No. 2024-001

Financial Constraints and Firm Performance in Small Island Developing States

Xu, Peng*
Takase, Koichi†

March 2025

Abstract

This study empirically analyzes the impact of financial constraints on firm performance in Small Island Developing States (SIDS) by utilizing the data from the World Bank Enterprise Surveys (WBES). A greater part of SIDS is suffering from stagnating business performance and economic growth. We revise the existing indicators to measure financial constraints and firm performance, and to improve the precision of the standard regression models. The results show that firms with better access to finance tend to have higher growth rates and labor productivity in SIDS. The regression analysis with SIDS dummy reveals that easing financial constraints has a more pronounced effect in SIDS on improving labor productivity than in non-SIDS countries.

Key words:
Financial Constraint, Financial Access, SIDS, Firm Performance, Labor Productivity
JEL Classification Codes:
O12, O16, O57

---

* Graduate School of Commerce, Waseda University. This is a revised version of my master's thesis (in Japanese), submitted to the Graduate School of Commerce at Waseda University, co-authored with Prof. Koichi Takase. I am deeply grateful for the valuable feedback I received from Prof. Katayama, Prof. Kano, and other faculty members who contributed their insights during my thesis work. I would like to express my sincere appreciation to all of them.

† Faculty of Commerce, Waseda University. Email: ktakase@waseda.jp

1. Introduction

Small Island Developing States (SIDS) are geographically isolated, small, and vulnerable to natural disasters, making them economically vulnerable (OECD, 2018)[1]. Their geographical isolation also places them at a logistical and competitive disadvantage in international trade. These countries have long relied on small and mono-economies. They are frequently heavily indebted due to external shocks such as natural disasters. As a result, they are heavily dependent on foreign remittances and official development assistance (UN-OHRLLS, 2022)[2]. Against this backdrop, active planning to strengthen resilience to various external shocks is essential for these countries to maintain a secure living environment and to achieve sustainable economic growth. In this context, the financial sector plays an important role in mitigating external shocks (Zhang & Managi, 2020).

Many studies have shown that financial development has a positive impact on economic growth (King & Levine, 1993; Beck et al., 2004; Holden & Howell, 2009). According to UNEP (2013)[3], financing is a key challenge for SIDS to strengthen disaster resilience and achieve sustainable development. Zhang & Managi (2020) also note that the development of domestic finance has significantly improved disaster resilience in the Pacific Island region.

Since firm is one of the most important actors in the process of influencing economic growth, growth of firms is considered a key element of a country's economic development (Ayyagari et al., 2008). By obtaining the necessary funds through effective financial strategies, companies expand, innovate, and increase their own competitiveness, and so contribute to the growth of the nation (Brealey & Myers, 1996). Performance of financial and operational management in each firm has a direct impact on many economic indicators, such as unemployment, technological progress, and market vitality (Mankiw, 2009).

Available enterprise data are very limited in many SIDS countries because their weak fiscal foundations make their statistical administrations not well-developed (UNDP, 2023)[4]. This

[1] OECD: Organization for Economic Co-operation and Development.
[2] UN-OHRLLS: The United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States.
[3] UNEP: United Nations Environment Programme.
[4] UNDP: United Nations Development Programme.

leads to little empirical research on enterprise growth in SIDS. In this study, we empirically analyze the effects of financial constraints on firm performance in SIDS based on the firm-level (micro) data from the latest World Bank Enterprise Surveys (WBES).

This study contributes to existing literature in three ways. First, we focus on firm-level data, providing new insights into firm behavior and performance in these countries. This enables more precise policymaking to promote firm development in SIDS countries. Second, we modify the regression model of existing studies to measure the firm growth so that we exclude all the firm growth variables with past information before the time of survey dates. This adjustment minimizes the risk of reverse causality to enhance the reliability and validity of the study's findings. Third, we clarify the impact of geographical factors (small islands) on the effectiveness of financing. Contrary to their image of tropical paradise, SIDS countries are struggling to recover from their stagnating economic performance and even to protect their own land against the sea level rise. This study aims to provide practical insights to realize economic self-reliance and sustainable development in SIDS countries.

The structure of this paper is described as follows. Section 2 describes SIDS. Section 3 surveys the existing studies. Section 4 discusses the data in this study and explains core variables. Section 5 presents the hypotheses, shows the results of basic statistics, and explains the regression model. Section 6 explains the results of the regression analysis. Section 7 summarizes the conclusions.

2. SIDS

2.1 About SIDS

SIDS are a group of island nations characterized by their small land area, relatively limited populations, and economic vulnerability (UN-OHRLLS, 2024a). The list of the SIDS by the United Nations includes 39 countries and 18 relevant members of UN regional commissions (UN-OHRLLS, 2024b). Due to their political and sovereign statuses, the Cook Islands and Niue are not members of the UN, the World Bank or International Monetary Fund (UN, 2024; World Bank, 2024a; IMF, 2024)[5]. This study covers the total of 37 SIDS countries without these two.

[5] UN: United Nations. IMF: International Monetary Fund.

SIDS countries are scattered in the Pacific Ocean, Caribbean Sea, Indian Ocean, Atlantic Ocean, and South China Sea (UN-OHRLLS, 2024a). Despite the name of Developing States, the list includes some developed countries. According to the World Bank's latest definition, countries with a GNI per capita of US$1,145 or less are “low income” countries, those between US$1,146 and US$4,515 are “lower middle income” countries, those between US$4,516 and US$14,005 are “upper middle income” countries, and those with $14,006 or more are “high income” countries (Metreau et al., 2024). Table 2-1 classifies the 37 SIDS countries by regions and income levels.

Table 2-1. SIDS Countries by Region

No.	Country	Income level	No.	Country	Income level
Atlantic, Indian Ocean, South China Sea (AIS) (8)			19	Jamaica	Upper middle
1	Cabo Verde	Lower middle	20	St. Kitts and Nevis	High
2	Comoro	Lower middle	21	St. Lucia	Upper middle
3	Guinea-Bissau	Low	22	St. Vincent and the Grenadines	Upper middle
4	Maldives	Upper middle	23	Suriname	Upper middle
5	Mauritius	Upper middle	24	Trinidad and Tobago	High
6	Sao Tomé and Principe	Lower middle			
7	Seychelles	High	***Pacific (13)***		
8	Singapore	High	25	Fiji	Upper middle
			26	Kiribati	Lower middle
Caribbean (16)			27	Marshall Islands	Upper middle
9	Antigua and Barbuda	High	28	Micronesia, Fed. Sts.	Lower middle
10	Bahamas	High	29	Nauru	High
11	Barbados	High	30	Palau	High
12	Belize	Upper middle	31	Papua New Guinea	Lower middle
13	Cuba	Upper middle	32	Samoa	Lower middle
14	Dominica	Upper middle	33	Solomon Islands	Lower middle
15	Dominican Republic	Upper middle	34	Timor-Leste	Lower middle
16	Grenada	Upper middle	35	Tonga	Upper middle
17	Guyana	High	36	Tuvalu	Upper middle
18	Haiti	Lower middle	37	Vanuatu	Lower middle

Source: UN DESA Sustainable Development (2024)[6] and World Bank website.

Total population of SIDS is approximately 65 million, representing less than 1% of the global population (UN-OHRLLS, 2024a). In spite of its relatively small geographical area and population size, each SIDS country tends to hold remarkable linguistic and cultural diversity (Paul, 2019). This could be an important foundation for the development of cultural industries, tourism,

[6] UN DESA Sustainable Development: The Division for Sustainable Development Goals in the United Nations Department of Economic and Social Affairs.

trade, and international cooperation (Paul, 2019; UNESCO, 2023; UNESCO, 2024)[7]. Table A-1 in the Appendix provides information on the population, land area, currency, and languages spoken in the SIDS countries.

These countries often share three common dimensions of geographical, economic, and environmental characteristics (Briguglio, 1995; OECD, 2018; Paul, 2021; UN-OHRLLS, 2023). Geographic characteristics of the SIDS is the isolated location (UN-OHRLLS, 2024a). These countries have limited land area and are often located in remote areas. The insularity and remoteness inherent to SIDS creates challenges related to transportation and communication (Briguglio, 1995; OECD, 2018; UN-OHRLLS, 2022). These countries tend to have relatively high unit transportation costs in international trade compared to other countries (Briguglio, 1995; OECD, 2018).

Economic characteristics of the SIDS are the smallness, the openness, and the dependence on external sources (Briguglio, 1995; Fauzel, 2016; OECD, 2018). Major economic activities are tourism, fishing, and agriculture (Fauzel, 2016; Paul, 2021). Lack of diversity in economic structure and heavy reliance on imports make them highly vulnerable to external shocks (Briguglio, 1995; UN-OHRLLS, 2022). Some SIDS countries are heavily dependent on funds from abroad, especially remittances from migrants and development assistance from donor countries. This situation is particularly pronounced in the Pacific region (Briguglio, 1995). These inflows of foreign funds have enabled those SIDS to improve their living standards and to compensate for their trade deficits. Owing to their small market size and their limited volume of imports and exports in the global market, those SIDS countries become complete price takers with little control the prices of traded products (Briguglio, 1995; OECD, 2018; UN-OHRLLS, 2022). Since the small economic size makes it difficult to take advantage of economies of scale, production and labor costs tend to be high. This leads to an overreliance on technological imports and suppresses the development of endogenous technologies (Briguglio, 1995).

Environmental characteristics of the SIDS are the vulnerability from natural disasters, pollution, and resource depletion (Briguglio, 1995; OECD, 2018; Paul, 2021; UN-OHRLLS, 2022; OECD, 2024). Most SIDS countries suffer from natural disasters such as typhoons,

[7] UNESCO: United Nations Educational, Scientific and Cultural Organization.

earthquakes, landslides, and volcanic eruptions. The livelihoods of the inhabitants, national infrastructure, and even the survival of the country are threatened (UN-OHRLLS, 2022; UN-OHRLLS, 2024a). According to Briguglio (1995), the SIDS often face high environmental pressures in the process of economic development. Agricultural land decreases rapidly owing to increased demand for housing and industrial production. Many SIDS countries are forced to dispose of more waste than their capacity because they extensively use their coastal areas for tourism and marine activities. Quite a few SIDS countries extract their natural resources extensively because they rely on exports of natural resources as a means of compensating for their large trade deficit (Niles & Lloyd, 2013).

2.2 Macroeconomy of SIDS

Table 2-2 presents GDP, GDP per capita, GDP growth, and GDP per capita growth figures in 2023 for the 37 SIDS countries. There are notable differences in the total GDP in the SIDS countries. For example, Singapore has the highest total GDP and Nauru has the lowest. The difference is extremely large, with Singapore's total GDP being approximately 3251 times greater than Nauru's. A similar trend can be observed for GDP per capita that the highest Singapore's GDP per capita is 89 times higher than the lowest Guinea-Bissau's GDP per capita.

As shown in Table 2-1, there are 10 high-income countries out of the total 37 SIDS countries, while the remaining 27 countries are 1 low- and 26 middle-income countries. This means that the income level of the majority of SIDS is not high. Table 2-2 shows some evidence of slow economic growth of SIDS countries. Average of per capita GDP growth rate of all the SIDS belonging to the low- and middle-income groups (1.58%) is lower than the world average of per capita GDP growth rate (1.92%). Average of Per capita GDP of middle-income SIDS countries (1.53%) is lower than the world average of middle-income countries (3.85%). In particular, average of per capita GDP of Pacific SIDS countries (0.61%) is a little surprising owing to an extremely low rate of newly born Timor-Leste (-19%). Average growth rate of Pacific SIDS without Timor-Leste (2.38%) is still not so satisfactory. There are seven SIDS countries (Belize, Cuba, Haiti, Marshall Islands, Sao Tome and Principe, Timor-Leste, Vanuatu) with negative growth rate. It is true that more detailed investigation on the recent economic performance of SIDS counties is necessary for any conclusion, but we have a good reason to study the stagnating

situation of SIDS economies.

