THAILAND IN THE MIDDLE-INCOME TRAP:
AN UNRECOGNIZED CONTRIBUTION FROM THE GOVERNMENT

Nonarit Bisonyabut¹ and Chatra Kamsaeng²

Thailand Development Research Institute

Abstract

Much of the literature confirms that Thailand is in the middle-income trap. Many reasons are offered, including low R&D activities, lack of human capital and political instability. Though there are many explanations for the low engagement in R&D, there are some missing factors that also undermine the private incentives to invest in R&D: the share of revenue from government procurement to total revenue and the requirement of special licenses issued by public officials to operate in certain industries.

A standard logistic binary choice model applied to Thailand’s 446 listed firms finds that both factors contribute to the lack of R&D investment. In other words, lack of private interests in engaging R&D activity is stemmed partly from the government’s improper rules and regulations and its lack of transparency. Therefore, generous government subsidies and tax allowances aiming to stimulate private R&D is insufficient. It has to revise the necessity of special licenses in order to promote effective competition, and the government procurement process must be

¹ Research Fellow, Macroeconomic Policy Program, Thailand Development Research Institute. (bisonyabut@tdri.or.th)
² Researcher, Sectoral Economic Program, Thailand Development Research Institute. (chatra@tdri.or.th)
reformed to get rid of the patronage system that results in bribery and competition among businesses instead of competition to improve themselves.

Keywords: Thailand’s economic development, middle-income trap, research and development, licensing, public procurement, competition

1. Introduction

Thailand is a country caught in the middle-income trap: from the average annual GDP growth rate around 7 to 8 percent before the 1997 Asian financial crisis, the country has experienced a sharp decline in its growth rate to around 3 to 4 percent afterward. The country, which was once expected to be the fifth tiger of Asia, following Hong Kong, Singapore, South Korea and Taiwan, is now branded as the new “sick man” of Southeast Asia.

There are many explanations to the causes of this trap including 1) insufficient levels of investment in private R&D and innovation 2) lack of sufficiently qualified manpower to assist in upgrading its economy and 3) oligarchic political power structures with over-centralized authority that leads to the political trap.

This paper focuses on the first explanation and tries to illuminate why Thailand has a very low level of private R&D investment. The scope of the analysis is the Stock Exchange of Thailand (SET) data, which covers Thailand’s top-level businesses who should have the strongest capability to engage in R&D activities. This study specifically assesses two key government-related factors that could disincentivize R&D investment, namely, the high share of sales to the public sector and the requirement of special licenses to operate in certain industries.

Both factors discourage investment through lack of competition. Sales to the public sector are often associated with bribery and corruption, especially in developing countries where the public procurement process is not transparent. The winning firm needs not be the most innovative firm
nor must it provide the best quality, instead it is the firm with the highest bribery payment. Special license requirements also limit competition by acting as entry barriers. A market with limited number of players enjoys economic rent without having to venture into R&D activities.

The organization of this paper is as follows. The first section provides an overview of the paper. Section two provides a brief account of how Thailand’s economic development is caught in the middle-income trap. The paper then focuses on one specific causal explanation related to the low level of private R&D activities. Two government related factors are put forth to understand the lack of private R&D engagement. Section three describes the data and modelling methodology for this study, and a discussion of the estimates are presented in section four. The final section concludes the findings.

2. How Thailand is caught in the middle-income trap

Before the 1997 Asian financial crisis, Thailand’s economy was branded ‘the fifth tiger of Asia’ (Hoare, 2004). At that time, the economy had been growing at the rate of 7 to 8 percent per year for over 30 years (Figure 1). Thai economy had been expected to follow the path of the Four tigers, namely, Hong Kong, Singapore, Taiwan and South Korea, which had enjoyed a long period of high growth rates with rapid industrialization and had reached high-income country status in a short period of time.

Unfortunately, Thailand’s rapid economic growth in the 1990s seems to have been a result of a bubble in real estate, which burst in 1997 and spread over East and Southeast Asia causing the 1997 Asian financial crisis.

After the crisis, Thailand’s real GDP growth dropped to around 3 to 4 percent per year i.e., a persistent and significant drop that categorizes Thailand as a country that is caught in the middle-
income trap (Eichengreen et.al, 2011; Felipe, 2012). Recently, Agence France-Presse (AFP) has branded Thailand as a new sick man of Southeast Asia\(^3\). This notion was hotly debated and remains a shared view among leading economists\(^4\). The average real GDP growth for Thailand in the last two years was merely 1.83%.

