth expectations particularly in baby businesses, thereby supporting hypothesis H3.

For the other two sets of institutional framework conditions – i.e., rule of law and financial institutions – virtually no association was exhibited by these on employment growth expectations of baby businesses. Therefore, this set of analyses failed to support H3.

The average marginal effects of institutional variables on employment growth expectations were smaller than for product innovation and export activity. The average marginal effects of one standard-deviation increase in both the number of registration procedures and the cost of registering a new business were -1.9% and -1.7%, respectively, on employment growth expectations in baby businesses (Table 11).

Summarizing, hypothesis H3 received some support in our analysis, but the impact of institutional framework conditions on employment growth expectations appeared more marginal than for the other two proxies of entrepreneurial firms' productivity potential.

Table 9: Descriptive Statistics for Entrepreneurs' High-Growth Expectations Analysis

Variable	Observation	Mean	Std. Dev.	Min.	Max.
High-growth expectation (yes=1)	14,903	0.04	0.20	0	1
Gender (male=1; female=0)	14,903	0.53	0.50	0	1
Age	14,903	37.18	11.04	18	64
Household income	14,903	2.14	0.81	1	3
Education	14,903	3.01	1.01	1	5
Fear of failure (yes=1)	14,903	0.39	0.49	0	1
Business formation rate (%)	14,903	0.29	0.11	0.05	0.51
Population size (millions)	14,903	477.65	562.19	2.96	1397.72
Population growth (%)	14,903	0.92	0.50	0.05	3.13
GDP per capita PPP(5 quintiles)	14,076	2.91	1.42	1	5
GDP growth (%)	14,903	5.79	2.50	-2.46	14.23
Number of procedures	14,903	10.04	3.54	2	17
Registration cost (% per capita income)	14,903	14.09	14.98	0.30	102.03
Paid-in minimum capital (% per capita income)	14,903	37.87	68.43	0	352.07
Rule of law	14,903	-0.43	0.61	-1.83	2.28
Financial development index	14,903	0.51	0.16	0.20	0.84
Private credit ratio	14,903	95.42	47.18	16.94	214.31
Year	14,903	2013.31	3.51	2006	2019

GDP = gross domestic product, Max. = maximum, Min. = minimum, PPP = purchasing power parity, Std. Dev. = standard deviation.

Source: Authors.

**Table 10: Effects of Institutional Conditions on Entrepreneurs'
High-Growth Expectations in Baby Businesses**

VARIABLES	Model 1	Model 2	Model 3
Number of procedures		-0.559* (0.264)	-0.455+ (0.262)
Registration cost		-0.477* (0.217)	-0.515* (0.253)
Paid-in minimum capital		0.205 (0.155)	0.254 (0.166)
Rule of law		0.135 (0.138)	-0.052 (0.124)
Financial development		-0.378 (0.240)	
Private credit ratio			0.126 (0.230)
Gender (male=1)	0.517*** (0.102)	0.512*** (0.101)	0.509*** (0.101)
Age	0.035 (0.050)	0.038 (0.050)	0.037 (0.050)
Income (middle tier)	0.111 (0.154)	0.096 (0.155)	0.098 (0.155)
Income (upper tier)	0.314+ (0.163)	0.300+ (0.163)	0.301+ (0.163)
Education1 (some secondary)	-0.113 (0.343)	-0.129 (0.343)	-0.110 (0.344)
Education2 (secondary)	0.153 (0.336)	0.137 (0.333)	0.157 (0.335)
Education3 (post-secondary)	0.902** (0.341)	0.888** (0.339)	0.902** (0.340)
Education4 (graduate experience)	1.753*** (0.420)	1.712*** (0.421)	1.727*** (0.422)
Fear of failure (yes=1)	0.144 (0.135)	0.140 (0.135)	0.142 (0.135)
Rate of business formation	-0.245 (0.168)	-0.033 (0.169)	-0.169 (0.171)
Population size	0.054 (0.140)	0.645* (0.251)	0.391+ (0.230)
Population growth (%)	-0.251* (0.113)	-0.040 (0.135)	0.068 (0.127)
GDP per capita PPP (2nd quintile)	-0.426 (0.468)	-0.604 (0.527)	-0.745 (0.475)
GDP per capita PPP (3rd quintile)	-1.068* (0.497)	-1.399** (0.506)	-1.519** (0.495)
GDP per capita PPP (4th quintile)	0.104 (0.479)	-0.279 (0.585)	-0.796 (0.515)
GDP per capita PPP (5th quintile)	0.865+ (0.492)	0.789 (0.696)	-0.019 (0.548)
GDP growth (%)	0.484** (0.168)	0.113 (0.170)	0.130 (0.182)

