Part III

11. Comparative Analysis for ASEAN Member States, Except Myanmar
12. Backlog Analysis

Yoshitoshi Tanaka
Mika Goto
Yuji Tou
Suzuka Yoshida

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Part III

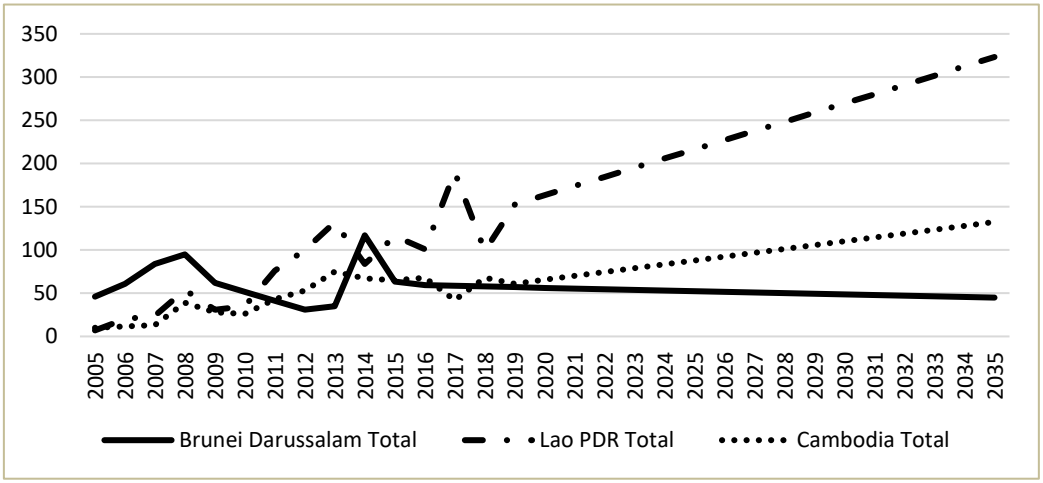
11. Comparative Analysis for ASEAN Member States, Except Myanmar

11.1. Total IP applications by country

In this analysis, the ASEAN Member States were divided into two groups: Group A, which has relatively lower IP applications (Brunei Darussalam, Lao PDR, and Cambodia), and Group B, comprising the remaining countries (excluding Myanmar).

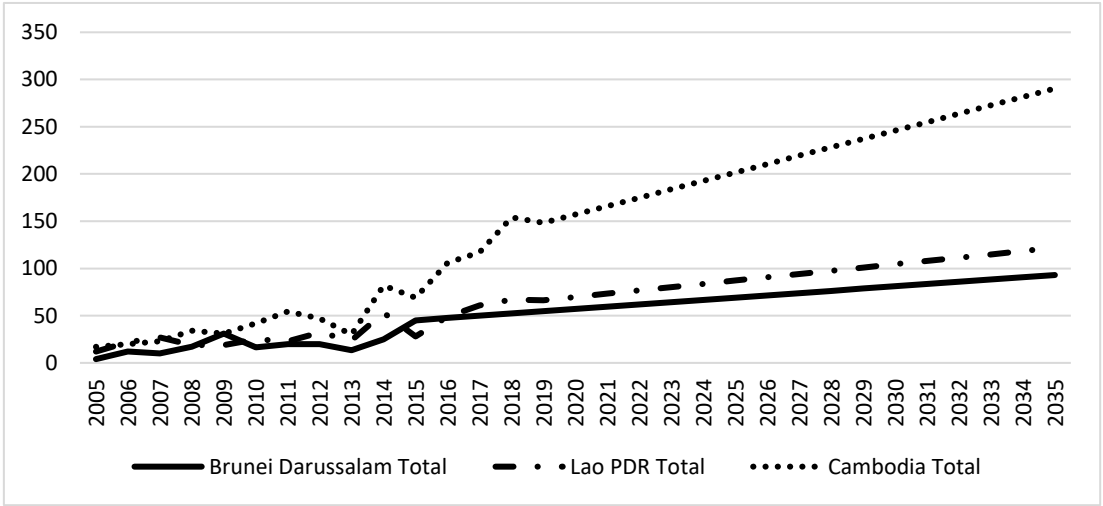
a) Group A (Brunei Darussalam, Lao PDR, and Cambodia)

Figure 124. Total patent applications (Brunei Darussalam, Lao PDR, and Cambodia)



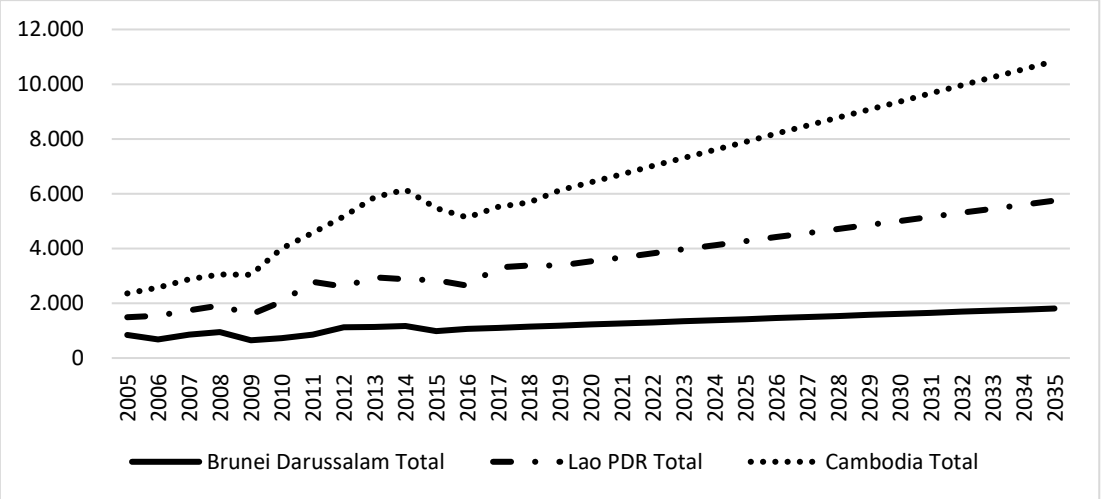
Source: Authors' calculation.

Figure 125. Total Design Applications (Brunei Darussalam, Lao PDR, and Cambodia)



Source: Authors' calculation.

Figure 126. Total Trademark Applications (Brunei Darussalam, Lao PDR, and Cambodia)



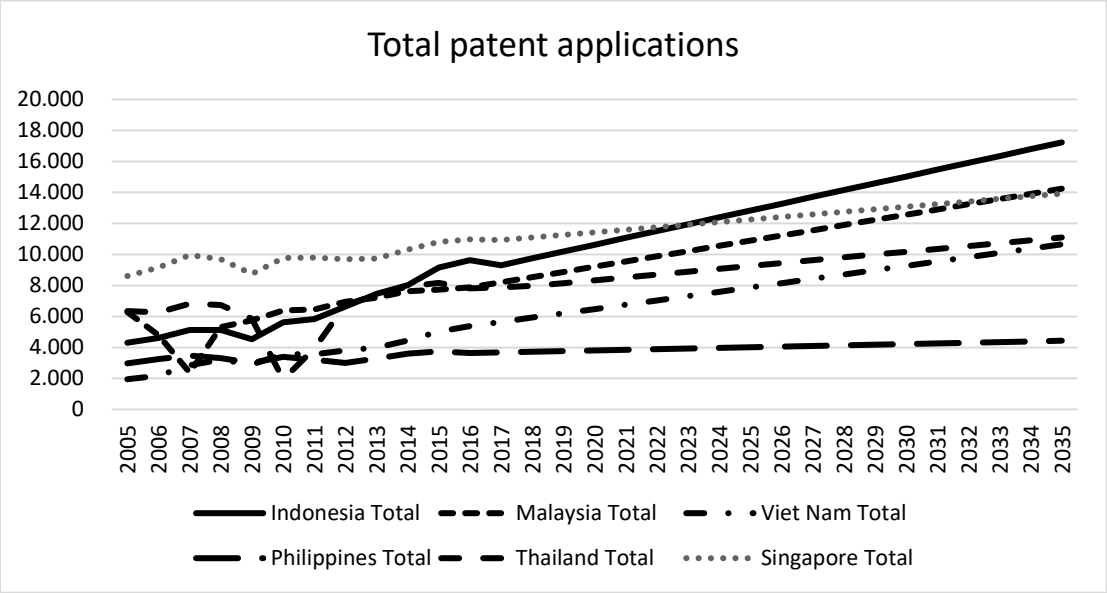
Source: Authors' calculation.

Figures 124–126 show that Brunei maintains a similar number of IP applications over the period. For patents, the Lao PDR has the trend of the highest number of applications and growth, while Cambodia has the same trend for design and trademark applications.

b) Group B (Indonesia, Malaysia, Viet Nam, Philippines, Thailand, and Singapore)

Figure 127. Total Patent Applications

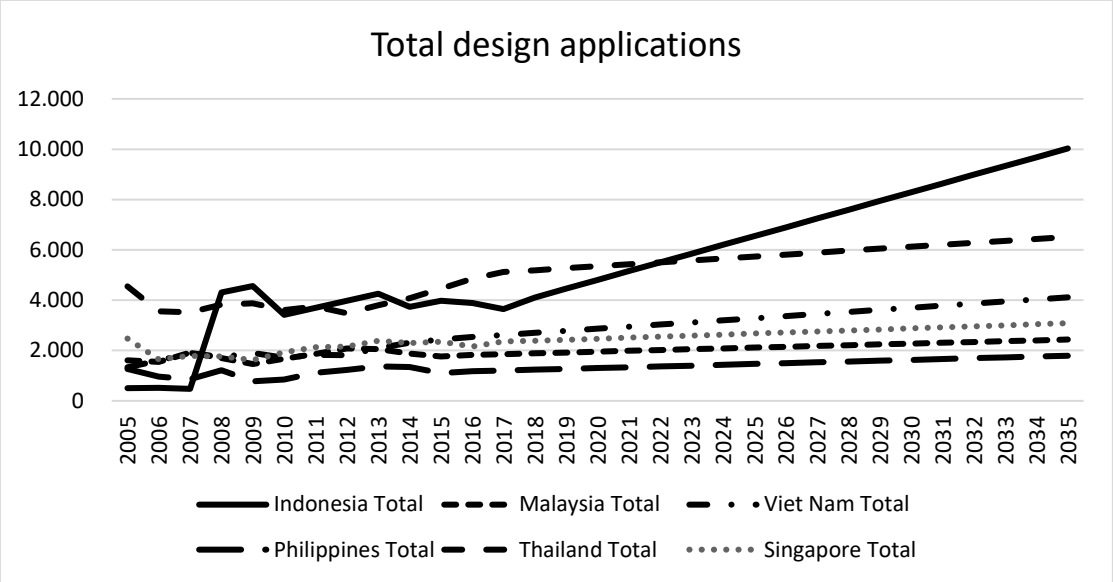
(Indonesia, Malaysia, Viet Nam, Philippines, Thailand, and Singapore)



Source: Authors' calculation.

Figure 128. Total Design Applications

(Indonesia, Malaysia, Viet Nam, Philippines, Thailand, and Singapore)

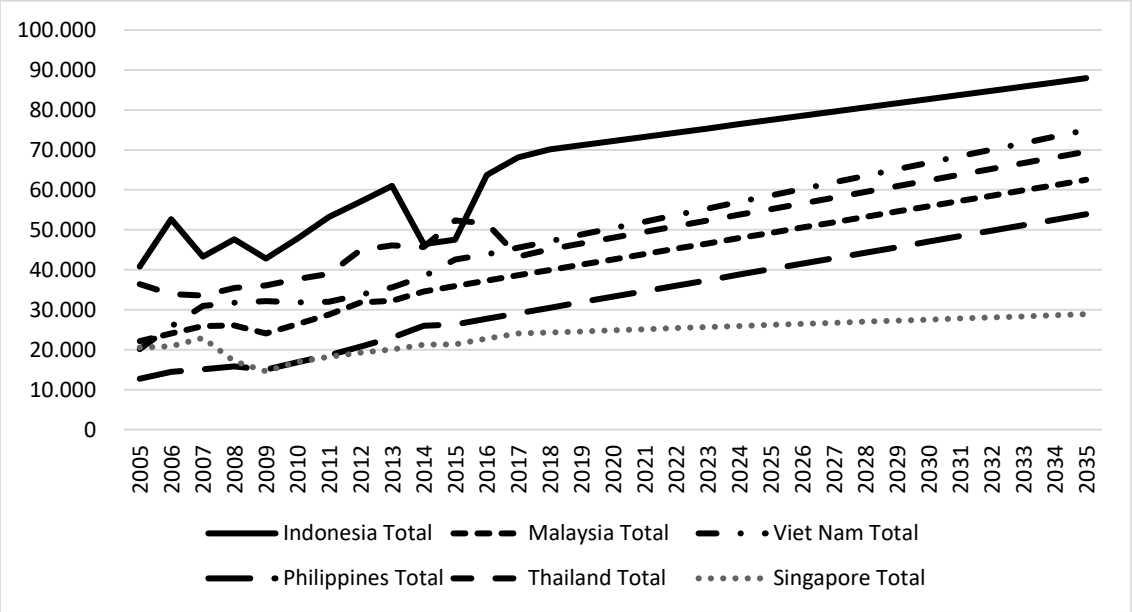


Source: Authors' calculation.