Figure 1: Thailand’s 11-years Moving Average real GDP growth

![Thailand’s 11-years Moving Average real GDP growth](image)

Source: TDRI (2013)

The literature offers several explanations for why a country may be caught in the middle-income trap. However, for the case of Thailand, three explanations stand out as the main causes: 1) Thailand’s low level of R&D engagement, 2) Thailand’s low level of human capital especially from the quality aspect and 3) Thai political structures favoring elite groups that create tension for redistribution. This paper focuses on the first explanation while the remaining two explanations are briefly discussed below for completion.


The role of human capital as an important growth engine is well recognized. Mincer (1981) and Romer (1989) offer earlier contributions in its foundation, theory and empirical evidence. Recently, the role of education quality for economic growth is emphasized in the work of Hanushek and Woessmann (2007).

In the case of Thailand, human capital is less well-developed in both quantity and quality (TDRI, 2013). Thai students, on average, spend 4.39 fewer years of schooling than those of the advanced economies. Moreover, Thai students also perform poorly on international standard tests that measure education quality such as the Programme for International Student Assessment (PISA)\(^5\). The PISA average scores for Thai students in Mathematics, Reading, and Science are not only below the OECD average, but also lower than the average of all participating countries.

The cause of the middle-income trap may also come from political factors. Phongpaichit et.al (2012) employs a political economy approach to investigate the issue. They find that the middle-income trap is associated with uneven development between economic development and political progress. Economic growth is not evenly shared and is skewed toward a relatively small number of elites and their connections that control political power. This uneven development, on the one hand, limits broad-based human capital accumulation i.e., it creates inequalities in access to education and in the quality of education between rural and urban areas while also creating an uneven competitive field that favors big companies that are well-connected to the ruling party over small and medium companies. On the other hand, it also creates political tensions as gradual democratization challenges the ruling status of the elite.

Thailand’s over-centralized authority leads to disproportionate public expenditure between Bangkok, the capital city, and other areas. Bangkok and its surrounding area has developed into

\(^5\)PISA assesses the extent to which students near the end of compulsory education have acquired some of the knowledge and skills that are essential for full participation in society. Key subject areas include mathematics, reading and science.
a primate city that dwarfs all other urban areas. The majority of the population then has fewer prospects for accessing human capital development, less of an enabling environment for small and medium enterprises, and inadequate infrastructure. It comes as no surprise that the rural population, or the grassroots, demands greater government redistribution policies. Thailand is then stuck in a political trap where the ruling minority elites protect their own interests on the one side, and the majority grassroots demand more populist policies on the other side. This has led to the ongoing political turmoil of the last 12 years.

R&D investment plays another important role in sustaining growth at the middle-income level. As a country develops toward its middle-income country status, its labor wage bills increase rapidly. A country attaining the middle-income state then can no longer exploit cheap labor as a growth engine any further. It has to find a new development path that can support its future growth. High levels of R&D investment are a necessary condition for a country to break the middle-income trap because this type of investment is capital- and technological- intensive i.e., this type of investment does not suffer a hold back from wage competition. There are many successful case studies that support this idea including: Britain before the 18th century, Germany, France, the United States in the 19th century, Japan and the four tigers in the 20th century (Amsden, 1989; Chang, 2003, Gerschenkorn, 1962; Lin and Monga, 2010; and Wade, 1990).

For Thailand, the level of R&D engagement, measured by gross expenditure on research and development (GERD) as a percentage of GDP, is lower than other competing developing countries (Table 1) and is considerably less in comparison with developed nations. It should be noted also that the amount of R&D performed by business enterprises in Thailand is also lower than others as well.
Table 1: Comparison of R&D engagement (selected countries)

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP per capita (constant 2005 US)*</th>
<th>GERD as % of GDP</th>
<th>GERD – performed by business enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>3,344</td>
<td>1.98</td>
<td>76</td>
</tr>
<tr>
<td>Thailand</td>
<td>3,390</td>
<td>0.37</td>
<td>51</td>
</tr>
<tr>
<td>Brazil</td>
<td>5,730</td>
<td>1.21</td>
<td>n.a.</td>
</tr>
<tr>
<td>Malaysia</td>
<td>6,790</td>
<td>1.07</td>
<td>57</td>
</tr>
<tr>
<td>S. Korea</td>
<td>23,303</td>
<td>4.04</td>
<td>72*</td>
</tr>
<tr>
<td>Singapore</td>
<td>36,110</td>
<td>2.23</td>
<td>62</td>
</tr>
<tr>
<td>Japan</td>
<td>36,912</td>
<td>3.39</td>
<td>77</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>39,793</td>
<td>1.78</td>
<td>64</td>
</tr>
<tr>
<td>United States</td>
<td>45,038</td>
<td>2.76</td>
<td>69</td>
</tr>
</tbody>
</table>

Source: UNESCO, ERA Watch, World Bank, NRCT (data retrieved on June 14th, 2015), asterisk (*) denotes 2012 data.

