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Why do some regions exhibit a greater degree of manufacturing export and entrepreneurship activities than others? Evidence from Indonesia

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DEVELOPMENT ECONOMICS | RESEARCH ARTICLE

Why do some regions exhibit a greater degree of manufacturing export and entrepreneurship activities than others? Evidence from Indonesia

Yohanes Mean Duli^{1*}, Wihana Kirana Jaya, Samsubar Saleh and Evita H. Pangaribowo

Abstract: Manufacturing export and entrepreneurship have become increasingly important for economic development. However, there is limited information systems research examining the role of regional ICT infrastructure, knowledge infrastructure, democracy, and the number of foreign tourists for entrepreneurship activities and manufacturing export. This study investigates the impact of ICT infrastructure, knowledge infrastructure, democracy, and the number of foreign tourists on entrepreneurship activities and manufacturing export. Using The PLS-SEM, we found that foreign tourists positively and significantly impact manufacturing exports while knowledge infrastructure and entrepreneurship activities negatively affect manufacturing exports. The findings also supported the significant role of ICT infrastructure and foreign tourists in entrepreneurship activities. This result offers practical implications for policymakers in designing a roadmap of entrepreneurship and manufacturing export policies in developing countries.

Subjects: International Economics; Political Economy; Entrepreneurship and Small Business Management; Manufacturing Industries

Keywords: Manufacturing export; entrepreneurship; infrastructure; democracy; tourism



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PUBLIC INTEREST STATEMENT

Manufacturing export and entrepreneurship have become increasingly important for economic development. However, there is limited information systems research examining the role of regional ICT infrastructure, knowledge infrastructure, democracy, and the number of foreign tourists for entrepreneurship activities and manufacturing export in developing countries. We found that (1) knowledge infrastructure, especially the number of universities, negatively affects manufacturing exports; (2) foreign tourists have a positive and significant impact on manufacturing exports; (3) entrepreneurship activities have a negative effect on manufacturing export, and FDI reduces this negative effect; (4) ICT infrastructure and foreign tourists have a positive and significant impact on entrepreneurship activities. This result offers practical implications for policymakers in designing a roadmap of entrepreneurship activities and manufacturing export policies in developing countries.

1. Introduction

For more than three decades, Indonesia has had a deficit in manufacturing export (World Bank, 2020)¹. Compared with China, the leader in the world manufacturing export, Indonesia is far behind the one. In 2018, Indonesia's manufacturing export was only 44.7 percent of total export, while China had 93.3 percent. In the same year, Indonesia's manufacturing import is about 65.9 percent; therefore, Indonesia's manufacturing export deficit is about 21.2 percent (World Bank, 2020)². This deficit is an accumulation of manufacturing export deficit at the province level of Indonesia. The manufacturing export in Indonesia has been dominated by the west of Indonesia such as West Java, East Java, and Riau provinces (Statistics Indonesia, 2018)³.

Why do some countries or regions exhibit a greater degree of export activity than others? This key question was pointed out by a set of previous studies for hundreds of years, such as Smith (1937), Ricardo (1963), Heckscher (1935), and M. Porter (1990), and other researchers. The exhaustive literature review by Chen et al. (2016) identifies the determinant of export performance spanning from the firm-level characteristics to country-level characteristics. The resource-based view theory explains the firm-level characteristics, and the institutional-based view theory explains the country-level characteristics.

In country-level characteristics, M. Porter (1990) introduces Porter's Diamond of the nation's competitive advantage, which includes factor conditions, demand conditions, related and supporting industries, and competition, strategy, and structure. Many scholarly investigations have examined exporting activities, focusing in particular on factor conditions such as labor (Fernandes et al., 2019; Krammer et al., 2018) and infrastructure (Baniya et al., 2019; Bianchi & Mathews, 2016; Bonfatti & Poelhekke, 2017; Coşar and Demir, 2016; Portugal-Perez & Wilson, 2012; Wu et al., 2016). Although there is a lot of recent literature on this subject, it is rare to find previous research that focuses on examining manufacturing export activities. The previous findings apply to overall export performance, but not necessarily to manufacturing exports, especially in developing countries.