Indonesia shows significant increases in total design applications in the future, while others have steady growth.

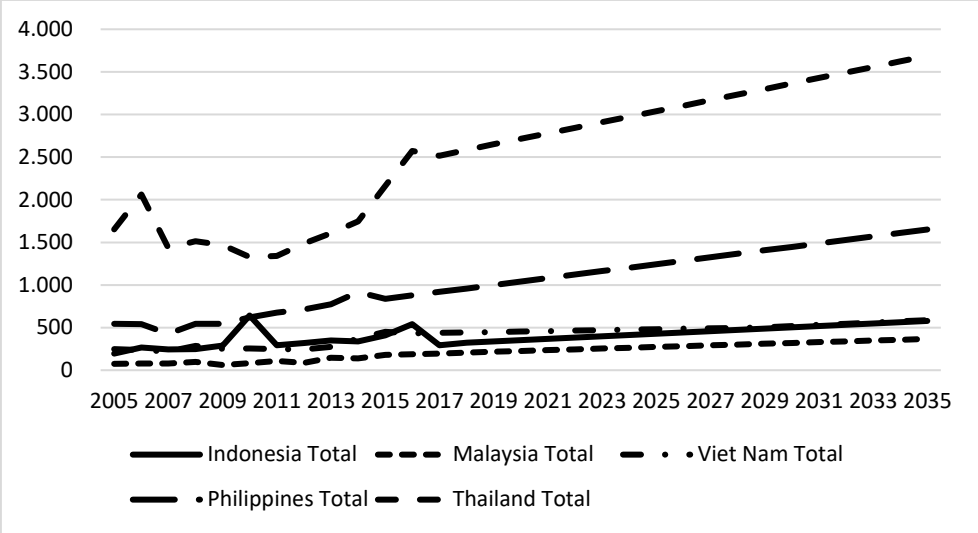
Figure 129. Total Trademark Applications

(Indonesia, Malaysia, Viet Nam, Philippines, Thailand, and Singapore)



Source: Authors' calculation.

Figure 130. Total Utility Model Applications
(Indonesia, Malaysia, Viet Nam, Philippines, Thailand, and Singapore)



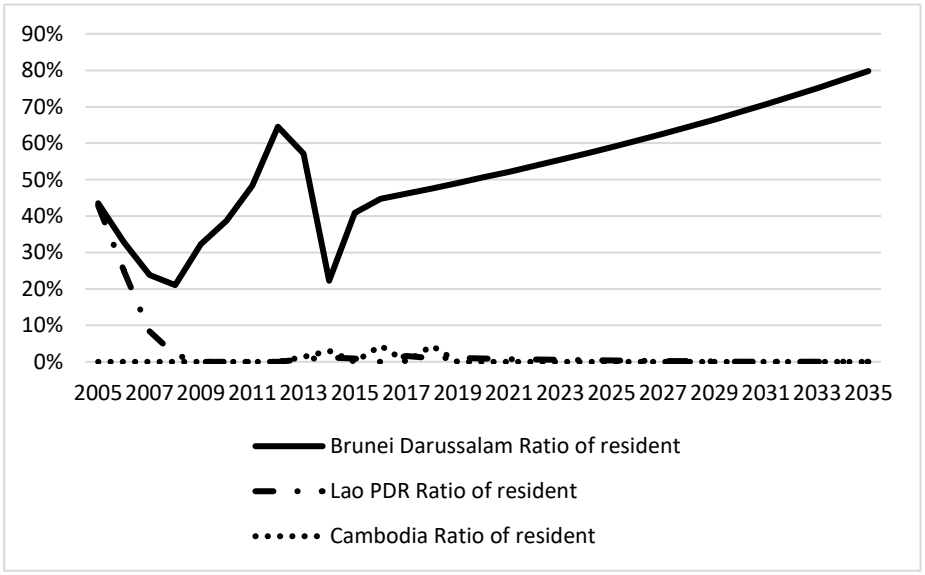
Source: Authors' calculation.

Indonesia shows the highest total applications among Group B for patent, design, and trademark applications. However, for utility model applications, Malaysia has the highest total applications over the forecasting period.

11.2. Ratio of IP applications by residents

a) Group A (Brunei Darussalam, Lao PDR, and Cambodia)

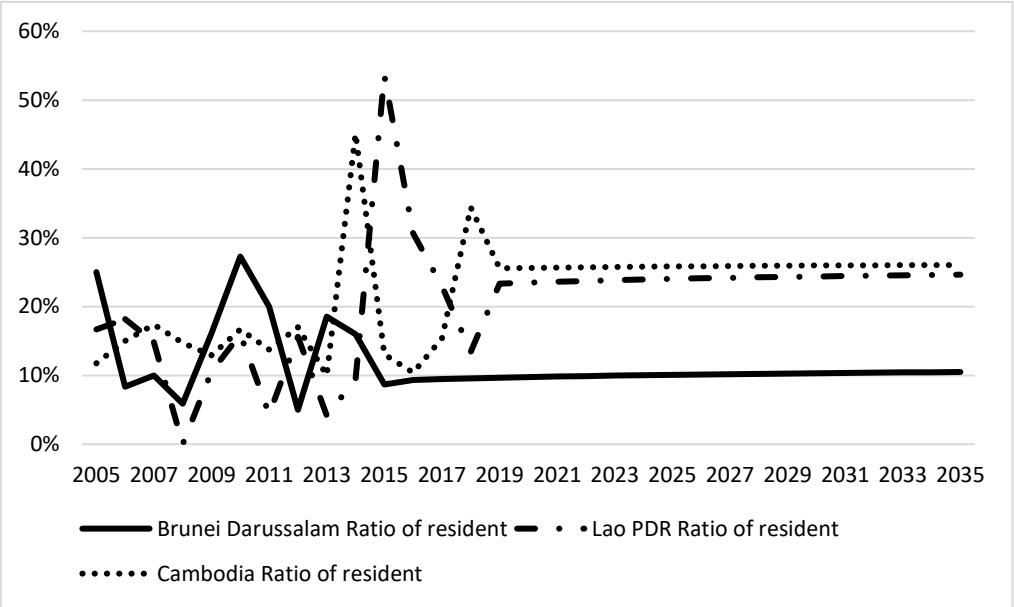
Figure 131. Ratio of Patent Applications by Residents
(Brunei Darussalam, Lao PDR, and Cambodia)



Source: Authors' calculation.

Figure 131 shows that for Brunei Darussalam, the ratio of patent applications by residents will increase in the future, while the Lao PDR and Cambodia maintain very low ratios.

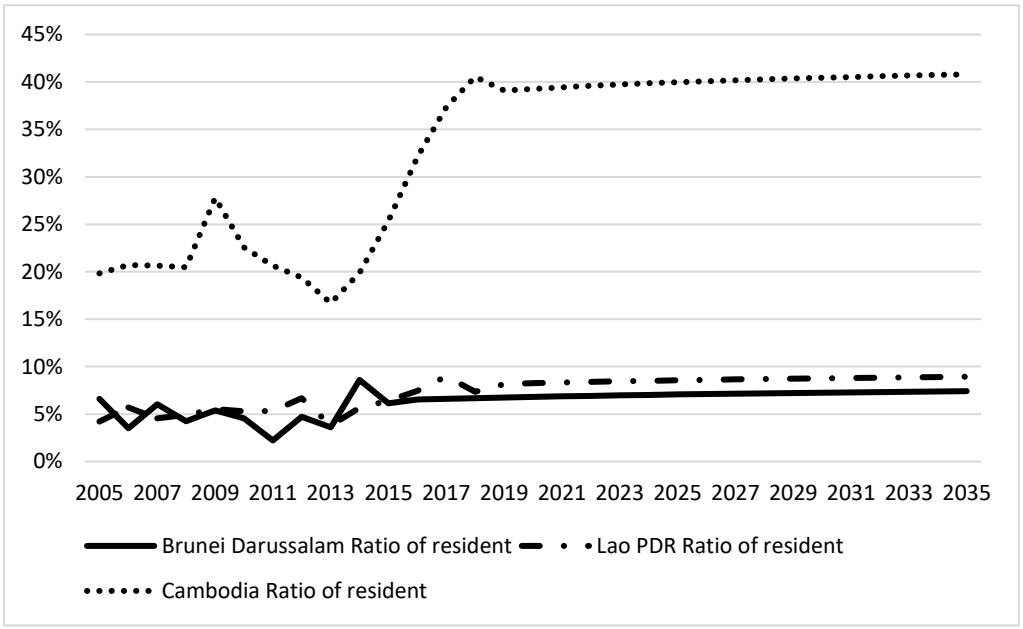
Figure 132. Ratio of Design Applications by Residents (Brunei Darussalam, Lao PDR, and Cambodia)



Source: Authors' calculation.

Figure 132 shows that all of the Group A countries are expected to maintain similar ratios for design applications by residents in the future.

Figure 133. Ratio of Trademark Applications by Residents (Brunei Darussalam, Lao PDR, and Cambodia)



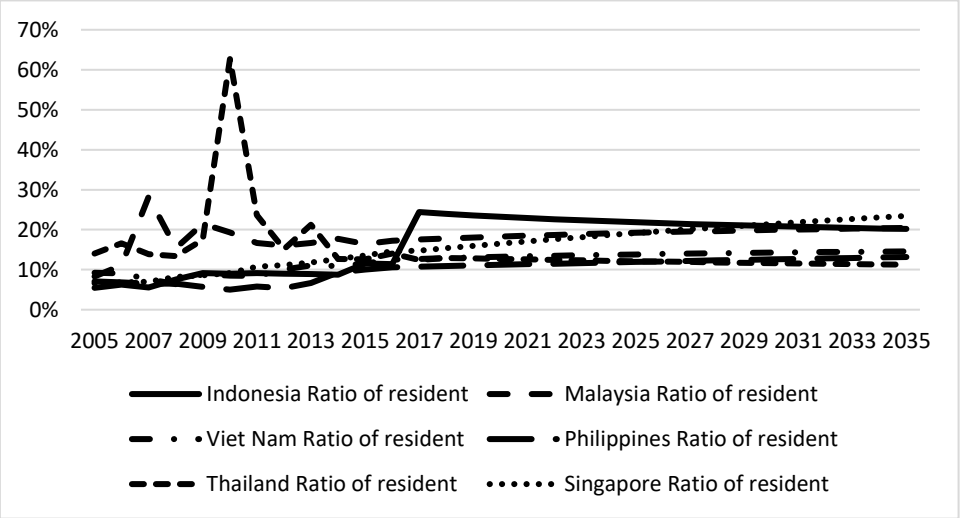
Source: Authors' calculation.

Figure 133 shows that Cambodia will have a relatively high ratio (around 40%) compared to the Lao PDR and Brunei (between 5% and 10%). However, all three Group A countries are expected to maintain similar ratios for trademark applications by residents in the future.

b) Group B (Indonesia, Malaysia, Viet Nam, Philippines, Thailand, and Singapore)

Figure 134. Ratio of patent applications by residents

(Indonesia, Malaysia, Viet Nam, Philippines, Thailand, and Singapore)

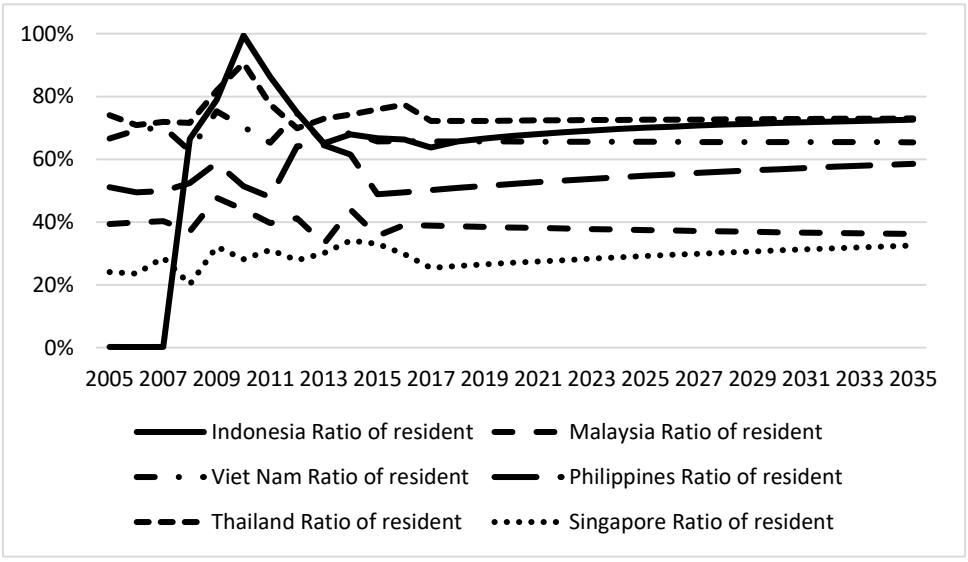


Source: Authors' calculation.