Table 2-2. GDP Indicators in SIDS in 2023

Country	Income level	GDP (US$ million)	GDP per capita (US$ thousand)	GDP growth (%)	GDP per capita growth (%)
Antigua and Barbuda	High	2,033.1	21.79	3.86	3.33
Bahamas	High	14,338.5	35.90	2.64	2.15
Barbados	High	6,720.7	23.80	4.09	4.09
Belize	Upper middle	3,066.9	7.46	1.15	-0.91
Cabo Verde	Lower middle	2,533.8	4.85	5.48	4.95
Comoros	Lower middle	1,352.4	1.59	3.00	1.03
Cuba	Upper middle	--	--	-1.93	-1.57
Dominica	Upper middle	654.0	9.83	4.71	5.21
Dominican Republic	Upper middle	121,444.3	10.72	2.36	1.45
Fiji	Upper middle	5,442.0	5.89	7.52	6.97
Grenada	Upper middle	1,316.7	11.25	3.57	3.42
Guinea-Bissau	Low	2,048.3	0.95	5.20	2.86
Guyana	High	17,159.5	20.77	33.80	33.04
Haiti	Lower middle	19,850.8	1.71	-1.86	-2.99
Jamaica	Upper middle	19,423.4	6.84	2.20	2.18
Kiribati	Lower middle	279.2	2.11	4.12	2.51
Maldives	Upper middle	6,590.9	12.53	4.73	4.35
Marshall Islands	Upper middle	259.3	6.68	-3.93	-0.84
Mauritius	Upper middle	14,644.5	11.61	6.96	7.08
Micronesia, Fed. Sts.	Lower middle	460.0	4.08	0.78	0.32
Nauru	High	154.2	12.98	0.59	-0.04
Palau	High	281.8	15.90	1.88	2.06
Papua New Guinea	Lower middle	30,729.2	2.96	3.04	1.19
Samoa	Lower middle	938.2	4.33	8.58	7.88
Sao Tome and Principe	Lower middle	679.0	2.94	0.37	-1.61
Seychelles	High	2,141.5	17.88	3.16	3.25
Singapore	High	501,427.5	84.73	1.08	-3.72
Solomon Islands	Lower middle	1,633.3	2.04	3.08	0.64
St. Kitts and Nevis	High	1,055.5	22.57	2.28	2.18
St. Lucia	Upper middle	2,430.1	13.55	2.21	1.92
St. Vincent and the Grenadines	Upper middle	1,066.0	10.52	6.02	6.77
Suriname	Upper middle	3,455.1	5.49	2.54	1.61
Timor-Leste	Lower middle	2,079.9	1.50	-18.12	-19.00
Tonga	Upper middle	--	--	--	--
Trinidad and Tobago	High	27,372.3	20.02	1.35	1.22
Tuvalu	Upper middle	62.3	6.34	3.85	5.71
Vanuatu	Lower middle	1,126.3	3.52	2.21	-0.14
East Asia & Pacific (excluding high income)		--	9.90	5.11	4.91
Latin America & Caribbean (excluding high income)		--	10.18	2.07	1.34
World		--	13.17	2.83	1.92

Low income economies	--	0.90	2.24	-0.48
Middle income economies	--	6.25	4.64	3.85
High income economies	--	48.75	1.78	1.24

Source: WDI (World Development Indicators by the World Bank)

SIDS are heavily dependent on three major industries: fishing, tourism, and agriculture, according to Paul (2021). These sectors create employment opportunities for up to 40% of the labor force. UN-OHRLLS (2015) notes that fisheries contribute up to 10% to the total GDP of the Pacific region. Agriculture is a base industry for many SIDS although its contribution to GDP varies from country to country. According to OECD (2018), agriculture accounts for about 23% of GDP in Cape Verde, Kiribati, Papua New Guinea, Solomon Islands, and Vanuatu. In contrast, it is only about 7% in other SIDS. Tourism is an important source of income, especially for the Caribbean and the Pacific islands. According to UN-OHRLLS (2015), about 12% of the labor force is employed in tourism in the Caribbean, generating about 14% of GDP annually. In the Pacific region, the tourism contributions to GDP are widely spread. According to Harrison & Prasad (2013), the contribution of tourism is 67.1% in Palau and 50% in the Cook Islands, while in Solomon Islands and Papua New Guinea it is lower at 1.7% and 0.1%, respectively.

2.3 Financial Sectors in SIDS

Financial sector is very large in the Caribbean. According to Masetti (2021), total financial sector assets accounted for 169% of the region's GDP in 2018. In Barbados, Trinidad and Tobago, and the Eastern Caribbean Monetary Union regional countries, the share reached about 200%. In that year, the size of the Caribbean financial sector was about $137 billion. Trinidad and Tobago and Jamaica, the largest economies in the region, also have the largest financial sectors, accounting for 37% and 21% of the total financial sector assets in the Caribbean, respectively. In addition, the financial sector in the Caribbean is primarily banking. Masetti (2021) notes that the banking sector accounts for more than 50% of total financial sector assets in most countries in the region. Since foreign banks and the broader Caribbean banking sector play an important role in the region, there are no local banks trading in Barbados.

Many of the Pacific Island countries have small economies and very limited financial sectors. In small countries such as Kiribati and Tuvalu, total domestic banking assets and lending are very small and many financial activities are externally dependent (UN-OHRLLS, 2023). In addition, most SIDS in the Pacific do not have capital (stock and bond) markets. As a result,

companies and governments have limited options for raising funds and tend to rely heavily on external aid and loans (UN-OHRLLS, 2022).

In the AIS, there are marked differences in the level of financial development in each country. Singapore is considered the financial hub of the Asian region as one of the world's leading financial centers, rivaling New York and London. On the other hand, Comoros and Guinea-Bissau share common challenges with very few local financial institutions and under the underdeveloped and fragile financial system (OECD, 2018; UN-OHRLLS, 2023).

3. Literature review

Large literature discusses the relationship between financial constraints and firm growth. According to corporate finance theory, underdeveloped financial and legal systems lead to market imperfections, which in turn constrain firms' ability to finance investment projects. Rajan & Zingales (1998) shows that dependent industries on external financing grow faster in countries with more developed financial systems. Becchetti & Trovato (2002) empirically analyzed more than 5,000 SME firms in the Italian manufacturing sector. The results revealed that firms with abundant external financial capacity grew significantly faster. This difference in growth rate was more than doubled for firms with fewer than 50 employees.

Beck et al. (2005) empirically studied the impact of financial, legal, and corruption obstacles on firm growth using survey data from more than 4,000 firms in 54 countries. The results show that the constraints of firm growth depend on the size of the firm. The smaller the size of the firm, the more vulnerable it is to these constraints. As financial and institutional development progress, constraints due to financial, legal, and corruption gradually weaken. This trend is particularly pronounced for small firms.

Ayyagari et al. (2008) analyzed the characteristics of the business environment that directly affect firm growth using data from the WBES. This survey data conducted for 80 developed countries in 1999 and 2000. Regression analysis and the Directed Acyclic Graph (DAG) method[8] finds that financial, criminal, and political instability are directly related to firm growth among the 10 types of business environment obstacles reported by firms. It also shows

[8] A Directed Acyclic Graph (DAG) is a directed graph with no cycles, widely used for representing dependencies in various applications such as data processing, blockchain, and machine learning.

that the direct impact of financing on firm growth is the most significant. The results indicate that other business environment obstacles may have an indirect impact through three main constraints of finance, legislation, and corruption.

There are numerous theoretical and empirical macroeconomic studies on the impact of financial development on firm performance. In the endogenous growth model, innovation is the primary driver of economic growth. Levine (1997) mentions various important functions of financial system, including its role in influencing economic growth through innovation and capital accumulation. Hall (1992) finds that complexity and uncertainty in the innovation process makes it difficult for firms to obtain external finance. Since firms have a difficulty to obtain the necessary funds in the credit market, they may refrain from their innovation activities. Himmelberg & Petersen (1994) finds a positive correlation between R&D activities and cash flows after the firm-level panel data analysis for large listed-firms in Germany and the United Kingdom. Hall et al. (1998) shows that R&D investment is highly elastic to the cash flow for the U.S. high-tech firms.

Large number of studies analyzes the impact of financial system on corporate business expansion. Mehrotra & Sergeyev (2021) examines the importance of credit on job creation during the 2008 financial crisis. Their study shows that firms' credit constraints contributed to an approximately 18% increase in unemployment in 2008. Bellone et al. (2010) uses the panel data on over 25,000 manufacturing firms from 1993 to 2005 to analyze the association between credit constraints and export behavior. The results show that firms with better financial conditions are more likely to be exporters. They also find that a well-developed financial system would help firms with limited funds expand their foreign operations.

Comparative studies of firms in different countries and of different sizes investigated the impact of financial development on the economic growth of a country or a firm. Demirgüç-Kunt & Maksimovic (1998) finds that the differences in the legal system and the financial system have a significant impact on firms' external financing. Their firm-level data analysis shows that firms in countries with well-developed financial institutions and efficient legal systems are able to raise more external financing. Becchetti & Trovato (2002) and Beck et al. (2005) show that credit constraints have a deep impact on the SMEs because SMEs are short of credits provided by financial institutions for the uncertainty of the firms themselves, the information asymmetry, and lack of collateral. Donati (2015) finds that SMEs with difficulties in accessing finance face a

variety of barriers in scaling up capital investments and creating jobs because SMEs tend to be excluded from traditional financial channels.

In developing countries, financial constraints have an even more pronounced impact on firm growth because the large number of firms are SMEs in informal sectors under the underdeveloped financial systems and institutions. Fang & Yano (2017) studies the impact of financial development by region on SME performance through various macroeconomic financial indicators based on the data for about 2 million non-listed firms in China from 1998 to 2009. The study finds an overall positive relationship between regional financial development and SME performance.

An increasing number of studies analyze the impact of financing on firm growth based on the data of expanding WBES. Most studies focus on specific regions or countries. Fowowe (2017) empirically analyzes the impact of financing constraints on firm growth for 10,888 firms in 30 African countries. The results show that financial constraints have a pronounced negative impact on firm growth. Ahmad et al. (2020) examine the impact of financial constraints on firm performance based on Pakistani firm data from 2013 to 2017. The results show that financial channels are important in firm performance. They find that improving financial channels leads to higher firm performance measured by labor productivity. Lee et al. (2020) use the firm data of 47 developing countries from 2006 to 2016 to study the impact of financial inclusion on firm sales growth. They investigate the differences between financial crisis and non-financial crisis periods, between Asian and non-Asian regions, and between small and large firms with the result that financial inclusion contributes to higher sales growth during non-financial crisis periods in non-Asian regions.

Since our literature survey does not find any empirical research to investigate the effects of financial constraints on firm performance in SIDS based on the firm-level (micro) data, we have a good reason to utilize the WBES data to find any causal relationship between financial constraints and firm performance in SIDS. This study aims to find any way for SIDS countries to achieve the economic prosperity by promoting their local businesses and protecting their own land and cultural diversity.