Previous studies discussed the demand conditions by only analyzing the relationship between the characteristics of domestic buyers, specifically domestic-buyer expectation about quality (Beise-Zee & Rammer, 2006; Dögl et al., 2012; M. Porter, 1990). The other side of the demand condition that has not been widely discussed in previous studies is the perception of the domestic buyer about democracy. Domestic buyers' perceptions of democracy can affect export activities because democratization in exporting countries will improve product quality, reduce trade costs, and increase bilateral trade (Yu, 2010). It is rare to find previous research linking the democracy index, which is a combination aspect of civil liberties, political rights, and the quality of democratic institutions, with manufacturing exports' performance in developing countries.

Another aspect of demand conditions that have not been widely studied is the relationship between foreign tourists and export activities, especially manufacturing export activities. It is important to study because many countries have attractive tourist destinations and many foreign tourists. Several previous studies have linked the number of foreign tourists with overall export performance (Çalışkan et al., 2019; Cattaneo, 2009). However, it is rare to find previous studies that specifically link the number of foreign tourists to the performance of manufacturing exports, especially in the context of developing countries.

Several Schumpeterian researchers argued that there is a relationship between entrepreneurship and export performance (Cumming et al., 2014; Pradhan et al., 2020) as well as economic growth through knowledge spillover mechanism (Acs et al., 2009; D.B. Audretsch & Keilbach, 2007). However, several previous researchers argued that entrepreneurship activities negatively affect economic growth in developing countries (Acs et al., 2008; Hessels & van Stel, 2011). The effect of

entrepreneurship activities on manufacturing export in developing countries has not been thoroughly examined empirically.

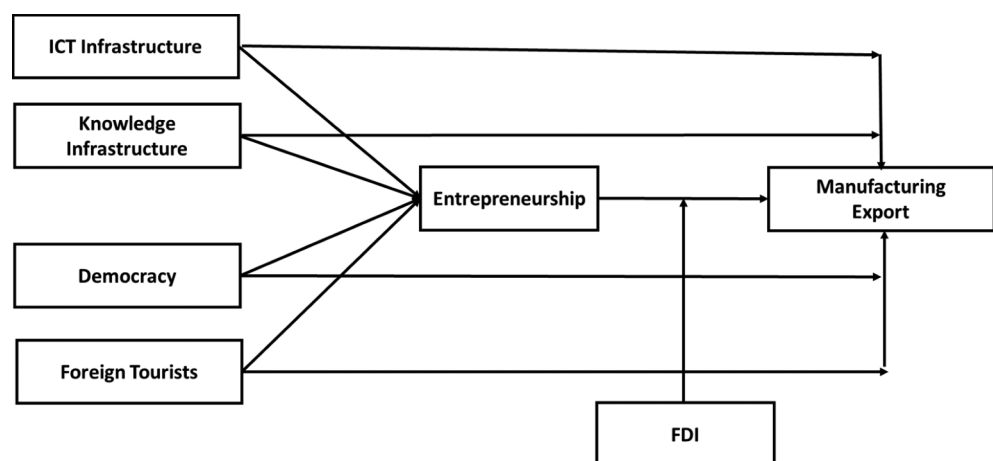
On the other hand, why do some regions have a greater degree of entrepreneurial activities than others? The study of the factors that influence entrepreneurship is not new, as many previous researchers have widely studied this topic (e.g., Acs et al., 2014; Audretsch et al., 2015; Bosma et al., 2018; Cooke, 2001; Edquist & Johnson, 1997; Isenberg, 2011; Roig-Tierno et al., 2015; Rusu, 2011; Sternberg, 2009). Some of them believe that Information and Communications Technology (ICT) infrastructure and knowledge infrastructure have a positive relationship with entrepreneurship activities (Audretsch et al., 2015; Roig-Tierno et al., 2015). However, this has not yet become a consensus because the level of internet penetration can increase the need for using products from other regions (Cumming & Johan, 2010). In developing countries such as Brazil, the knowledge infrastructure, namely universities, has not made a maximum contribution to entrepreneurship activities (Fischer et al., 2019).