For Group B, Figure 134 shows that the ratios for patent applications by residents for all countries remain low (less than 25%) over the forecasting period.

Figure 135. Ratio of Design Applications by Residents

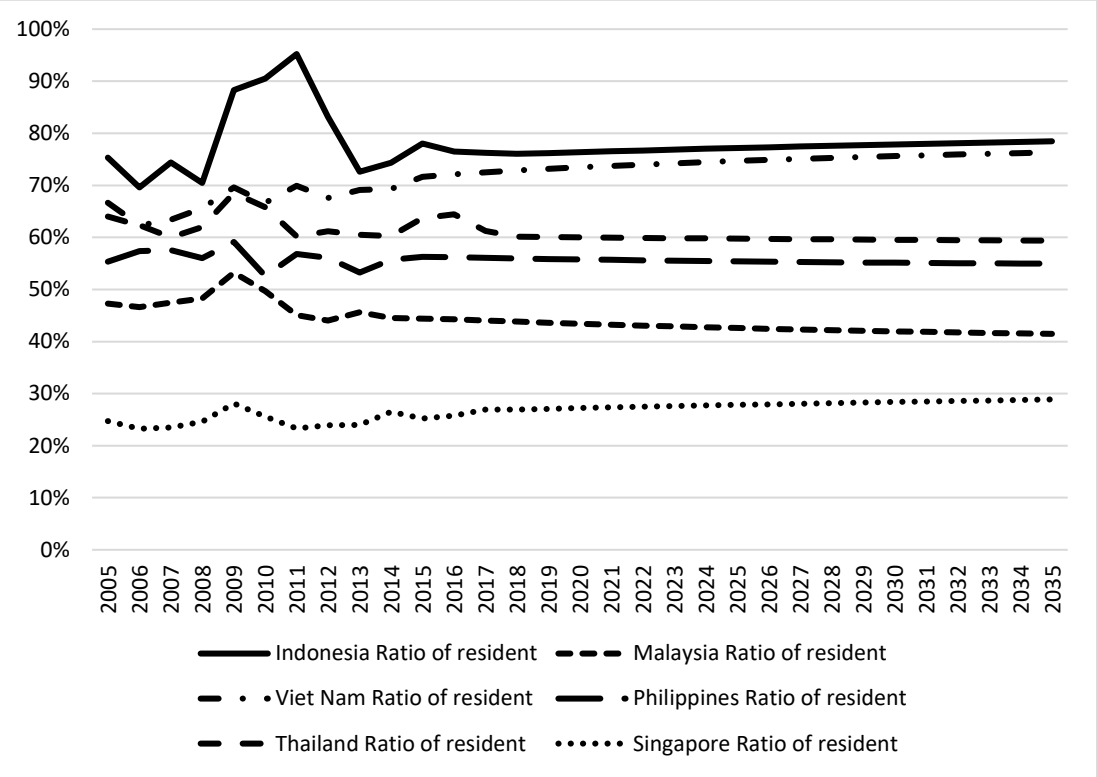
(Indonesia, Malaysia, Viet Nam, Philippines, Thailand, and Singapore)



Source: Authors' calculation.

For Group B, Figure 135 shows that the ratios of design applications by residents remain similar, between 30% and 75%. Indonesia, Philippines, Malaysia and Viet Nam are located above 50% while Thailand and Singapore are located below 40%.

Figure 136. Ratio of Trademark Applications by Residents
(Indonesia, Malaysia, Viet Nam, Philippines, Thailand, and Singapore)

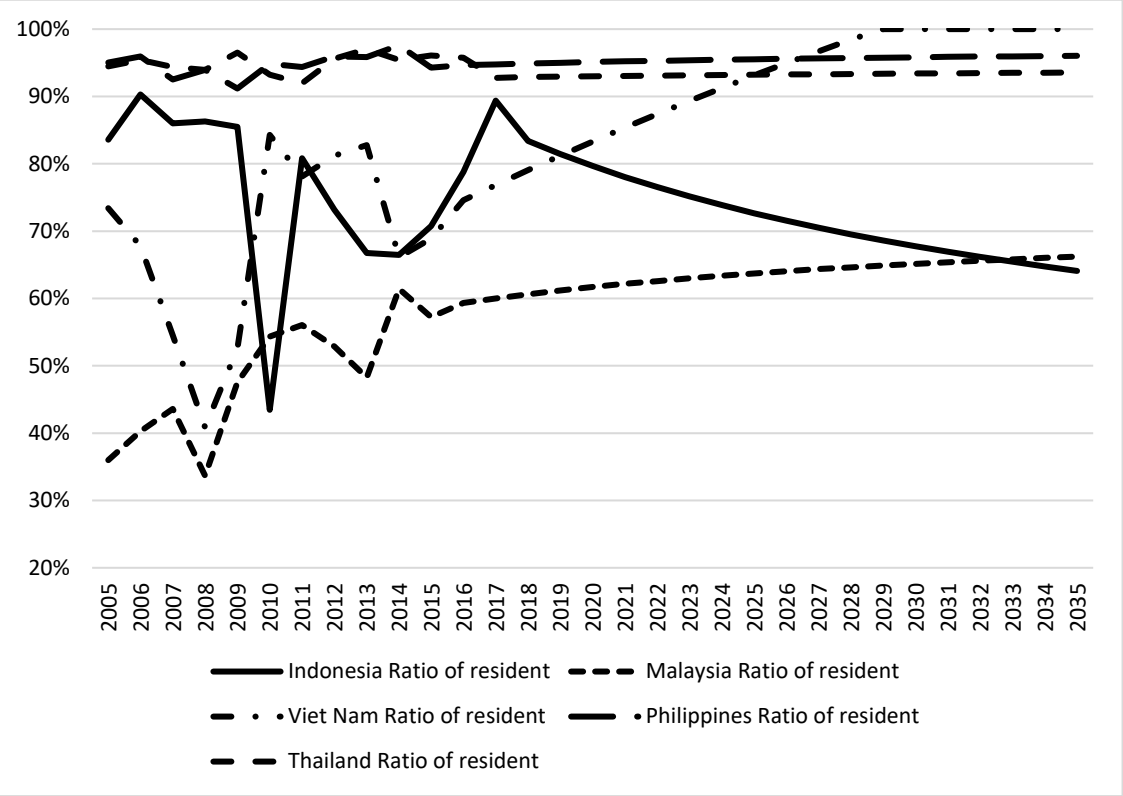


Source: Authors' calculation.

In Group B, Figure 136 shows the ratios of trademark applications by residents to remain similar at above 40%, except for Singapore at nearly 30%.

Figure 137. Ratio of Utility Model Applications by Residents

(Indonesia, Malaysia, Viet Nam, Philippines, Thailand, and Singapore)



Source: Authors' calculation.

In Group B, the graph shows the ratios of utility model applications by residents to remain above 60%. Although Viet Nam will reach 100% in 2029, Indonesia will gradually decrease from 2017.

11.3. Variables for which the coefficients are positive in the multi-regression for IP applications by residents

a) Patent applications

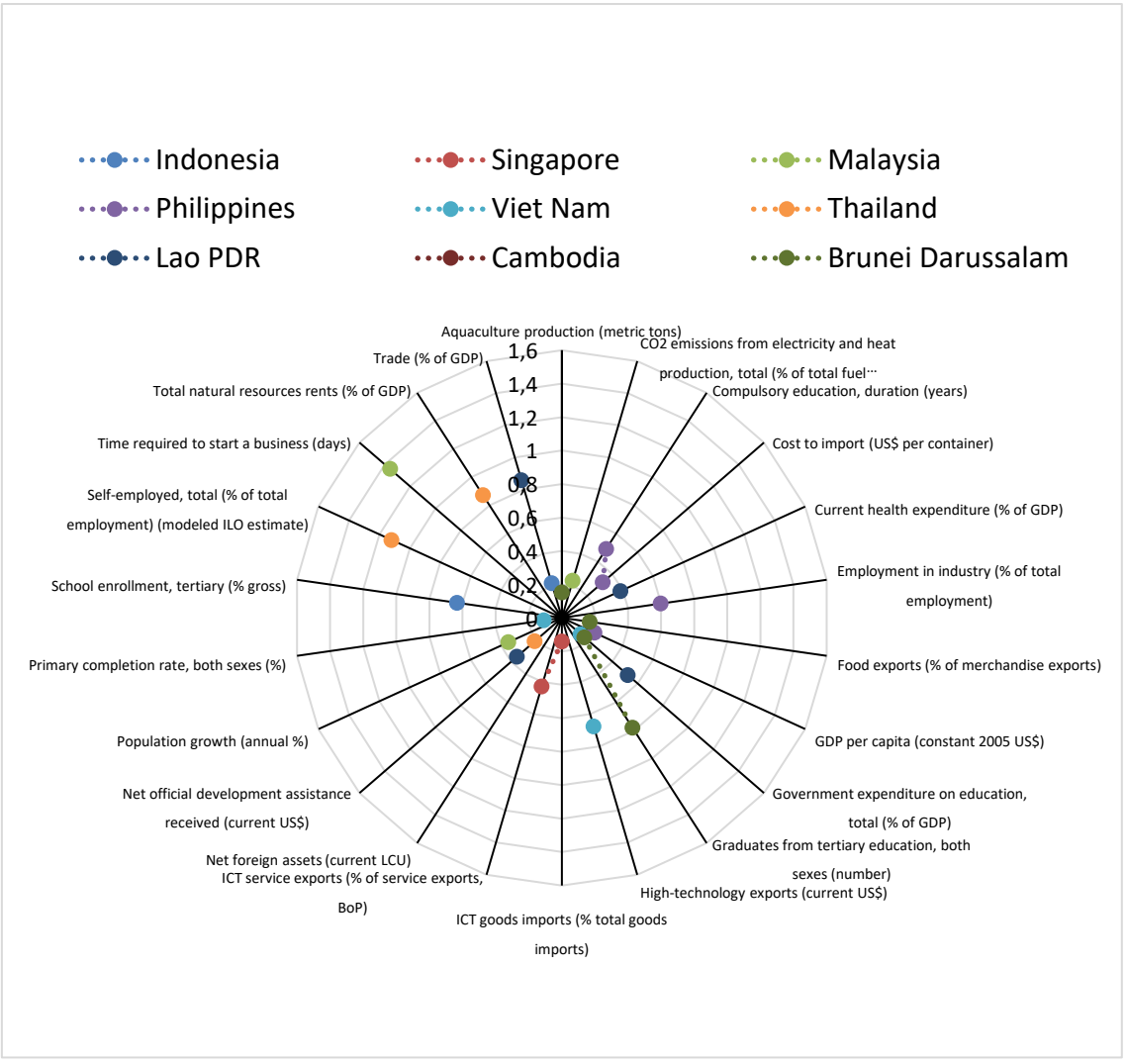
Table 1: Variables for which their coefficients are positive in the multi-regression for patents applications by residents

	Indonesia	Singapore	Malaysia	Philippines	Viet Nam	Thailand	Lao PDR	Cambodia	Brunei Darussalam
Aquaculture production (metric tons)									0.153
CO2 emissions from electricity and heat production, total (% of total fuel combustion)			0.231						
Compulsory education, duration (years)				0.490					
Cost to import (US$ per container)				0.324					
Current health expenditure (% of GDP)							0.385		
Employment in industry (% of total employment)				0.598					
Food exports (% of merchandise exports)									0.169
GDP per capita (constant 2005 US$)				0.214					
Government expenditure on education, total (% of GDP)					0.149		0.522		0.178
Graduates from tertiary education, both sexes (number)									0.780
High-technology exports (current US$)					0.676				
ICT goods imports (% total goods imports)		0.142							
ICT service exports (% of service exports, BoP)		0.427							
Net foreign assets (current LCU)	4.559								
Net official development assistance received (current US$)						0.214	0.356		
Population growth (annual %)			0.351						
Primary completion rate, both sexes (%)					0.109				
School enrollment, tertiary (% gross)	0.633								
Self-employed, total (% of total employment) (modeled ILO estimate)						1.119			
Time required to start a business (days)			1.359						
Total natural resources rents (% of GDP)						0.873			
Trade (% of GDP)	0.216						0.857		

Source: Authors' calculation.

