



MALAYSIA ECONOMIC MONITOR

OCTOBER 2024

Farming the Future:

Harvesting Malaysia's Agricultural
Resilience through Digital Technologies



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Cover design and layout: Kane Chong Sdn Bhd

Acknowledgements

This edition of the Malaysia Economic Monitor (MEM) was co-led by Chong Yew Keat and Deisigan Shammugam, with the special topic prepared by Anuja Kar with a core team comprising of Andrew Kam Jia Yi, Carlo Bravi (FAO), Illisriyani Ismail, Larry Wong Chee Yoong, and Katrina Brandon. The broader team is comprised of Apurva Sanghi, Fionne Lim Jing Wen, Ririn Salwa Purnamasari, Matthew Dornan, Amanina Abdur Rahman, Alyssa Farha Jasmin, Natalie Fang Ling Cheng, Tatiana Didier, Philbert Tiki Yong, Shahira Zaireen Johan Arief Jothi, Aruhvi Krishnasamy, Douglas Zhihua Zeng, Marco Larizza, Carmen Loo, and Muhammad Faisal Ali Baig.

The team is grateful to Irina Schuman, Parmesh Shah, Mario Guadamillas, Nah Yoon Shin, Gonzalo Varela, and Ekaterine Vashakmadze for their constructive input on the document and to Zafer Mustafaoglu, Judith Green, Yasuhiko Matsuda, Lars Moller, and Paavo Eliste for their overall guidance.

The MEM consists of two parts. Part 1 presents a review of recent economic developments and a macroeconomic outlook. Part 2 focuses on a selected special topic that is key to Malaysia's medium-term development prospects and to the achievement of shared prosperity.

This report benefited from productive discussions with staff from the Ministry of Economy, the Ministry of Finance, the Ministry of Agriculture and Food Security, Bank Negara Malaysia and several other government ministries and agencies, all of whom provided valuable information and useful feedback.

In particular, the team would like to thank the International Cooperation Division of the Ministry of Economy, the International Division of the Ministry of Finance and the Economics and Monetary Policy Department of Bank Negara Malaysia for close ongoing collaboration with the World Bank and for the crucial support to the launch of this report.

Jeannette Goon, Dina Murad, and Aizzat Nordin led external communications and Kane Chong led the production and design of the report. Emmilyn Yeoh provided editing assistance, while Minisha Deepu and Arifurrahman Rusman provided administrative support.

The report is based on information current as of September 27, 2024.

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Abbreviations

12MP	Twelfth Malaysia Plan
AE	Advanced Economies
AFC	Asian Financial Crisis
AIFF	ASEAN Investment Facilitation Framework
AR5	IPCC's Fifth Assessment Report
ASEAN	Association of Southeast Asian Nations
BNM	Bank Negara Malaysia
CCDR	World Bank Group's Country Climate and Development Report
CET1	Common Equity Tier 1
CPI	Consumer Price Index
CSA	Climate-Smart Agriculture
DAT	Digital Agricultural Technology
DDI	Domestic Direct Investment
DFS	Digital Financial Services
DOA	Department of Agriculture
DOFM	Department of Fisheries Malaysia
DOSM	Department of Statistics Malaysia
E&E	Electricals and Electronics
EAP	East Asia and Pacific
ECRL	East Coast Rail Link
EMDE	Emerging Market and Developing Economies
EPF	Employees Provident Fund
EUDR	European Union's Regulation on Deforestation-Free Products
FBMKLCI	FTSE Bursa Malaysia Kuala Lumpur Composite Index
FDI	Foreign Direct Investment
FRA	Fiscal Responsibility Act
GDP	Gross Domestic Product
GEAR-up	Government-linked Enterprises Activation and Reform Program
GFCF	Gross Fixed Capital Formation