4. Data and Basic Statistical Analysis

4.1 World Bank Enterprise Surveys

The World Bank Enterprise Surveys (WBES) is a global enterprise survey project sponsored and conducted by the World Bank to collect firm-level data, and to provide in-depth analysis of the operating environment of firms in countries and regions around the world. The WBES has conducted more than 220,000 firm surveys and interviews in more than 170 countries and regions of the world, making it one of the leading global sources of information on firm-level data (WBES, 2024).

This study employs the WBES data to construct key variables necessary for our empirical analysis partly because the WBES is a single source of published firm-level micro data open to any researchers in the world, and partly because there is not such a firm-level survey data in SIDS available other than the WBES. We utilize the entire WBES dataset for SIDS as the treatment group, and for non-SIDS as control group to systematically identify similarities and differences by comparing between SIDS and non-SIDS countries.

We consolidate all firm data in each country and at each time (year). Although the unification of the WBES questionnaire and the format of the collected data began in 2006, there are still some countries and regions in 2007 where interviews of outdated questionnaires were conducted. Since the firm data in those periods are excluded for the data consistency, data period in this study is from 2008 to 2024. Relevant data are extracted from the entire data set and rows containing missing values are removed. These missing values are mainly due to firms' refusing to answer or answering "don't know" during the interview. Since there are firms surveyed in duplicate in multiple times (years), we select only the first data and delete the subsequent data[9] to ensure that each data is independently representative for the accuracy and the validity of the analytical results. The other reason we forgo the panel data is that there is data from only one country in the SIDS because the WBES is in the process of compiling the panel data.

[9] The WBES does not assign a specific ID to firms outside of the panel data, only indicating whether the firm has been surveyed in previous years. 'FRESH' refers to newly surveyed firms while 'PANEL' refers to firms surveyed in previous years. Because of the difficulty in accurately identifying and removing firms marked as 'PANEL' from the data in the earlier years, this study retains only the first survey data for firms that were surveyed in duplicate.

As a result of data cleansing described above, the final sample in this study contains data on 148,419 firms from 161 Countries. Of these, 27 countries belong to the SIDS, with 6,329 firms. Table 4-1 shows the number of sample firms in each SIDS country.

Table 4-1. Number of Sample Firms in SIDS

Country	Numbers of firm	Percent	Country	Numbers of firm	Percent
Mauritius	668	10.55	St. Lucia	150	2.37
Singapore	623	9.84	Fiji	149	2.35
Dominican Republic	604	9.54	Tonga	149	2.35
Trinidad and Tobago	367	5.80	Antigua and Barbuda	148	2.34
Jamaica	349	5.51	Solomon Islands	148	2.34
Timor-Leste	348	5.50	St. Kitts and Nevis	148	2.34
Suriname	323	5.10	St. Vincent and the Grenadines	147	2.32
Barbados	292	4.61	Bahamas	145	2.29
Samoa	229	3.62	Cabo Verde	144	2.28
Vanuatu	216	3.41	Haiti	131	2.07
Guyana	165	2.61	Seychelles	103	1.63
Grenada	153	2.42	Micronesia, Fed. Sts.	66	1.04
Belize	150	2.37	Papua New Guinea	64	1.01
Dominica	150	2.37			
Total				**6,329**	**100**

Source: World Bank Enterprise Surveys (WBES)

4.2 Firm Performance

According to Santos & Brito (2012), indicators of firm performance fall into two categories: financial and nonfinancial indicators. Financial indicators include revenue, profit, return on investment, and return on equity, and so on. Non-financial indicators include firm profitability, growth, customer satisfaction, employee satisfaction, social performance, and environmental performance, etc. This study selects those indicators for evaluating firm performance that the available data in the WBES allow us to calculate.

4.2.1 Firm growth

The WBES survey asks each firm to report the information, related to its size and growth: total annual sales in the last fiscal year, total annual sales three years ago, number of employees at the end of last fiscal year, and number of employees at the end of three years ago. Beck et al. (2005), Ayyagari et al. (2008), Harrison et al. (2012), and Lee et al. (2020) adopt the rate of change in sales as a firm growth indicator because the change in sales directly reflects a firm's market

performance and profitability. Sales are also considered a more uniform measure when comparing across different industries. Dinh et al. (2010), Aterido & Hallward-Driemeier (2010), Aterido et al. (2011), and Fowowe (2017) choose the rate of change in the number of employees. According to Fowowe (2017), reporting sales at company surveys is prone to deviations owing to large fluctuations in sales and tendency to give approximate figures especially on the past sales in three years ago. Besides, Dinh et al. (2010) indicates that firms may not report actual sales during surveys for tax reasons.

Based on the methodology of Dinh et al. (2010) and Fowowe (2017), annual growth rates of sales and employees are calculated by taking the natural logarithm of the difference between the value in the year in question and the value three years prior to that year and dividing the difference by the interval of years, as shown in the following equations:

$$SG_{i,t} = \frac{\ln Sales_{i,t} - \ln Sales_{i,t-3}}{3} \qquad (4-1)$$

$$EG_{i,t} = \frac{\ln Employees_{i,t} - \ln Employees_{i,t-3}}{3} \qquad (4-2)$$

$SG_{i,t}$ and $Sales_{i,t}$ indicate the sales growth rate and the sales revenue, respectively. indicates. $EG_{i,t}$ and $Employees_{i,t}$ refer to the growth rate of the number of full-time employees and the number of employees, respectively. The subscript i denotes the firm and t denotes the year.

Table 4-2 presents descriptive statistics on these two indicators of firm growth rates in SIDS. SIDS average sales growth rate is 0.107 while SIDS average employees growth rate is about 0.056. There are significant differences between these two indicators. For example, the average sales growth rate in Cape Verde is -0.173, well below the SIDS average, while the average employees growth rate is about the same as the SIDS average. Direction of growth rates calculated on these two criteria is reversed in some countries. For example, the sales growth rate is negative while the employees growth rate is positive in Antigua and Barbuda, Cape Verde, and Timor-Leste. This suggests that different conclusions may be drawn depending on the indicators used to measure firm growth rates.

Table 4-2: Growth Rates of Firms in SIDS

Country	Sales Growth	Labor growth

	Mean	SD	Min	Max	Mean	SD	Min	Max
Antigua and Barbuda	-0.019	0.163	-0.576	0.405	0.036	0.165	-1.040	1.007
Bahamas	0.025	0.250	-1.168	1.173	0.047	0.196	-1.156	0.805
Barbados	0.154	0.281	-1.672	1.457	0.040	0.132	-1.206	0.668
Belize	0.039	0.093	-0.181	0.394	0.038	0.099	-0.294	0.321
Cabo Verde	-0.173	1.191	-3.464	3.427	0.056	0.194	-0.535	1.386
Dominica	0.017	0.100	-0.216	0.354	0.032	0.146	-0.269	0.805
Dominican Republic	0.084	0.218	-0.758	1.364	0.062	0.178	-0.675	1.320
Fiji	0.143	0.511	-1.354	1.988	0.051	0.183	-0.535	0.805
Grenada	0.063	0.370	-1.844	1.421	0.051	0.196	-0.549	0.805
Guyana	0.089	0.222	-0.541	1.498	0.052	0.159	-0.399	0.896
Haiti	0.105	0.436	-0.549	1.060	0.058	0.184	-0.452	0.668
Jamaica	0.067	0.179	-1.151	1.565	0.029	0.092	-0.534	0.616
Mauritius	0.227	0.552	-2.611	4.773	0.069	0.308	-1.450	3.719
Micronesia, Fed. Sts.	0.086	0.603	-1.199	1.753	0.068	0.226	-0.458	0.805
Papua New Guinea	0.003	0.242	-0.520	0.872	0.031	0.161	-0.399	0.552
Samoa	0.156	0.482	-3.504	2.300	0.116	0.205	-0.500	1.151
Seychelles	0.193	0.314	-0.631	1.242	0.053	0.180	-0.612	0.714
Singapore	0.206	0.256	-0.532	1.741	0.086	0.160	-0.506	1.532
Solomon Islands	0.178	0.249	-0.598	1.036	0.129	0.152	-0.405	1.040
St. Kitts and Nevis	0.047	0.147	-0.458	0.521	0.050	0.153	-0.438	0.478
St. Lucia	0.031	0.092	-0.321	0.345	0.035	0.091	-0.184	0.458
St. Vincent and the Grenadines	0.051	0.197	-0.314	1.624	0.037	0.144	-0.693	0.549
Suriname	0.057	0.146	-0.798	0.805	0.023	0.120	-0.405	0.602
Timor-Leste	-0.013	0.518	-1.844	2.649	0.034	0.172	-0.549	1.080
Tonga	0.047	0.315	-1.208	2.187	-0.018	0.349	-2.906	0.693
Trinidad and Tobago	0.110	0.188	-1.047	1.318	0.058	0.122	-0.424	0.973
Vanuatu	0.242	0.427	-0.896	3.657	0.115	0.222	-0.458	0.805
SIDS Total (All enterprises)	**0.107**	**0.364**	**-3.504**	**4.773**	**0.056**	**0.190**	**-2.906**	**3.719**

Source: World Bank Enterprise Surveys (WBES)

4.2.2 Labor productivity

According to their approach of Amin & Ulku (2019) and Ahmad et al. (2020) to calculate the firm productivity on the WBES data, this study adopts their firm performance indicator as labor productivity. This indicator is calculated by dividing the total annual sales in the last fiscal year by the number of employees employed by the firm at the end of the same year, as shown in the equation below. Local sales are converted to U.S. dollars by the average exchange rate for the year in question from the WDI data set.[10]

[10] Some countries do not issue their own currency but circulate the currency of another country. For example, Federated States of Micronesia and Timor-Leste use the U.S. dollar, i.e., the exchange rate in these countries is fixed at 1.

$$LP_{i,t} = \frac{Sales_{i,t} \cdot e_{j,t}}{Employees_{i,t}} \qquad (4-3)$$

$LP_{i,t}$, $Sales_{i,t}$ and $Employees_{i,t}$ indicate the labor productivity, the total sales and number of employees of the firm, respectively. $e_{j,t}$ indicates the exchange rate (US dollars equivalent to one local currency unit.). The subscript i denotes the company, t denotes the year, and j denotes the country to which the company belongs.

Table 4-3 shows the descriptive statistics on firm labor productivity in 27 SIDS countries. There are significant differences between labor productivity and firm growth. For example, the country with the highest average labor productivity is the Bahamas, but its firm growth rates are well below the SIDS average for the SIDS. On the contrary, Haiti's labor productivity is the lowest while its firm growth rates are high. This may suggest that labor productivity and firm growth rate capture different aspects of firm performance.