Table 1 shows that most variables differ by country, except for 1) 'government expenditure on education, total (% of GDP)'; 2) 'net ODA received (current US$)'; and 3) 'trade (% of GDP)', which are common in more than two countries: 1) Viet Nam, Lao PDR, Brunei Darussalam, 2) Thailand, Lao PDR, and 3) Indonesia, Lao PDR.

Figure 138. Variables and Positive Coefficients Used for Regression Analysis of Patent Applications



b) Design applications

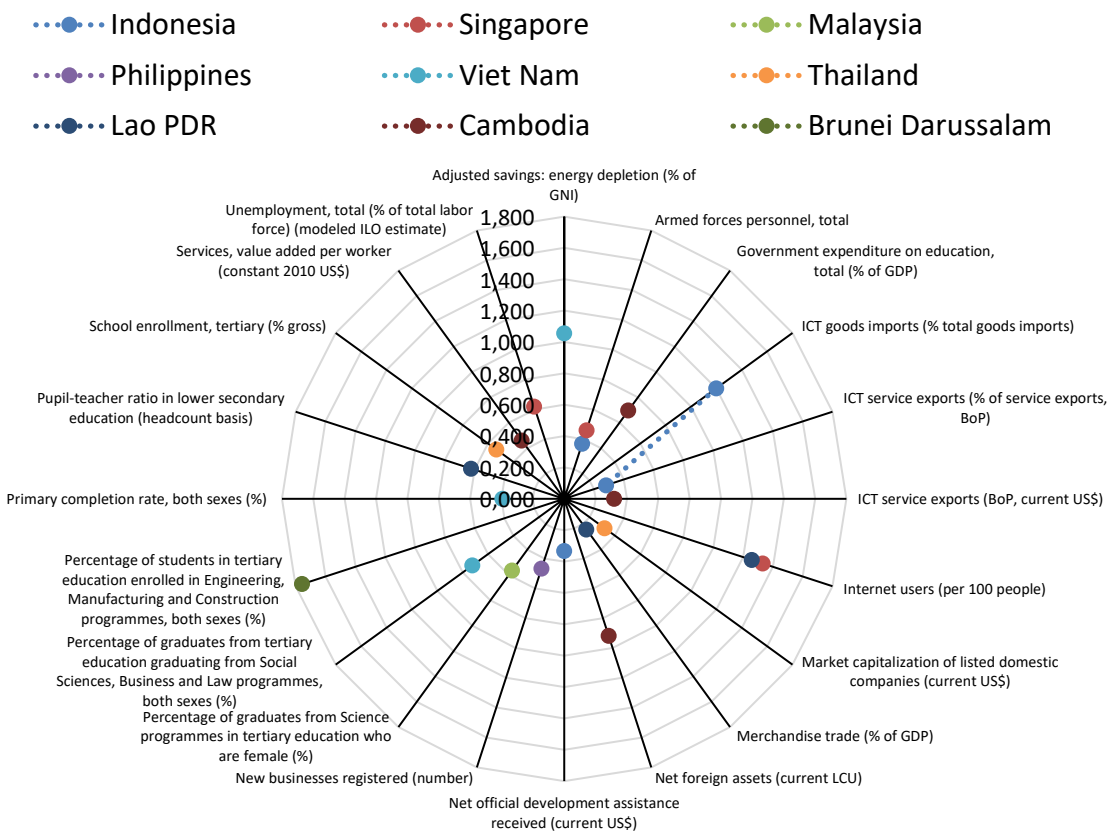
Table 2: Variables for which their coefficients are positive in the multi-regression for design applications by residents

	Indonesia	Singapore	Malaysia	Philippines	Viet Nam	Thailand	Lao PDR	Cambodia	Brunei Darussalam
Adjusted savings: energy depletion (% of GNI)					1.055				
Armed forces personnel, total	0.370	0.461							
Government expenditure on education, total (% of GDP)								0.696	
ICT goods imports (% total goods imports)	1.199								
ICT service exports (% of service exports, BoP)	0.281								
ICT service exports (BoP, current US$)								0.319	
Internet users (per 100 people)		1.331					1.259		
Market capitalization of listed domestic companies (current US$)						0.318			
Merchandise trade (% of GDP)							0.242		
Net foreign assets (current LCU)								0.918	
Net official development assistance received (current US$)	0.333								
New businesses registered (number)				0.468					
Percentage of graduates from Science programmes in tertiary education who are female (%)			0.566						
Percentage of graduates from tertiary education graduating from Social Sciences, Business and Law programmes, both sexes (%)					0.723				
Percentage of students in tertiary education enrolled in Engineering, Manufacturing and Construction programmes, both sexes (%)									1.758
Primary completion rate, both sexes (%)					0.394				
Pupil–teacher ratio in lower secondary education (headcount basis)							0.625		
School enrollment, tertiary (% gross)						0.534			
Services, value added per worker (constant 2010 US$)								0.460	
Unemployment, total (% of total labor force) (modeled ILO estimate)		0.619							

Source: Authors' calculation.

Table 2 shows that the common variables for design in more than two countries are: 'armed forces personnel, total' and 'Internet users (per 100 people)', in Indonesia and Singapore, and in Singapore and Lao PDR, respectively.

Figure 139. Variables and Positive Coefficients Used for Regression Analysis for Design Applications



Source: Authors' calculation.

c) Trademark applications

Table 3: Variables for which their coefficients are positive in the multi-regression for trademark applications by residents

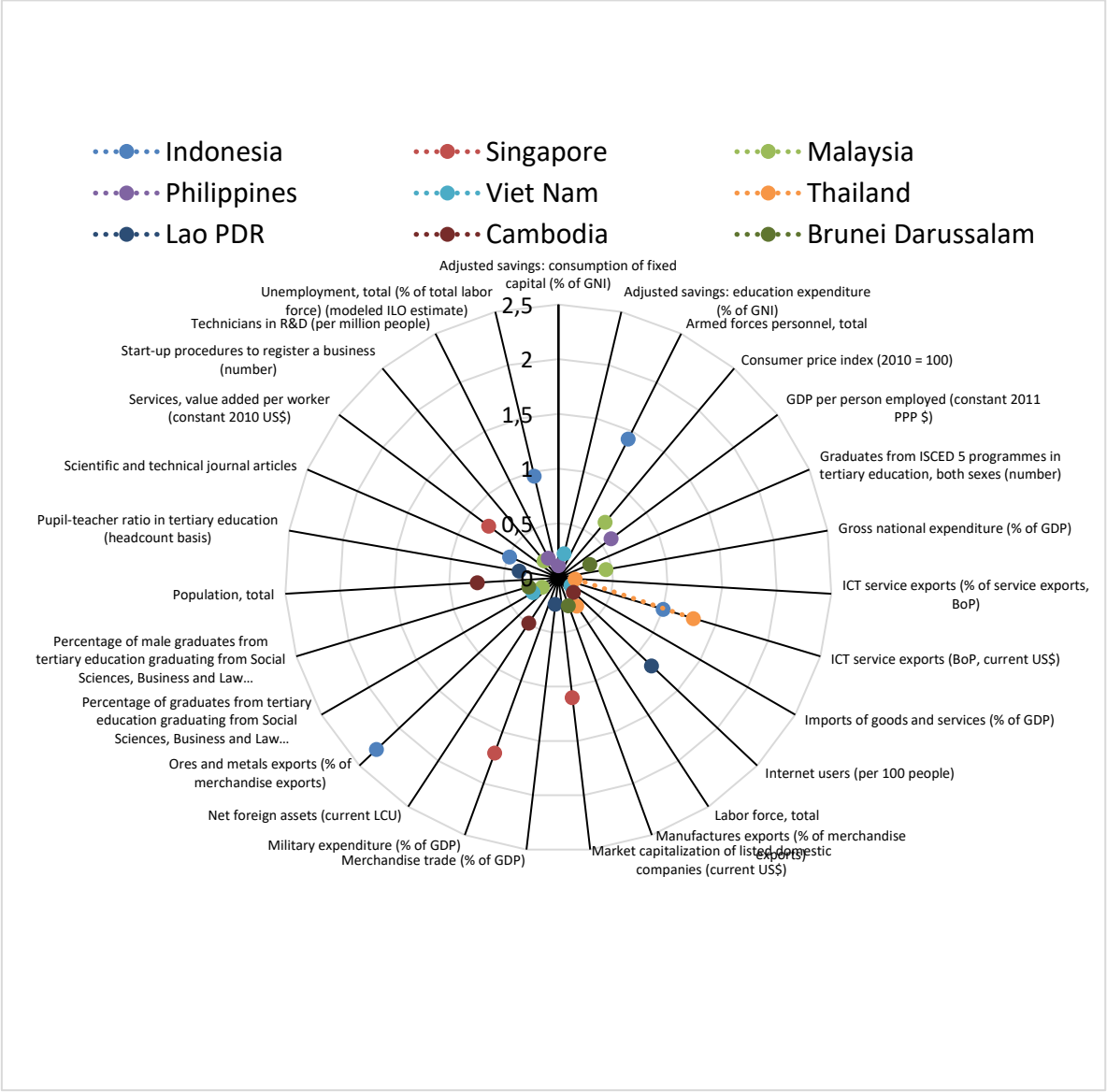
	Indonesia	Singapore	Malaysia	Philippines	Viet Nam	Thailand	Lao PDR	Cambodia	Brunei Darussalam
Adjusted savings: consumption of fixed capital (% of GNI)				0.114					
Adjusted savings: education expenditure (% of GNI)					0.229				
Armed forces personnel, total	1.421								
Consumer price index (2010 = 100)			0.665						
GDP per person employed (constant 2011 PPP $)				0.601					
Graduates from ISCED 5 programmes in tertiary education, both sexes (number)									0.313
Gross national expenditure (% of GDP)			0.444						
ICT service exports (% of service exports, BoP)						0.155			
ICT service exports (BoP, current US$)	1.003					1.291			
Imports of goods and services (% of GDP)					0.135				
Internet users (per 100 people)							1.173	0.190	
Labor force, total						0.308			
Manufactures exports (% of merchandise exports)									0.271

Market capitalization of listed domestic companies (current US$)		1.102							
Merchandise trade (% of GDP)							0.243		
Military expenditure (% of GDP)		1.703							
Net foreign assets (current LCU)								0.493	
Ores and metals exports (% of merchandise exports)	2.285								
Percentage of graduates from tertiary education graduating from Social Sciences, Business and Law programmes, both sexes (%)			0.168		0.267				
Percentage of male graduates from tertiary education graduating from Social Sciences, Business and Law programmes, male (%)									0.282
Population, total								0.742	
Pupil-teacher ratio in tertiary education (headcount basis)							0.364		
Scientific and technical journal articles	0.483								
Services, value added per worker (constant 2010 US$)		0.792							
Start-up procedures to register a business (number)			0.203						
Technicians in R&D (per million people)				0.202					
Unemployment, total (% of total labor force) (modeled ILO estimate)	0.956								

Source: Authors' calculation.

Table 3 shows that most variables differ for each country, except 1) 'ICT service exports (BoP, current US$)', 2) 'Internet users (per 100 people)', and 3) 'percentage of graduates from tertiary education graduating from social sciences, business, and law programmes, both sexes (%)', which are common in more than two countries, 1) Indonesia, Thailand, 2) Lao PDR, Cambodia, and 3) Malaysia, Viet Nam.

