OECD Economics Department Working Papers No. 1470

**Boosting productivity
and living standards
in Thailand**

**Vincent Koen,
Hidekatsu Asada,
Mohamed Rizwan
Habeeb Rahuman,
Adam Bogiatzis**

<https://dx.doi.org/10.1787/e525c875-en>

ECONOMICS DEPARTMENT

BOOSTING PRODUCTIVITY AND LIVING STANDARDS IN THAILAND

ECONOMICS DEPARTMENT WORKING PAPERS No. 1470

By Vincent Koen, Hidekatsu Asada, Mohamed Rizwan Habeeb Rahuman and Adam Bogiatzis

OECD Working Papers should not be reported as representing the official views of the OECD or of its member countries. The opinions expressed and arguments employed are those of the author(s).

Authorised for publication by Álvaro Pereira, Acting Chief Economist, Economics Department.

All Economics Department Working Papers are available at www.oecd.org/eco/workingpapers

JT03432451

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

OECD Working Papers should not be reported as representing the official views of the OECD or of its member countries. The opinions expressed and arguments employed are those of the author(s).

Working Papers describe preliminary results or research in progress by the author(s) and are published to stimulate discussion on a broad range of issues on which the OECD works.

Comments on Working Papers are welcomed, and may be sent to OECD Economics Department, 2 rue André Pascal, 75775 Paris Cedex 16, France, or by e-mail to eco.contact@oecd.org.

All Economics Department Working Papers are available at www.oecd.org/eco/workingpapers.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

© OECD (2018)

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for commercial use and translation rights should be submitted to rights@oecd.org

ABSTRACT/RESUMÉ

Boosting productivity and living standards in Thailand

The Prosperity pillar of the 2030 Agenda for Sustainable Development calls for an integrated approach based on boosting productivity through diversification, upgrading technology and innovation, and increasing employment and entrepreneurship. Thailand needs to address all these challenges to achieve high-income country status by 2036.

Over the past decade, limited structural reform and capital investment have held back productivity growth and improvements in well-being, and Thailand has lost ground vis-à-vis regional comparators. More recently, however, economic growth has started to regain momentum helped by a pick-up in global trade, which has supported exports, and by a substantial public infrastructure investment programme. Moving forward, Thailand will need to boost productive capacity in the face of intensified competition with regional peers and rapid demographic ageing. In addition, productivity gains will be increasingly necessary to drive growth. Key areas of focus include improving human resource development, encouraging technology diffusion via cluster development, promoting innovation and digitalisation, improving the SME policy framework and expanding regional integration, as emphasised in the government's 12th Plan and Thailand 4.0.

This Working Paper relates to the *Initial Assessment report of the Multi-dimensional Country Review of Thailand* (<http://www.oecd.org/eco/surveys/multi-dimensional-review-thailand.htm>)

JEL classification: E44, E62, E66, F13, F15, I25, J21, L78, O15, O38, O47, O53, Q18, R11

Keywords: cluster development, digitalisation, education, fiscal consolidation, innovation, monetary policy, productivity, regional integration, regulatory reform, skills, SMEs, structural reform, trade, TVET

Améliorer la productivité et le niveau de vie en Thaïlande

Le pilier Prospérité du Programme de Développement Durable à l'horizon 2030 appelle à une approche intégrée visant à stimuler la productivité via la diversification, la montée en gamme technologique et l'innovation, ainsi qu'à créer des emplois et à favoriser l'entrepreneuriat. La Thaïlande doit prendre tous ces défis à bras le corps pour devenir un pays à revenu élevé d'ici 2036.

Au cours de la décennie écoulée, l'insuffisance des réformes structurelles et de l'investissement en capital productif ont limité les gains de productivité et l'amélioration du bien-être, et la Thaïlande a perdu du terrain vis-à-vis des pays comparateurs dans la région. Plus récemment toutefois, la croissance a repris de la vigueur, aidée par une accélération du commerce mondial, qui a stimulé les exportations, et par un programme important d'investissements publics en infrastructures. La Thaïlande doit maintenant renforcer sa capacité productive dans un contexte de concurrence intensifiée avec ses pairs dans la région et de vieillissement démographique. En outre, la croissance devra être tirée de plus en plus par les gains de productivité. Les domaines prioritaires à cet égard incluent le développement des ressources humaines, l'incitation à la diffusion des technologies via le développement par regroupements, la promotion de l'innovation et de la digitalisation, l'amélioration des politiques cadres pour les PME et l'extension de l'intégration régionale, comme cela est souligné dans le 12^{ème} Plan du gouvernement et dans Thaïlande 4.0.

Ce Document de travail se rapporte à *l'évaluation initiale de l'Examen multidimensionnel de la Thaïlande* (<http://www.oecd.org/eco/surveys/multi-dimensional-review-thailand.htm>).

Classification JEL: E44, E62, E66, F13, F15, I25, J21, L78, O15, O38, O47, O53, Q18, R11

Mots-clés: développement de clusters, numérisation, éducation, consolidation budgétaire, innovation, politique monétaire, productivité, intégration régionale, réforme de la réglementation, compétences, réformes structurelles, PME, commerce extérieur, apprentissage professionnel

TABLE OF CONTENTS

BOOSTING PRODUCTIVITY AND LIVING STANDARDS IN THAILAND	5
Sound macroeconomic fundamentals will help Thailand achieve its long-term growth ambitions	5
Growth has picked up in recent years	6
Monetary policy targets low inflation	10
Thailand has some strong buffers.....	10
Thailand's financial sector is sound despite vulnerabilities in some areas	11
Boosting productivity on the way to Thailand 4.0.....	12
Improving labour productivity is key to Thailand 4.0.....	12
A holistic approach is required for cluster development.....	16
Fostering innovation will help Thailand move up the value-added ladder	18
Fostering the digital economy can help boost productivity and socio-economic development	20
SMEs need to be better financed, digitalised and properly incentivised.....	22
Furthering global value chain participation and regional integration	24
REFERENCES	30

Tables

Table 1. Macroeconomic indicators and projections	7
Table 2. Selected vulnerabilities	10
Table 3. Thailand's Special Economic Zones	17
Table 4. Thailand's digital infrastructure targets.....	21

Figures

Figure 1. Thailand has been catching up but faster growth is needed	6
Figure 2. Growth has been picking up, while investment has been lacklustre	8
Figure 3. Inflation is low, the exchange rate has appreciated and the share of bad loans has risen.....	9
Figure 4. Non-performing loans are on the rise	12
Figure 5. Thailand needs to further boost labour productivity growth	13
Figure 6. Lacklustre capital formation has held back growth and productivity.....	14
Figure 7. Labour input has not driven Thailand's recent growth	14
Figure 8. Employment in the primary sector remains high and productivity low	15
Figure 9. Labour reallocation has not boosted productivity substantially in Thailand.....	15
Figure 10. Thailand's R&D expenditure is rising, but remains below many comparator countries	19
Figure 11. Thailand has room to improve in digital infrastructure and skills readiness	21
Figure 12. Use of mobile phones to process financial transactions has grown rapidly	24
Figure 13. GVC participation has improved	25
Figure 14. Thailand's average tariff rate fell in the past decade.....	25
Figure 15. Thailand's trade facilitation has made good progress	26
Figure 16. Service trade restrictiveness index in the construction and architecture sectors	27
Figure 17. FDI is still subject to substantial restrictions	28
Figure 18. Gross FDI inflows have slowed in recent years	29

Boxes

Box 1. Lowering the cost and improving the ease of financial transactions.....	23
--	----

BOOSTING PRODUCTIVITY AND LIVING STANDARDS IN THAILAND

By Vincent Koen, Hidekatsu Asada, Mohamed Rizwan Habeeb Rahuman and Adam Bogiatzis¹

Thailand has made commendable socio-economic progress since the 1970s and has ambitions to become a high-income country by 2036. This will require stepping up structural reforms to boost economic potential and inclusiveness. Thailand needs to develop human capital, foster innovation, invest in infrastructure, support SMEs and remain open to global trade, in line with the Prosperity pillar of the Sustainable Development Goals (SDGs), which calls for strong economic foundations through sustained and inclusive growth.

This working paper reviews Thailand's macroeconomic fundamentals, recent developments and projections. It also discusses the main structural challenges to boosting productivity and economic growth. These include removing obstacles preventing labour reallocation to higher-productivity sectors, increasing technology diffusion through cluster development, fostering innovation and digitalisation, improving the SME policy framework and furthering regional integration (for further discussion of human capital development, competition and regulation, see Fleischer et al. (2018) and Mohd Arif et al. (2018)).

Sound macroeconomic fundamentals will help Thailand achieve its long-term growth ambitions

Thailand's ambition to become a high-income economy by 2036 calls for a substantial acceleration in growth rates. Between 1970 and 2016, Thailand's GDP growth per capita averaged 4.2% per year in purchasing power parity terms, with income per head reaching 42% of the OECD average in 2016 (Figure 1A). Thailand's economic structure underwent major changes during this period, with the share of the primary sector in GDP falling from 26% in 1970 to 8% in 2016. Concurrently, the share of industry rose from 25% to 36% and that of services increased from 49% to 56%, while the share of exports grew from 15% to 69%.