Table 4-3: Labor Productivity of Firms in SIDS

Country	Labor productivity			
	Mean	SD	Min	Max
Antigua and Barbuda	73,184.0	105,871.8	6,790.1	909,545.9
Bahamas	164,590.2	286,356.7	8,000.0	1,721,043.0
Barbados	91,096.6	116,824.0	1,533.1	954,545.4
Belize	60,198.7	77,566.7	1,500.0	588,235.3
Cabo Verde	2,309,479.0	19,300,000.0	17.5	219,000,000.0
Dominica	53,731.9	35,329.5	8,888.9	208,333.3
Dominican Republic	45,819.3	83,852.7	772.0	1,330,534.0
Fiji	84,560.9	246,830.9	313.7	2,150,318.0
Grenada	74,891.8	192,377.8	5,387.2	1,810,253.0
Guyana	82,107.1	193,074.0	267.9	1,892,517.0
Haiti	13,190.9	21,520.1	0.1	85,744.3
Jamaica	90,921.2	322,866.0	1,737.6	5,441,594.0
Mauritius	435,593.1	9,150,110.0	137.9	230,000,000.0
Micronesia, Fed. Sts.	33,126.2	54,222.7	422.0	374,814.8
Papua New Guinea	109,113.2	170,448.3	6,367.3	986,668.6
Samoa	141,843.7	1,289,850.0	1,008.5	18,100,000.0
Seychelles	83,022.5	99,987.7	2,101.9	458,839.7
Singapore	133,159.9	363,494.1	1,450.7	5,802,708.0
Solomon Islands	107,255.4	204,240.5	1,341.3	2,151,958.0
St. Kitts and Nevis	55,962.9	55,526.7	2,666.7	325,925.9
St. Lucia	47,715.9	37,303.2	10,582.0	234,567.9
St. Vincent and the Grenadines	59,365.6	95,288.7	8,888.9	966,183.6
Suriname	47,383.6	83,441.4	40.1	816,157.6
Timor-Leste	846,990.2	9,185,460.0	5.7	139,000,000.0

Tonga	96,340.7	612,712.5	1,447.9	6,983,161.0
Trinidad and Tobago	71,876.4	263,991.7	4,182.7	4,705,507.0
Vanuatu	54,381.1	85,403.6	251.9	544,732.4
SIDS Total (All enterprises)	**219,048.5**	**4,838,723.0**	**0.1**	**230,000,000.0**

Source: World Bank Enterprise Surveys (WBES).

4.3 Financial Constraints

As in the existing studies (Beck et al., 2005; Ayyagari et al., 2008; Fowowe, 2017; Ahmad et al., 2020), this study calculates the indicators of financial constraints of a firm as main variable to affect the performance of its firm based on the WBES firm data. Following Fowowe (2017)'s approach, we analyze the effect of both subjective and objective financial constraints on firm performance. WBES interviewees are asked to rate the degree of obstacles in their own operations for 15 aspects of the business environment, including financing constraints. The degree of obstacles is rated on a 5-point scale, with 1 indicating "very severe obstacle" and 5 indicating "no obstacles." Table 4-4 shows the SIDS average of the subjective financial constraint (Access to Finance). The higher the value of Access to Finance, the lower the obstacles of financial constraints. Singapore shows the least financial constraints among SIDS countries under the matured financial system. Countries in the Pacific region such as Papua New Guinea, Fiji, and Timor-Leste also show relatively high marks, so that their financial development reach relatively high stage. In contrast, countries in the Caribbean region such as Antigua and Barbuda, St. Lucia, Belize, and Dominica have low marks, so that local SMEs are likely to face challenges in obtaining necessary finance.

Table 4-4. Indicator of Subjective Financing Constraints in SIDS

Country	Access to finance	Country	Access to finance
Singapore	4.71	Tonga	3.55
Papua New Guinea	4.27	Vanuatu	3.51
Fiji	4.06	Grenada	3.50
Timor-Leste	4.03	Haiti	3.30
Bahamas	3.91	Jamaica	3.30
Samoa	3.85	Mauritius	3.28
Solomon Islands	3.84	Trinidad and Tobago	3.21
Barbados	3.72	Cabo Verde	3.13
Seychelles	3.71	St. Kitts and Nevis	3.05
Guyana	3.69	Antigua and Barbuda	2.99
Micronesia, Fed. Sts.	3.61	St. Lucia	2.79

St. Vincent and the Grenadines	3.59	Belize	2.41
Dominican Republic	3.58	Dominica	2.39
Suriname	3.56		

Source: World Bank Enterprise Surveys (WBES)

Note: This table shows the average values of the subjective Access to Finance variable in the SIDS countries.

Since the numerical value of FCC merely indicates order or rank, the differences between the values do not accurately reflect real differences. For example, the difference between "1: very severe obstacle" and "2: major obstacle" is not necessarily equal to the difference between "3: moderate obstacle" and "4: minor obstacle. Also, these evaluations are susceptible to diverse factors such as respondents' personal experiences, market perceptions, and understanding of the survey items because these responses primarily reflect subjective evaluations of the business environment. As a result, responses may be biased and may not adequately reflect a company's actual financing situation. To address these issues, the regression analysis of this study creates a dummy variable for the Access to Finance. The dummy variable is 1 if the respondent answers as "no obstacle," and 0 otherwise to improve the reliability of the analytical results.

Drawing on the methods of Fowowe (2017), Ahmad et al. (2020), and Lee et al. (2020), this study constructs objective indicators of financial constraints. The WBES provides objective information on the status of a firm's access to external funding, loan limit, and implementation of loan application. According to Kuntchev et al. (2013)'s classification for firms' Credit Constrained Status (CCS), we classify firms in the WBES into the following four categories: Not Credit Constrained (NCC), Maybe Credit Constrained (MCC), Partially Credit Constrained (PCC), and Fully Credit Constrained (FCC). NCC means that firms do not require finance because they have sufficient internal funds. MCC means that firms have successfully applied for loans and used external finance for working capital and investment. PCC means that firms use external financing for working capital and investment but did not apply for a loan in the previous year because they could not meet the loan requirements or applied for a loan but were rejected. Finally, FCC means that firms either did not meet loan requirements and did not apply for a loan in the previous year or applied for a loan but were rejected and did not use external finance for working capital or investment. Therefore, the index of CCS in this study shall take values of 4, 3, 2, and 1, respectively, depending on whether the firm belongs to NCC, MCC, PCC, or FCC. A smaller value indicates a stronger degree of financing constraints.

Table 4-5. Subjective and Objective Indicators Financial Constraints in SIDS

Country	Access to finance	CCS	Credit line	Overdraft
Antigua and Barbuda	0.26	3.05	0.49	0.63
Bahamas	0.42	2.96	0.35	0.60
Barbados	0.41	3.43	0.42	0.64
Belize	0.07	3.03	0.46	0.72
Cabo Verde	0.22	2.79	0.40	0.32
Dominica	0.19	2.86	0.41	0.49
Dominican Republic	0.29	3.31	0.60	0.73
Fiji	0.40	3.46	0.43	0.61
Grenada	0.30	3.21	0.49	0.57
Guyana	0.35	3.25	0.51	0.66
Haiti	0.17	2.04	0.25	0.79
Jamaica	0.24	2.97	0.29	0.69
Mauritius	0.31	3.25	0.57	0.66
Micronesia, Fed. Sts.	0.34	2.50	0.45	0.13
Papua New Guinea	0.55	3.02	0.48	0.56
Samoa	0.37	3.02	0.48	0.46
Seychelles	0.41	3.14	0.46	0.46
Singapore	0.78	3.55	0.31	0.20
Solomon Islands	0.22	3.41	0.45	0.57
St. Kitts and Nevis	0.24	3.07	0.50	0.61
St. Lucia	0.29	2.90	0.40	0.53
St. Vincent and the Grenadines	0.33	3.10	0.59	0.61
Suriname	0.33	2.87	0.43	0.68
Timor-Leste	0.55	2.85	0.08	0.15
Tonga	0.13	2.39	0.54	0.45
Trinidad and Tobago	0.19	2.90	0.61	0.79
Vanuatu	0.25	3.24	0.39	0.46

Source: World Bank Enterprise Surveys (WBES)

According to Fowowe (2017) and Ahmad et al. (2020), we construct two objective indicators (dummy variables) of financial constraints to measure the capacity of corporate finance: corporate credit limit (Creditline) and overdraft agreement (Overdraft) based on the WBES survey items. Creditline is 1 if the firm have a credit limit and 0 otherwise. Overdraft is 1 if the firm has an overdraft agreement and 0 otherwise. These two variables reflect the financial flexibility and the convenience of the firm.

Table 4-5 shows the average of four indicators of subjective and objective financial constraints: Access to Finance (dummy), CSS, Creditline (dummy), and Overdraft (dummy) in the SIDS countries. Some countries such as Singapore, Fiji, Barbados, and Solomon Islands have relatively high marks, indicating that firms face small financial constraints. In these countries,

financial markets are well-developed, and law and order are implemented enough to support corporate finance. On the other hand, other countries such as Haiti, Tonga, Federated States of Micronesia, and Cape Verde have low marks, suggesting that firms face large financial constraints. have relatively few opportunities to raise funds. In these countries, financial system is under-developed owing to the lack of governance and accountability in private and public institutions.

4.4 Control Variables

We introduce control variables in our empirical analysis to eliminate potential confounding factors and to mitigate endogeneity problems. Survey implementation years of the WBES in each country are not perfectly consistent in the period of this study from 2008 to 2024. Table 4-6 shows the years of firm surveys conducted in SIDS countries.

Table 4-6. Years of WBES Surveys in SIDS

Country	Year	Country	Year
Antigua and Barb	2011	Papua New Guinea	2015, 2016
Bahamas	2011	Samoa	2009, 2023
Barbados	2011, 2023	Seychelles	2023
Belize	2011	Singapore	2023
Cabo Verde	2009	Solomon Islands	2015, 2016
Dominica	2011	St. Kitts and Nevis	2011
Dominican Republic	2011, 2016, 2017	St. Lucia	2011
Fiji	2009, 2010	St. Vincent and the Grenadines	2011
Grenada	2011	Suriname	2011, 2018
Guyana	2011	Timor-Leste	2009, 2015, 2016, 2021, 2022
Haiti	2019	Tonga	2009
Jamaica	2011	Trinidad and Tobago	2011
Mauritius	2008, 2009, 2023, 2024	Vanuatu	2009, 2023, 2024
Micronesia, Fed. Sts.	2009		

Source: World Bank Enterprise Surveys (WBES)

According to Beck et al. (2005), Ayyagari et al. (2008), Aterido et al. (2011), Fowowe (2017), Amin & Ulku (2019), and Lee et al. (2020), we introduce the firm-level control variables by constructing measures of firm size and firm age based on the WBES data. Tables 4-7 and 4-8 show the distribution of firms by size and age (volume and percentage) in each SIDS country. Firm size dummy variables consist of four categories (Micro, Small, Medium, and Large): A micro company with 10 or fewer employees, a small company with 11 to 50 employees, a medium company with 51 to 200 employees, and a large company with more than 200 employees.