Figure 140. Variables and Positive Coefficients Used for Regression Analysis for Trademark Applications



Source: Authors' calculation.

d) Utility model applications

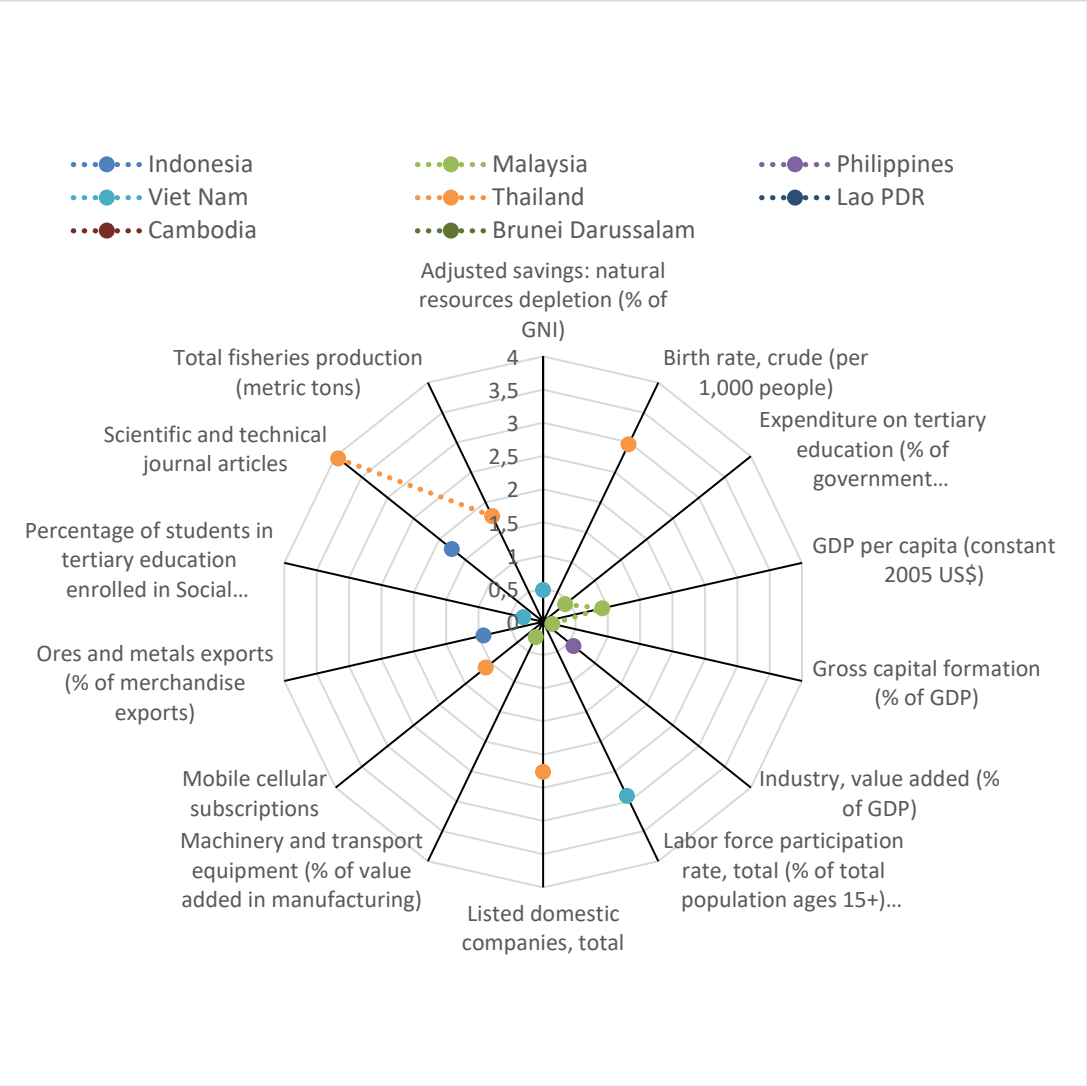
Table 4: Variables for which their coefficients are positive in the multi-regression for utility model applications by residents

	Indonesia	Malaysia	Philippines	Viet Nam	Thailand
Adjusted savings: natural resources depletion (% of GNI)				0.478	
Birth rate, crude (per 1,000 people)					2.966
Expenditure on tertiary education (% of government expenditure on education)		0.425			
GDP per capita (constant 2005 US$)		0.912			
Gross capital formation (% of GDP)		0.142			
Industry, value added (% of GDP)			0.586		
Labor force participation rate, total (% of total population ages 15+) (modeled ILO estimate)				2.912	
Listed domestic companies, total					2.259
Machinery and transport equipment (% of value added in manufacturing)		0.254			
Mobile cellular subscriptions					1.106
Ores and metals exports (% of merchandise exports)	0.918				
Percentage of students in tertiary education enrolled in Social Sciences, Business and Law programmes, both sexes (%)				0.309	
Scientific and technical journal articles	1.756				3.947
Total fisheries production (metric tons)					1.769
*No data available in Singapore, Lao PDR, Cambodia, and Brunei Darussalam.					

Source: Authors' calculation.

The above table shows that the common variable for the utility model for two countries is 'scientific and technical journal articles', for Indonesia and Thailand.

Figure 141. Variables and Positive Coefficients Used for Regression Analysis for Utility Model Applications



Source: Authors' calculation.

12. Backlog Analysis

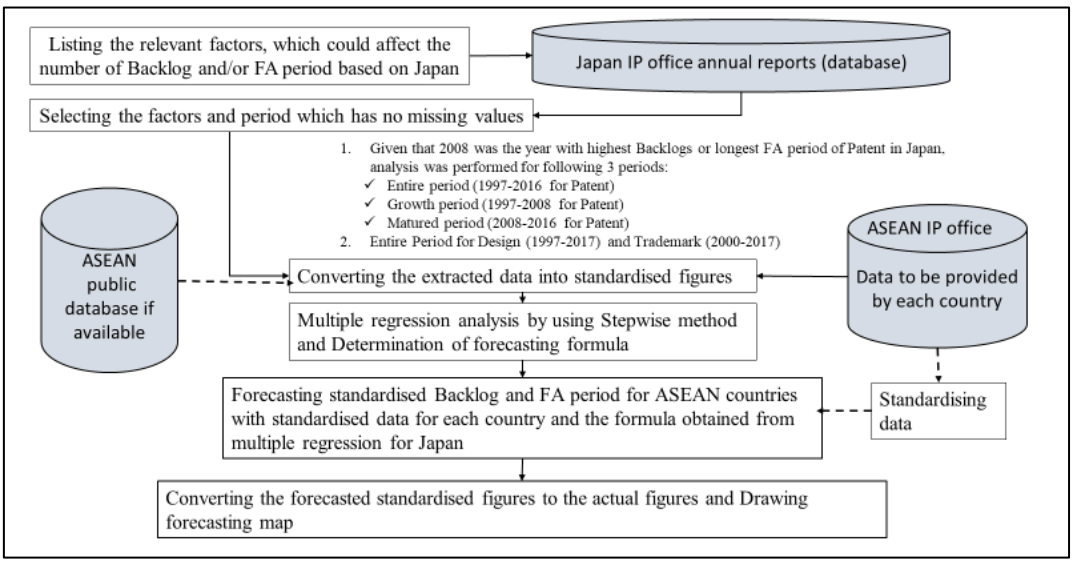
12.1. Process

The process of forecasting the number of backlogs and the period to First Action from the examination request (FA period) were determined. First, the relevant factors that could affect the number of backlogs and/or the FA period based on Japan's IP office annual reports (database) are listed. Secondly, the factors and periods with no missing values were selected. Given that 2008 was the year with the highest backlogs and the longest FA periods for patents in Japan, analysis was performed for the following periods: the entire period (1997–2016 for patents), the growth period (1997–2008 for patents), the matured period (2008–2016 for patent), and the entire period for design (1997–2017) and trademarks (2000–2017). Thirdly, before conducting multiple regression analysis, the extracted date should be converted to standardised figures.

For ASEAN countries, the database can be replaced by ASEAN's public database (if available), ASEAN IP office data, or data provided by each country. A stepwise method was used to determine the forecasting formula in the multiple regression analysis.

The standardised backlog and FA period for ASEAN countries were calculated over the forecasting period by substituting standardised variables into the formula obtained from the multiple regression and using the same slopes for the variables for the future. Lastly, the forecasted standardised figures were converted to the actual figures.

Figure 142. Process of Forecasting the Number of Backlog and FA Period



Source: Authors' calculation.

12.2. Entire period for patents (1997–2016)

a) Relevant factors for the regression analysis for Japan

A total of 19 factors were selected, which relate the number of backlogs and the FA period.

Figure 143. The Relevant Factors for Regression Analysis on Backlogs on Patent Application and Period from Examination Request to the FA Period During 1997-2016 (Japan Patent)

1. No. of patent application
2. No. of resident patent applications
3. No. of non-resident patent applications
4. No. of request for examination
5. No. of patent decision of patent applications
6. No. of patent registrations
7. No. of resident patent registrations
8. No. of non-resident patent registrations
9. No. of appeals against refusal decision
10. No. of PCT Applications (Receiving office: Foreign)
11. No. of ISR on PCT applications
12. No. of IPER on PCT applications
13. No. of examiners (for patent and utility model)
14. No. of appeal examiners
15. No. of early examination request
16. No. of the first actions
17. No. of patent attorneys
18. Fee for a patent application
19. Fee for a request for examination

Source: Authors' calculation.

b) Multiple regression analysis

Figure 144. Multiple Regression Analysis of Backlog Patent Applications by the Relevant Factors During 1997-2016 (Japan Patent)

Model Summary

Method: Stepwise (Criteria: F-to-enter >= 1.500, F-to-remove <= 1.000).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
11	0.998	0.996	0.992	0.0889168

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
11	(Constant)	0.141	0.047		2.993	0.014
X1	No. of request for examination	0.099	0.055	0.100	1.779	0.106
X2	No. of early examination request	0.781	0.394	0.741	1.984	0.075
X3	No. of examiners (for patent and utility model)	1.667	0.160	1.698	10.435	0.000
X4	No. of non-resident patent registrations	−0.893	0.096	−0.907	−9.330	0.000
X5	No. of appeals against refusal decision	0.257	0.048	0.261	5.355	0.000
X6	No. of patent attorneys	−2.257	0.508	−2.294	−4.446	0.001
X7	No. of ISR on PCT applications	0.700	0.215	0.688	3.253	0.009
X8	Fee for a patent application	0.489	0.182	0.494	2.685	0.023
X9	Fee for a request for examination	0.212	0.105	0.221	2.024	0.070

a. Dependent Variable: Backlog on patent application

Multiple Regression Formula for Backlog on patent application:

Y^{*}=0.099***X1***+0.781***X2***+1.667***X3***-0.893***X4***+0.257***X5***-2.257***X6***+0.700***X7***+0.489***X8***+0.212***X9***+0.141

Source: Authors' calculation.

From the coefficients above, X6 'no. of patent attorneys' should be increased to decrease the backlogs of patent applications over the entire period. As the data covers the entire period, including the growth and matured period, there are some contradicting variables, such as X3

'no. of examiners (for patents and utility model)', (e.g. the number of examiners has a positive correlation with the number of backlogs).

Figure 145. Multiple Regression Analysis of FA Period by the Relevant Factors During 1997-2016 (Japan Patent)

Model Summary

Method: Stepwise (Criteria: F-to-enter >= 1.500, F-to-remove <= 1.000).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
9	0.990	0.980	0.968	0.1835441

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
9	(Constant)	−0.104	0.045		−2.296	0.041
X1	No. of the first actions	1.208	0.115	1.231	10.471	0.000
X2	No. of non-resident patent applications	−0.832	0.200	−0.832	−4.160	0.001
X3	No. of appeals against refusal decision	0.195	0.137	0.195	1.424	0.180
X4	No. of patent decision of patent applications	−3.040	0.767	−3.096	−3.965	0.002
X5	No. of resident patent applications	1.119	0.286	1.119	3.920	0.002
X6	No. of patent attorneys	1.485	0.474	1.485	3.131	0.009
X7	No. of resident patent registrations	1.815	0.692	1.815	2.624	0.022

a. Dependent Variable: Period from examination request to the first action (FA period)

Multiple Regression Formula for FA period on patent application:

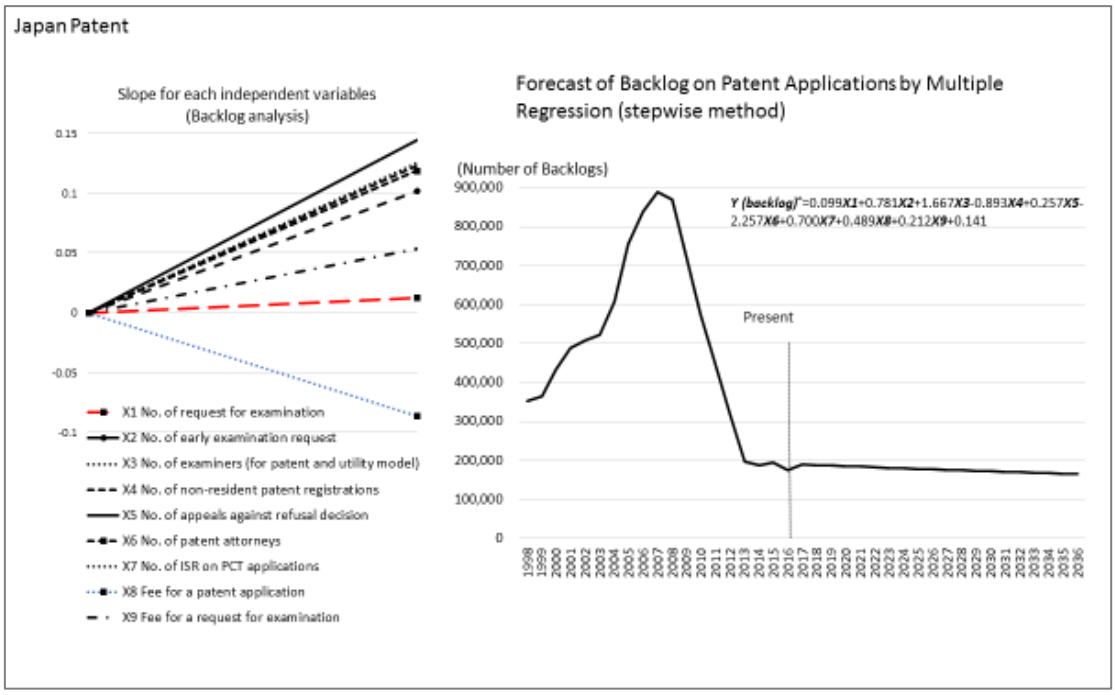
Y^{*}=1.208***X1***-0832***X2***+0.195***X3***-3.040***X4***+1.119***X5***+1.485***X6***+1.815***X7***-0.104

Source: Authors' calculation.