GHG	Greenhouse Gas
GIS	Geographic Information System
GLC	Government-Linked Company
GLIC	Government-Linked Investment Company
GVA	Gross Value Added
HES	Household Expenditure Survey
HIC	High-Income Countries
HQLA	High-Quality Liquid Assets
ICT	Information and Communication Technology
IFRS	International Financial Reporting Standards
IoT	Internet of Things
IPO	Initial Public Offering
JS-SEZ	Johor-Singapore Special Economic Zone
JTC	Jurong Town Corporation
KUADP	Kenya Unified Agriculture Data Platform
LCR	Liquidity Coverage Ratio
LDR	Loan-to-Deposit Ratio
LFPR	Labor Force Participation Rate
LFS	Labor Force Survey
M&E	Machinery and Equipment
MASCO	Malaysia Standard Classification of Occupations
MATs	Malaysia Animal Traceability System
MDEC	Malaysia Digital Economy Corporation
MEM	Malaysia Economic Monitor
MGII	Malaysian Government Investment Issues
MGS	Malaysian Government Securities
MIDA	Malaysian Investment Development Authority
MITB	Malaysian Islamic Treasury Bills
MOF	Ministry of Finance Malaysia

MOHE	Ministry of Higher Education
MPC	Monetary Policy Committee
MTB	Malaysian Treasury Bills
MTEF	Medium-Term Expenditure Framework
MTRS	Medium-Term Revenue Strategy
MYR	Ringgit Malaysia
MYSA	Malaysian Space Agency
NABDP	National Agriculture Big Data Platform
NGO	Non-Governmental Organization
OE	Operating Expenditure
OECD	Organization for Economic Co-operation and Development
OPR	Overnight Policy Rate
P2P	Peer-to-Peer
PIMA	Public Investment Management Assessment
PITA	Petroleum Income Tax
PLI	Poverty Line Income
PMRNA	Agrofood Value Chain Modernization Program
PPP	Public-Private Partnership
PSDC	Penang Skills Development Center
RCA	Revealed Comparative Advantage
ROA	Return on Assets
ROE	Return on Equity
RTS	Rapid Transit System
SEZ	Special Economic Zone
SMART SBB	<i>SMART Sawah Berskala Besar</i>
SMEs	Small and Medium-Sized Enterprises
SRU	Skill-Related Underemployment
STPM	<i>Sijil Tinggi Persekolahan Malaysia</i>
SST	Sales and Services Tax

STR	<i>Sumbangan Tunai Rahmah</i>
SWS	Salaries and Wage Survey
TCR	Total Capital Ratio
TFP	Total Factor Productivity
TFPG	Total Factor Productivity Growth
UNCTAD	United Nations Conference on Trade and Development
U.S.	United States
USD	United States Dollar
UST	U.S. Treasury
Y/Y	Year-on-Year



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Executive Summary

Malaysia's economy is expected to expand at a faster pace in 2024. After experiencing weaker-than-expected growth last year, Malaysia's economy grew strongly in the first half of 2024, driven by robust private consumption, increased investment amid higher FDI inflows, and improved export performance. In 2024, the economy is forecast to expand by 4.9 percent, an increase of 0.6 percentage points from the previous forecast in April 2024. Inflation is projected to moderate due to softer global commodity prices and weaker-than-anticipated passthrough effects of recent policy changes. Meanwhile, fiscal space is narrowing, and rigid spending is expected to rise due to the recently announced salary adjustments. While optimizing public spending amid ongoing subsidy rationalization efforts can free up budgetary resources, enhancing revenue mobilization is vital to restore fiscal space and sustainably finance Malaysia's growing spending needs.

To maintain its economic momentum and achieve high-income status, Malaysia must transform key sectors—including agriculture—into sustainable engines of growth. The agrofood sector plays a significant role in supporting Malaysia's economy,

contributing 11.6 percent to the national GDP and employing 1.87 million people in 2023 (approximately 10 percent of the total Malaysian workforce). The Government's vision strategy outlines three key objectives for the agrofood system: (i) become globally competitive and innovative; (ii) enhance the wellbeing of food producers while providing affordable, nutritious food; and (iii) reduce the sector's environmental footprint. Addressing the imbalance between food demand and supply, exacerbated by urbanization, is crucial. This requires reducing transaction costs and information asymmetries that affect both farmers' and consumers' decisions. High transaction costs hinder farmers' market access and contribute to information gaps. Digital Agricultural Technologies (DATs) offer transformative solutions to these challenges by boosting productivity, creating better jobs (especially for youth), and improving access to finance. Effective DAT implementation requires a focus on three strategic pillars: investing in public goods (e.g., digital literacy and rural connectivity), fostering innovative ecosystems (e.g., data platforms and startup incubators), and cultivating an enabling environment to incentivize private sector development in digital agriculture.