Structural reforms played an important role in this transformation, with trade and investment liberalisation and business-friendly regulatory reforms encouraging participation in global value chains (GVCs). As a result of these efforts, Thailand has become an integral part of GVCs in the Asia-Pacific region, particularly for automobile and electronics, which account for some 30% and 20% of total manufacturing output, respectively, up from about 10% for both sectors in 1996. Thailand's important role in regional GVCs is also reflected in automobile and electronics exports, which together account for

¹ The authors worked in the OECD Economics Department at the time of writing. The authors thank Thailand officials, members of the Economic and Development Review Committee and the Development Centre's Mutual Learning Group, Alvaro Pereira, Christine Lewis and Margit Molnar from the OECD Economics Department, Ruben Maximiano from the OECD Directorate for Financial and Enterprise Affairs, Inese Rozensteine, Janos Ferencz, Kaveri Bopiah and Shingo Kimura from the OECD Trade and Agriculture Directorate for their valuable comments. Special thanks are due to Jan Rieländer, Catriona Marshall, Andrea Colombo and Vararat Atisophon at the OECD Development Centre for co-ordinating and supporting the project of the Initial Assessment Report of the Multi-dimensional Country Review of Thailand, and to Mercedes Burgos and Sisse Nielsen for technical preparation.

around 30% of Thailand's total goods exports. Over 70% of goods exports go to the Asia-Pacific region, with Southeast Asian countries alone accounting for around a quarter of total goods exports. Tourism dominates the service sector in Thailand, which is one of the world's top tourist destinations. Tourism generates close to 13% of GDP, up from 4% in 1996, providing a valuable source of foreign exchange earnings. In 2016, Thailand welcomed 32.6 million tourists, the ninth largest inflow globally according to the World Tourism Organization.

Figure 1. Thailand has been catching up but faster growth is needed

Note: In 2016, Thailand's per capita GDP in USD PPP was 17 359, versus an OECD average of 41 776.

Source: Conference Board (2017), Total Economy Database, May 2017, www.conference-board.org/data/economydatabase; Datastream and OECD calculations.

Growth has picked up in recent years

Trend GDP growth has declined progressively since the 1970s, due to unexpected shocks including the 1997-98 Asian financial crisis and the 2008 global financial crisis. In more recent times, growth has been hampered by the 2011 floods, which disrupted activities in key industrial areas, and broader political uncertainty, which affected investor confidence. Thailand's growth has thus remained below estimates of potential and is slower than in many comparator countries in East Asia (Figure 1B and 1C).

In recent years, growth has regained momentum, propelled by higher electronics exports, buoyant tourist arrivals and public investment (Figure 2A, C and D). Growth is projected to increase to 4.0% in 2018 and 4.1% in 2019 (Table 1). However, as the near-term outlook is largely supported by a cyclical uptick in global demand, Thailand will still need to undertake extensive structural reform to boost economic potential. The risks surrounding the projections are broadly balanced. On the one hand, exports and manufacturing performance could be stronger than foreseen, if global growth, and growth in ASEAN and China in particular, were to be faster. On the other hand, further implementation delays of the various planned infrastructure projects, increased global volatility from accelerated normalisation of monetary policy in advanced economies and a sharper slowdown in China, which accounts for around 11% of exports, could exert a drag on growth.

Table 1. Macroeconomic indicators and projections

Annual percentage changes unless specified

	2013	2014	2015	2016	2017	2018	2019
						Projection	
Real GDP	2.7	1.0	3.0	3.3	3.9	4.0	4.1
Private consumption	0.9	0.8	2.3	3.0	3.2	3.2	3.4
Public consumption	1.5	2.8	2.5	2.2	0.5	3.5	2.5
Gross fixed capital formation	-1.0	-2.2	4.3	2.8	0.9	4.2	4.7
- Private	-1.5	-0.9	-2.1	0.5	1.7	2.2	2.5
- Public	0.8	-6.6	28.4	9.5	-1.2	9.8	10.4
Exports (goods and services)	2.7	0.3	1.6	2.8	5.5	5.3	5.9
Imports (goods and services)	1.7	-5.3	0.0	-1.0	6.8	6.6	6.8
Consumer prices	2.2	1.9	-0.9	0.2	0.7	1.2	1.5
Policy interest rate (end-year, in %)	2.5	2.0	1.5	1.5	1.5	1.5	1.5
Unemployment rate (% of labour force)	0.7	0.8	0.9	1.0	1.2	1.2	1.2
Current account balance (% of GDP)	-1.2	3.7	8.1	11.7	10.8	8.5	8.0
General government fiscal balance (% of GDP, fiscal year)	0.5	-0.8	0.1	0.6	-1.7 ¹	-1.8	-1.8
Public debt (% of GDP, fiscal year) ²	42.2	43.4	42.5	41.8	41.9	41.2	40.6
Household debt (% of GDP)	76.6	79.9	81.2	79.9	78.3 ³	-	-
Gross official reserves (end-year, USD billion)	167.2	157.1	156.5	171.9	202.6	-	-
World trade growth (volume)	3.6	3.7	2.7	2.6	5.2	4.1	4.0
Oil price (spot, Brent, USD per tonne)	108.6	99.0	52.4	43.7	51.7	65.0	65.0

1. This figure is a projection. Final outcome was unavailable at the time of publication.

2. As of the end of the fiscal year (September). Includes general government and state-owned enterprises debt.

3. As of the end of 3Q 2017.

Source: OECD (2017k), Economic Outlook 102 database; CEIC database; NESDB; Bank of Thailand and Public Debt Management Office (February 2018).

Indeed, while exports have been accelerating in 2017, industrial production growth has been modest and domestic demand remains sluggish, with lacklustre private investment (Figure 2B), slow implementation of public infrastructure projects (Figure 2E), and consumption growth hampered by high household debt (Figure 2F). Accordingly, the current account surplus remains very large (Figure 3C). Looking further ahead, the Bank of Thailand (BoT) states that in the absence of structural reforms, export growth (in dollar value terms) will slow beyond 2018 to 2-3% per annum, down from an average of 10% over the past decade (BOT, 2017).

Figure 2 Growth has been picking up, while investment has been lacklustre

Note: ASEAN-6 is the weighted average growth rates of Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam. Tourism income refers to gross travel service receipts in the balance of payments.

Source: OECD (2017d), National Accounts database, <http://dx.doi.org/10.1787/na-data-en>; World Bank (2017), World Development Indicators, <http://databank.worldbank.org/data/home.aspx>; CEIC; Bank of Thailand; and Ministry of Commerce.

Figure 3. Inflation is low, the exchange rate has appreciated and the share of bad loans has risen

Note: A: The inflation target changed from the quarterly average of core inflation to an annual average headline rate in 2015.

Source: CEIC; Bank of Thailand.

For trend growth to approach the 5-6% rate needed to achieve Thailand's high-income status ambitions under the 12th Plan, a revival in investment is needed. To this end, the government should prioritise investment spending. Reliance in recent years on consumer-related measures, such as income tax rebates, rural subsidies and cash handouts to low-income households, has provided relief to some groups as well as short-term stimulus, but has done little to increase longer-term productive capacity. Programmed higher public investment, particularly in infrastructure, may help lift the anaemic private investment rate. Although it is important Thailand remain fiscally prudent, undertaking targeted public investment in productivity-enhancing infrastructure is necessary to increase economic potential. Notwithstanding the government's ambitious infrastructure investment programme, public debt expected to remain around 41% of GDP in the coming years (see below). Some of the vulnerabilities that are difficult to assess in the context of this projection feature in Table 2.

Table 2. Selected vulnerabilities

Potential shock	Likely economic impact
More frequent natural disasters	Loss of assets, lower agricultural production and disruption of value chains
Hard landing for emerging economies, particularly China	Negative spillovers on growth through real and financial sector channels, amplified by close regional integration
Increase in protectionism	With foreign trade accounting for over 100% of GDP, growth would be affected
Intensified geopolitical tensions	Unexpected turbulence in the financial markets and weakening of business confidence
Turmoil in international financial markets	Tighter financing conditions and growth setback
More frequent or more harmful cyber-attacks	Economic and social disruptions

The government has long recognised the key role of infrastructure investment to boost both inclusivity and economic growth. While planning efforts in this area have been stepped up, implementation has lagged (Figure 2E). In the coming years, it will be important to ensure that unnecessary red tape does not slow down the approval and rollout of new infrastructure projects and improvements are made in both financing arrangements and public-private partnerships processes (Bogiatzis et al., 2018). Public investment is expected to pick up soon with the resolution of land issues that will allow several mass-transit projects to proceed. In addition, the approval by Parliament of key Eastern Economic Corridor (EEC) legislation will incentivise inward foreign direct investment (FDI) to the area.