From the coefficients above, X4 'no. of patent decisions of patent applications' should be increased to decrease the FA period of patent applications over the entire period, which is very convincing. However, X6 'no. of patent attorneys' is contradictory since patent attorneys actually increased and succeeded in decreasing the FA period after 2010.

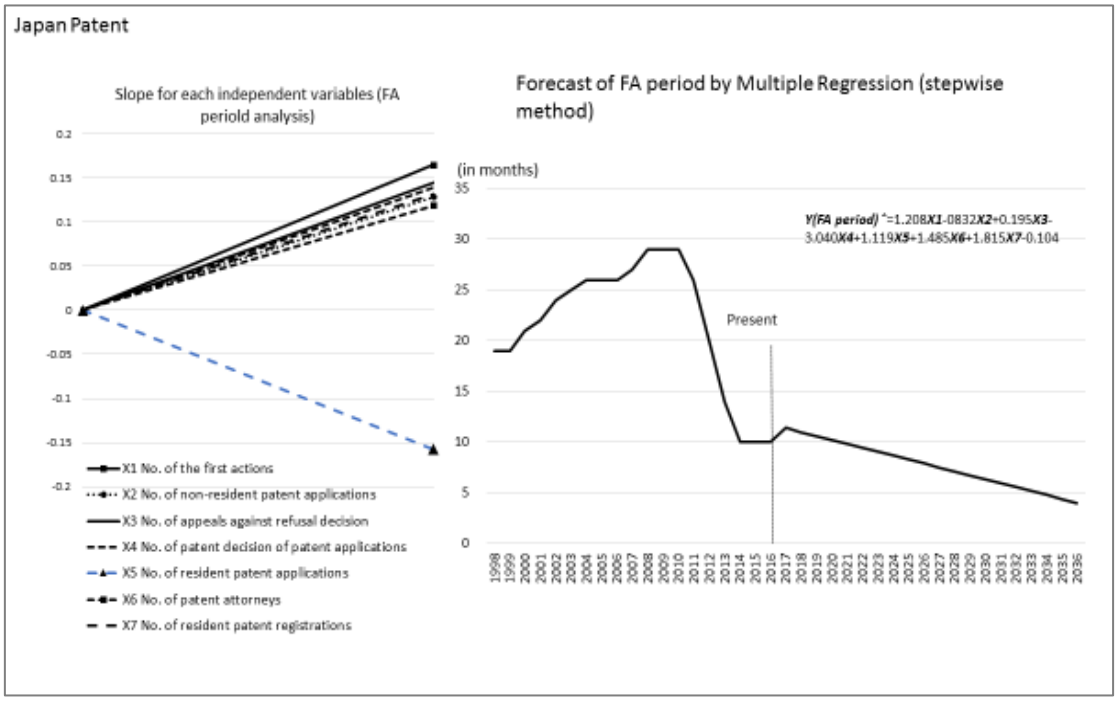
c) Forecast

Figure 146. Forecast of Backlog on patent applications (Japan Patent)



Source: Authors' calculation.

Figure 147. Forecast of FA period (Japan Patent)



Source: Authors' calculation.

Figure 148. Excluded Variables and coefficients of backlog patent applications which Beta In is negative (Japan Patent)

Japan-Patent

(1997-2016)

Excluded Variables from Multiple regression coefficients of Backlog patent applications which Beta In is Negative

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
11	No. of patent application	-.090[a]	-0.698	0.504	-0.226	0.026
	No. of resident patent applications	-.094[a]	-0.620	0.551	-0.202	0.019
	No. of non-resident patent applications	-.116[a]	-0.899	0.392	-0.287	0.025
	No. of patent decision of patent applications	-.056[a]	-0.361	0.726	-0.120	0.018
	No. of appeal examiners	-.016[a]	-0.425	0.681	-0.140	0.316
	No. of the first actions	-.052[a]	-0.395	0.702	-0.131	0.026

a. Dependent Variable: Backlog on patent application

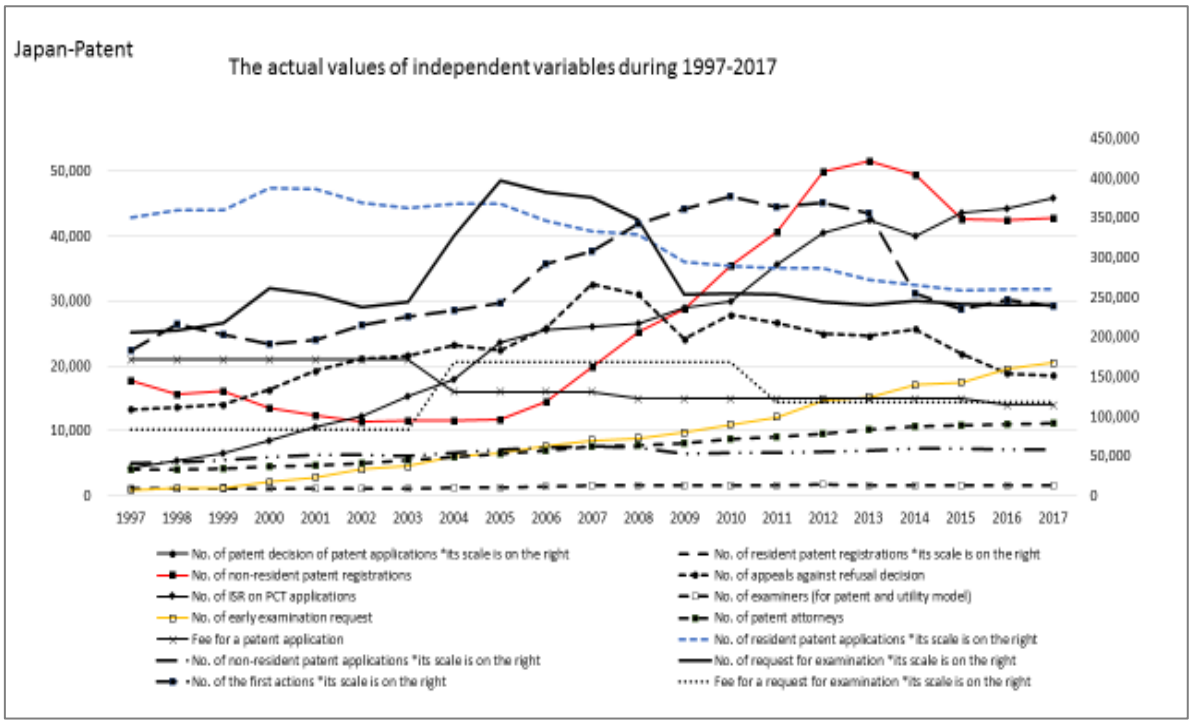
Excluded Variables from Multiple regression coefficients of FA period which Beta In is Negative

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
9	No. of request for examination	-.093[a]	-0.586	0.563	-0.177	0.072
	No. of PCT Applications (Receiving office: Foreign)	-.021[a]	-0.200	0.845	-0.060	0.171
	No. of ISR on PCT applications	-.505[a]	-0.828	0.425	-0.242	0.005
	No. of ISR on IPER applications	-.012[a]	-0.138	0.893	-0.042	0.255
	No. of early examination request	-.580[a]	-0.824	0.427	-0.241	0.003
	Fee for a request for examination	-.034[a]	-0.328	0.749	-0.099	0.167

a. Dependent Variable: Period from examination request to the first action (FA period)

Source: Authors' calculation.

Figure 149. Actual values of independent variables during 1997-2017 (Japan Patent)



Source: Authors' calculation.

12.3. Growth period for patents (1997–2008)

a) Multiple regression analysis

Figure 150. Multiple Regression Analysis of Backlog Patent Applications by the Relevant Factors during 1997-2008 (Japan Patent)

Model Summary

Method: Stepwise (Criteria: F-to-enter >= 1.500, F-to-remove <= 1.000).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
4	0.999	0.997	0.996	0.0676042

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
4	(Constant)	0.000	0.020		0.000	1.000
X1	No. of patent attorneys	1.458	0.194	1.458	7.527	0.000
X2	No. of request for examination	0.367	0.054	0.367	6.838	0.000
X3	No. of PCT Applications (Receiving office: Foreign)	−0.293	0.064	−0.293	−4.585	0.003
X4	No. of early examination request	−0.532	0.179	−0.532	−2.978	0.021

a. Dependent Variable: Backlog on patent application

Multiple Regression Formula for Backlog on patent application:

$Y^{\wedge}$=1.458***X1***+0.367***X2***-0.293***X3***-0.532***X4***+0.000

Source: Authors' calculation.

Figure 151. Multiple Regression Analysis of FA Period by the Relevant Factors During 1997-2008 (Japan Patent)

Model Summary

Method: Stepwise (Criteria: F-to-enter >= 1.500, F-to-remove <= 1.000).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
3	0.981	0.962	0.948	0.2390198

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
3	(Constant)	0.000	0.069		0.000	1.000
X1	No. of early examination request	1.010	0.073	1.010	13.880	0.000
X2	No. of IPER on PCT applications	0.483	0.169	0.483	2.858	0.021
X3	No. of appeal examiners	−0.363	0.170	−0.363	−2.136	0.065

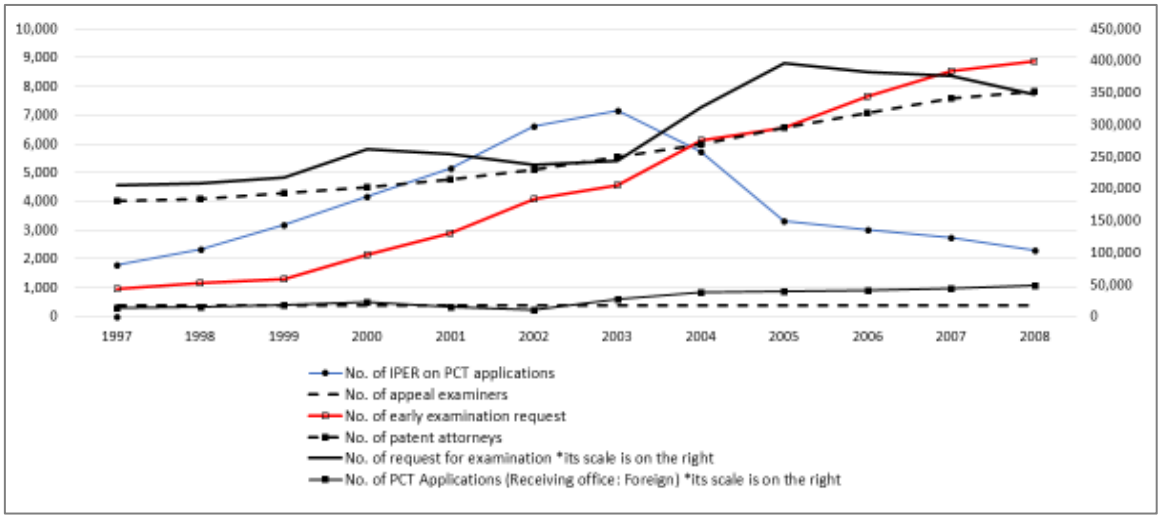
a. Dependent Variable: Period from examination request to the first action (FA period)

Multiple Regression Formula for FA period on patent application:

$Y^{\wedge}$=1.010***X1***+0.483***X2***-0.363***X3***+0.000

Source: Authors' calculation.

Figure 152. The Actual Values of Independent Variables for Backlogs and FA Period During 1997-2008 (Japan Patent)



Source: Authors' calculation.