Year dummies	Yes	Yes	Yes
Inverse mills ratio	0.751** (0.234)	0.762** (0.235)	0.764** (0.235)
Constant	-3.473*** (0.502)	-3.939*** (0.675)	-3.505*** (0.653)
Observations	14,903	14,903	14,903
Number of groups	90	90	90
Pseudo-R2	0.4117	0.4164	0.4278
Log likelihood	-2133.649	-2122.5744	-2123.7394
Degrees of freedom	31	36	36
Wald chi2	342.03	407.45	372.54

GDP = gross domestic product, PPP = purchasing power parity, *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Note: Robust standard errors are in parentheses.

Source: Authors.

Table 11: Average Marginal Effects of Institutional Variables on Entrepreneurs' High-Growth Expectations

High-growth expectation of Baby Businesses	Average marginal effect	Standard error	Z
Number of procedures	-0.019*	0.009	-2.08
Registration cost (% per capita income)	-0.017*	0.008	-2.15

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Source: Authors

D. Moderating Effects of Individual Characteristics: Education and Household Income

We tested the moderating role of individual-level characteristics in the relationship between a country's institutional framework conditions and the productivity potential of entrepreneurial businesses.

Specifically, we investigated the interactions between the education and household income of individual entrepreneurs and the rule of law and financial development of their countries.

We found that an entrepreneur's *level of education* moderated negatively the relationship between the country's financial development and the likelihood of the baby business to engage in export activity as shown in Table 12. The results indicate that the positive association of a country's financial development with entrepreneurs' export activity was weaker for entrepreneurs who had received higher levels of education (e.g., -0.37* for secondary, -0.441* for post-secondary, and -0.679** for graduate education) in comparison with entrepreneurs received no education, as shown in Model 2 of Table 12. In other words, entrepreneurs who had little or no education exhibited a stronger statistical association with a country's financial development than those who received higher levels of education.

Similarly, the entrepreneur's *level of household income* was found to negatively moderate the relationship between the country's financial development and baby businesses' likelihood of engaging in

export activity (-0.233 , $p < 0.05$)), as shown in Models 3 of Table 12. In other words, entrepreneurs with lower levels of household income exhibited a stronger statistical association with the country's level of financial development than did those with higher household income levels.

Summarizing, these observations suggest that increases in the country's financial development may be more effective in increasing the productivity potential of less educated entrepreneurs who come from low-income households. These findings suggest that the country's institutional framework conditions may not affect all entrepreneurs the same way. Improving the quality of financial institutions could be particularly effective in plugging productivity deficit caused by gaps in individual entrepreneurs' education and household income.

Table 12: Moderation Effects of Education and Income on Entrepreneurs' Export Activity