Table 4-7. Distribution of Firms by Size in SIDS

Country	Size of firm								Total
	Micro firm		Small firm		Medium firm		Large firm		
	Obs.	%	Obs.	%	Obs.	%	Obs.	%	
Antigua and Barbuda	58	39.2	73	49.3	14	9.5	3	2.0	148
Bahamas	52	35.9	49	33.8	35	24.1	9	6.2	145
Barbados	79	27.1	135	46.2	68	23.3	10	3.4	292
Belize	49	32.7	72	48.0	26	17.3	3	2.0	150
Cabo Verde	55	38.2	55	38.2	27	18.8	7	4.9	144
Dominica	70	46.7	62	41.3	17	11.3	1	0.7	150
Dominican Republic	137	22.7	232	38.4	157	26.0	78	12.9	604
Fiji	42	28.2	73	49.0	26	17.4	8	5.4	149
Grenada	67	43.8	63	41.2	21	13.7	2	1.3	153
Guyana	26	15.8	76	46.1	47	28.5	16	9.7	165
Haiti	58	44.3	61	46.6	12	9.2	0	0.0	131
Jamaica	60	17.2	196	56.2	64	18.3	29	8.3	349
Mauritius	215	32.2	292	43.7	104	15.6	57	8.5	668
Micronesia, Fed. Sts.	36	54.5	25	37.9	5	7.6	0	0.0	66
Papua New Guinea	6	9.4	27	42.2	22	34.4	9	14.1	64
Samoa	134	58.5	84	36.7	9	3.9	2	0.9	229
Seychelles	43	41.7	45	43.7	12	11.7	3	2.9	103
Singapore	187	30.0	291	46.7	123	19.7	22	3.5	623
Solomon Islands	29	19.6	89	60.1	24	16.2	6	4.1	148
St. Kitts and Nevis	62	41.9	66	44.6	17	11.5	3	2.0	148
St. Lucia	47	31.3	73	48.7	25	16.7	5	3.3	150
St. Vincent and the Grenadines	81	55.1	54	36.7	9	6.1	3	2.0	147
Suriname	100	31.0	176	54.5	42	13.0	5	1.5	323
Timor-Leste	187	53.7	127	36.5	30	8.6	4	1.1	348
Tonga	98	65.8	51	34.2	0	0.0	0	0.0	149
Trinidad and Tobago	96	26.2	147	40.1	95	25.9	29	7.9	367
Vanuatu	99	45.8	102	47.2	15	6.9	0	0.0	216

Source: World Bank Enterprise Surveys (WBES).

Firm age is calculated as the time span between the survey year and the formation year to control for different firm types and business environment (Aterido et al., 2011). In Table 4-8, Young Medium, and Older firms are established for less than 5 years, between 6 and 15 years, and for 16 years or longer, respectively.

Table 4-8: Distribution of Firms by Age in SIDS Countries

Country	Age of firm						Total
	Young firm		Mature firm		Older firm		
	Obs.	%	Obs.	%	Obs.	%	

Antigua and Barbuda	12	8.1	62	41.9	74	50.0	148
Bahamas	12	8.3	43	29.7	90	62.1	145
Barbados	21	7.2	78	26.7	193	66.1	292
Belize	6	4.0	61	40.7	83	55.3	150
Cabo Verde	27	18.8	65	45.1	52	36.1	144
Dominica	22	14.7	79	52.7	49	32.7	150
Dominican Republic	40	6.6	208	34.4	356	58.9	604
Fiji	19	12.8	38	25.5	92	61.7	149
Grenada	9	5.9	45	29.4	99	64.7	153
Guyana	17	10.3	25	15.2	123	74.5	165
Haiti	53	40.5	40	30.5	38	29.0	131
Jamaica	16	4.6	104	29.8	229	65.6	349
Mauritius	104	15.6	196	29.3	368	55.1	668
Micronesia, Fed. Sts.	14	21.2	22	33.3	30	45.5	66
Papua New Guinea	2	3.1	16	25.0	46	71.9	64
Samoa	46	20.1	95	41.5	88	38.4	229
Seychelles	14	13.6	37	35.9	52	50.5	103
Singapore	94	15.1	239	38.4	290	46.5	623
Solomon Islands	43	29.1	42	28.4	63	42.6	148
St. Kitts and Nevis	21	14.2	48	32.4	79	53.4	148
St. Lucia	7	4.7	73	48.7	70	46.7	150
St. Vincent and the G	12	8.2	46	31.3	89	60.5	147
Suriname	14	4.3	103	31.9	206	63.8	323
Timor-Leste	107	30.7	192	55.2	49	14.1	348
Tonga	39	26.2	72	48.3	38	25.5	149
Trinidad and Tobago	24	6.5	134	36.5	209	56.9	367
Vanuatu	56	25.9	67	31.0	93	43.1	216

Source: World Bank Enterprise Surveys (WBES).

According to Beck et al. (2005), Ayyagari et al. (2008)Fowowe (2017), Amin & Ulku (2019), and Lee et al. (2020), we introduce country- and region-level control variables. Country -level variables are Inflation rate and average GDP growth rate over the past three years from the WDI[11]. Region-level dummy variable represents six regions: East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, South Asia, and Sub-Saharan Africa[12]. We introduce four (dummy) income group variables by the latest World Bank classification: low, lower-middle, upper-middle, and high-income groups. We classifies the sizes of the location of the firms into five categories: capital cities, cities with a population of 1 million or more, cities with a population of 250,000 to 1 million, cities with a population of 50,000 to 250,000, to summarize as dummy variables.

[11] These two variables are at the fiscal year when each firm is surveyed.
[12] Geographic classification generally includes seven regions: six in this study plus one (North America). Since the WBES data does not include countries in the North America, the North America is not included in this study.

4.5 Summary Statistics

Table A-2 in the Appendix shows a summary of all variables in this study. The descriptive statistics of key variables in Table 4-9 are calculated based on the data of firms in the SIDS. Table A-3 in the Appendix shows the descriptive statistics based on the data of all 161 WBES countries.

Table 4-9. Descriptive Statistics of Key Variables (SIDS)

	Obs.	Mean	Std. dev.	Min	Max
Sales growth	4,852	0.107	0.364	-3.504	4.773
Employee growth	5,811	0.056	0.190	-2.906	3.719
Labor productivity	5,609	219,048.500	4,838,723.000	0.059	230,000,000.000
Access to Finance	6,252	0.350	0.477	0	1
CCS	5,915	3.112	1.040	1	4
Creditline	6,193	0.442	0.497	0	1
Overdraft	6,199	0.553	0.497	0	1

Note: Statistics in this table are estimated based on the sample of firms from SIDS countries in the WBES.

The descriptive statistics reveal that firms in SIDS have an average sales growth rate of 10.7% and an average labor productivity of 219048.5 USD. Standard deviations are 0.364 and 4838723, respectively, indicating that the data variation is larger for labor productivity. On the other hand, the average employee growth rate is 5.6% with a standard deviation of 0.19. There is a certain amount of variation although the variability is smaller than the other variables. The mean value of Access to Finance is 0.35, indicating that 35% of the sample is not subject to financial constraints. The mean value of CCS (3.112) suggests that majority of firms have good credit status. Creditline and Overdraft variables indicate that 44.2% and 55.3% of the firms have a line of credit and an overdraft, respectively.

Comparing between the WBES averages in Table A-3 and the SIDS averages in Table 4-9, the SIDS averages are worse for all firm performance indicators and for all capital financing indicators except CSS. This may reflect possible factors of stagnant SIDS economy. In the forthcoming regression analysis, we exclude firms in Singapore from the SIDS sample as the outliers. Since Singapore is a global financial center with numerous international banks and investment funds, its financial environment completely differs from other SIDS countries.

5. Hypothesis and Empirical Model

5.1 Hypothesis

Finance plays an important role in firm growth. Access to external finance is essential for the SMEs' capital investment, capacity expansion, and technological innovation (Beck et al., 2005; Ayyagari et al., 2008). In developing countries, many firms can have their growth hampered by financial constraints (Aterido et al., 2011; Fowowe, 2017). A study by Fang & Yano (2017) shows that the development of financial institutions promotes firm activity by reducing the cost of capital and expanding financial options. Against this background, this study proposes the first hypotheses.

Hypothesis 1: Lesser financial constraints will have a positive impact on firm performance in SIDS countries.

Geographical characteristics of SIDS may affect the mechanism of financial constraints on firm performance. SIDS countries face unique challenges compared to firms in other regions. natural and human resource constraints. External finance is essential for firms to compensate for natural and human resource constraints such that they secure resources and expand their production capacity (Beck et al., 2004). Since the market size in SIDS countries is typically small, additional finance is required for firms to enter new or international markets by overcoming geographic constraints and by increasing competitiveness and growth potential. External finance provides the necessary capital for the risk management and the innovative R&D because external risks such as natural disasters and climate change can have a critical impact on the stability of operations of firms in SIDS countries. Therefore, firms in SIDS countries may be more affected by financial constraints. For this reason, this study establishes the second hypothesis.

Hypothesis 2: The impact of financial constraints on firm performance is stronger in SIDS countries compared to firms in other regions.

5.2 Empirical model

This study follows the empirical model of Fowowe (2017) to analyze the impact of

financial constraints on firm performance. We update the variable of subjective financial constraints by transforming them into a dummy variable (1 indicates "no obstacles" and 0 indicates "obstacles exist"). We choose the index of labor productivity as a single dependent variable of firm performance because firm sales growth rate and employee growth rate calculated on the WBES data may cause a serious problem of reverse causality.

Estimating causality requires that the independent variable (financial constraints) precedes the dependent variable (firm performance). This is to ensure that financial constraints have a predictive influence on firm performance. However, firm and employee growth rates are calculated for the past three years at the time of the survey. Financial constraints reflect conditions at the time of the survey. This is expected to cause the reverse causality because the dependent variable is affected by past conditions while independent variable is determined by present conditions. Since the labor productivity is calculated on the data at the time of the survey, the regression model in this study employs only the labor productivity as the dependent variable of firm performance[13].

According to Amin & Ulku (2019), the logarithm of labor productivity LP_i as the dependent variable is in the regression model of the subjective financial constraints shown as the following equation:

$$\ln(LP_i) = \alpha_0 + \alpha_1 FC_i + \alpha_2 BC_i + \alpha_3 Year + \alpha_4 Country + \alpha_5 Firm + \varepsilon_i \qquad (5-1)$$

FC_i is a core dummy variable of subjective financial constraints. BC_i are control variables including the other 14 business constraints (access to land, business permits and licenses, corruption, courts, crime and theft, customs and trade regulations, electricity supply, poorly educated labor force, labor regulations, political instability, tax administrations, tax rates, transportations). $Year$ is the annual control variable and $Country$ is the control variable for country/region (inflation rate, average GDP growth over the last three years, regional dummy,

[13] Labor productivity is the ratio of sales (converted to U.S. dollars) in year t divided by the number of employees in year t as in equation $(4-3)$. All explanatory variables, including the core explanatory variable (financial constraints indicator) in equation $(5-1)$ are in year t. This means that the possibility of reverse causality may not perfectly disappear. It would be more desirable to use the explanatory variables in year $t-1$ or earlier for the dependent variable in year t. However, we must use the explanatory variables in year t because available data in this study is cross-section. Since the core explanatory variables are the financial constraints indicators, they may reflect the situation in recent years prior to year t even though the survey timing is in the same year t.

income level group dummy, and country dummy). $Firm$ are firm-level control variables (firm age and firm size dummy).

Based on Fowowe (2017)'s approach, a regression model of objective financial constraints including three key independent variables: Credit Constrained Status (CCS), Creditline, and Overdraft is as follows:

$$\ln(LP_i) = \alpha_0 + \alpha_1 CCS_i + \alpha_2 Creditline_i + \alpha_3 Overdraft + \alpha_4 Year + \alpha_5 Country + \alpha_6 Firm + \varepsilon_i \quad (5-2)$$

LP_i is the labor productivity index. CCS_i is a dummy variable of the financial constraints. Among four states of financial constraints, FCC (full credit constraint) is a reference category. PCC (partial credit constraint), MCC (maybe credit constrained), and NCC (no credit constraint) dummy variables are 1 if applicable and 0 otherwise. $Creditline_i$ is a dummy variable of the credit limit status of the firm with the value of 1 if the firm holds it and 0 if the firm does not hold it. $Overdraft_i$ is a dummy variable of the overdraft services with the value of 1 if the firm can use them and 0 if the firm cannot use them.