Monetary policy targets low inflation

Thailand's independent central bank, the Bank of Thailand (BoT), has a broad range of responsibilities including monetary policy, financial sector regulation and payment systems. It has been pursuing flexible inflation targeting since 2000, which has enhanced the credibility of the monetary policy framework, as is the case in a number of OECD countries. In 2015, the target changed from 0.5-3.0% for the quarterly average of core inflation to an annual average headline rate of 2.5% with a tolerance band of $\pm 1.5\%$. Monetary policy transparency is high, with edited minutes of the discussions of the Monetary Policy Committee, which meets eight times a year, released publicly two weeks after each meeting, as well as four press conferences per year. The Committee's membership is diverse and consists of four external experts, the BoT Governor and two Deputy Governors.

Since April 2015, the policy rate has remained at 1.5%, just 25 basis points above the record low reached in 2009 in the aftermath of the global financial crisis. Headline inflation, which turned negative in 2015, was below the target range, and underlying price pressures remain very subdued, with core inflation below 1% since November 2015. Even so, the policy rate is expected to remain unchanged in 2018 given the persistent appreciation of the Thai baht in recent years and high household debt.

Headline inflation is projected to inch up and to re-enter the policy target band in 2018. While output growth is on course to increase, not least thanks to the anticipated rollout in infrastructure spending, inflationary pressures are expected to remain contained, reflecting a variety of structural factors. These may include reduced agricultural output costs due to economies of scale and improved irrigation, continued globalisation and improvements in GVCs, and increased e-commerce amid a burgeoning digital economy (see below) (BOT, 2017).

Thailand has some strong buffers

Thailand has a long history of fiscal prudence and in the near term the fiscal outlook remains sound. Since 2013, the general government fiscal balance has averaged a slight surplus. Looking ahead, however,

deficits are projected commensurate with the government's large public infrastructure investment programme and additional funding for farm sector reform and expanded social welfare included in the 2018 supplementary budget. Public debt-to-GDP is expected to edge down as a result of the projected uptick in economic growth. Ongoing fiscal reforms, such as the introduction of an inheritance tax and a land and building tax, will help raise revenue. On the spending side, the share in GDP of general government outlays, at around 21% of GDP, is only half of the OECD average, but similar to the levels in Malaysia (22%), Mexico (22%) and the Philippines (17%). Subsidies have been reduced substantially, in line with the government's commitment to rationalise non-productive subsidy programmes via fuel subsidy reform, and the replacement of the rice pledging scheme with a more targeted alternative. Over the longer term, however, ageing will be a major challenge for fiscal sustainability (Bogiatzis et al., 2018).

On the external side, Thailand has sizeable buffers. The current account surplus was close to 11% of GDP in 2017, and foreign exchange reserves are equivalent to about 13 months of imports and three times short-term external debt (Figure 3C). The large current account surplus, driven by high tourism receipts and buoyant exports as well as a falling oil import bill following the oil price decline in 2014-15, has underpinned currency appreciation (Figure 3D). The anticipated pick-up in public investment in the coming years should help increase imports, easing one source of upward pressure on the Thai baht.

The pace and modalities of Thailand's financial liberalisation efforts will also have a bearing on the exchange rate. Since 2010, the central bank has embarked on a financial liberalisation strategy, focusing especially on the deregulation of the capital account and other foreign exchange measures. Going forward, it is considering further measures including lowering foreign exchange hedging requirements for financial institutions' offshore investments and encouraging outward FDI.

Thailand's financial sector is sound despite vulnerabilities in some areas

Overall, the financial sector is sound, notwithstanding the risks posed by high household debt, rising non-performing loans and possible vulnerabilities from the expanding shadow banking sector. Financial institutions are highly capitalised, in some cases exceeding the Basel III regulation standards (Figure 4A). In addition, the central bank is implementing the stricter net stable funding ratio, complementing the existing liquidity coverage ratio, across all financial institutions from January 2018. It has also been proactive in designating five major banks as of systemic domestic importance, with higher capital requirements to be phased in by 2020. However, the share of non-performing business loans has increased, especially for small and medium-sized enterprises (which accounted for over half of total non-performing loans as of end-2017) (Figure 4B). This could become a growing problem in the future when interest rates rise. Furthermore, households have been shifting deposits to more lightly regulated non-bank financial institutions, which offer higher-yielding instruments and cheaper funding. This has also favoured bond issuance by higher-rated firms. Harmonising regulatory treatment across all financial institutions, with integrated supervision of conglomerates and liquidity risk, may help preserve financial stability (IMF, 2017).

Figure 4. Non-performing loans are on the rise

1. For domestically incorporated commercial banks.

Source: CEIC; Bank of Thailand; IMF (2017), Financial Soundness Indicators (database).

Boosting productivity on the way to Thailand 4.0

Improving labour productivity is key to Thailand 4.0

Productivity performance conditions long-run economic prosperity and well-being. Differences in labour productivity across countries are reflected in per capita income gaps. As in other East Asian emerging economies, productivity gains made during Thailand's early industrialisation phase came from the reallocation of under-utilised rural labour from agriculture to labour-intensive manufacturing, supported by capital accumulation and imported technology embodied in FDI. To attain high-income country status, Thailand's growth needs to be driven increasingly by productivity gains, rather than by the sheer accumulation of capital and labour inputs.

Thailand's 12th Plan sets a target of over 2.5% annual growth both for labour productivity and total factor productivity (TFP), enshrined in Thailand 4.0 and premised on innovation, human capital development, regulatory reform and infrastructure development. This compares with a 1.1% average TFP growth rate experienced over 2011-15. Thailand 4.0 entails a transformation to a more productivity and technology-driven economy. It embodies a progression from the accumulation of capital and labour inputs led by the agricultural sector in "Thailand 1.0", light industry (e.g. food processing and textiles) in "Thailand 2.0", and heavy industry (e.g. petrochemicals and steel) in "Thailand 3.0". Gains from imported technology are contributing less to productivity growth, while high-technology and knowledge-intensive activities, domestic innovation, investment in knowledge-based capital and human resource development have become increasingly important.

Since the first half of the 2000s, labour productivity growth has averaged 3%. However, in recent years, and as in many OECD countries, it has not recovered to pre-global financial crisis rates (Figure 5), partially due to weak demand arising from lacklustre global trade, which slowed capital formation and the associated productivity gains. Intensified competition for FDI from China, the Philippines and Viet Nam has also held back investment (Figure 6), as have domestic political uncertainty, delays in public investment projects and widening skills gaps (Fleischer et al., 2018).

Figure 5. Thailand needs to further boost labour productivity growth

Source: OECD calculations based on data provided by the National Statistical Office and Datastream; OECD (2017e), Productivity Statistics database, www.oecd.org/std/productivity-stats

Thailand's historical competitive advantage in labour-intensive manufacturing is eroding due to higher wage costs, compared with regional peers such as Indonesia, the Philippines and Viet Nam. This partly reflects demographics: Thailand's population is ageing earlier than in other East Asian countries, which weighs on domestic labour supply. Indeed, the contribution of labour inputs to GDP growth was substantial through the 1990s, but declined gradually afterwards and even turned negative in 2011-15 (Figure 7).

Figure 6. Lacklustre capital formation has held back growth and productivity

Source: NESDB; World Bank (2017), World Development Indicators database, <http://databank.worldbank.org/data/home.aspx>.

Figure 7. Labour input has not driven Thailand's recent growth

Source: Asia Productivity Organization (2017), Productivity database 2017 Version 1, www.apo-tokyo.org/wedo/measurement.

Labour reallocation from the low-productivity agricultural sector in rural areas to higher-productivity sectors in urban areas is a key feature of catch-up growth and structural transformation. In Thailand, the share of the primary sector in GDP, at 8% in 2016, is not far above the average for upper middle-income countries, but its share of total employment (33%) is still high and closer to that of lower middle-income countries such as Indonesia and the Philippines (Figure 8A). Labour productivity in Thailand's agricultural sector relative to the manufacturing and services sectors has room to improve compared with other countries in the region (Figure 8B).

Figure 8. Employment in the primary sector remains high and productivity low

Source: World Bank (2017), World Development Indicators database, <http://databank.worldbank.org/data/home.aspx>; ILO (2017), ILO Stat (database), www.ilo.org/global/statistics-and-databases/lang-en/index.htm; and Asia Productivity Organization (2017), Productivity database 2017 Version 1, www.apo-tokyo.org/wedo/measurement.

Over the past three decades, the contribution of labour reallocation to overall labour productivity growth has declined (Figure 9A). From 2001 to 2015, it was lower than in China and Viet Nam (Figure 9B), reflecting the impact of rising agricultural commodity prices in the world market and a widening skills mismatch for rural migrant workers. Additionally, rural development policy in the first half of the 2010s, notably a rice-pledging scheme launched in October 2011 and abolished in 2014 (under which the government bought rice at a considerably higher cost than the market price), may have discouraged labour reallocation by distorting its expected return (Egawa, 2015).