	Model 1	Model 2	Model 3
Number of procedures	-0.048 (0.164)	-0.053 (0.168)	-0.043 (0.164)
Registration cost	-0.212 (0.151)	-0.222 (0.168)	-0.208 (0.151)
Paid-in minimum capital	-0.032 (0.099)	-0.037 (0.102)	-0.035 (0.100)
Rule of law	0.361** (0.137)	0.354** (0.137)	0.360** (0.137)
Financial development	0.112 (0.206)	0.493+ (0.285)	0.241 (0.228)
FD x Education1 (some secondary)		-0.122 (0.147)	
FD x Education2 (secondary)		-0.370* (0.173)	
FD x Education3 (post-secondary)		-0.441* (0.184)	
FD x Education4 (graduate experience)		-0.679** (0.222)	
FD x Income (middle tier)			-0.046 (0.089)
FD x Income (upper tier)			-0.233* (0.113)
Gender (male=1)	0.029 (0.077)	0.028 (0.078)	0.029 (0.077)
Age	-0.030 (0.031)	-0.034 (0.030)	-0.030 (0.031)
Income (middle tier)	-0.097 (0.097)	-0.083 (0.099)	-0.088 (0.106)
Income (upper tier)	0.375** (0.122)	0.392** (0.124)	0.420** (0.137)
Education1 (some secondary)	-0.249 (0.201)	-0.212 (0.215)	-0.235 (0.203)
Education2 (secondary)	0.027 (0.216)	0.087 (0.231)	0.034 (0.218)
Education3 (post-secondary)	0.352 (0.222)	0.439+ (0.236)	0.368 (0.224)
Education4 (graduate experience)	0.634* (0.279)	0.848** (0.279)	0.672* (0.279)
Fear of failure (yes=1)	-0.014 (0.086)	-0.018 (0.086)	-0.018 (0.085)
Rate of business formation	-0.418** (0.140)	-0.438** (0.137)	-0.431** (0.138)
Population size	0.000 (0.234)	0.034 (0.235)	0.007 (0.234)
Population growth (%)	0.192 (0.127)	0.212+ (0.127)	0.193 (0.126)
GDP per capita PPP (2nd quintile)	-0.368 (0.398)	-0.445 (0.399)	-0.346 (0.394)
GDP per capita PPP (3rd quintile)	-1.964*** (0.370)	-2.065*** (0.376)	-1.962*** (0.385)
GDP per capita PPP (4th quintile)	-0.865* (0.389)	-1.011* (0.405)	-0.863* (0.393)
GDP per capita PPP (5th quintile)	-0.802 (0.537)	-0.932+ (0.545)	-0.812 (0.534)
GDP growth (%)	0.061 (0.127)	0.011 (0.132)	0.055 (0.127)

Year dummies	Yes	Yes	Yes
Inverse mills ratio	0.204 (0.144)	0.218 (0.146)	0.211 (0.144)
Constant	1.563+ (0.799)	1.660* (0.824)	1.530+ (0.799)
Observations	13,963	13,963	13,963
Number of groups	90	90	90
Pseudo-R2	0.395	0.404	0.400
Log likelihood	-5939.94	-5920.55	-5930.28
Degrees of freedom	36	40	38
Wald chi2	294.2	379.85	310.57

GDP = gross domestic product, PPP = purchasing power parity, *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Note: Robust standard errors are in parentheses.

Source: Authors.

Discussion

In this report, we set out to explore the ability of a country's entry regulations, rule of law, and financial development on the potential of its entrepreneurial resource allocation dynamic to allocate resources towards high-productivity uses, i.e., ones more likely to boost the country's TFP. Previous research has signalled that country-level institutional framework conditions such as the quality of its political and economic institutions, property protection, rule of law, and the stringency of its bankruptcy laws can exhibit a strong associations with entrepreneurial activity within the country, including who chooses to become an entrepreneur in the first place, and what choices entrepreneurs are likely to make post entry. This study adds to this still small but growing body of evidence by exploring the effect of three sets of institutional framework conditions in a set of Asian countries: those of entry regulations, rule of law, and the quality of financial institutions.

The key takeaway from our analysis is that a country's institutional framework conditions exhibit a strong and consistent association with the propensity of its entrepreneurs to engage in activities associated with a high productivity potential at the firm level, namely, in product innovation and in export activity. Entrepreneurs in countries with less onerous entry regulations were also more likely to exhibit high employment growth expectations, although the evidence for this relationship was weaker and less consistent than for product innovation and export activity. Our analysis of average marginal effects showed that the associations were not trivial, as one standard-deviation improvement in a country's institutional framework conditions was associated with an up to 6% increase in the productivity potential of its entrepreneurial resource allocation dynamic.

At a more detailed level, looking at the country's entry regulations, we found that new business registration costs were adversely associated with the likelihood of baby business entrepreneurs of engaging in product innovation and exhibiting high employment growth expectations. The number of procedures required to start a business was also negatively associated with baby businesses' likelihood of high-growth expectations. Surprisingly, the number of procedures required to start a business was positively associated with baby businesses' likelihood of product innovation, although this effect was only marginally significant. We did not find other significant relationships between business entry regulations and the productivity potential of the country's entrepreneurial businesses though. This could be because these regulations are closely related to the immediate creation of entrepreneurial ventures, and our method (i.e., Heckman two-stage selection model) already accounted for the predicted likelihood of an individual becoming an entrepreneur in the second-stage regressions of the Heckman

two-stage model. Therefore, although some expected effects were observed, we did not find strong and broad effects of entry regulations on the productivity potential of entrepreneurial businesses.