We clarify the effect of originating in the SIDS countries themselves on financial constraints (the small island effect) by utilizing data of firms in both SIDS and non-SIDS countries. We create $SIDS_i$ dummy variable to identify whether firms belong to SIDS or not. It takes the value 1 if the firm belongs to a SIDS country and 0 otherwise. We add a cross term of the $SIDS_i$ dummy and the indicator of financial constraints to the regression model to analyze whether the impact of financial constraints on firm performance in SIDS countries is different from other countries or not.

Most WBES data are obtained from surveys of the firms at a specific point in time although there is an exceptional possibility of panel data from follow-up surveys conducted in some specific regions. Therefore, this study utilizes the standard linear ordinary least squares (OLS) method to analyze this cross-sectional data by controlling the country, region, and firm fixed effects as well as time trends as much as we can.

6. Empirical Results

6.1 Financial Constraints and Labor Productivity

Table 6-1 shows the results of the regression analysis with subjective Access to Finance as the explanatory variable and labor productivity as the explained variable. In this table, (1), (2) and (3) show the results of the model with only Access to Finance. (4), (5) and (6) show the results including the other 14 business environment factor variables. (1) (3) (4) and (6) are the results of the entire WBES firms while (2) and (5) are the results of the SIDS countries. (3) and (6) are the results of the model including the cross terms of Access to Finanance and the SIDS dummy.

Table 6-1 confirms that all the regression results support Hypothesis 1 because the coefficient of Access to Finance is positive and statistically significant. Since the coefficient without financial constraints in (2) is 0.205, labor productivity with no financial constraints is 20 percent higher than that with financial constraints. The positive sign and significance of this coefficient means that the smaller the obstacles to financial constraints, the more effective the improvement in firm performance. These results are consistent with those of previous studies and further support the universality of the impact of financial constraints on firms. Since the coefficients of the cross term for Financial Access and the SIDS dummy in (3) and (6) are positive (relatively small) but not statistically significant, it is difficult to draw conclusions about the small island effect for the subjective financial constraints.

Table 6-1. Subjective Financial Constraints

Dependent Variables: log (Labor productivity)						
	(1)	(2)	(3)	(4)	(5)	(6)
Access to finance	0.146***	0.205***	0.145***	0.191***	0.209***	0.191***
SIDS			0.233***			0.179***
Access to finance × SIDS			0.016			0.021
Access to land				-0.008	-0.010	-0.008
Business licensing and permits				-0.015**	-0.017	-0.015**
Corruption				0.026***	0.007	0.026***
Courts				-0.005	0.002	-0.005
Crime and theft				-0.001	-0.051***	0.001
Customs and trades				-0.103***	-0.089***	-0.101***
Electricity				0.041***	0.002	0.042***
Informal sector competitors				0.033***	0.054***	0.033***

Labor regulations				-0.031***	0.017	-0.033***
Low educated labor				-0.012**	-0.014	-0.010*
Political instability				0.035***	0.024	0.034***
Tax administrations				0.017**	0.049**	0.016**
Tax rates				-0.013**	-0.009	-0.013**
Transportations				-0.033***	0.002	-0.035***
Inflation	0.013***	-0.011**	0.013***	0.011***	-0.017***	0.011***
GDP growth (average)	-0.007***	-0.034***	-0.007***	-0.013***	-0.023***	-0.013***
Age of firm	0.007***	0.006***	0.007***	0.007***	0.006***	0.007***
Constant	8.411***	9.724***	8.407***	8.987***	9.995***	8.985***
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Income classification Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Country region Dummy	Yes	Yes	Yes	Yes	Yes	Yes
City size Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Firm size Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Adj.R^2	0.208	0.180	0.209	0.214	0.197	0.214
Obs.	120016	4741	120016	95395	3847	95395

Note: 1. Significance is denoted by *** (1%), ** (5%), * (10%).

2. Singapore has been excluded from the regression analysis.

Table 6-2 shows the results of the objective financial constraints (CCS, Creditline, and Overdraft) where (1) and (2) mean the entire WBES firms and SIDS firms. (3), (4) and (5) show the results of the cross terms of five subjective financial constraint variables and the SIDS dummy. The results support Hypothesis 1 because CCS, Creditline, and Overdraft are able to adequately explain the firm performance in SIDS with significantly positive coefficients on firm labor productivity. NCC has the largest coefficient, followed by MCC, and finally PCC. The results of the interaction term of the CCS and the SIDS dummies do not support Hypothesis 2 so that the small island effect is not a significant reinforcing factor in each credit status stage. On the other hand, Hypothesis 2 and the small island effect are supported for Creditline and Overdraft because the coefficients of the cross term with SIDS dummy are positive and significant.

Table 6-2. Objective Financial Constraints

Dependent Variables: log (Labor productivity)					
	(1)	(2)	(3)	(4)	(5)
PCC (Partially Credit Constrained)	0.072***	0.243**	0.069***	0.069***	0.070***
MCC (Maybe Credit Constrained)	0.258***	0.315***	0.267***	0.257***	0.259***
NCC (Not Credit Constrained)	0.262***	0.394***	0.259***	0.260***	0.260***
Creditline	0.234***	0.085*	0.233***	0.040	0.234***
Overdraft	0.471***	0.251***	0.469***	0.469***	0.190***
SIDS			0.114	0.187***	0.261***
PCC × SIDS			0.011		
MCC × SIDS			-0.175*		

NCC × SIDS			0.015		
Creditline × SIDS				0.204***	
Overdraft × SIDS					0.290***
Inflation	0.014***	-0.015***	0.014***	0.014***	0.014***
GDP growth (average)	-0.006**	-0.034***	-0.005**	-0.006**	-0.006**
Age of firm	0.006***	0.006***	0.006***	0.006***	0.006***
Constant	7.884***	9.478***	7.881***	7.879***	7.878***
Year Dummy	Yes	Yes	Yes	Yes	Yes
Income classification Dummy	Yes	Yes	Yes	Yes	Yes
Country region Dummy	Yes	Yes	Yes	Yes	Yes
City size Dummy	Yes	Yes	Yes	Yes	Yes
Firm size Dummy	Yes	Yes	Yes	Yes	Yes
Adj.R^2	0.227	0.198	0.227	0.227	0.227
Obs.	110133	4472	110133	110133	110133

Note: 1. Significance is denoted by *** (1%), ** (5%), * (10%).

2. Singapore has been excluded from the regression analysis.

6.2 Income Level Groups

Since the effects of financial constraints on firm performance depend on the income level of the country a firm resides, we classify the WBES countries into three groups according to the aforementioned World Bank definition of low-, middle-, and high-income countries. We analyze only middle- and high-income groups because currently available WBES database does not include countries classified as low-income countries in the SIDS. (1) and (3) show the results of the middle-income countries, and (2) and (4) show the results of high-income countries in Table 6-3.

Table 6-3. Subjective Financial Constraints (Middle- and High-Income Groups)

Dependent Variables: log (Labor productivity)				
	(1)	(2)	(3)	(4)
Access to finance	0.145***	0.128***	0.184***	0.119***
SIDS	0.407***	0.426**	0.315***	0.528***
Access to finance × SIDS	-0.077	0.104	-0.066	0.121
Access to land			0.003	-0.007
Business licensing and permits			-0.028***	0.010
Corruption			0.016**	0.046***
Courts			0.011	-0.023**
Crime and theft			-0.015**	-0.020**
Customs and trades			-0.079***	-0.096***
Electricity			0.064***	0.019***
Informal sector competitors			0.019***	0.086***
Labor regulations			-0.036***	-0.009
Low educated labor			-0.014**	0.015**

Political instability			0.059***	-0.012
Tax administrations			0.025***	0.028***
Tax rates			-0.050***	0.042***
Transportations			-0.019***	-0.066***
Inflation	0.015***	-0.083***	0.014***	-0.075***
GDP growth (average)	0.002	-0.031***	-0.007*	-0.033***
Age of firm	0.005***	0.004***	0.005***	0.004***
Constant	8.434***	12.343***	8.666***	12.461***
Year Dummy	Yes	Yes	Yes	Yes
Income classification Dummy	No	No	No	No
Country region Dummy	Yes	Yes	Yes	Yes
City size Dummy	Yes	Yes	Yes	Yes
Firm size Dummy	Yes	Yes	Yes	Yes
Adj.R^2	0.095	0.252	0.105	0.278
Obs.	81613	29884	64883	23658

Note: 1. Significance is denoted by *** (1%), ** (5%), * (10%).

2. Singapore has been excluded from the regression analysis.

The results in Table 6-3 strongly suggest Hypothesis 1 that Access to Finance has a positive impact on firm performance in both middle- and high- income countries. However, Hypothesis 2 is not supported because of insignificant results for the cross term. In particular, the coefficient of the cross term is negative and not significant in middle-income countries. Comparing SIDS and non-SIDS, there is no significant enhancement effect specific to SIDS of the financial impact on firm performance.

Table 6-4 shows the results of objective financing constraints. Columns (1), (3), and (5) are about middle-income countries, and columns (2), (4), and (6) are about high-income countries. (1) and (2), (3) and (4), and (5) and (6) are the results of the cross terms of SIDS dummy and CCS dummies, Creditline, and Overdarft, respectively.

Table 6-4. Objective Financial Constraints (Middle- and High-Income Groups)

Dependent Variables: log (Labor productivity)						
	(1)	(2)	(3)	(4)	(5)	(6)
PCC (Partially Credit Constrained)	0.078***	-0.003	0.077***	0.006	0.079***	0.006
MCC (Maybe Credit Constrained)	0.264***	0.192***	0.252***	0.192***	0.253***	0.192***
NCC (Not Credit Constrained)	0.214***	0.189***	0.216***	0.190***	0.217***	0.189***
Creditline	0.266***	0.046***	0.158***	-0.023	0.268***	0.046***
Overdraft	0.470***	0.313***	0.470***	0.313***	0.278***	0.226***
SIDS	0.207*	0.374	0.258***	0.494**	0.319***	0.519***
PCC × SIDS	0.012	0.163				
MCC × SIDS	-0.171	0.044				
NCC × SIDS	0.056	0.058				
Creditline × SIDS			0.116**	0.072		

Overdraft × SIDS					0.201***	0.090
Inflation	0.016***	-0.073***	0.016***	-0.073***	0.016***	-0.073***
GDP growth (average)	0.005	-0.038***	0.005	-0.038***	0.004	-0.038***
Age of firm	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***
Constant	7.996***	12.311***	7.996***	12.315***	7.994***	12.315***
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Income classification Dummy	No	No	No	No	No	No
Country region Dummy	Yes	Yes	Yes	Yes	Yes	Yes
City size Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Firm size Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Adj.R^2	0.121	0.265	0.120	0.265	0.121	0.265
Obs.	74137	28008	74137	28008	74137	28008

Note: 1. Significance is denoted by *** (1%), ** (5%), * (10%).

2. Singapore has been excluded from the regression analysis.

The overall effect of CCS on firm performance is positive and statistically significant. This effect tends to be larger in the middle-income group than in the high-income group. However, the coefficient of the cross term is very small and not statistically significant in both income groups. The analysis with CSS does not provide any clear evidence for the existence of a small island effect.

The effects of Creditline and Overdraft indicators on firm performance are generally larger in middle-income countries than in high-income countries. The coefficient of the cross term is positive and statistically significant in the middle-income country group while the coefficient is not significant in the high-income country group. These results suggest that the small island effect of financial constraints exists mainly in middle-income (developing) countries.