12.4. Matured period for patents (2008–2016)

a) Multiple regression analysis

Figure 153. Multiple Regression Analysis of Backlog Patent Applications by the Relevant Factors During 2008-2017 (Japan Patent)

Model Summary

Method: Stepwise (Criteria: F-to-enter >= 1.500, F-to-remove <= 1.000).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
4	0.999	0.999	0.998	0.0506649

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
4	(Constant)	0.000	0.016		0.000	1.000
X1	No. of ISR on PCT applications	−0.116	0.075	−0.116	−1.554	0.181
X2	No. of non-resident patent registrations	−0.341	0.029	−0.341	−11.581	0.000
X3	No. of resident patent applications	0.223	0.047	0.223	4.752	0.005
X4	No. of patent attorneys	−0.389	0.084	−0.389	−4.632	0.006

a. Dependent Variable: Backlog on patent application

Multiple Regression Formula for Backlog on patent application:

$Y^{\wedge}$=-0.116***X1***-0.341***X2***+0.223***X3***-0.389***X4***+0.000

Source: Authors' calculation.

Figure 154. Multiple Regression Analysis of FA Period by the Relevant Factors During 2008-2017 (Japan Patent)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	0.988	0.975	0.968	0.1872273

Method: Stepwise (Criteria: F-to-enter >= 1.500, F-to-remove <= 1.000).

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
2	(Constant)	0.000	0.059		0.000	1.000
X1	No. of patent attorneys	−0.890	0.064	−0.890	−13.825	0.000
X2	No. of non-resident patent applications	−0.204	0.064	−0.204	−3.164	0.016

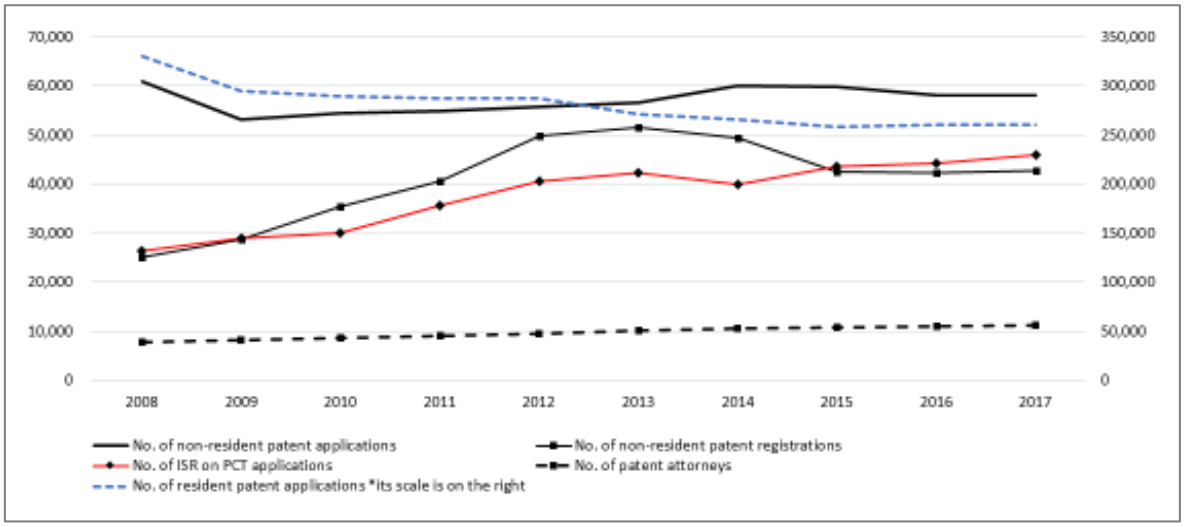
a. Dependent Variable: Period from examination request to the first action (FA period)

Multiple Regression Formula for FA period on patent application:

Y^{*}=-0.890***X1***-0.204***X2***+0.000

Source: Authors' calculation.

Figure 155. The Actual Values of Independent Variables for Backlogs and FA Period During 2008-2017 (Japan Patent)



Source: Authors' calculation.

12.5. Entire period for design (1997–2017) and trademarks (2000–2017)

a) Relevant factors for the regression analysis for Japan

Figure 156. The Relevant Factors for Regression Analysis on Period from Application to the FA Period During 1997-2017 (Japan Design)

1. No. of Design application
2. No. of resident Design applications
3. No. of non-resident Design applications
4. No. of Design decision of Design applications
5. No. of Design registrations
6. No. of resident Design registrations
7. No. of non-resident Design registrations
8. No. of appeals against refusal decision
9. No. of examiners (for Design)
10. No. of appeal examiners
11. No. of early examination request
12. No. of the first actions
13. No. of Design attorneys

Source: Authors' calculation.

Figure 157. The Relevant Factors for Regression Analysis on Period from Application to the FA During 2000-2017 (Japan Trademark)

1. No. of Trademark application
2. No. of resident Trademark applications
3. No. of non-resident Trademark applications
4. No. of Trademark decision of Trademark applications
5. No. of Trademark registrations
6. No. of resident Trademark registrations
7. No. of non-resident Trademark registrations
8. No. of appeals against refusal decision
9. No. of examiners (for Trademark)
10. No. of appeal examiners
11. No. of early examination request
12. No. of the first actions
13. No. of Trademark attorneys
14. No. of Applications in Madrid system (JPO receiving from Foreign)
15. No. of the first action in Madrid system
16. No. of the Trademark decision in Madrid system
17. No. of the Trademark registration in Madrid system
18. No. of Applications in Madrid system (Received at JPO)
19. No. of total Applications in Madrid system (Receiving from JPO to Foreign)

Source: Authors' calculation.

b) Multiple regression analysis

Figure 158. Multiple Regression Analysis of FA Period by the Relevant Factors During 1997-2017 (Japan Design)

Model Summary

Method: Stepwise (Criteria: F-to-enter >= 1.500, F-to-remove <= 1.000).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
10	0.988	0.976	0.965	0.1911640

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
10	(Constant)	0.000	0.042		0.000	1.000
X1	No. of appeal examiners	-0.424	0.055	-0.424	-7.707	0.000
X2	No. of early examination request	0.370	0.074	0.370	4.997	0.000
X3	No. of examiners (for Design)	-0.204	0.060	-0.204	-3.401	0.004
X4	No. of non-resident Design applications	-0.437	0.164	-0.437	-2.659	0.019
X5	No. of appeals against refusal decision	0.512	0.090	0.512	5.662	0.000
X6	No. of non-resident Design registrations	-0.247	0.186	-0.247	-1.329	0.205

a. Dependent Variable: Period from application to the first action (FA period)

Multiple Regression Formula for FA period on Design application:

Y'=-0.424***X1***+0.370***X2***-0.204***X3***-0.437***X4***+0.512***X5***-0.247***X6***+0.000

Source: Authors' calculation.

Figure 159. Excluded Variables from Multiple Regression Coefficients of FA Period which Beta In is Negative

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance	VIF	Minimum Tolerance
10	No. of Design application	-.018[b]	-0.133	0.896	-0.037	0.100	9.996	0.044
	No. of resident Design applications	-.023[b]	-0.133	0.896	-0.037	0.060	16.666	0.044

a. Dependent Variable: Period from application to the first action (FA period)

Source: Authors' calculation.

Figure 160. Multiple Regression Analysis of FA Period by the Relevant Factors During 2000-2017 (Japan Trademark)

Model Summary

Method: Stepwise (Criteria: F-to-enter >= 1.500, F-to-remove <= 1.000).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
8	0.991	0.983	0.973	0.1685134

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
8	(Constant)	0.000	0.040		0.000	1.000
X1	No. of Trademark attorneys	−1.727	0.203	−1.727	−8.499	0.000
X2	No. of non-resident Trademark registrations	1.091	0.107	1.091	10.172	0.000
X3	No. of appeal examiners	−0.192	0.073	−0.192	−2.641	0.023
X4	No. of the first actions	0.698	0.121	0.698	5.754	0.000
X5	No. of Trademark decision of Trademark applications	−0.765	0.116	−0.765	−6.604	0.000
X6	No. of total Applications in Madrid system (Receiving from JPO to Foreign)	0.223	0.138	0.223	1.616	0.134

a. Dependent Variable: Period from application to the first action (FA period)

Multiple Regression Formula for FA period on Trademark application:

$Y^{\wedge}$=-1.727***X1***+1.091***X2***-0.192***X3***+0.698***X4***-0.765***X5***+0.223***X6***+0.000

Source: Authors' calculation.

Figure 161. Excluded Variables from Multiple Regression Coefficients of FA Period which Beta In is Negative (Japan Trademark)

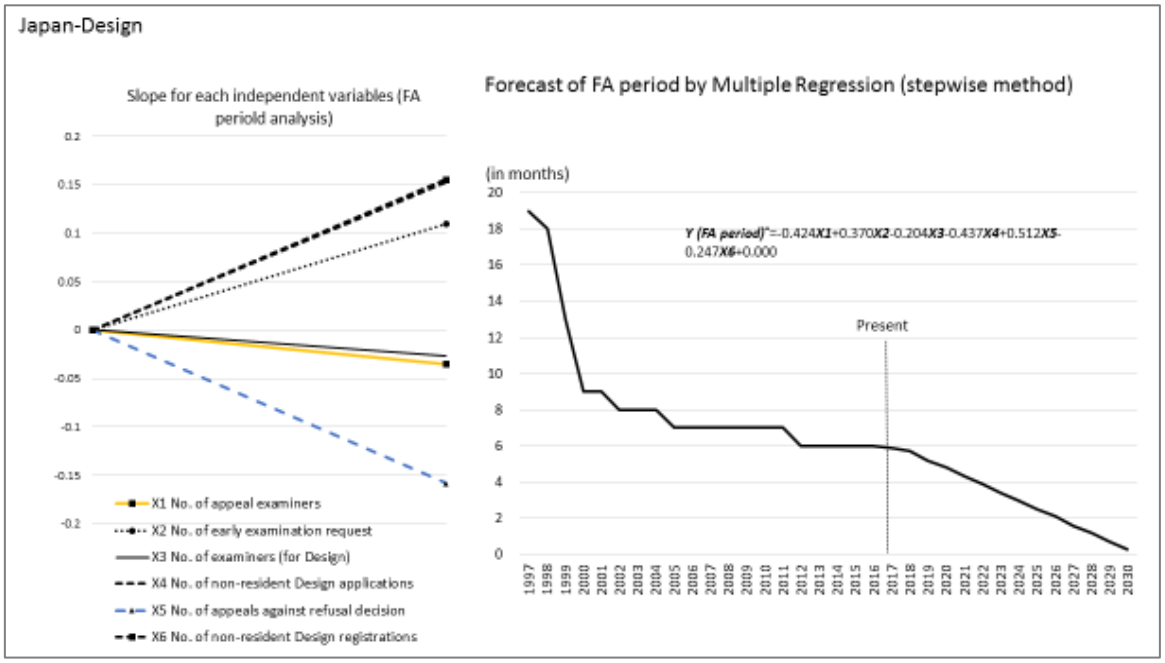
Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance	VIF	Minimum Tolerance
8	No. of Trademark application	-.051[f]	-0.684	0.510	-0.211	0.299	3.348	0.017
	No. of resident Trademark applications	-.048[f]	-0.691	0.506	-0.213	0.340	2.944	0.017
	No. of non-resident Trademark applications	-.057[f]	-0.459	0.656	-0.144	0.110	9.126	0.025
	No. of Trademark registrations	-.070[f]	-0.411	0.690	-0.129	0.058	17.289	0.021
	No. of resident Trademark registrations	-.062[f]	-0.411	0.690	-0.129	0.074	13.538	0.021
	No. of examiners (for Trademark)	-.004[f]	-0.043	0.967	-0.013	0.244	4.093	0.025
	No. of Applications in Madrid system (Receiving office: Foreign)	-.101[f]	-0.812	0.436	-0.249	0.105	9.513	0.032
	No. of the first action in Madrid system	-.005[f]	-0.038	0.970	-0.012	0.094	10.622	0.016
	No. of the Trademark decision in Madrid system	-.057[f]	-0.342	0.739	-0.108	0.062	16.024	0.021
	No. of the Trademark registration in Madrid system	-.089[f]	-0.441	0.668	-0.138	0.042	23.737	0.019
	No. of Applications in Madrid system (Receiving office: JPO)	-.294[f]	-0.924	0.377	-0.280	0.016	63.503	0.016

a. Dependent Variable: Period from application to the first action (FA period)

Source: Authors' calculation.