Besides ICT infrastructure and knowledge infrastructure, other factors considered to influence entrepreneurship activities are democracy and the number of foreign tourists (Bosma et al., 2018; Rusu, 2011). However, the impact of democracy on economic liberalization can increase the need for imported products (Fu et al., 2021; Goldberg et al., 2009), which has an impact on decreasing domestic entrepreneurial activities. Many foreign tourists do not necessarily contribute to domestic entrepreneurship activities because they still use imported products (Santana-Gallego et al., 2011) and even foreign e-payments such as AliPay in Malaysia (Chew et al., 2020).

Different from earlier studies, we evaluate: (1) the impact of ICT infrastructure, knowledge infrastructure, democracy, and foreign tourists on manufacturing export; (2) the impact of entrepreneurship activities on manufacturing export; (3) the moderating effect of Foreign Direct Investment (FDI) on the relationship between entrepreneurship activities and manufacturing export; (4) the impact of ICT infrastructure, knowledge infrastructure, democracy, and foreign tourists on entrepreneurship activities. Figure 1 presents the conceptual framework of this study.

This research has contributed in five ways. First, many previous researchers have argued that the factor condition, namely infrastructure, has a positive effect on exports, but we argue that this positive influence does not necessarily apply to the context of manufacturing exports, especially in

Figure 1. Conceptual framework.
 Source: Authors, 2021



developing countries. Second, in an archipelagic country with many tourist destinations, a high number of foreign tourists can become potential buyers for local export products. However, it is rare to find previous studies that analyze the effect of demand conditions, particularly the number of foreign tourists on manufacturing exports, in developing countries. In this way, we can add to the existing literature by showing a possibility of positive influence on the number of foreign tourists on manufacturing exports. Third, the result may suggest that in developing countries, entrepreneurship activities would have a negative impact on manufacturing export if there is a low share of technology-based entrepreneurship activities. Fourth, it is virtually the first study to link the manufacturing export to entrepreneurship with FDI as moderating variable. Fifth, this study is the first comprehensive province-level analysis of the effects of ICT infrastructure, knowledge infrastructure, democracy, and the number of foreign tourists on entrepreneurship activities, thereby offering practical implications for policymakers in designing a roadmap of entrepreneurship activities policies.

2. Theoretical framework and hypothesis

2.1. *Competitive advantage of nations*

The views of classical economists that still resonate today are looking at efficiency and factors of production as the key to world trade. Trade occurs between two countries when each country specializes in products produced more efficiently than the other (Smith, 1937). Meanwhile, according to Heckscher (1935), a country will export commodities produced using the abundant production factors in that country. However, M. Porter (1990) suggested the national competitive advantages framework, including factor conditions, demand conditions, strategy and competition, and supporting and related industries. We used a quantitative model in analyzing Porter's national competitive advantage framework. In this study, the proxy for national competitive advantage is each province's manufacturing exports. We only focus on factor and demand conditions as the independent variables. Factor conditions include ICT infrastructure and knowledge infrastructure. Meanwhile, demand conditions include the democracy index and the number of foreign tourists.

Several previous studies have argued that ICT infrastructure, knowledge infrastructure, democracy, and the number of foreign tourists positively influence exports. The internet can reduce the cost of communication between companies with suppliers and buyers (Fernandes et al., 2019) and improve relations between suppliers and buyers for product innovation (Wu et al., 2016). The existence of universities enhances knowledge spillovers in areas that are geographically close to universities so that they play a role in local economic development (Agasisti et al., 2019). Democracy plays a pivotal role in economic liberalization (Fidrmuc, 2003), and democratization in exporting countries will improve product quality, reduce trade costs, and increase bilateral trade (Yu, 2010). A country with a powerful tourism brand can take advantage of many foreign tourists to export its products/services to the global market (Gnoth, 2002). Therefore, we propose:

H1: ICT infrastructure, knowledge infrastructure, democracy, and the number of foreign tourists have a positive and significant impact on manufacturing export.