6.3 Country Dummies

To avoid multicollinearity, we replace all the country-level control variables for a single country dummy variable although the small island effect of SIDS cannot be examined. Table 6-5 and Table 6-6 show the results of subjective and objective financial constraints with country dummies. In Table 6-5, columns (1) and (3), and columns (2) and (4) are the results of the WBES and SIDS firms respectively. In Table 6-6, columns (1) and columns (2) are the results of the WBES and SIDS firms respectively.

Table 6-5. Subjective Finance Constraints (Country dummies)

Dependent Variables: log (Labor productivity)

	(1)	(2)	(3)	(4)
Access to finance	0.132***	0.233***	0.182***	0.241***
Access to land			-0.003	-0.010
Business licensing and permits			-0.008	-0.003
Corruption			0.013**	0.009
Courts			0.000	-0.010
Crime and theft			-0.012**	-0.047**
Customs and trades			-0.102***	-0.071***
Electricity			0.027***	-0.005
Informal sector competitors			0.048***	0.047***
Labor regulations			0.008	0.031
Low educated labor			-0.004	-0.016
Political instability			0.004	0.016
Tax administrations			0.007	0.038
Tax rates			-0.014***	-0.009
Transportations			-0.038***	0.006
Age of firm	0.004***	0.006***	0.004***	0.005***
Constant	10.504***	10.135***	10.873***	10.310***
Year Dummy	Yes	Yes	Yes	Yes
Country Dummy	Yes	Yes	Yes	Yes
City size Dummy	Yes	Yes	Yes	Yes
Firm size Dummy	Yes	Yes	Yes	Yes
Adj.R^2	0.385	0.215	0.388	0.229
Obs.	120241	4741	95588	3847

Note: 1. Significance is denoted by *** (1%), ** (5%), * (10%).

2. Singapore has been excluded from the regression analysis.

These two tables confirm that both the subject and objective coefficients of the financial constraints are positive and statistically significant. This is a very strong support for Hypothesis 1. Comparing the magnitudes of the coefficients between the WBES and the SIDS, Hypothesis 2 is verified so that the impact of financial constraints on firm performance in the SIDS is larger in the WBES. This finding could add robustness to the previous regression analysis to imply the possibility of the small island effect.

Table 6-6. Objective Financial Constraints (Country Dummies)

Dependent Variables: log (Labor productivity)		
	(1)	(2)
PCC (Partially Credit Constrained)	0.120***	0.158*
MCC (Maybe Credit Constrained)	0.270***	0.283***
NCC (Not Credit Constrained)	0.236***	0.317***
Creditline	0.172***	0.084*
Overdraft	0.343***	0.228***
Age of firm	0.003***	0.005***

Constant	10.379***	10.002***
Year Dummy	Yes	Yes
Country Dummy	Yes	Yes
City size Dummy	Yes	Yes
Firm size Dummy	Yes	Yes
Adj.R^2	0.386	0.228
Obs.	110936	4472

Note: 1. Significance is denoted by *** (1%), ** (5%), * (10%).

2. Singapore has been excluded from the regression analysis.

7. Conclusion

This study empirically analyzed the effects of financial constraints on firm performance in Small Island Development States (SIDS). We utilized the variables to assess firm performance and financing constraints based on the World Bank's Business Enterprise Survey (WBES) data with 148,419 firms in 161 countries. We employed subjective and objective measures to evaluate the financial constraints. We examined whether there are any differences in the impact of financial constraints on firm performance between SIDS and non-SIDS by introducing the SIDS dummy.

The results confirm that financial constraints have a pronounced impact on firm labor productivity. We found that easing financing constraints and improving firms' credit conditions significantly increase firms' productivity. In addition, our study revealed the small island effect so that the impact of better financial access on firm performance is larger in the SIDS than non-SIDS countries. Furthermore, the regression analysis of multiple income groups made clear the island effect in middle-income countries but not such effect in high-income countries.

Therefore, it is important for governments and policymakers in SIDS countries to improve the financial environment, provide more financing channels, and support firms' credit in order to facilitate their development. This conclusion also suggests directions for further research for academia, specifically exploring how different geographical characteristics affect the relationship between financial access and firm performance, and how these constraints can be mitigated through innovative financial tools and policy design.

Finally, several limitations and room for improvement exist in this study. First, the availability of firm data on SIDS remains very limited, so this study was unable to construct panel data and had to limit itself to a cross-sectional analysis. This posed a major challenge in examining time series factors and causal relationships in more detail. In addition, although this study

improved the dependent variable based on previous studies and sought to increase the precision of the analysis by incorporating a variety of control variables and fixed effects, it was difficult to completely eliminate endogeneity issues and reverse causality. These challenges are mainly due to the cross-sectional data, and the limitations of the data structure constrain the rigor of causal inference. In future research, further data accumulation from the World Bank Business Enterprise Survey (WBES) and the development of panel data are likely to overcome these limitations. In addition, the development of more effective control variables and the application of advanced analytical methods to address the endogeneity problem are expected to more accurately elucidate the relationship between firm performance and access to finance in SIDS.

Reference

Ahmad, W., Abbas, Z., & Shah, Z. A. (2020). Access to Finance, Financial Development and Firm Performance – Evidence from Pakistan. *NICE Research Journal, 13*(2), 49-68.

Amin, M., & Ulku, H. (2019). *Corruption, Regulatory Burden and Firm Productivity.* Policy Research Working Paper No. WPS8911, World Bank Group.

Aterido, R., & Hallward-Driemeier, M. (2010). *The impact of the investment climate on employment growth : does Sub-Saharan Africa mirror other low-income regions?* Policy Research Working Paper No. WPS5218, World Bank Group.

Aterido, R., Hallward-Driemeier, M., & Pagés, C. (2011). Big Constraints to Small Firms' Growth? Business Environment and Employment Growth across Firms. *Economic Development and Cultural Change, 59*(3), 609-647.

Ayyagari, M., Demirguc-Kunt, A., & Maksimovic, V. (2008). How Important Are Financing Constraints? The Role of Finance in the Business Environment. *The World Bank Economic Review, 22*(3), 483-516.

Becchetti, L., & Trovato, G. (2002). The Determinants of Growth for Small and Medium Sized Firms. The Role of the Availability of External Finance. *Small Business Economics, 19*(4), 291-306.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2004). *Finance, Inequality, and Poverty: Cross-Country Evidence.* Policy Research Working Paper No. WPS3338, World Bank.

Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2005). Financial and legal constraints to firm growth: Does size matter? *The Journal of Finance, 60*(1), 137-177.

Bellone, F., Musso, P., Nesta, L., & Schiavo, S. (2010). Financial Constraints and Firm Export Behaviour. *The World Economy, 33*(3), 347-373.

Brealey, R. A., & Myers, S. C. (1996). *Principles of corporate finance* (5th ed.). New York: McGraw-Hill.

Briguglio, L. (1995). Small island developing states and their economic vulnerabilities. *World Development, 23*(9), 1615-1632.

CFPB. (2022, February 22). *What is a Personal Line of Credit?* Retrieved December 25, 2024, from Consumer Financial Protection Bureau: https://www.consumerfinance.gov/ask-cfpb/what-is-a-personal-line-of-credit-en-901/

CFPB. (2024, January 31). *What is an overdraft?* Retrieved December 25, 2024, from Consumer Financial Protection Bureau: https://www.consumerfinance.gov/ask-cfpb/what-is-an-overdraft-en-1035/

Demirgüç-Kunt, A., & Maksimovic, V. (1998). Law, Finance, and Firm Growth. *The Journal of Finance, 53*(6), 2107-2137.

Dinh, H. T., Mavridis, D. A., & Nguyen, H. B. (2010). *The binding constraint on firms' growth in developing countries.* Policy Research Working Paper No. WPS5485, World Bank Group.

Donati, C. (2015). Firm growth and liquidity constraints: evidence from the manufacturing and service sectors in Italy. *Applied Economics, 48*(20), 1881-1892.

Fang, Y., & Yano, G. (2017). *Does Local Financial Development Matters for the Performance of Small and Medium Enterprises: Evidence from China.* Working Paper Series No. 2017-01, Kyoto University, Graduate School of Economics.

Fauzel, S. (2016). Modeling the Relationship between FDI and Financial Development in Small Island Economies: A PVAR Approach. *Theoretical Economics Letters, 6*(3), 367-375.

Fowowe, B. (2017). Access to finance and firm performance: Evidence from African countries. *Review of Development Finance, 7*(1), 6-17.

Hall, B. H. (1992). *Investment and Research and Development at the Firm Level: Does the Source of Financing Matter?* Working Paper No. 4096, National Bureau of Economic Research.

Hall, B. H., Mairesse, J., Branstetter, L., & Crepon, B. (1998). *Does Cash Flow Cause Investment and R&D?: An Exploration Using Panel Data for French, Japanese, and United States Scientific Firms.* Working Paper No. 98-260, University of California Berkeley, Deptartment of

Economics.

Harrison, A. E., Lin, J., & Xu, L. C. (2012). Performance of Formal Manufacturing Firms in Africa. In *Performance of Manufacturing Firms in Africa : An Empirical Analysis* (pp. 27-46). World Bank.

Harrison, D., & Prasad, B. (2013). The Contribution of Tourism to the Development of Fiji and Other Pacific Island Countries. In C. A. Tisdell, *Handbook of Tourism Economics - Analysis, New Applications and Case Studies* (pp. 741-761). Singapore: World Scientific Publishing.

Himmelberg, C. P., & Petersen, B. C. (1994). R & D and Internal Finance: A Panel Study of Small Firms in High-Tech Industries. *The Review of Economics and Statistics, 76*(1), 38-51.

Holden, P., & Howell, H. (2009). *Institutions and the Legal Framework for Business Development in the Caribbean.* Private Sector Development Discussion Paper No.3, Inter-American Development Bank.

IMF. (2024, November 11). *List of Members's Date of Entry*. Retrieved November 25, 2024, from International Monetary Fund (IMF): https://www.imf.org/external/np/sec/memdir/memdate.htm

King, R. G., & Levine, R. (1993). Finance and Growth: Schumpeter Might be Right. *The Quarterly Journal of Economics, 108*(3), 717-737.

Kuntchev, V., Ramalho, R., Rodriguez-Meza, J., & Yang, J. S. (2013). *Publication: What Have We Learned from the Enterprise Surveys Regarding Access to Credit by SMEs?* Policy Research Working Paper No. WPS6670, World Bank Group.

Lee, C.-C., Wang, C.-W., & Ho, S.-J. (2020). Financial inclusion, financial innovation, and firms' sales growth. *International Review of Economics & Finance, 66*, 189-205.

Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature, 35*(2), 688-726.

Mankiw, G. N. (2009). *Macroeconomics.* New York: Worth Publishers.

Masetti, O. (2021). *Private and Financial Sector Resilience in the Caribbean : 360° Resilience Background Paper.* World Bank.

Mehrotra, N., & Sergeyev, D. (2021). Financial shocks, firm credit and the Great Recession. *Journal of Monetary Economics, 117*, 296-315.

Metreau, E., Young, K. E., & Eapen, E. G. (2024, July 1). *World Bank country classifications by*

income level for 2024-2025. Retrieved November 5, 2024, from World Bank Blog: https://blogs.worldbank.org/en/opendata/world-bank-country-classifications-by-income-level-for-2024-2025

Niles, K., & Lloyd, B. (2013). Small Island Developing States (SIDS) & energy aid: Impacts on the energy sector in the Caribbean and Pacific. *Energy for Sustainable Development, 17*(5), 521-530.

OECD. (2018). *Making Development Co-operation Work for Small Island Developing States.* OECD Publishing.