Domestic developments

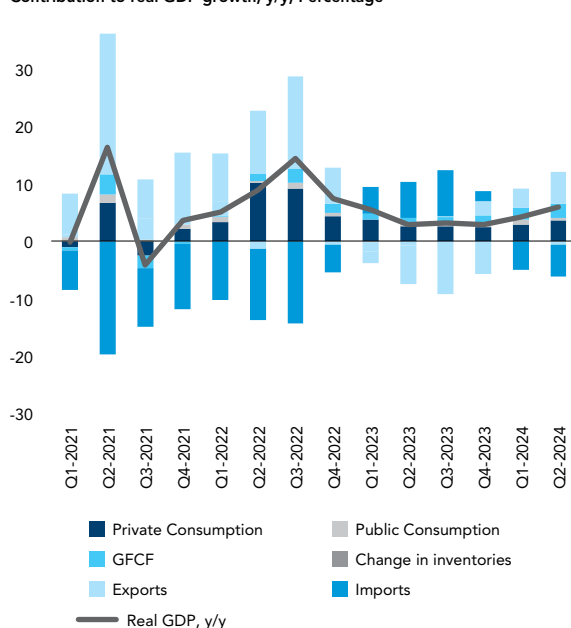
Malaysia experienced stronger Q2 growth amid robust household consumption, investment and trade activity

Malaysia's economy saw stronger year-on-year gross domestic product (GDP) growth of 5.9 percent in Q2 2024, up from 4.2 percent in Q1 2024 (Figure ES1). Private consumption grew by 6.0 percent in Q2 2024, supported by favorable labor market conditions and continued government policy support. Investment activity surged, with gross fixed capital formation (GFCF) growing by 11.5 percent, largely due to private sector expansion in manufacturing and services. Net exports rebounded, increasing by 3.4 percent, supported by improved international goods trade amid a global technological upswing. Malaysia's GDP per capita is approximately 12 percent above the pre-COVID level, outperforming many ASEAN peers.

FIGURE ES1

Malaysia's economy saw stronger growth amid robust household consumption, investment and trade activity

Contribution to real GDP growth, y/y, Percentage

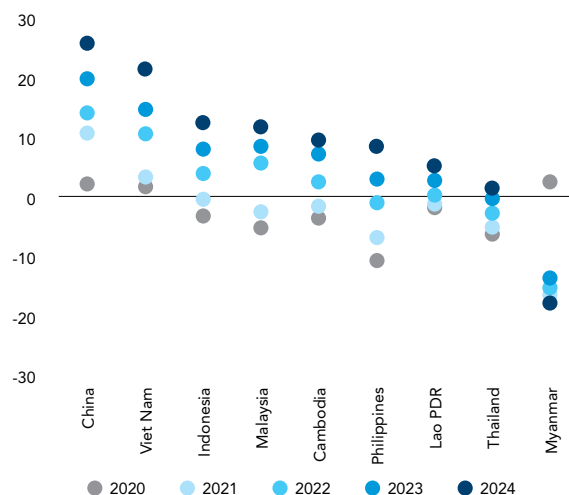


Source: World Bank staff calculations based on DOSM data

FIGURE ES2

Per capita output in Malaysia is now about 12 percent above the pre-COVID level, outperforming many ASEAN peers.

Evolution of GDP per capita compared to 2019, Percentage



Source: October 2024 World Bank EAP Economic Update

Growth accelerated across most economic sectors in Malaysia, particularly in construction and agriculture.

The construction sector saw robust growth of 17.3 percent in Q2 2024, driven in part by increased activity in civil engineering. The agriculture sector rebounded with a 7.2 percent growth in Q2 2024, following a slower first quarter, reflecting improved production in the oil palm and fisheries subsectors. The services sector grew by 5.9 percent, supported by improvements in consumer and business services, while the manufacturing sector expanded by 4.7 percent, benefiting from strong growth in both export- and domestic-oriented industries. In contrast, the mining sector's growth slowed to 2.7 percent due to production disruptions in the oil and gas sector.