The country's rule of law regime showed strong, consistent, and positive associations with entrepreneurial businesses' product innovation and export activities, and the average marginal effect of rule of law signalled a non-trivial association. The country's financial development conditions only exhibited a significant positive association with product innovation. The associations of these institutional framework conditions were not significant where the entrepreneurs' high employment growth expectations were concerned. One reason for this could be that our dependent variable in this case was quite restrictively limited to those businesses who expected to employ 20 or more employees in 5 years' time – a threshold that the great majority of new businesses never reach. It is possible that a less restrictive outcome variable might have reacted more readily to the four institutional framework conditions examined.

Examining moderation effects of the entrepreneurs' education level and household income revealed interesting additional nuance. Summarizing, improvements in financial framework conditions appeared more effective in boosting the productivity potential of less advantaged entrepreneurs. These moderation effects provide an important signal that not all institutional framework conditions may operate in the same ways, and not all institutional framework conditions may affect all entrepreneurs in the same ways. These insights may prove helpful in targeting policy action to improve a country's institutional framework conditions for productive entrepreneurship.

Finally, we should note some limitations in our analysis. Our sample included 15 ADB member countries, and we did not have full time series data for all countries and all years. This limits the statistical power of our analysis.

Conclusion and Implications for Policy

This analysis adds to the small but growing body of evidence that reports significant and non-trivial associations between country-level institutional conditions and individual-level entrepreneurial activity. Given that the decision to start and operate a new business is an occupational choice that allocates human, social, and financial capital to new economic activity, this dynamic has the potential to shape the country's economic productivity. Given that entrepreneurial businesses are highly heterogeneous in terms of their productivity potential, policy-makers will be well advised to pay attention to this important phenomenon. Our analysis adds to the growing evidence that high-quality institutions are able to support a high-quality entrepreneurial dynamic which allocates economic resources to high-productivity uses.

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Appendix: Correlation Matrix

Table A1: Correlations of Variables
(New Products Introduction of Baby Businesses)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 New product (yes=1)	1																		
2 Gender (male=1; female=0)	-0.01	1																	
3 Age	-0.06*	0	1																
4 Household income	0.10*	0.04*	-0.04*	1															
5 Education	0.12*	0.05*	-0.17*	0.24*	1														
6 Fear of failure (yes=1)	-0.02*	-0.03*	0.02*	-0.04*	-0.01*	1													
7 Business rate (%)	-0.10*	-0.11*	-0.01	-0.09*	-0.08*	0.05*	1												
8 Population size (millions)	0.20*	0.02*	-0.11*	0.04*	-0.10*	-0.01	-0.05*	1											
9 Population growth (%)	-0.14*	0.01	-0.05*	-0.08*	-0.03*	-0.02*	-0.19*	-0.20*	1										
10 GDP development stage (2nd quintile)	-0.004	-0.04*	-0.01	-0.07*	-0.03*	-0.02*	0.23*	0.15*	0.01	1									
11 GDP development stage (3rd quintile)	0.03*	-0.04*	-0.03*	-0.01	-0.03*	0.005	0.09*	0.16*	0.01	-0.25*	1								
12 GDP development stage (4th quintile)	0.05*	-0.04*	0.01	0.02	-0.01	0.03*	0.20*	0.09*	-0.45*	-0.27*	-0.23*	1							
13 GDP development stage (5th quintile)	-0.04*	0.07*	0.10*	0.04*	0.15*	-0.06*	-0.45*	-0.58*	0.12*	-0.25*	-0.21*	-0.24*	1						
14 GDP growth (%)	0.14*	0.003	-0.09*	0.05*	-0.05*	-0.05*	-0.16*	0.57*	-0.02*	0.28*	0.04*	-0.20*	-0.28*	1					
15 Number of procedures	0.04*	-0.03*	-0.09*	-0.03*	-0.11*	-0.01	0.07*	0.53*	0.45*	0.12*	0.25*	-0.24*	-0.52*	0.37*	1				
16 Registration cost	-0.10*	0.01	-0.01	-0.10*	-0.12*	-0.02*	0.06*	0.09*	0.41*	-0.04*	0.03*	-0.31*	-0.12*	-0.07*	0.50*	1			
17 Paid-in minimum capital	0.09*	0.06*	-0.06*	-0.001	-0.01	-0.07*	-0.05*	0.49*	-0.13*	0.11*	0.07*	-0.16*	-0.12*	0.50*	0.31*	0.21*	1		
18 Rule of law	0.05*	0.07*	0.08*	0.09*	0.18*	-0.09*	-0.47*	-0.42*	-0.05*	-0.16*	-0.13*	-0.10*	0.66*	-0.11*	-0.53*	-0.28*	-0.03*	1	
19 Financial development	0.10*	0.04*	0.12*	0.06*	0.10*	-0.03*	-0.12*	-0.23*	-0.55*	-0.22*	-0.23*	0.42*	0.52*	-0.25*	-0.66*	-0.39*	-0.04*	0.57*	1
20 Private credit ratio	0.14*	0.01	0.05*	0.10*	0.09*	-0.01	0.02*	-0.08*	-0.71*	-0.11*	-0.22*	0.50*	0.25*	-0.04*	-0.66*	-0.57*	-0.01	0.39*	0.84*