2.2. *Entrepreneurship and export performance*

The role of entrepreneurs is essential in economic development, where they are "agents of creative destruction," who carry out the production process by using various possible combinations of new resources to obtain a decent profit (Schumpeter, 1934). These new combinations result in new products, production methods, markets, supply of inputs, and organizations. According to him, despite the abundance of inventions and business opportunities, the contribution to economic development

will not be achieved if there is no commercialization. The process of transforming inventions and business opportunities into commercialization is called entrepreneurship (Fritsch, 2017).

Entrepreneurial activities will have a pronounced effect on economic growth and export performance for the following reasons. First, entrepreneurship in the form of new startups enhances innovation and increases product variants and competitive advantage in the domestic market (Fritsch, 2013) so that domestic companies are able to compete in the global market. Second, many companies can expand into the global market since they are born-global firms (Knight & Cavusgil, 2004). Thirdly, entrepreneurship contributes to knowledge spillover (D. Audretsch & Keilbach, 2004) in the company's relationship with relevant stakeholders, facilitating the diffusion of innovation among actors along the value chain of business activities. Therefore, we propose:

H2.a: Entrepreneurship activities have a positive and significant impact on manufacturing export.

A country's domestic innovation and entrepreneurship are also determined by external factors, namely Foreign Direct Investment (FDI). The existence of FDI, explained by the product cycle theory by Vernon (1992), said that in the early stages of a product cycle, the production location would be in the country of origin. When the products have been adopted and used globally, the firm will move its production location through FDI to other countries with cheaper production factors. Migration of production locations usually occurs from developed countries to developing countries, where developed countries are producers and owners of technology. The benefits of moving production locations for multinational companies from the home country are cheaper production costs, cheaper labor, or closer to raw materials (Dunning, 1993). Another benefit is that the distance to the customer becomes closer where residents of the host country are potential buyers.

FDI contributes to domestic firms through spillover knowledge transfer mechanisms that facilitate product and process innovation and even increase productivity and create new businesses (Acs et al., 2009; Branstetter, 2006; Herrera-Echeverri et al., 2014; Wang & Wu, 2016). A study conducted in 87 countries in 2004–2009 concluded that in developing countries, FDI has a role in creating new businesses through a knowledge spillover mechanism (Herrera-Echeverri et al., 2014). Another study of 10,099 companies in the electronics industry covering 5,026 domestic companies and 5,073 foreign companies investing in China in 2009 said that the innovative activities concentrated in certain areas by foreign companies investing in China significantly facilitate product innovation of domestic companies (Wang & Wu, 2016). Therefore, we propose:

H2. b: FDI moderates the relationship between entrepreneurship activities and manufacturing export

2.3. Entrepreneurship ecosystem

The concept of an entrepreneurial ecosystem is an evolution of the concepts of industrial districts, clusters, and innovation systems (Stam & Spigel, 2016). The industrial district approach emphasizes the places where workers and firms specializing in primary and secondary industries live and work (Marshall, 1920). A cluster is a geographic concentration of interconnected companies, specialized suppliers, service providers, companies in related industries, and related institutions (e.g., universities, standards institutes, trade associations) in a particular field that compete and cooperate (M.E. Porter, 2000). Regional innovation systems or national innovation systems refer to the networks and institutions that link knowledge-generating centers (such as universities and

public research laboratories in a region) with innovative companies, allowing knowledge spillovers to increase innovation in the region (Cooke, 2001).

Isenberg (2011) introduced an entrepreneurial ecosystem consisting of culture, infrastructure, academic institutions, human resources, financial institutions, suppliers and customers, and government institutions. We used a quantitative model in analyzing Isenberg's entrepreneurship ecosystem framework. This study only focuses on physical infrastructure, academic institutions, government institutions, and culture as independent variables. The democracy index measures government institutions because one aspect of democracy is the quality of democratic institutions. The quality of good democratic institutions can facilitate the formation of regulations that support the business environment (Bosma et al., 2018). The culture analyzed in this study is the influence of a culture of tolerance measured by the number of foreign tourists in each province. The high number of foreign tourists in an area depends on the culture of tolerance and openness (Armenski et al., 2011).