The literature offers several explanations as to why Thai businesses are less likely to engage in R&D activity. The explanations include 1) ineffective and incoherent government supportive policies, 2) stand-alone education and training institutes that do not respond to industrial needs for R&D researchers, technicians and staffs, 3) risk-averse financial institutions that are less likely to prefer R&D ventures, 4) protective industrial, investment and trade policies from foreign competition that permits passive and slow technological learning (Intarakumnerd et.al, 2002; and Charoenporn, 2006).

In our view, all of the above explanations are valid and should be addressed in order to encourage more R&D activities. However, there is another factor that is not well-recognized in the literature that should be addressed as well: the government-related factor. In the standard R&D literature, government policy can support R&D activities by providing extra incentives such as tax
allowances for R&D expenditures as these activities create positive spillovers. However, government policy can also distort incentives to engage in R&D activity by creating an uneven playfield for firms and hampering effective competition. For example, governments can set the maximum number of firms that can operate in certain industries or can set minimum standard requirements that limit market competition. Established and qualified firms in these industries then enjoy extra economic rents without a need to venture in R&D activity. It follows that R&D activity is discouraged by certain types of government policy as well.

In this paper, we will focus on two important government-related factors that distort competition in many industries, namely, licensing and public procurement. Licensing heightens the entry barriers and limits the total number of firms that can operate in certain industries. Public procurement is the process at which government purchases products/services from firms. When the process is unfair or rests upon patronage rather than the quality of products/services, the market is distorted in a way that diverts firms’ resources and attention to rent-seeking behavior through bribery instead of focusing on R&D competition to improve product/service quality in an effort to outperform competitors.

Both licensing and government procurement are important for most businesses operating in Thailand. Licensing is widely used in many industries including, but not limited to, oil palm, finance, chemicals, shipping, mining, construction, real estate development, utilities, healthcare, hospitality, media and telecommunications. Government procurement also constitutes a sizable demand. Each year, government purchases goods and services up to 350 billion baht which is equivalent to 3% of GDP.

3. Data description and modeling methodology
The data on firms that obtain operating licenses, firms that won government procurement and firms that conduct R&D activity are all private information. Due to the limitations of accessing private data, this paper opts for stock exchange data that contains relatively large firms that allow public security trading in the Stock Exchange of Thailand (SET). Under the Securities Exchange of Thailand Act, B.E. 1974, members of the SET are obligated to publish detailed information of the company’s operations that are required for this study and may not be obtained elsewhere.

There are 567 listed companies and only 446 firms that have sufficient information to be employed in the study. Each company is one of the top companies in their own industries and their contributions to the Thai economy are very large. One extreme example is a company named PTT Public Company Limited. The turnovers of this company only are around 22% of Thailand’s GDP in 2014.

Focusing on large firms is also important in the study of R&D engagement. Because large firms have more financial access and are more capable of taking R&D ventures than small and medium firms. If Thailand is in the process of transformation toward an R&D-driven economy, it is likely that the R&D activity should be widespread among these large firms as they have more capability to do so.

In order to understand how licensing and government procurement affects the level of R&D engagement in these firms, a standard binary logistic model is applied to examine the issue. The targeted dependent variable in this study is the binary choice variable of whether the firm is engaging in R&D activity or not.\textsuperscript{6}

\textsuperscript{6}We choose a binary dependent variable of R&D engagement instead of a level of R&D engagement because only 118 firms or only 26\% of all firms report to engage in R&D activity. The large number of R&D inactivity suggests that the problem for Thailand is about the choice of doing R&D, not the size of R&D activity.
To ensure that R&D activity counts in the same widely accepted standard, we redefined the reported R&D activity based on the definition of R&D provided in the Frascati Manual released in 2002 by the OECD. This process mainly excludes conducts that are commonly misperceived as R&D activity e.g., market research and standardization of the production process. Therefore, the data employed in this study is dated 2007 which was the last year that companies were obligated to report the detailed R&D activity with some exceptions of unavailable data when 2008 or 2009 data will be used instead.

Explanatory variables used in this paper are export income share, licensing involvement (indicated by a binary variable), share of revenue from public procurement to the total revenue and industrial dummies.

The literature (Charoenporn, 2006) offers a framework for the determinants of firms’ decision to carry out R&D that includes internal factors such as firms’ characteristics, internal resources, competencies, strategic variables and contextual factors that cover industrial competition and government related policies.

In this paper, the internal factors related to a firm’s characteristics, internal resources and competencies are of less concern because the firms in consideration are top-tier firms in their respective industries. Their characteristics, internal resources and competencies are top-class; some companies are even at the level of world class. For instance, Thai Union Frozen Products Public Company Limited is one of the world’s leading producers in seafood-processed products. Indorama Ventures Public Company Limited is also one of the world’s leading producers in the intermediate petrochemicals industry and a global manufacturer of wool yarns. PTT Public Company Limited is ranked 84th in the 2014 Fortune 500 ranking. Nevertheless, one proxy
variable for a firm’s characteristics, internal resources and competencies is used in the model, namely, firm’s turnovers\(^7\).