* Indicates correlation coefficients significant at 5% level or better.

(observations =14,076)

Source: Authors.

**Table A2: Correlations of Variables
(Export of Baby Businesses)**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 Export (yes=1)	1																		
2 Gender (male=1; female=0)	0.06*	1																	
3 Age	-0.01	0	1																
4 Household income	0.14*	0.04*	-0.04*	1															
5 Education	0.16*	0.05*	-0.17*	0.24*	1														
6 Fear of failure (yes=1)	-0.05*	-0.03*	0.02*	-0.04*	-0.01*	1													
7 Business rate (%)	-0.28*	-0.11*	-0.01	-0.10*	-0.08*	0.05*	1												
8 Population size (millions)	-0.10*	0.01	-0.09*	0.04*	-0.11*	-0.02*	-0.05*	1											
9 Population growth (%)	0.04*	0.01	-0.04*	-0.07*	-0.02*	-0.03*	-0.18*	-0.23*	1										
10 GDP development stage (2nd quintile)	-0.04*	-0.04*	-0.01	-0.06*	-0.03*	-0.01	0.25*	0.12*	0.04*	1									
11 GDP development stage (3rd quintile)	-0.18*	-0.04*	-0.03*	-0.02	-0.04*	-0.003	0.09*	0.17*	0.02*	-0.25*	1								
12 GDP development stage (4th quintile)	-0.06*	-0.03*	0.01	0.03*	-0.005	0.03*	0.15*	0.14*	-0.41*	-0.25*	-0.23*	1							
13 GDP development stage (5th quintile)	0.21*	0.07*	0.10*	0.02*	0.13*	-0.04*	-0.38*	-0.60*	0.07*	-0.26*	-0.23*	-0.24*	1						
14 GDP growth (%)	0.04*	0.01	-0.09*	0.05*	-0.06*	-0.05*	-0.16*	0.60*	-0.04*	0.18*	0.03*	-0.16*	-0.33*	1					
15 Number of procedures	-0.15*	-0.03*	-0.08*	-0.03*	-0.11*	-0.02	0.07*	0.53*	0.43*	0.11*	0.26*	-0.21*	-0.54*	0.37*	1				
16 Registration cost	-0.10*	0.001	-0.01	-0.09*	-0.12*	-0.02*	0.06*	0.06*	0.42*	-0.02*	0.04*	-0.30*	-0.13*	-0.08*	0.50*	1			
17 Paid-in minimum capital	-0.05*	0.06*	-0.05*	0.00	-0.02*	-0.08*	-0.05*	0.50*	-0.15*	0.04*	0.07*	-0.14*	-0.15*	0.51*	0.31*	0.17*	1		
18 Rule of law	0.29*	0.07*	0.08*	0.09*	0.18*	-0.08*	-0.48*	-0.43*	-0.02*	-0.16*	-0.14*	-0.08*	0.62*	-0.10*	-0.53*	-0.28*	-0.02*	1	
19 Financial development	0.15*	0.04*	0.12*	0.06*	0.10*	-0.02*	-0.13*	-0.23*	-0.55*	-0.23*	-0.24*	0.36*	0.57*	-0.25*	-0.66*	-0.41*	-0.04*	0.57*	1
20 Private credit ratio	0.11*	0.01	0.05*	0.10*	0.08*	0.004	0.01	-0.06*	-0.71*	-0.12*	-0.24*	0.46*	0.29*	-0.03*	-0.66*	-0.59*	0.01	0.38*	0.83*