Figure 9. Labour reallocation has not boosted productivity substantially in Thailand

Note: The "within effect" refers to the contribution to total labour productivity growth from productivity growth within sectors. The "labour reallocation effect" refers to the contribution of the movement of labour from lower to higher-productivity sectors, where sectors are disaggregated into nine categories: (i) primary; (ii) mining; (iii) manufacturing; (iv) construction; (v) electricity, gas and water supply; (vi) wholesale and retail trade, and hotels and restaurants; (vii) transport and communications; (viii) financial intermediation, real estate and business activities; and (ix) community, social and personal services.

Source: OECD calculations based on Asia Productivity Organization (2017), Productivity database 2017 Version 1, www.apo-tokyo.org/wedo/measurement.

To remedy this, the government should encourage such reallocation by narrowing skills mismatches through lifelong learning and skills training. In addition, it should promote productivity gains in the agricultural sector by spurring the transformation of the traditional family-based and low technology model. In this regard, the 12th Plan aims to integrate fragmented farm land to facilitate the introduction of higher skills and technology and reap economies of scale. Thailand is also encouraging innovation through expanded ICT use, particularly through the Smart Agriculture Programme. The latter develops databases and knowledge management systems to provide useful data to farmers in specific localities and for specific agricultural products. OECD experience suggests that providing farmers with access to innovations that meet their diverse and complex needs, ensures that public spending on agricultural R&D raises agricultural productivity more effectively and sustainably, compared with other public expenditures in agriculture such as irrigation and fertiliser subsidies (OECD, 2015, 2017j). Agricultural policy should also be diversified from supporting rice production to promote more high value-added products such as livestock and horticultural products. In the process, it is important to avoid introducing incentives that would leave some rural groups behind.

The importance of food processing and food-related services will grow, particularly in rural areas, as primary agriculture becomes more capital and knowledge-intensive and less labour intensive. Thailand should strengthen the competitiveness of food industries that add value to primary agricultural products, bearing in mind that policies to boost the domestic prices of agricultural products are likely to have the opposite effect. The OECD's Trade in Value-Added database shows that value-added from Thailand's service sector is low in food and agriculture exports (OECD-WTO, 2017). Thailand should enhance the linkage between the agrifood sector and the service sector to promote high value-added food production, including the development of agriculture-related service industries such as technical services and farm machine services, and distribution via e-commerce of local specialities. Another policy area that merits attention is the regulatory environment. Strengthening food safety standards and the food labelling system, among others, will contribute to ensuring a fair market valuation for high-quality products.

To boost productivity gains, narrowing the productivity gap between frontier and lagging firms in the manufacturing and services sectors is also key. A large share of lagging firms is likely to be small businesses run by low-skilled entrepreneurs, employing low-skilled workers, and operating informally or semi-informally. OECD experience suggests that catch-up with high-productivity firms can be facilitated through human capital development, encouraging technology diffusion, promoting digitalisation, improving the SME policy framework and furthering regional integration (OECD, 2016b). These policies are prioritised in the 12th Plan and are discussed below.

A holistic approach is required for cluster development

In the context of Thailand 4.0, the government selected a set of priority sectors which builds off the existing industrial base in November 2015, comprising “First S-Curve” and “New S-Curve” industries (MOI, 2015). The “S-Curve” concept posits that during the infancy stage, an industry's growth is relatively slow due to limited market size; once economies of scale take hold and the market expands, output rises rapidly, and eventually growth levels off due to demand saturation. First S-curve industries aim to upgrade the existing industrial base and include sectors such as agro-products processing, automobile and electronics manufacturing, and tourism, with a view to maintaining growth momentum in the short and medium term. They include next-generation automotive (e.g. electronic vehicles), smart electronics (e.g. high value-added ICT products), medical and wellness tourism, agriculture and biotechnology, and food for the future (e.g. functional foods). New S-curve industries are found in sectors identified as promising drivers of growth in the long term, based upon further technological sophistication. They include robotics, aviation and logistics, biofuels and biochemicals, the digital industry and the medical hub.

To support the development of these priority sectors, the government has launched investment promotion measures in designated Special Economic Zones (SEZs), located in different areas and with specific purposes (Table 3). SEZs are based on the concept of clusters designed to improve industrial value chains by strengthening linkages among firms, research and academic institutions, and public organisations within a geographical area. The government designates the SEZs and provides financial incentives (e.g. tax reduction and subsidies to innovation and human resource development by firms), as well as non-financial stimuli (e.g. simplifying visa procedures for skilled foreign labour and easing the regulation of foreign equity and land ownership). In July 2016, the government designated three provinces in the east coast area as the Eastern Economic Corridor (EEC). This flagship SEZ builds on the existing manufacturing and energy industrial base. The government has an ambitious target for public and private investment in the EEC of THB 1.5 trillion (some 10% of 2016 nominal GDP) over 2017-21.

Although industrial cluster policies have been in place in Thailand since the early 2000s, their success in creating a base of high value-added industries has been limited. Moreover, policy measures have concentrated on providing financial incentives to investment such as tax breaks, but have not adequately promoted agglomeration within the cluster. In particular, weak collaboration and co-ordination at various levels, including the government, firms, and research and academic institutions, hampered the horizontal and vertical integration of stakeholders in the clusters (Fukuoka et al., 2016).

Table 3. Thailand's Special Economic Zones

Border area SEZs	10 provinces close to the borders of neighbouring ASEAN countries aiming to boost cross-border trade and employment (started in 2016).
Super-clusters and other targeted clusters	Super cluster zones located in 32 provinces in total (including overlaps), mainly in the Central and Eastern regions. Targeted sectors include: automotive and parts, electrical and electronics, eco-friendly petrochemicals, digital services, food, aviation and aerospace, automation and robotics, and medical services. Other targeted clusters are located in rural regions and focus on agro-processing and textiles (started in 2016).
Eastern Economic Corridor (EEC)	Three coastal provinces (Cachengsao, Chonburi and Rayong) in the Eastern region aiming to promote 10 S-curve industries. The Act to develop the EEC passed in February 2018. FDI in the EEC will be encouraged through tax incentives, infrastructure development and zone-specific regulatory reform (e.g. easing visa restrictions for foreign workers).

Source: Board of Investment, Thailand (2017).

OECD experience shows that successful clusters are underpinned by good public governance characterised by the ability to respond adequately to industry needs, strengthen skills training for the local labour force and support the entry of innovative SMEs (OECD, 2009). In line with these observations, the government set up an EEC Policy Committee chaired by the Prime Minister. To ensure effective collaboration and communication among stakeholders, the Committee is composed of relevant ministers and private sector representatives. The Policy Committee is pursuing a range of initiatives; for example, it is seeking to halve the 20-month approval process for public-private partnership infrastructure projects by streamlining duplicative bureaucratic work.

To strengthen collaboration between research and academic institutions and firms in SEZs, the government has made access to investment incentives in some SEZs, most notably the EEC conditional on various forms of co-operation including participation in the Talent Mobility Programme and the government's human resource development programmes, such as the promotion of internship and dual systems that combine on-the-job training and school (see below).

While the government is undertaking high-profile promotion efforts targeted at foreign investors, clear and detailed plans and measures would help enhance linkages between foreign and domestic firms in the SEZs, notably the EEC. This would strengthen technology diffusion and ensure that the benefits of regional-based industrial cluster policies are shared, thereby promoting nationwide well-being and reducing regional inequality. Encouraging the entry of innovative domestic SMEs and their participation in horizontal and vertical agglomeration within the SEZs is key in this respect.

Fostering innovation will help Thailand move up the value-added ladder

Thailand needs to facilitate further domestic innovation to realise Thailand 4.0 and move up the value-added ladder. As industries and companies innovate, their competitiveness in international markets, participation in GVCs and the quality of their products improve. The efficient production of higher quality and higher value-added products leads to sustainable growth in real income and living standards. This is all the more important in a world of rapid technological progress and falling automation costs. However, Thailand's innovation performance, as measured for example by the Global Innovation Index, has either fallen behind or lost ground vis-à-vis some comparator East Asian countries.

To date, imported technology linked to FDI has been the major source of innovation. Given the lack of backward linkages, this foreign-sourced technology has not spilled over to domestic businesses. Indeed, while Thailand is exporting goods such as automobiles and hard disk drives, its input into the production of these goods tends to be at the lower value end, with higher-end components imported rather than produced domestically (ADB, 2015).

Recognising the importance of fostering innovation, the government put in place a 10-year National Science Technology and Innovation Master Plan 2012-2021 (STI Plan), which sets out societal, economic and environmental objectives based on the increased use of science, technology and innovation. It seeks to facilitate innovation by expanding the quantity and quality of research and development (R&D) and improving enabling institutions and infrastructure including human capital. So far, R&D investment, especially in applied research, has been modest and has held back innovation (NESDB, 2017). In addition, a constraining regulatory environment and poor human capital have hampered innovation (Fleischer et al., 2018).