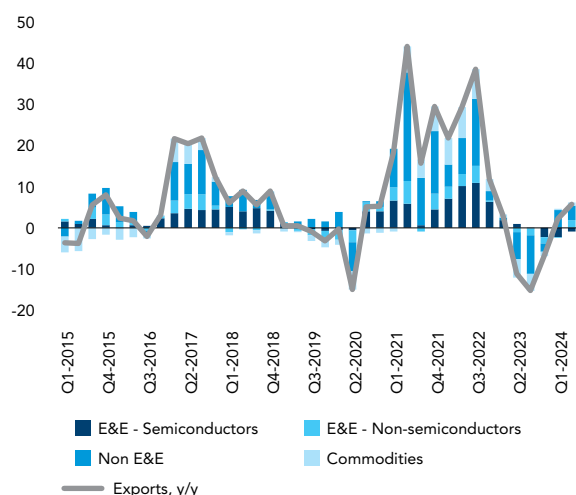
Exports experienced a positive turnaround amid strengthening external demand for both electricals and electronics (E&E) and non-E&E exports (Figure ES3).

Gross export growth accelerated to 5.8 percent in Q2 2024, driven by a recovery in the technology cycle that boosted E&E exports, along with sustained demand for non-E&E products such as machinery, equipment and parts, as well as optical and scientific equipment. Gross imports saw strong growth of 15.0 percent in Q2 2024, fueled by higher intermediate imports and strong domestic demand for capital and consumption goods.

FIGURE ES3

Export growth rebounded in H1 2024, driven by improved demand for both E&E and non-E&E exports

Contribution to export growth, y/y, Percentage



Source: World Bank staff calculations based on DOSM data

Malaysia saw an increase in net foreign direct investment (FDI) inflow in Q2 2024, primarily in the services sector. Malaysia also registered a 16.7 percent and 19.1 percent year-on-year increase respectively in approved FDIs and DDIs in H1 2024. While many factors affect FDI (as noted in previous MEMs), efforts to minimize operational restrictions could further help enhance FDI attraction into Malaysia (see Box 1 on Malaysia's FDI Dynamics: Challenges and Opportunities). Similarly, the development of the special economic zone (SEZ) with Singapore, if successful, could generate additional synergies, strengthen networks, and enhance spillovers, driving further investment and growth opportunities in Malaysia. The SEZ's success will largely depend on the type of incentives provided and its implementation (see Box 2 on Special Economic Zones - Key Policy Lessons from Global Experience).

Labor market conditions have broadly returned to pre-pandemic levels

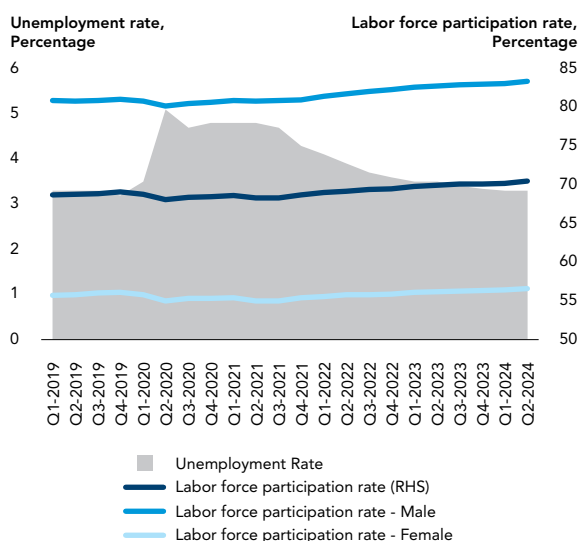
Key labor market indicators have shown improvement over the recent quarters (Figure ES4).

The national unemployment rate remained steady at 3.3 percent in Q2 2024, similar to pre-pandemic levels. Unemployment is slightly higher for females (3.5 percent) than males (3.1 percent), but it has decreased slightly for younger workers. However, the rate for those aged 55-64 rose from 1.9 percent in Q2 2023 to 3.3

percent in Q2 2024, likely due to higher participation in the labor force. The overall labor force participation rate (LFPR) increased slightly from 70.2 percent to 70.5 percent, but the gender gap in participation remained unchanged and large at 26.8 percent. Labor market tightness, as reflected in job vacancies per unemployed person, has also increased over the past year.