* Indicates correlation coefficients significant at 5% level or better.

(observations =13,963)

Source: Authors.

Table A3: Correlations of Variables
(High-growth Expectations of Baby Businesses)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 High-growth expectation (Yes=1)	1																		
2 Gender (male=1; female=0)	0.08*	1																	
3 Age	-0.01	-0.001	1																
4 Household income	0.10*	0.04*	-0.04*	1															
5 Education	0.10*	0.05*	-0.17*	0.24*	1														
6 Fear of failure (yes=1)	-0.04*	-0.03*	0.02*	-0.04*	-0.01*	1													
7 Business rate (%)	-0.10*	-0.11*	-0.01	-0.09*	-0.08*	0.05*	1												
8 Population size (millions)	0.03*	0.02	-0.10*	0.04*	-0.10*	-0.01	-0.05*	1											
9 Population growth (%)	-0.06*	0.01	-0.05*	-0.08*	-0.02*	-0.02*	-0.18*	-0.19*	1										
10 GDP development stage (2nd quintile)	-0.03*	-0.03*	-0.01	-0.04*	-0.03*	-0.02*	0.18*	0.20*	0.02*	1									
11 GDP development stage (3rd quintile)	-0.03*	-0.03*	-0.03*	-0.01	-0.03*	-0.01	0.08*	0.21*	0.04*	-0.25*	1								
12 GDP development stage (4th quintile)	0.02*	-0.04*	0.02*	0.01	-0.01	0.04*	0.21*	0.06*	-0.45*	-0.29*	-0.23*	1							
13 GDP development stage (5th quintile)	0.06*	0.07*	0.10*	0.04*	0.15*	-0.06*	-0.44*	-0.57*	0.12*	-0.26*	-0.21*	-0.25*	1						
14 GDP growth (%)	0.07*	0.003	-0.09*	0.05*	-0.06*	-0.05*	-0.14*	0.56*	-0.05*	0.32*	0.05*	-0.19*	-0.29*	1					
15 Number of procedures	-0.09*	-0.03*	-0.09*	-0.04*	-0.11*	-0.01	0.07*	0.54*	0.45*	0.18*	0.25*	-0.22*	-0.51*	0.36*	1				
16 Registration cost	-0.09*	0.01	-0.01	-0.10*	-0.11*	-0.02*	0.06*	0.09*	0.42*	-0.03*	0.02*	-0.29*	-0.11*	-0.07*	0.50*	1			
17 Paid-in minimum capital	0.05*	0.06*	-0.05*	-0.002	-0.02	-0.08*	-0.05*	0.48*	-0.13*	0.09*	0.09*	-0.17*	-0.13*	0.50*	0.32*	0.21*	1		
18 Rule of law	0.09*	0.07*	0.09*	0.09*	0.18*	-0.08*	-0.46*	-0.42*	-0.06*	-0.15*	-0.16*	-0.08*	0.65*	-0.11*	-0.53*	-0.27*	-0.03*	1	
19 Financial development	0.08*	0.04*	0.12*	0.06*	0.10*	-0.04*	-0.11*	-0.20*	-0.54*	-0.22*	-0.23*	0.40*	0.51*	-0.24*	-0.63*	-0.38*	-0.03*	0.57*	1
20 Private credit ratio	0.11*	0.01	0.06*	0.10*	0.08*	-0.01	0.02*	-0.05*	-0.71*	-0.13*	-0.22*	0.49*	0.24*	-0.02*	-0.64*	-0.56*	0.004	0.38*	0.84*

* Indicates correlation coefficients significant at 5% level or better.

(observations =14,903)

Source: Authors.