As part of the STI Plan and the 12th Plan, the government is seeking to boost R&D spending as a share of GDP to 1.5% by 2021, with 70% coming from the private sector. It also intends to increase the share of R&D personnel to 0.25% of full-time employees (NESDB, 2017; NSTIPO, 2014). Thus far, results have been mixed. Gross expenditure on R&D has increased in recent years, reaching 0.6% of GDP in 2015, but remains below target and lower than other countries in the region including Malaysia (1.3%), China (2.1%) and Singapore (2.2%), as well as the OECD average (2.4%) (Figure 10). Even so, its composition has improved, with the share of business innovation rising from 52% in 2011 to 66% in 2015 (UNESCO-UIS, 2017). Targeted policy measures over the past two years have also helped. The tax deduction available for R&D expenses was raised from an already high 200% to 300%, and the government established a competitiveness fund that provides matching grants for projects engaged in R&D and for those that undertake technology transfer or acquisition activities. Furthermore, the share of R&D personnel has risen from 0.079% in 2011 to 0.132% in 2015 (UNESCO-UIS, 2017).

Figure 10. Thailand's R&D expenditure is rising, but remains below many comparator countries

Note: The 2% R&D expenditure target included in the STI Plan was subsequently revised downwards in the 12th Plan to 1.5%. Data for Indonesia, the Philippines, Viet Nam and South Africa refer to 2013. Data for Turkey and Singapore refer to 2014.

Source: UNESCO-UIS (2017), Science, Technology and Innovation (dataset), UIS Data Centre, <http://data.uis.unesco.org>; and OECD (2017f), Gross domestic spending on R&D, <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>.

Promotion of innovation has been hindered, however, by governance issues including weak co-ordination and lack of clarity around institutional roles and responsibilities. This often leads to the dispersion of funds across multiple projects with insufficient critical mass. Moreover, the limited involvement of industry in public R&D activities hampers technology transfer and commercialisation potential (UNCTAD, 2015). The absence of a strategic approach at all levels of the process (including policy development, funding and research priorities) is creating overlaps in operations among concerned organisations, and delays in technology and innovation development (NESDB, 2017).

To address these issues, the government established the National Research and Innovation Policy Council in late 2016 to establish the direction for research and innovation policy. Chaired by the Prime Minister, it consists of relevant ministers, independent experts, and representatives from state-owned enterprises, business and academia. The Council is currently undertaking a review of Thailand's research and innovation system and developing a new 20-year National Research and Innovation Policy Framework, which aims to boost competitiveness through the enhancement of S-curve industries (see above).

Another major barrier to innovation is access to talent, particularly in the case of business. Weak collaboration between academia and industry limits the flow of researchers between the two sectors. To help foster mobility, the government established a Talent Mobility Programme, which enables industry and/or the government to reimburse universities for access to talent, while universities allow academics to take leave and return without incurring any career penalties (Durongkaveroj, 2015). To further improve the human capital pool, the government is assisting industry to access talent from abroad, by setting up a one-stop shop where firms can source talent from ASEAN countries. This programme will also facilitate streamlined visa arrangements. Moreover, the government has launched the Eastern Economic Corridor of Innovation (EECi) project as part of the flagship EEC development plan. The EECi aims to create a regional innovation hub which will attract international talent and foster R&D in the public sector, private sector, academia and local communities. In 2016, the government also launched a campaign to support entrepreneurs and start-ups through financial aid programmes (e.g. the Research Gap Fund and the

Technology and Innovation Enterprise Development Fund), and by expanding entrepreneurship education programmes, setting up innovation districts and revising commercial law to facilitate business operations for start-ups.

Beyond supply-side innovation policies, like many OECD countries, Thailand seeks to make greater use of demand-side policies where government action complements market mechanisms with minimal financial outlays. For instance, in 2016, the Government Procurement Programme to Support Local Innovation was introduced to fast-track local innovation products through the government procurement process and to foster technology spillovers to local firms. Although targeted procurement programmes can help spur business innovation, they are not without risk, as they can favour large firms over small, lead to technology lock-in and may not be compatible with “value for money” requirements (OECD, 2016c). As such, it is vitally important that efforts to facilitate efficient and fair domestic market conditions remain at the centre of Thailand’s demand-side innovation policy settings. In this regard, Thailand should enhance competition and consumer laws and crack down on corruption (Mohd Arif et al., 2018), ensure state-owned enterprises operate on a level playing field with private business and price/regulate externalities where appropriate.

Fostering the digital economy can help boost productivity and socio-economic development

Digitalisation can boost productivity and efficiency, as well as broader socio-economic development. It allows for better governance arrangements and a more inclusive society through improved access to and quality of key services such as health, education and banking. It aids innovation and helps countries move up value chains (OECD, 2017a). Moreover, having the means to participate in a global digital economy is essential, as cross-border digital flows continue to grow (Chakravorti and Chaturvedi, 2017). The government recognises the benefits of expanding the use of digital technologies and is seeking to increase the coverage of affordable digital services as part of the 12th Plan. While increased digitalisation offers tremendous opportunities, it is also highly disruptive and changing the ways in which people work and live their lives. Adequate plans therefore need to be in place to ensure Thai society is ready to embrace the digital revolution.

To ensure the benefits from the digital economy are spread equally, all individuals, businesses and governments must have reliable and affordable access to digital networks and services. Thailand is making progress in this area, but has room to improve. According to the 2016 Network Readiness Index, Thailand’s information and communication technology (ICT) infrastructure is in the middle of the pack vis-à-vis comparator countries, but ahead of all regional comparators except Korea and Singapore (Figure 11A). However, the share of people using the internet, which reached 47.5% in 2016, is below most comparator economies. Meanwhile, despite efforts, the gap in urban/rural access to ICT remains wide: in 2016, 57% of people in urban areas were internet users versus 40% in rural areas (NSO, 2016). However, Thailand performs well with regard to mobile phones with over 81% of the population aged six and over using a phone in 2016 and over 176 connections per 100 people – the highest amongst comparator countries (NSO, 2016; ITU, 2016).

If ICT infrastructure is the vehicle to reach the digital economy, ICT literacy is the driver. According to the Network Readiness Index, Thailand’s education system, including the quality of maths and science courses, is under-equipping Thai students with the skills required for effective ICT use. Indeed, Thailand’s digital skills readiness ranks below most comparator countries (Figure 11B). Further efforts to address digital knowledge deficiencies are needed to ensure all people can participate and thrive in a digital economy.

Figure 11. Thailand has room to improve in digital infrastructure and skills readiness

Index, scale 1-7 from lowest to highest level of readiness, 2016

Source: WEF (2016), Network Readiness Index, <http://reports.weforum.org/global-information-technology-report-2016/networked-readiness-index>.

Thailand also faces challenges in relation to cyber security. In the first quarter of 2017, Thailand had a malware encounter rate (the number of computers that detect a malware or unwanted software threat) of 20%, one of the highest among comparator countries (Microsoft, 2017). Meanwhile, Thailand ranked tenth and seventh worldwide, respectively, for reported data breaches and the average lifespan of a bot-infected computer (Symantec, 2017). Boosting digital security is important to foster individual and business confidence in the use of digital technologies.

Thailand is implementing a number of initiatives to help overcome these obstacles. In 2016, the Ministry of Digital Economy and Society developed a Thailand Digital Economy and Society Development Plan, which consists of four phases over 20 years. As part of the first phase, the government seeks primarily to boost digital infrastructure (Table 4). Indeed, the number of broadband connections with speeds of 10 Mbps or higher soared in 2017 (Akamai, 2017). The government is also trying to leverage private investment in ICT infrastructure by offering tax incentives to encourage local and international businesses to establish data centres. Additionally, the Ministry of Digital Economy and Society is establishing a digital park to support digital businesses and offering a range of tax and non-tax incentives (e.g. simplified visa and work permit procedures).

Table 4. Thailand's digital infrastructure targets

Target	Time frame
Provide broadband access to all villages	Within two years
Provide broadband access to 90% of users in all municipalities and economic zones at speeds no less than 10 Mbps	Within three years
Provide broadband access to 95% of schools, sub-district health promotion hospitals, local administration organisations and digital community centres at speeds no less than 30 Mbps	Within five years

Source: MEDS (2016)

While investment in necessary infrastructure is progressing, Thailand needs to focus on improving ICT literacy and skills. Established community learning centres can serve to build familiarity and knowledge of ICT. At the same time, ICT education in schools needs to improve, with ICT use integrated into teaching, including the development of appropriate learning materials (Fleischer et al., 2018).

Digital technologies can promote social inclusion by facilitating better access to quality education, offering new opportunities for skills development, enhancing access to healthcare, and more generally improving access to free and low-cost information, knowledge and data. Mobile telephony in particular has been used intensively in a number of initiatives that aim to improve the welfare of lower-income and excluded groups in developing countries (OECD, 2017a).