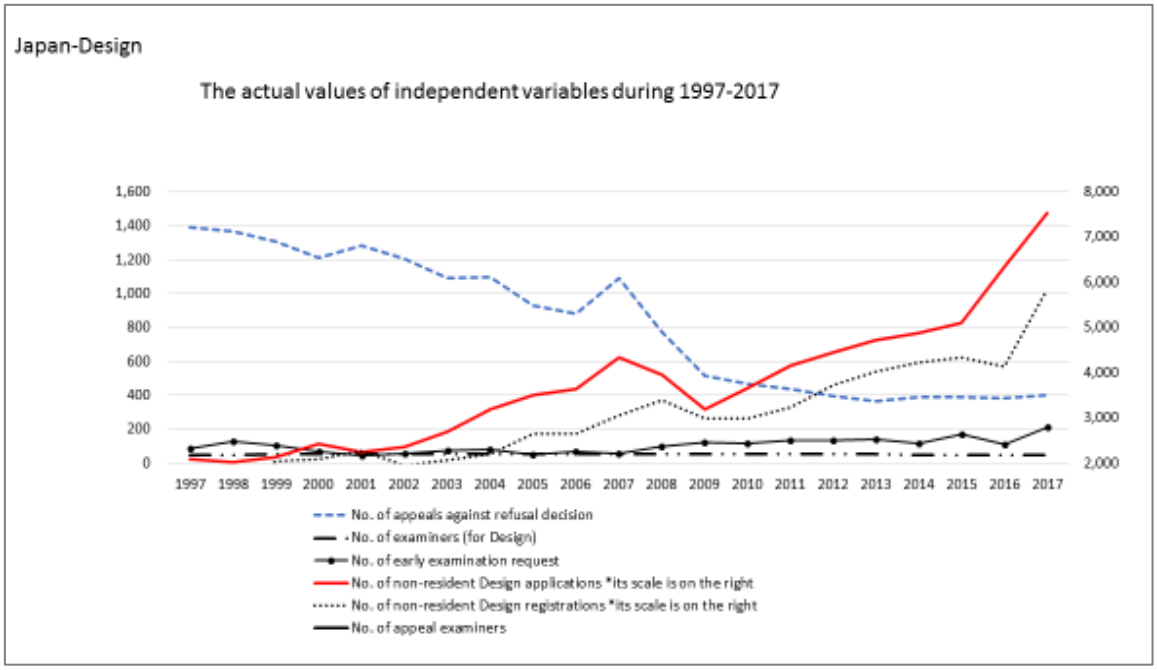
c) Forecast

Figure 162. Forecast of FA period (Japan Design)



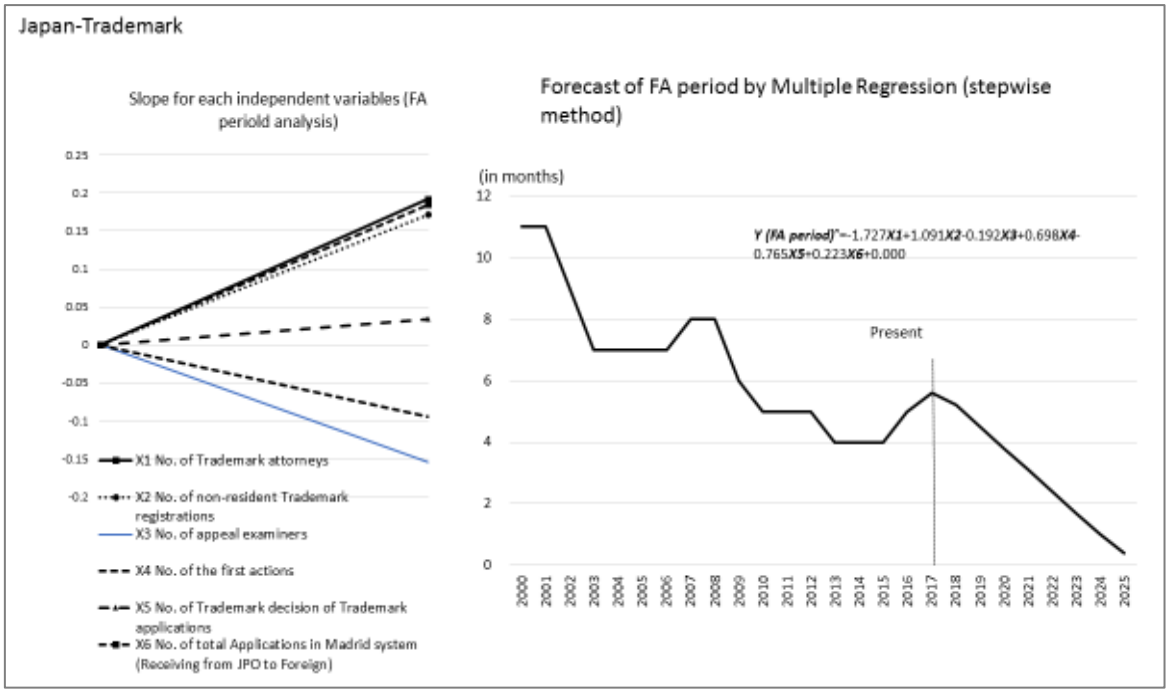
Source: Authors' calculation.

Figure 163. Actual values of independent variables during 1997-2017 (Japan Design)



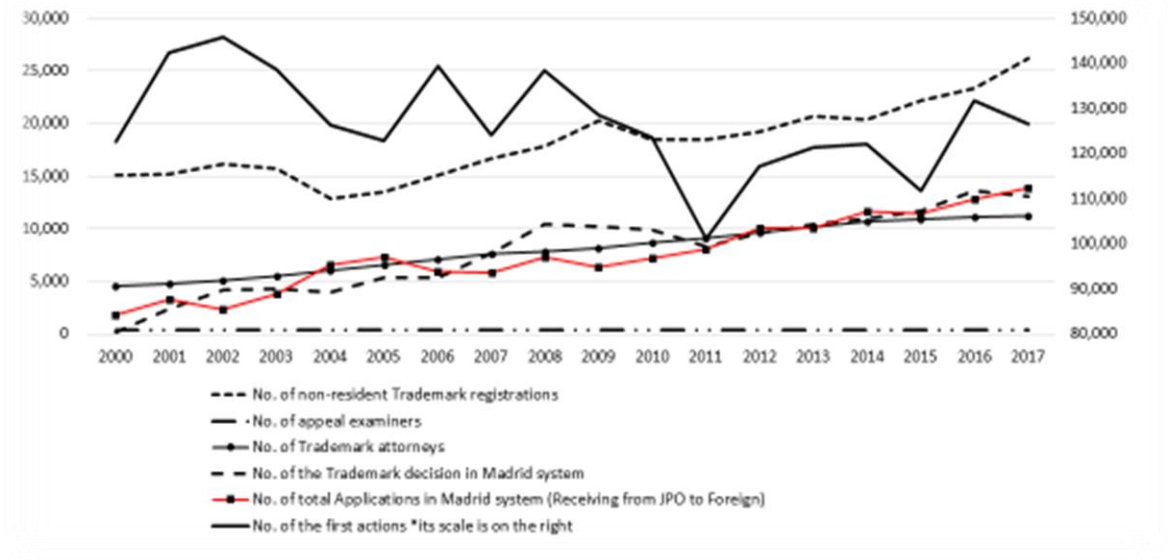
Source: Authors' calculation.

Figure 164. Forecast of FA period (Japan Trademark)



Source: Authors' calculation.

Figure 165. The Actual Values of Independent Variables During 2000-2017 (Japan Trademark)



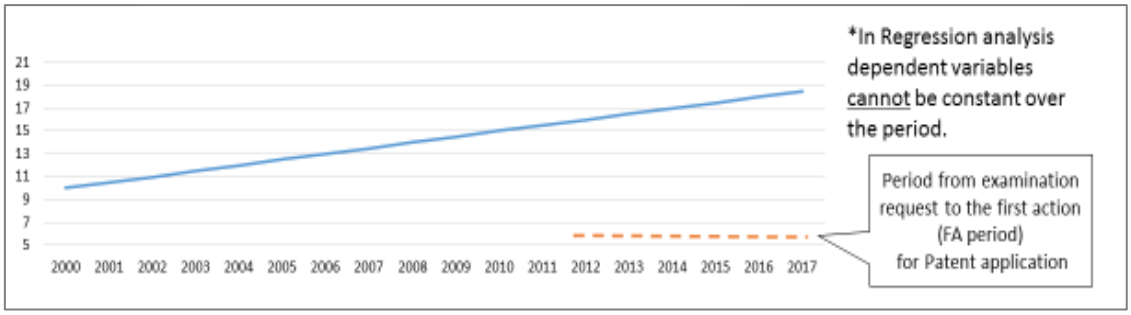
Source: Authors' calculation.

12.6. Brunei Darussalam Analysis

a) Background

1. Only trademark analysis was performed as there are not sufficient data provided by the Brunei Darussalam WG for patents and design.
2. For trademarks, neither the 'number of backlogs for applications' nor historical data of the 'period from application to the first action (FA period) (in month)' were not provided as dependent variables.
3. To execute the regression analysis, dummy data of the 'period from application to the first action (FA period) (in month)' as shown below were used as a dependent variable.

Figure 166. Dummy Period from Application to the FA Period (in Month)



Source: Authors' calculation.

4. The dummy data were created based on comparisons with the actual data for patents (six months constantly for the last six years) and the quote that 'It will usually take up to eighteen (18) to twenty-four (24) months to register a trade mark in Brunei Darussalam.'[4]

b) The relevant factors available for the regression analysis on the period from application to the first action (FA period) during 2000–2017 were as follows:

1. No. of trademark applications
2. No. of resident trademark applications
3. No. of non-resident trademark applications
4. No. of trademark registrations
5. No. of resident trademark registrations
6. No. of non-resident trademark registrations

[4]https://www.southeastasia-iprhelpdesk.eu/sites/default/files/publications/Brunei%20Factsheet.pdf

c) Multiple regression analysis of the FA period by the relevant factors during 2000–2017

Figure 167. Multiple Regression Analysis of FA Period by the Relevant Factors During 2000-2017 (Trademark)

Model Summary

Method: Stepwise (Criteria: F-to-enter >= 1.500, F-to-remove <= 1.000).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,673[a]	0,453	0,419	0,7841608

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-0.000	0.185		0.000	1.000
X1	No. of resident Trademark applications	0.673	0.185	0.673	3.643	0.002

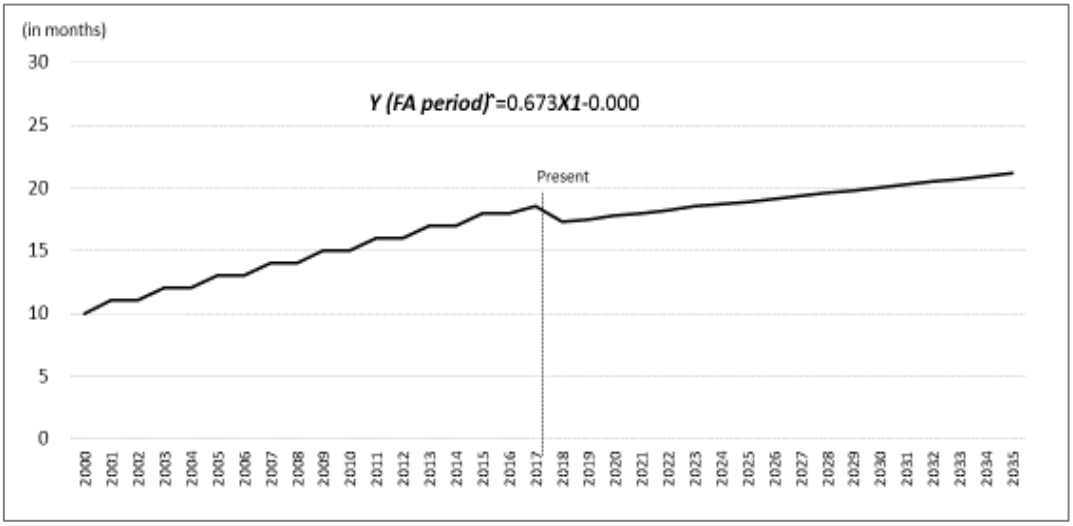
a. Dependent Variable: Period from application to the first action (FA period)

Multiple Regression Formula for FA period on Trademark application:
$Y^{\wedge}$=0.673*X1*-0.000

Source: Authors' calculation.

d) Forecast

Figure 168. Forecast of FA Period by Multiple Regression (Stepwise Method) (Trademark)



Source: Authors' calculation.

12.7. Conclusion

The WG requested each IPO in AMS to provide the historical data necessary to perform the backlog analysis. However, it was difficult for AMS to provide the data, except for Brunei Darussalam. In particular, the Viet Nam IPO indicated that they will not be participating in the backlog analysis. Therefore, measures and practices taken in the past in each AMS were not available, either.