Several previous studies have argued that ICT infrastructure, represented by the level of internet penetration, academic institutions, namely universities, democracy, and the number of foreign tourists, positively correlates with entrepreneurship activities. The level of internet penetration can reduce trade costs between suppliers and buyers and lower information costs for business people (Lin, 2014). As knowledge producer, universities generate knowledge spillovers that facilitate entrepreneurs in identifying and exploiting opportunities (Acs et al., 2009). Democracy facilitates economic liberalization (Fidrmuc, 2003), which is a significant factor in entrepreneurial activity (Dempster & Isaacs, 2017), both formal and informal entrepreneurship (Dau & Cuervo-Cazurra, 2014). Tourism development has a higher comparative growth (Seetana, 2011; Tang & Tan, 2015) through entrepreneurial activities in the archipelago economy. Therefore, we propose:

H3: ICT infrastructure, knowledge infrastructure, democracy, and the number of foreign tourists have a positive and significant impact on entrepreneurship activities

3. Research methodology

This study uses data from the Statistics Indonesia⁴, at the provincial level in Indonesia, for 2013–2018. The benefit of conducting analyzes at the provincial level within one country allows the researcher to control for country-specific factors. The type of sampling is non-probability sampling, especially the purposive sampling method, which uses specific criteria such as data availability, provincial expansion, and the state capital. Thus, we selected 31 out of 34 provinces for analysis.

Table 1 provides the measurement of variables. Manufacturing export was measured by the value of manufacturing exports divided by Regional Gross Domestic Product (GDP). We used the number of micro and small manufacturing companies per 100 population to measure Entrepreneurship activities, following D. Audretsch and Keilbach (2004). ICT infrastructure was measured using the percentage of households that access the internet in each province, following Fernandes et al. (2019). Knowledge infrastructure was measured by the number of universities per 100,000 population following Audretsch et al. (2015). We use the composite aspects of democracy, namely civil liberties, political rights, and democratic institutions, to measure democracy following Yue and Zhou (2018) and Yu (2010). The number of foreign tourists was measured using the number of foreign tourists staying in star and non-star hotels in each province.

FDI was measured using the realization of FDI divided by the Regional GDP of each province. FDI does not include Oil and Natural Sector, Banking, Non-Bank Financial Institutions, Insurance, Leases, Investments whose licenses are issued by technical agencies or sectors, Portfolio

Table 1. Measurements of variables

Variables	Measures
Manufacturing export	The value of manufacturing exports divided by Regional GDP
Entrepreneurship activities	The number of micro and small manufacturing companies per 100 population
ICT Infrastructure	Percentage of households accessing the internet in the last three months
Knowledge Infrastructure	The number of universities per 100,000 population
Democracy	The composite aspects of democracy, namely civil liberties, political rights, and democratic institutions
Foreign Tourists	the number of foreign tourists staying in star and non-star hotels
FDI	Realized FDI divided by Regional GDP at Current Prices
Regional GDP	Log Regional GDP Per Capita at Current Prices (Millions)
Population	Log Population (Thousands)

Source: Authors, 2021

Investment (Capital Market), and Household. The control variables in this study are regional GDP and the population of each province following Portugal-Perez and Wilson (2012), Asongu and Nwachukwu (2018), and Fu and Cao (2020). We add control variables to overcome the effect of differences in GDP and population on manufacturing export and entrepreneurial activity.

Table 2 provides the descriptive statistics. Hypothesis testing H1, H2, and H3, each is done separately. We made a sensitivity test on each hypothesis by removing 25 percent of observation in poor, rich, and medium provinces in terms of regional GDP per capita, respectively, following Fu and Cao (2020).