SMEs need to be better financed, digitalised and properly incentivised

Small and medium enterprises (SMEs) represent about 42% of Thailand's GDP, mostly in services and manufacturing. In 2015, they accounted for 99.7% of the total number of enterprises in the country, 80% of employment and about a quarter of total exports. Addressing the obstacles faced by SMEs and promoting entry of innovative SMEs are crucial for economy-wide growth and reducing inequality between regions and individuals (Lee et al., 2017). While some Thai SMEs have benefited from linkages with GVCs in key manufacturing segments, particularly automotive and electronics, most SMEs are excluded.

SMEs face a number of interrelated problems, not least because of their often-informal status (Lathapipat and Poggi, 2016). These include inadequate financing, insufficient upgrading of capital stock and slower adoption of technology, as well as inadequate regional integration (Charoenrat and Harvie, 2017). The government has developed an SME Promotion Masterplan (2017-2021), with the objective to increase the SME share of GDP to at least 50% by 2021. To this end, it is prioritising regulatory reform by streamlining licensing procedures, initiating an experimental regulatory regime for FinTech firms, promoting skills training with an emphasis on ICT, and facilitating start-ups through the provision of entrepreneurship education and finance (Mohd Arif et al., 2018). To adequately address these cross-cutting issues, improved co-ordination is needed across existing agencies responsible for delivering both financial and non-financial support to SMEs.

Better access to financing is key, as Thai SMEs often struggle in this area, as do their peers elsewhere. Even though collateral requirements for SME loans are much stricter, the share of non-performing loans has been rising for SMEs (see above). The bulk of SME loans are disbursed through specialised financial institutions, which may affect the degree of credit access between sectors and regions. While the government tried to alleviate the problem in 2008 by introducing a credit guarantee scheme through the Small Business Credit Guarantee Corporation (SBCGC), the take-up rate has been low (OECD, 2016a). Potential solutions that could help broaden its appeal include higher government funding for the SBCGC and more targeted guarantee-related products offered to SMEs, with lower rates and fees. In addition, reliance on bank financing could be reduced by encouraging SMEs to access the capital market via the creation of a special lower-cost bourse in the Thai Stock Exchange. In June 2017, Malaysia launched a similar instrument, the Leading Entrepreneur Accelerator Platform, to help its SMEs access the capital market (Bursa Malaysia, 2017).

SMEs also need to embrace the digital economy by tapping into the rapid development of e-commerce and e-payment. In this regard, the central bank has introduced measures such as PromptPay and standardised quick response (QR) code payments (Box 1).

Over the slightly longer term, e-commerce offers many opportunities for SMEs. The government has launched a National e-Commerce Master Plan (2017-2021) whose measures include improving ICT access in rural areas and promoting an e-payment service for cheaper and easier transactions. Regional peers such as Malaysia and Singapore have pioneered specific incentives, reduced costs and set up clusters, such as the Digital Free Trade Zone in Malaysia, to help promote e-commerce among SMEs. Thailand could envisage such clusters for Thai SMEs, notably in under-served economic regions in the Northeast, North and South. This would help reduce regional economic imbalances through infrastructure development and take advantage of lower costs in these regions compared to the Bangkok Metropolitan Area and Eastern regions. In accordance with Thailand 4.0, the government should also step up the development of high-speed broadband network infrastructure in these regions, starting with 4G mobile broadband for a quicker rollout (Bangkok is expected to move to 5G mobile in 2018-19), while building a fixed broadband network in parallel, which may be slower to set up but is necessary.

Last but not least, SMEs face challenges with respect to taxation. Under the present tax regime, SMEs with paid-up capital below THB 3 million and annual income below THB 30 million qualify for a reduced corporate tax of 0%, 15% or 20%, depending on their net profit, against a 20% regular corporate tax rate. In 2015 and 2016, this was cut to 0-10%, to support SMEs amid the economic slowdown. In 2017, this support was temporarily continued to encourage greater tax compliance by SMEs and reduce the vast informal sector, but normal rates are due to be restored in 2018. While this approach led to an increase in tax registration among SMEs, it is important to offer greater certainty through the creation of a more stable corporate income tax rate structure. One option could be a permanently lower tax rate of 10% for qualifying SMEs. To mitigate any threshold effects and avoid discouraging expansion, a lower marginal tax rate could also be considered to reward more successful SMEs, as is the case in Malaysia. For example, SMEs with income growth exceeding 10% could be granted a five-percentage point reduction on the tax rate applicable to their incremental income.

Box 1. Lowering the cost and improving the ease of financial transactions

PromptPay is the first project to be rolled out under the government's National e-Payment Master Plan. Since early 2017, it has enabled registered individuals and businesses to more efficiently transfer funds between banks and e-wallets, by using mobile phones or citizen ID numbers instead of exchanging bank account details. PromptPay provides one of the cheapest rates globally, with free transfer services for transactions up to THB 5 000 (USD 150) and a top tier rate of THB 10 (USD 0.30) for transactions over THB 100 000 (USD 3 000). As of the end of 2017, over 37 million people had registered for PromptPay.

Thailand has also used the PromptPay system to launch a standardised QR code for payment services. This offers an efficient and cost-effective e-Payment alternative, whereby consumers can pay for goods and services instantly by scanning the QR code through a smartphone application. Thailand's performance is in line with global best practice in this area, as consumers need not scan different QR codes to make payments, while merchants only need to display one QR code. Aside from the expediency and convenience, increased use of QR code payments also helps to collect financial data on SMEs which could eventually be used to support access to credit. By the end of 2017, the Bank of Thailand had permitted eight Thai Banks to provide QR code payment services. Looking ahead, QR code payment services will be expanded to allow the use of alternative sources of funds including credit and debit cards.

The cost and convenience benefits of PromptPay and QR code payments are demonstrated by their rapid uptake across the economy (Figure 12). Spreading the use of these systems will help drive further efficiencies, incentivise SMEs to join the formal economy and provide a foundation for innovative financial services.

Figure 12. Use of mobile phones to process financial transactions has grown rapidly

Source: Banchongduang (2017); Bank of Thailand (2017), Payment transactions statistics, <https://www.bot.or.th/English/Statistics/PaymentSystems/Pages/StatPaymentTransactions.aspx>; and Santiprabhob (2017a, b).

Furthering global value chain participation and regional integration

Trade and foreign investment have been major drivers of Thailand's industrialisation since the second half of the 1970s. Foreign trade amounted to 123% of GDP in 2017, more than double the OECD average, reflecting active participation in GVCs. The share of foreign value-added in gross total exports (i.e. the proportion of imported intermediate goods in total exports) rose from 24% in 2001 to 37% in 2014, well above the OECD average of 26% (Figure 13). Thailand's participation in GVCs has also brought about significant productivity gains thanks to international technology and knowledge transfers. Participation in GVCs provides opportunities to diversify exports into sectors characterised by a faster pace of technological progress, and to attract FDI (OECD, 2013).

Making the best of opportunities created by participation in GVCs calls for efficient and cheap access to imported intermediate and capital goods. Thailand has made substantial progress in this regard, almost halving the weighted applied mean tariff rate for manufacturing goods between 2007 and 2015 (Figure 14). During the same period, a series of free trade agreements (FTAs) were concluded, either bilaterally or regionally through ASEAN, with major trade partners such as Australia, China, India, Korea, Japan and New Zealand. By 2010, tariffs had been almost completely eliminated for intra-regional trade with ASEAN countries (except Cambodia, Lao PDR, Myanmar and Viet Nam) as a consequence of the ASEAN Free Trade Area. Following the advent of the ASEAN Economic Community (AEC) in December 2015, remaining tariffs for these four countries have now been abolished. In addition, FTAs have contributed to reducing non-tariff trade barriers, notably by harmonising standards and streamlining rules of origin to reduce compliance costs. By 2016, 60% of Thailand's trade value was covered by FTAs (JETRO, 2017). These developments have strengthened regional linkages among ASEAN countries, including Thailand, with some traditional suppliers of intermediates in Europe, Japan and the United States being replaced by regional suppliers (Lopez Gonzales, 2016).

Figure 13. GVC participation has improved

Share of foreign value-added in gross total exports of goods and services

Source: OECD-WTO (2017), Trade in Value-added database, <https://stats.oecd.org/index.aspx?queryid=75537>.

Figure 14. Thailand's average tariff rate fell in the past decade

Weighted mean applied tariff rate for manufacturing goods

Source: UNCTAD (2017), Trade Analysis and Information System database, <http://unctad.org/en/Pages/DITC/Trade-Analysis/Non-Tariff-Measures/NTMs-trains.aspx>; World Bank (2017), World Development Indicators database, <http://databank.worldbank.org/data/home.aspx>.

Trade costs can also be reduced by streamlining trade-related procedures and enhancing the quality of related infrastructure and services. According to the OECD Trade Facilitation Indicators, Thailand compares favourably to the average Asian or upper-middle-income country in this respect. In fact, Thailand matches global best practice with respect to the involvement of the trade community, appeal procedures and formalities (documents, automation and procedures) (Figure 15). Further trade facilitation gains can be reaped by promoting this agenda multilaterally, in particular with neighbouring ASEAN countries with which Thailand's trade ties have strengthened, such as Cambodia, Lao PDR, Myanmar and Viet Nam.