Another important internal factor is firms’ strategies. We argue that the strategy of the firm follows context factors in such a way that maximize the firms’ profits. To be more specific, a firm’s strategy to engage in R&D depends on the business environment set forth by the competition and government-related policies. Therefore, this factor is normally hidden and can be observed from variation in the contextual factors.

Contextual factors in our analysis consist of the level of competition and government-related factors. Export share and industrial dummies are used to capture the competition level, and government-related factors are licensing and the share of revenue generated from government procurement.

4. Estimation results and discussion

Table 2 summarizes our estimation results. Business turnover, which is our proxy for internal resource and competency, contributes positively toward R&D decisions. On the other hand, export shares of income, which represents a firm’s exposure to international competition, are inversely related to R&D decisions. This result is somewhat unanticipated. Theoretically, more competition should encourage competing firms to engage in more R&D activity to outclass others. In our view, there are at least two explanations that can explain this contradiction. First, the recent literature (Aghion et.al, 2002) postulates that the relationship between competition and innovation, a broader concept than R&D, is inverted as a U shape. The reason is that competition discourages laggard firms from innovating but encourages neck-to-neck firms to innovate. For Thailand, a

\(^7\) Other proxy variables are also estimated for robust check such as firm’s total asset. However, one proxy variable is included in each estimation to avoid multicolinearity problem.
negative relationship may come from the fact that many firms in the SET are still laggard firms in
global competition. A second explanation comes from the problem of selection bias. When
observations are chosen as purposive rather than randomly chosen, insignificant or opposite
signs may be observed when the characteristics of the purposive dataset are skewed in certain
dimensions other than the average or the random dataset. In other words, the unexpected
estimated relationship of exports on the choice of R&D may come from the fact that the firms in
our study are more export-intensive than the average Thai firm.

Turning our attention to the remaining two important factors, both licensing and the share of
income from government procurement have a negative effect on R&D decisions. That is, firms
that are operating under licensing and/or have a higher income share from government
procurement, tend to have a lower probability of engaging in R&D activities. This result is robust
to different model specifications, including a different set of a firm’s capabilities proxy and different
choices of industrial dummies.

Table 2: Estimation results

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>R&amp;D engagement (binary variable)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>R&amp;D engagement (binary variable)</td>
<td></td>
</tr>
<tr>
<td>Firm’s capability:</td>
<td>coefficient</td>
<td>standard error</td>
</tr>
<tr>
<td>Turnovers (mil. of baht)</td>
<td>0.0000069**</td>
<td>0.0000036</td>
</tr>
<tr>
<td>Contextual factors:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Licensing (binary)</td>
<td>-1.26***</td>
<td>0.24</td>
</tr>
<tr>
<td>Government procurement income share (%)</td>
<td>-0.016**</td>
<td>0.006</td>
</tr>
<tr>
<td>Export share</td>
<td>-0.963***</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Note: *, ** and *** represent the significant level of 10%, 5% and 1% respectively. Estimated
results for industrial dummies are omitted.

Source: Author’s estimation
5. Conclusion

The knowledge to bring Thailand out of the middle-income trap is still in its early stages. The literature has offered several paths that could explain how and why Thailand is caught in the trap. One way to improve Thailand’s position is to follow what other successful countries has done to reach high-income status which is to raise the level of R&D engagement.

Public attempts to encourage the private sector to engage in R&D often involve promoting policies such as R&D tax allowances. This paper offers another channel for the government to further encourage the R&D activity by limiting policies that discourage R&D investment.

This study focuses on two important policies that could discourage R&D investment: 1) licensing and 2) government procurement. Licensing restricts competition in the market and creates excess monopoly rent that the exclusive firms can enjoy without the need to venture into R&D activity. Government procurement, when conducted without transparency, can also lead to bribery competition instead of offering the best deal to the auctioneer. Firms competing in this malfunctioning market need not use R&D investment to improve its quality of product/service.

Binary choice regression of R&D engagement is performed using SET data which contains all top-notched businesses across major industries in Thailand. The result supports both hypotheses.

All in all, to provide a suitable environment for R&D upgrading, governments must do more than just implementing R&D financial incentivized promoting policies; they need to reexamine its rules and regulations on licensing. The government needs to reevaluate the necessity of licenses in industries where there are many potential competitors ready to enter the market. Additionally, the procurement process must be made more transparent. Both factors are crucial to moving Thailand closer to the knowledge-based economy and break the country out of the middle-income trap.
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