We utilized Partial Least Squares—Structural Equation Modeling (PLS-SEM) models to test the hypotheses. PLS modeling is primarily designed for causal predictive analysis of problems with high complexity (Wold, 1980). PLS-SEM is a multivariate statistical approach covering all standard multivariate analysis methods and helps researchers simultaneously estimate complex causal relationships (J. Hair et al., 2017). This analytical method was chosen because PLS-SEM offers solutions: (1) Small sample size; (2) The model consists of many constructs and a large number of items; (3) and the absence of distribution assumptions (J.F. Hair et al., 2012; Willaby et al., 2015; Wold et al., 1984). SEM is a popular technique of choice for economics and management scholars (Hancock & Mueller, 2006).

4. Empirical results and discussion

Table 3 illustrates the baseline models and sensitivity analysis results for Hypotheses 1, while Table 4 illustrates the results for Hypotheses 2, and Table 5 illustrates results for Hypotheses 3. In these Tables, Column (1) presents the results with no regional control variables such as GDP and population. Column (2) presents the baseline results by including the control variables. We present a variation of the analysis with different experiments to ensure no sensitivity issues to minor changes in the sample. We do this by removing 25 percent of the observations for the poor, rich, and middle-income provinces in terms of regional GDP per capita, respectively. Column (3) presents the result with remove 25 percent observation of poor provinces while Column (4) presents the result with remove 25 percent observation of rich provinces and Column (5) presents the result with remove 25 percent observation of middle-income provinces.

Table 3 presents the SEM result for Hypotheses 1. In column (2), namely the baseline, the results show that ICT infrastructure has no relationship with manufacturing exports. This finding supports

Table 2. Descriptive statistics

	Export	Entre	ICT	Knowledge	Democracy	Tourists	FDI	GDP	Population
Mean	0.11	1.46	0.43	1.46	0.71	4.60	0.04	1.58	3.65
Median	0.07	1.30	0.41	1.26	0.71	4.57	0.02	1.57	3.60
Maximum	0.77	3.51	0.79	4.23	0.84	7.07	0.68	2.24	4.69
Minimum	0.00	0.17	0.11	0.73	0.53	2.66	0.00	0.68	2.92
Std. Dev.	0.12	0.80	0.16	0.62	0.06	0.94	0.07	0.23	0.43
Skewness	2.11	0.45	0.23	1.59	-0.31	0.23	6.61	0.36	0.74
Kurtosis	9.13	2.18	2.18	6.12	2.81	2.61	63.14	4.82	3.23

Source: Authors, 2021

Table 3. SEM result for Hypotheses 1

Competitive advantages of nations—Manufacturing Export

Variables	(1)	(2)	(3)	(4)	(5)
ICT Infrastructure	0.27***	0.08	0.07	0.08	−0.04
Knowledge Infrastructure	−0.26***	−0.21***	−0.25***	−0.19**	−0.14***
Democracy	−0.04	−0.08	0.10	−0.09	−0.02
Foreign Tourist	0.22**	0.24**	0.31***	0.23**	0.14**
GDP		0.54	0.51	0.53	0.65
Population		0.00	0.06	−0.03	−0.24*
Observation	186	186	168	180	162
R-square	0.19	0.44	0.47	0.40	0.40

Source: Authors' own calculation, based on WarpPLS software

Note. Significance levels 0.1, 0.05 and 0.01 are denoted by *, ** and ***, respectively.

Controlled variables that include province-specific variable such as GDP per capita, population.

Cheng et al. (2021), who said that in lower-middle-income countries, the implications of ICT diffusion on economic growth are still ambiguous and even negatively related to economic growth (Maurseth, 2018). A high level of internet penetration in an area can increase the consumption of goods or services produced by other regions (Cumming & Johan, 2010). Therefore, It would deter entrepreneurship and competitive advantage of companies in that area to compete in the domestic and international markets.

With proxy for the number of universities, knowledge infrastructure has a negative and significant effect on manufacturing exports. The low number of technology-based entrepreneurial activities may cause the negative effect of knowledge infrastructure on economic development (Audretsch et al., 2015) and manufacturing export. Another possible reason is that the presence of startup incubators and Technology Transfer Offices (TTOs) at universities does not significantly contribute to increasing innovative entrepreneurship (Belitski et al., 2019; Fischer et al., 2019).