Figure 15. Thailand's trade facilitation has made good progress

As of 2017; indicators range from 0 (worst) to 2 (best)

Source: OECD (2017g), Trade Facilitation Indicators database, www.oecd.org/trade/facilitation/indicators.htm.

Trade liberalisation and facilitation has lagged somewhat in the services sector, but is key for productivity and competitiveness. Open and well-regulated services markets are the gateway to GVCs, ensuring access to information, skills and technology, reducing costs and improving quality of services (OECD, 2017c). This is true in particular for digital, logistics and professional services used in high value-added activities. However, restrictions on services trade, in particular on telecommunication, transportation and professional services, remain high in Thailand (World Bank, 2016). While the ASEAN countries including Thailand have committed to services trade liberalisation by allowing higher foreign equity ownership in various areas (including business services, professional services, construction, healthcare and finance), progress is still limited due to delays in regulatory reform in each country (OECD, 2017b).

The OECD Services Trade Restrictiveness Index (STRI) quantifies barriers to services trade and helps identify regulatory bottlenecks and “low-hanging fruit” for policy reforms. The STRI for Thailand is being computed for the first time and is focusing on two services sectors – construction and architecture – between 2014 and 2017. These services provide key inputs and infrastructure for manufacturing and other sectors, and accounted for 3% of GDP and 6% of employment in 2016.

The STRI results show that Thailand’s regulatory framework creates international trade impediments in both the construction and architecture service sectors (Figure 16). The impediments result from both economy-wide and sector specific regulations. The economy-wide regulations include residency requirements for boards of directors, foreign land acquisition restrictions and a 49% cap on foreign ownership for companies without a foreign business license. To obtain a foreign business licence companies must have investments screened by the government and meet minimum capital requirements. In public procurement markets, preference is given to local suppliers. Apart from the economy-wide implications, such limitations have a particular bearing on construction services providers given the

importance of government demand for such services in infrastructure development. Concerning foreign workers seeking to provide services in Thailand, employers must first undertake labour market tests and give preference to Thai nationals. When foreign work permits are granted, they are limited to 12 months. In addition, companies must employ a minimum of four Thai nationals for every foreign worker. Combined, these requirements create a large disincentive for foreigners seeking to provide services in Thailand.

Figure 16. Service trade restrictiveness is high in the construction and architecture sectors

Note: The OECD Services Trade Restrictiveness Index (STRI) is a unique, diagnostic tool that inventories trade restrictions in 44 countries for 22 services sectors, allowing countries to benchmark their services regulations relative to global best practice, identify outlier restrictions and prioritise reform efforts. Composite indices quantify restrictions across five policy areas, with values between zero and one. Complete openness to trade in services gives a score of zero, while complete closure to foreign services providers yields a score of one. Since 2014, the STRI database monitors changes in services trade policies on an annual basis. It records measures on a Most Favoured Nations basis, so preferential trade agreements are not taken into account.

Source: OECD (2017h), Services Trade Restrictiveness index database, www.oecd.org/tad/services-trade/services-trade-restrictiveness-index.htm.

International trade in construction and architecture services is also impacted by sector-specific restrictions. For construction services, all professionals, such as civil engineers, must obtain local license.

Although there are processes in place to recognise foreign qualifications, applicants for licenses must have a local residence and undergo additional testing for specific engineering professions. Civil engineering professions related to testing, supervising and consulting on construction activities are reserved to Thai nationals. Companies providing architecture services must have a commercial presence in Thailand and a majority of their board members need to be locally licensed professionals. Moreover, foreign architects cannot operate independently, and must form a joint venture with local architects. Foreign architects also have to be residents and pass additional testing to get their qualification recognised.

Certain policy changes were introduced in 2017 to ease the conditions for foreign services suppliers. Reforms include allowing foreign suppliers to challenge the public procurement procedures and incorporating a constitutional obligation on the part of the government to consult with stakeholders, including foreign services suppliers, in the area of proposing new legislation. With regard to construction services, a centralised system for licenses has been created, making application for license more transparent and efficient.

As noted above, FDI has played an essential role in Thailand's industrialisation and export growth through the provision of capital, technology and managerial skills, delivering major productivity gains. Thailand initiated investment liberalisation for the manufacturing sector in the 1970s, and liberalised the services sector in the early 1990s. In recent years, Thailand has become a major source of FDI to other Southeast Asian countries, notably Cambodia, Lao PDR and Myanmar, thereby contributing to regional integration. Nevertheless, the rules governing inward FDI remain comparatively restrictive (Figure 17).

Figure 17. FDI is still subject to substantial restrictions

As of 2016; index ranges from 0 (open) to 1 (closed)

Note: The OECD FDI Regulatory Restrictiveness Index covers only statutory measures discriminating against foreign investors (e.g. foreign equity limits, screening and approval procedures, restrictions on key foreign personnel and other operational measures). Other important aspects of the investment climate (e.g. the implementation of regulations and state monopolies) are not considered. Data for Brunei Darussalam, Thailand and Singapore are preliminary.

ASEAN 10 comprises Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.

Source: OECD (2017i), FDI Regulatory Restrictiveness Index database, www.oecd.org/investment/fdiindex.htm.

Thailand's gross FDI inflows as a share of GDP have been comparatively high over the past 15 years, but have lost ground in relative terms vis-à-vis Indonesia, Malaysia and the Philippines (Figure 18A).

Amid intensified regional competition for FDI, Thailand may have been negatively affected by insufficient efforts to improve its business environment, even though the government has provided tax exemptions targeted to specific areas with a view to enhancing productivity gains (knowledge-based activities, human resource development and commercialisation of local R&D outputs). Despite these efforts, Thailand's performance improved only marginally between 2008 and 2017, according to the Global Competitiveness Index (Figure 18B). To address this lacklustre performance, the government conducted a series of regulatory reforms to promote FDI inflows. These include amendment of the Foreign Business Act allowing foreign majority ownership in financial and infrastructure sectors, and revision of the Licensing Facilitation Act to ensure accountability and transparency of business licensing (Mohd Arif et al., 2018).

Figure 18. Gross FDI inflows have slowed in recent years

Source: UNCTAD (2017), UNCTADstat, <http://unctadstat.unctad.org>; WEF (2017), Global Competitiveness Index 2017-2018 database, <http://reports.weforum.org/global-competitiveness-index-2017-2018/#topic=data>.

The furthering of regional integration is helping to promote trade and investment liberalisation, as well as reform in areas related to trade and investment facilitation, such as more efficient customs procedures, streamlining and digitalisation of formalities, and regulatory reform of entry into the services sector. In addition to the AEC and FTAs with major trade partners in Asia, further progress could be achieved by concluding FTA negotiations with the European Union and the United States. Thailand's regional and wider-scale integration agenda would be well served by its participation in regional trade and investment fora such as Asia-Pacific Economic Cooperation and the Regional Comprehensive Economic Partnership.

REFERENCES

- ADB (2015), *Thailand Industrialisation and Economic Catch-Up*, Asian Development Bank, Mandaluyong City, www.adb.org/sites/default/files/publication/178077/tha-industrialization-econ-catch.pdf.
- Akamai (2017), *State of the Internet: Q1, 2017 Report*, Vol. 10/1, Akamai, Paris, www.akamai.com/fr/fr/multimedia/documents/state-of-the-internet/q1-2017-state-of-the-internet-connectivity-report.pdf.
- Asia Productivity Organization (2017), “Productivity Database 2017 Version 1” (database), Tokyo, www.apo-tokyo.org/wedo/measurement.
- Banchongduang, S. (26 December 2017), “BoT governor to keep accommodative policy”, *Bangkok Post*, www.bangkokpost.com/business/news/1385742/bot-governor-to-keep-accommodative-policy.
- Bogiatzis, A., H. Asada and H.R. Mohamed Rizwan (2018), “Sustainable finance for inclusive growth in Thailand”, *OECD Economics Department Working Papers*, No. 1471, OECD Publishing, Paris. <http://dx.doi.org/10.1787/7ad06329-en>.
- BOT (2017), *Monetary Policy Report 2Q 2017*, Bank of Thailand, Bangkok.
- Board of Investment (2017), *A Guide to the Board of Investment 2017*, Bangkok, Board of Investment, www.boi.go.th/upload/content/BOI-A%20Guide%202017-EN-20170419_72762.pdf.
- Bursa Malaysia (2017), *LEAP Market Listing Requirements*, Bursa Malaysia Berhad, Kuala Lumpur, www.bursamalaysia.com/market/regulation/rules/listing-requirements/leap-market/listing-requirements.
- Chakravorti, B. and R. Chaturvedi (2017), *Digital Planet 2017: How Competitiveness and Trust in Digital Economies Vary Across the World*, The Fletcher School, Tufts University, https://sites.tufts.edu/digitalplanet/files/2017/05/Digital_Planet_2017_FINAL.pdf.
- Charoenrat, T. and C. Harvie (2017), “Thailand’s SME participation in ASEAN and East Asian regional economic integration”, *Journal of Southeast Asian Economies*, Vol. 34/1, pp. 148-174.
- Conference Board (2017), “Total Economy Database” (database), May 2017, www.conference-board.org/data/economydatabase.
- Durongkaveroj, P. (2015), *Science, Technology and Innovation Policies in Thailand: Achievements and Challenges*, 18th Annual session of United Nations Commission on Science and Technology for Development, 6 May, http://unctad.org/meetings/en/Presentation/ecn162015p15_Durongkaveroj_en.pdf.
- Egawa, A. (2015), “How should the Thai Government change its policy for narrowing income disparity among the provinces?”, *St. Andrew’s University Economic and Business Review*, Vol. 56/4, https://ci.nii.ac.jp/els/contentscinii_20180122061911.pdf?id=ART0010429792.
- Fleischer, L. et al. (2018), “Making growth more inclusive in Thailand”, *OECD Economics Department Working Papers*, No. 1469, OECD Publishing, Paris. <http://dx.doi.org/10.1787/263a78df-en>.
- Fukuoka, N., R. Ochiai and S. Tada (2016), “Analysis on the macroeconomy and industrial policies toward industrial upgrading in Thailand and policy recommendations” (in Japanese with English summary), *RIETI Discussion Papers*, Research Institute of Economy, Trade and Industry, Tokyo, www.rieti.go.jp/jp/publications/pdp/16p013.pdf.