OECD. (2024). *Helping Small Island Developing States graduate to success.* OECD Policy Briefs No.3, OECD Publishing.

Paul, B. K. (2019). Identifying and Analyzing the Dominant Languages in Small Island Developing States. *The Professional Geographer, 72*(1), 121-130.

Paul, S. (2021). Macroeconomic Trends, Vulnerability, and Resilience Capability in Small Island Developing States. In J. L. Roberts, S. Nath, S. Paul, & Y. N. Madhoo, *Shaping the Future of Small Islands: Roadmap for Sustainable Development* (pp. 21-36). Singapore: Palgrave Macmillan.

Rajan, R. G., & Zingales, L. (1998). Financial Dependence and Growth. *The American Economic Review, 88*(3), 559-586.

Santos, J. b., & Brito, L. A. (2012). Toward a Subjective Measurement Model for Firm Performance. *Brazilian Administration Review, 9*(SPE), 95-117.

UN. (2024, December 22). *Member States*. Retrieved December 22, 2024, from United Nations: https://www.un.org/en/about-us/member-states

UN DESA Sustainable Development. (2024, November 13). *Small Isalnd Developing States | Department of Economic and Social Affairs*. Retrieved November 13, 2024, from UN DESA Sustainable Development: https://sdgs.un.org/topics/small-island-developing-states#list_of_sids

UNDP. (2023). *INFFs and Small Island Developing States (SIDS).* United Nations Development Programme.

UNEP. (2013). *Financing for Sustainable Development in Small Island Developing States (SIDS).* United Nations Environment Programme.

UNESCO. (2023, April 20). *Cutting Edge: Small Island Developing States:Cultural diversity as a driver of resilience and adaptation.* Retrieved December 21, 2024, from UNESCO : Building Peace through Education, Science and Cultural Organization: https://www.unesco.org/en/articles/cutting-edge-small-island-developing-statescultural-diversity-driver-resilience-and-adaptation

UNESCO. (2024). *Mapping cultural policies in Small Island Developing States: amplifying SIDS voices in the global policy dialogue on culture and sustainable development.* United Nations Educational, Scientific and Cultural Organization.

UN-OHRLLS. (2015). *Small Island Developing States in Numbers - Climate Change Edition 2015.* The United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States.

UN-OHRLLS. (2022). *FINANCING FOR DEVELOPMENT OF SMALL ISLAND DEVELOPING STATES.* The United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States.

UN-OHRLLS. (2023). *Final Report: Promising Sectors for Economic Transformation of Small Island Developing States.* The United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States.

UN-OHRLLS. (2024a, November 12). *About Small Island Developing States*. Retrieved November 12, 2024, from Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States: https://www.un.org/ohrlls/content/about-small-island-developing-states

UN-OHRLLS. (2024b, November 5). *List of SIDS*. Retrieved November 5, 2024, from Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States: https://www.un.org/ohrlls/content/list-sids

WBES. (2023). *ENTERPRISE SURVEYS MANUAL AND GUIDE.* World Bank Enterprise Surveys.

WBES. (2024). *Enterprise Surveys Indicators Data - World Bank Group*. Retrieved December 6, 2024, from Enterprise Surveys Indicators Data - World Bank Group: https://www.enterprisesurveys.org/

World Bank. (2024a, August 23). *Member Countries*. Retrieved November 25, 2024, from World Bank Group: https://www.worldbank.org/en/about/leadership/members

World Bank. (2024b, November 15). *World Bank Country and Lending Groups | World Bank Data Help Desk*. Retrieved November 15, 2024, from World Bank Group: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

Zhang, D., & Managi, S. (2020). Financial development, natural disasters, and economics of the Pacific small island states. *Economic Analysis and Policy, 66*, 168-181.

Appendix

Table A-1. List of SIDS Countries

Country	Population	Area (sq.km)	Currency	Language
Atlantic, Indian Ocean, South China Sea (AIS)				
Cabo Verde	522,331	4,030	Cape Verdean escudo	**Portuguese**, Crioulo
Comoros	850,387	1,861	Comorian franc	**Arabic, French**, Shikomoro (Swahili/Arabic blend)
Guinea-Bissau	2,153,339	28,120	CFA franc	**Portuguese**, Criolo, African languages
Maldives	525,994	300	Maldivian rufiyaa	**Maldivian Dhivehi**, English
Mauritius	1,261,041	1,997	Mauritian rupee	**English**, Creole, Bojpoori, French
Sao Tome and Principe	230,871	960	The dobra	**Portuguese**
Seychelles	119,773	460	Seychellois rupee	**Seselwa Creole, English, French**
Singapore	5,917,648	718	Singapore dollar	**Mandarine**, English, Malay, Tamil
Caribbean				
Antigua and Barbuda	93,316	440	East Caribbean dollar	**English**, local dialects
Bahamas	399,440	10,010	Bahamian dollar	**English**, Creole
Barbados	282,336	430	Barbadian or Bajan dollar	**English**
Belize	411,106	22,810	Belize dollar	**English**, Spanish, Mayan, Garifuna, Creole
Cuba	11,019,931	103,800	Cuban peso	**Spanish**
Dominica	66,510	750	East Caribbean dollar	**English**
Dominican Republic	11,331,265	48,198	Dominican peso	**Spanish**
Grenada	117,081	340	East Caribbean dollar	**English**, French patois
Guyana	826,353	196,850	Guyanese dollar	**English**, Amerindian dialects, Creole, Hindi, Urdu
Haiti	11,637,398	27,560	Haitian gourde	**Creole, French**
Jamaica	2,839,786	10,830	Jamaican dollar	**English, Jamaican Creole**
St. Kitts and Nevis	46,758	260	East Caribbean dollar	**English**
St. Lucia	179,285	610	East Caribbean dollar	**English,** French patois
St. Vincent and the Grenadines	101,323	390	East Caribbean dollar	**English, French patois**
Suriname	628,886	160,508	Surinamese dollar	**Dutch**, Surinamese, English widely spoken, Hindustani, Javanese

Country	Population	Area (sq.km)	Currency	Language
Trinidad and Tobago	1,367,510	5,130	Trinidad and Tobago dollar	**English**, Hindi, French, Spanish, Chinese
Pacific				
Fiji	924,145	18,270	Fijian dollar	**English**, Fijian, Hindustani
Kiribati	132,530	810	Australian dollar	**English**, I-Kiribati (Gilbertese)
Marshall Islands	38,827	180	US dollar	**Marshallese, English**, Japanese
Micronesia, Fed. Sts.	112,630	700	US dollar	**English**, Chukese, Pohnpeian, Yapase, Kosrean, Ulithian, Woleaian, Nukuoro, Kapingamarangi
Nauru	11,875	20	Australian dollar	**Nauruan**, English
Palau	17,727	460	US dollar	**Palauan, English**, Tobi, Angaur, Filipino, Chinese, Carolinian, Japanese
Papua New Guinea	10,389,635	452,860	Kina	**Tok Pisin, Hiri Motu**, English, 715 indigenous languages
Samoa	216,663	2,780	Samoan tala	**Samoan, English**
Solomon Islands	800,005	27,990	Solomon Islands dollar	**English**, Melanesian pidgin,120 indigenous languages
Timor-Leste	1,384,286	14,870	US dollar	**Tetum, Portuguese**, Indonesian, English, other indigenous languages
Tonga	104,597	720	Pa'anga	**Tongan, English**
Tuvalu	9,816	30	Australian dollar	**Tuvaluan, English**, Samoan, Kiribati
Vanuatu	320,409	12,190	Vanuatu vatu	**Bislama, English, French**, more than 100 local languages

Source: WDI and official website of Ministry of Foreign Affairs of Japan.

Note: In the language column, languages in bold are the official languages of the Country.

Table A-2. Summary of All Variables

Variable	Source	Definition
Labor productivity	WBES	Labor productivity measured as sales per employee
Access to finance	WBES	1 for firms that Access to finance is No Obstacle to the current operations of this establishment, 0 otherwise
PCC (Partially Credit Constrained)	WBES	1 for firms that belong to the credit status of PCC, 0 otherwise
MCC (Maybe Credit Constrained)	WBES	1 for firms that belong to the credit status of MCC, 0 otherwise
NCC (Not Credit Constrained)	WBES	1 for firms that belong to the credit status of NCC, 0 otherwise
Creditline	WBES	1 for firms that have a line of credit, 0 otherwise
Overdraft	WBES	1 for firms that have an overdraft facility, 0 otherwise
SIDS	WBES	1 for firms located in a Country that belongs to SIDS, 0 otherwise
Access to land	WBES	1 for firms that Access to land is No Obstacle to the current operations of this establishment, 0 otherwise
Business licensing and permits	WBES	1 for firms that Business licensing and permits is No Obstacle to the current operations of this establishment, 0 otherwise
Corruption	WBES	1 for firms that Corruption is No Obstacle to the current operations of this establishment, 0 otherwise
Courts	WBES	1 for firms that Courts is No Obstacle to the current operations of this establishment, 0 otherwise
Crime and theft	WBES	1 for firms that Crime and theft is No Obstacle to the current operations of this establishment, 0 otherwise
Customs and trades	WBES	1 for firms that Customs and trades is No Obstacle to the current operations of this establishment, 0 otherwise
Electricity	WBES	1 for firms that Electricity is No Obstacle to the current operations of this establishment, 0 otherwise
Informal sector competitors	WBES	1 for firms that Informal sector competitors is No Obstacle to the current operations of this establishment, 0 otherwise
Labor regulations	WBES	1 for firms that Labor regulations is No Obstacle to the current operations of this establishment, 0 otherwise
Low educated labor	WBES	1 for firms that Low educated labor is No Obstacle to the current operations of this establishment, 0 otherwise
Political instability	WBES	1 for firms that Low educated labor is No Obstacle to the current operations of this establishment, 0 otherwise
Tax administrations	WBES	1 for firms that Tax administrations is No Obstacle to the current operations of this establishment, 0 otherwise
Tax rates	WBES	1 for firms that Tax rates is No Obstacle to the current operations of this establishment, 0 otherwise
Transportations	WBES	1 for firms that Transportations is No Obstacle to the current operations of this establishment, 0 otherwise
Inflation	WDI	Measured by the GDP deflator in the last fiscal year of the country which firms located in.
GDP growth (average)	WDI	Measured by the average GDP growth last three years of the country which firms located in

Variable	Source	Definition
Age of firm	WBES	Age of firm measured by year
Year Dummy	WBES	1 for firms' survey created in one certain year, 0 otherwise
Income classification dummy	World Bank	Categorical variable measuring the income level of the country which firms located in
Country region Dummy	World Bank	Categorical variable measuring region of the country which firms located in
Country dummy	WBES	Categorical variable measuring the country which firms located in
City size dummy	WBES	Categorical variable measuring the size of the population in a locality
Firm size dummy	WBES	Categorical variable measuring the number of the employee

Table A-3. Descriptive Statistics of Key Variables (WBES)

	Obs.	Mean	Std. dev.	Min	Max
Sales growth	114,428	0.111	0.546	-6.985	10.930
Employee growth	136,358	0.043	0.200	-6.103	3.719
Labor productivity	128,656	2,269,868.000	170,000,000.000	0.008	49,100,000,000.000
Access to Finance	145,738	0.381	0.486	0	1
CCS	135,391	2.971	1.151	1	4
Creditline	144,462	0.352	0.478	0	1
Overdraft	142,631	0.420	0.494	0	1

Note: Statistics in this table are estimated based on the sample of firms from all countries in the WBES.