Democracy, with proxy the composite aspects of civil liberties, political rights, and democratic institutions, does not affect the value of manufactured exports. Democracy can facilitate economic liberalization (Fidrmuc, 2003). Therefore, it may reduce the cost of intermediate-imported products (Fu et al., 2021) thus, reducing the cost of domestic products which use the intermediate-imported product. However, at the same time, economic liberalization may lead domestic consumers to use final-imported products (Goldberg et al., 2009).

This study yields an interesting finding: a positive relationship between the number of foreign tourists and manufacturing exports. The higher the number of foreign tourists in an area facilitates the introduction of domestic products to foreign tourists, thus, increasing exports of domestic products (Madaleno et al., 2017). Domestic companies may benefit from “free” feedback from foreign tourists about global consumer preferences (Santana-Gallego et al., 2016). The introduction of domestic products and low cost feedback from foreign tourists may contribute to domestic companies producing the global standards products accepted in the global market. Understanding the positive relationship between the number of foreign tourists and manufactured exports provides valuable messages and information for tourism destination management organizations and the manufacturing sector.

Table 4. SEM result for Hypotheses 2 Entrepreneurship and Manufacturing Export					
Variables	(1)	(2)	(3)	(4)	(5)
Entrepreneurship	-0.19***	-0.11*	-0.15*	-0.10	-0.10
FDI	0.47	0.15	0.17	0.08	-0.01
Entrepreneurship x FDI	0.16*	0.14*	0.12	0.14**	0.03
GDP		0.48***	0.42***	0.50***	0.62***
Population		0.21***	0.21***	0.21***	0.31***
Observation	186	186	180	168	162
R-square	0.27	0.42	0.40	0.39	0.50

Source: Authors' own calculation, based on WarpPLS software
Note. Significance levels 0.1, 0.05 and 0.01 are denoted by *, ** and ***, respectively.
Controlled variables that include province-specific variable such as GDP per capita, population.

Table 5. SEM result for Hypotheses 3 Entrepreneurship Ecosystem					
Variables	(1)	(2)	(3)	(4)	(5)
ICT Infrastructure	0.07	0.44***	0.44***	0.45***	0.40***
Knowledge Infrastructure	0.11	-0.05	-0.07	-0.05	0.07
Democracy	0.26***	0.08	0.08	0.07	0.14
Foreign Tourist	0.20**	0.23**	0.20**	0.25***	0.27***
GDP		-0.62***	-0.53***	-0.60***	-0.61***
Population		-0.07	-0.09	-0.06	0.06
Observation	186	186	168	180	162
R-square	0.16	0.40	0.37	0.39	0.45

Source: Authors' own calculation, based on WarpPLS software
Note. Significance levels 0.1, 0.05 and 0.01 are denoted by *, ** and ***, respectively.
Controlled variables that include province-specific variable such as GDP per capita, population.

Table 4 presents the SEM result for Hypotheses 2. Interestingly, the study found that Entrepreneurship activities have a negative and significant effect on manufacturing exports. Two factors can cause this negative relationship. First, most people in developing countries switch from their businesses in the informal sector to become employees (Acs et al., 2008). Second, there is a low level of knowledge-based or technology-based entrepreneurial activities in developing countries (Hessels & van Stel, 2011).

FDI reduces the negative impact of entrepreneurship activities on manufacturing exports. FDI contributes to domestic firms through spillover knowledge transfer mechanisms that facilitate product and process innovation and even increase productivity and the creation of new businesses (Acs et al., 2009; Branstetter, 2006; Herrera-Echeverri et al., 2014; Wang & Wu, 2016).

Table 5 presents the SEM result for Hypotheses 3. ICT infrastructure has a positive and significant influence on entrepreneurship. A high level of internet penetration reduces trade costs between suppliers and buyers (Lin, 2014), improving the information acquisition process (Barnett et al., 2019; Liñán et al., 2019). The role of internet penetration - in reducing trading costs and improving the information acquisition process lessens barriers to entry for companies (Asongu & Nwachukwu, 2018; Nambisan et al., 2018).