- ILO (2017), “ILO Stat” (database), ILO, Geneva, www.ilo.org/global/statistics-and-databases/lang--en/index.htm.
- IMF (2017), *Article IV Staff Report*, IMF Country Report No. 17/136, May, International Monetary Fund, Washington, DC.
- ITU (2016), “Global and Regional ICT Data” (dataset), International Telecommunications Union, Geneva, www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx.
- JETRO (2017), *JETRO Global Trade and Investment Report 2017*, Japan External Trade Organisation, Tokyo.
- Lathapipat, D. and C. Poggi (2016), “From many to one: Minimum wage effects in Thailand”, *PIER Discussion Papers*, No. 41, Puey Ungphakorn Institute for Economic Research, Bangkok, www.pier.or.th/wp-content/uploads/2016/08/pier_dp_041.pdf.
- Lee, C., D. Narjoko and S. Oum (2017), “Southeast Asian SMEs and regional economic integration”, *Journal of Southeast Asian Economies*, Vol. 34/1, pp. 1-3.
- Lopez Gonzalez, J. (2016), “Using foreign factors to enhance domestic export performance: A focus on Southeast Asia”, *OECD Trade Policy Papers*, No. 191, OECD Publishing, Paris, <http://dx.doi.org/10.1787/18166873>.
- Microsoft (2017), *Microsoft Security Intelligence Report*, Vol. 22, January-March, Microsoft Corporation, Redmond, WI, www.microsoft.com/en-us/security/intelligence-report.
- MEDS (2016), *Thailand Digital Economy and Society Development Plan, 1st edition*, Ministry of Digital Economy and Society, Bangkok, www.itu.int/en/ITU-D/Regional-Presence/AsiaPacific/Documents/Events/2016/Apr-Digital2016/S2_Present_Pansak_Siriruchatapong.pdf.
- Mohd Arif, A. Z. et al. (2018), “Enhancing governance in Thailand”, *OECD Economics Department Working Papers*, No. 1472, OECD Publishing, Paris. <http://dx.doi.org/10.1787/8ddfd4c6-en>.
- MOI (2015), *Thailand Moving Ahead with Cluster Development*, Ministry of Industry, Bangkok, www.boi.go.th/upload/content/Presentation%20by%20Minister%20of%20Industry_89274.pdf.
- NESDB (2017), *The Twelfth Economic and Social Development Plan (2017-2021)*, Office of the National Economic and Social Development Board, Bangkok, www.nesdb.go.th/nesdb_en/ewt_w3c/ewt_dl_link.php?nid=4345.
- NSO (2016), *The 2016 Household Survey on the Use of Information and Communication Technology*, National Statistics Office, Ministry of Information and Communication Technology, Bangkok.
- NSTIPO (2014), *Thailand’s Science, Technology and Innovation Policy and Institutional Framework*, National Science Technology and Innovation Policy Office, Bangkok, http://unctad.org/meetings/en/Presentation/MYEM2_2014_Durongkaveroj_Pichet.pdf.
- OECD (2017a), *Opportunities and Policy Challenges of Digitalisation in Southeast Asia*, OECD Publishing, Paris, www.oecd.org/southeast-asia/events/regional-forum/Forum_Note_Digital_Transformation_STI.pdf.
- OECD (2017b), *Economic Outlook for Southeast Asia, China and India 2017*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/saeo-2017-en>.
- OECD (2017c), *Services Trade Policies and the Global Economy*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264275232-en>.
- OECD (2017d), “National Accounts” (database), <http://dx.doi.org/10.1787/na-data-en>.
- OECD (2017e), “Productivity Statistics” (database), www.oecd.org/std/productivity-stats.

- OECD (2017f), “Gross domestic spending on R&D” (database), <http://dx.doi.org/10.1787/d8b068b4-en>.
- OECD (2017g), “Trade Facilitation Indicators” (database), www.oecd.org/trade/facilitation/indicators.htm.
- OECD (2017h), “Services Trade Restrictiveness Index” (database), www.oecd.org/tad/services-trade/services-trade-restrictiveness-index.htm.
- OECD (2017i), “FDI Regulatory Restrictiveness Index” (database), www.oecd.org/investment/fdiindex.htm.
- OECD (2017j), *Building Food Security and Managing Risk in Southeast Asia*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264272392-en>.
- OECD (2017k), “OECD Economic Outlook No. 102 (Edition 2017/2)”, *OECD Economic Outlook: Statistics and Projections* (database), <http://dx.doi.org/10.1787/05b705e7-en>
- OECD (2016a), *Financing SMEs and Entrepreneurs 2016: An OECD Scoreboard*, OECD Publishing, Paris, http://dx.doi.org/10.1787/fin_sme_ent-2016-en.
- OECD (2016b), *OECD Economic Surveys: Turkey 2016*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eco_surveys-tur-2016-en.
- OECD (2016c), “Stimulating demand for innovation”, in *OECD Science, Technology and Innovation Outlook 2016*, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_in_outlook-2016-26-en.
- OECD (2015), *Analysing Policies to Improve Agricultural Productivity Growth, Sustainably: Revised Framework*, OECD Publishing, Paris, www.oecd.org/agriculture/policies/innovation.
- OECD (2013), *Interconnected Economies: Benefitting Global Value Chains*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264189560-en>.
- OECD (2009), *Clusters, Innovation and Entrepreneurship*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264044326-en>.
- OECD-WTO (2017), “Trade in Value-added” (database), <https://stats.oecd.org/index.aspx?queryid=75537>.
- Santiprabhob, V. (2017a), “Confidence in connectivity of the GMS”, *Euromoney Conferences: The Greater Mekong Investment Forum*, Bangkok, www.bis.org/review/r170629b.pdf.
- Santiprabhob, V. (2017b), “Navigating through uncertainties for Thailand’s sustainability”, *Association of International Banks Dinner Talk Series*, Bangkok, www.bis.org/review/r170703d.pdf.
- Symantec (2017), *Internet Security Threat Report*, Vol. 22, Symantec Corporation, Mountain View, California.
- UNCTAD (2017), “Trade Analysis and Information System” (database), United Nations Conference on Trade and Development, Geneva, <http://unctad.org/en/Pages/DITC/Trade-Analysis/Non-Tariff-Measures/NTMs-trains.aspx>.
- UNCTAD (2015), *Science, Technology and Innovation Policy Review: Thailand*, United Nations Conference on Trade and Development, Geneva, http://unctad.org/en/PublicationsLibrary/dtlstict2015d1_en.pdf.
- UNESCO-UIS (2017), “Science, Technology and Innovation” (dataset), UNESCO Institute of Statistics, <http://data.uis.unesco.org>.
- World Bank (2017), “World Development Indicators” (database), <http://databank.worldbank.org/data/home.aspx>.

- World Bank (2016), *Thailand Economic Monitor 2016: Services as a New Driver of Growth*, Washington DC, World Bank, <http://pubdocs.worldbank.org/en/660991482204992792/TEM2016-Services-as-a-New-Driver-of-Growth.pdf>.
- WEF (2017), *Global Competitiveness Index 2017- 2018* (database), World Economic Forum, Geneva, <http://reports.weforum.org/global-competitiveness-index-2017-2018/#topic=data>.
- WEF (2016), “Network Readiness Index” (database), World Economic Forum, <http://reports.weforum.org/global-information-technology-report-2016/networked-readiness-index>.