Knowledge infrastructure has no relationship with entrepreneurship. A previous study reported no relationship between knowledge infrastructure and entrepreneurship activities because of the low level of technology-based entrepreneurship (Audretsch et al., 2015). Contrary to our findings, several researchers argued that the role of knowledge infrastructure is to create human resources (Jones & de Zubielqui, 2017), facilitate knowledge transfer to companies (Agasisti et al., 2019), and collaborate with industry for products/services innovation (Fischer et al., 2018).

Democracy has no impact on entrepreneurship. The impact of democracy on economic liberalization enhances the need for imported products (Fu et al., 2021; Goldberg et al., 2009). Increasing imports of foreign products may reduce domestic companies' productivity because foreign products absorb their market share. Another form of democracy is political freedom. At certain conditions, freedom of political choice may disrupt political stability and deteriorate the business environment. A previous study argued that the relationship between democracy and economic growth is an inverted U-shaped, meaning that if the democracy index exceeds the optimum limit, democracy will undermine economic growth (Alfano & Baraldi, 2016), including entrepreneurship activities.

Our interesting finding is that the number of foreign tourists has a positive and significant influence on entrepreneurial activities. An archipelagic country or a country with many tourist destinations, such as Indonesia, can take advantage of many tourists to increase entrepreneurial activities. A previous study said that the impact of the number of tourists on entrepreneurship activities is not only in the tertiary sector but also in the secondary and primary sectors (Rusu, 2011), such as domestic manufactured products, and natural products. These entrepreneurial activities would contribute to economic growth (Seetanah, 2011; Tang & Tan, 2015).

5. Conclusion

This study is one of the first studies that analyse the impact of ICT infrastructure, knowledge infrastructure, democracy, and the number of foreign tourists, on manufacturing export performance in a developing country. To analyse this relationship, we adopt the theory of national competitive advantage developed by M. Porter (1990). This study finds that, on the factor conditions, knowledge infrastructure has a negative relationship with manufacturing exports, while ICT infrastructure has no

relationship. Meanwhile, on the demand conditions, foreign tourists have a positive and significant impact on manufacturing exports, while democracy has no relationship with manufacturing export.

By integrating the Schumpeter (1934) theory of entrepreneurship and Vernon's (1992) theory of product cycle, we also investigate the impact of entrepreneurship on manufacturing export and the moderating effect of FDI on this relationship. Interestingly, the results show that entrepreneurship activities harm manufacturing export in developing countries, such as Indonesia, while FDI reduces this negative impact. Moreover, we analyse the determinants of entrepreneurship activities based on Isenberg's (2011) entrepreneurship ecosystem framework, especially the impact of ICT infrastructure, knowledge infrastructure, democracy, and foreign tourists on entrepreneurship activities. We find that ICT infrastructure and foreign tourists positively and significantly impact entrepreneurship activities while knowledge infrastructure and democracy have no relationship.

This study offers several suggestions for government agencies and individual entrepreneurs. Governments should play active roles in building and developing ICT infrastructure to attract entrepreneurs. Additionally, since tourism is one of the important sectors in Indonesia, the government is suggested to utilize the high number of foreign tourists in promoting domestic firms and domestic exporter firms. Moreover, the government should utilize the knowledge infrastructure such as universities as the hub of technology-based entrepreneurship activities and facilitate spillover knowledge from universities and foreign firms to local firms. In the meantime, entrepreneurs are suggested to gain access to ICT and exploit the benefits of information and opportunities available on ICT. Meanwhile, entrepreneurs should utilize many foreign tourists as potential buyers for their products and services.

According to M. Porter (1990), it is essential to note that this study does not explicitly analyze the relationship between other factors of national competitive advantage, namely relating and supporting industries and strategy, structure, and rivalry, with manufacturing exports. Therefore, the subsequent study can examine the effect of relating and supporting industries and strategy, structure, and rivalry on the performance of manufacturing exports. In addition, further studies may explore the influence of ICT infrastructure, knowledge infrastructure, democracy, and the number of foreign tourists, on the specific types of manufacturing export so that policymakers can treat an area with specialization in a particular type of manufacturing export industry differently.

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Endnotes

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