FIGURE ES4

Labor force participation rate increased while overall unemployment rate declined



Source: DOSM

Labor productivity growth has picked up while employment growth has slowed. Malaysia's labor productivity growth has increased to 3.1 percent in Q2 2024, driven by a significant 16.3 percent boost in the construction sector. However, employment growth slowed across all sectors, with declining overall year-on-year employment growth of 2.1 percent in Q1 2024 compared to 3.1 percent in Q1 2023. The services sector experienced the largest decline, with growth falling to 2.8 percent from 4.1 percent in the previous year.

Skill-related underemployment (SRU) in Malaysia, where individuals with tertiary education work in semi-skilled or low-skilled jobs, has grown significantly over time. The SRU rate is highest among younger workers, women, and those from lagging states. Factors driving SRU include lack of high-skilled job creation, inefficiencies in job matching, and mismatches between education and industry needs. Addressing these challenges requires strategies such as aligning education with industry demands, enhancing Malaysia's competitiveness, and supporting lifelong skill development (see Box 3 on A Deep Dive into Skill-Related Underemployment).

While Malaysia has nearly eliminated hardcore poverty, absolute poverty continues to be a concern, especially in rural areas and among the Bumiputera population. 6.2 percent of Malaysian households, or nearly half a million households, lived below the national average poverty line of RM2,589 per month in 2022. Rural poverty, at 12 percent, was notably higher than urban poverty at 4.5 percent. Regional and ethnic disparities are evident, with high absolute poverty rates in Sabah (19.7 percent) and among the Bumiputera (7.9 percent) population. Income inequality in Malaysia, with a Gini index of 39 in 2022, is the third highest in the region and remains elevated compared to both transitioning and established high-income countries (HIC).

Factors driving skill-related underemployment include lack of high-skilled job creation, inefficiencies in job matching, and mismatches between education and industry needs.

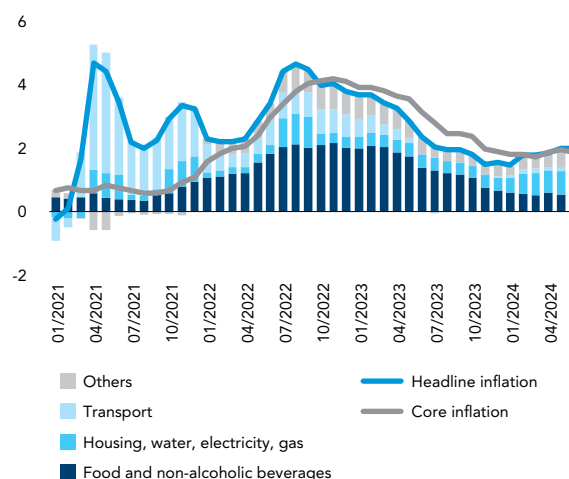
Inflation edged higher in recent quarters but remains moderate

Headline inflation increased slightly in H1 2024, reaching 1.9 percent in Q2 2024 (Figure ES5). This rise was driven primarily by policy adjustments affecting utilities and transportation, including changes to water tariffs, higher services taxes for electricity, and diesel subsidy cuts. The extent of price increases also broadened, with 49.4 percent of the consumer price index (CPI) items recording monthly price hikes in Q2 2024, surpassing the historical average. The central bank maintained the overnight policy rate (OPR) at 3.00 percent, anticipating higher inflation in H2 2024, partly due to the recent rationalization of diesel subsidies. At this OPR level, the monetary policy stance is deemed supportive of the economy. The recent announcement of salary increases for civil servants may create some inflationary pressure beginning 2025. However, the phased implementation over 14 months, combined with the central bank's credibility of maintaining price stability, suggests that the impact on inflation is likely to remain contained.

FIGURE ES5

Headline inflation edged higher in H1 2024, primarily driven by policy adjustments impacting utilities and transportation prices

Contribution to CPI, y/y, Percentage



Source: World Bank staff calculations based on DOSM data

The Malaysian banking sector expanded while remaining well-capitalized. The banking sector maintained strong capital buffers and liquidity in H1 2024. Deposits grew by 4.9 percent, and the loan-to-deposit ratio (LDR) rose to 86.8 percent. Asset quality improved, with gross impaired loans ratio decreasing to 1.6 percent, the lowest since March 2021. Private sector credit expanded by 6.0 percent to RM2.2 trillion, driven by a 6.2 percent increase in household debt and a 5.6 percent rise in business loans, with notable growth in finance, real estate, and retail sectors.

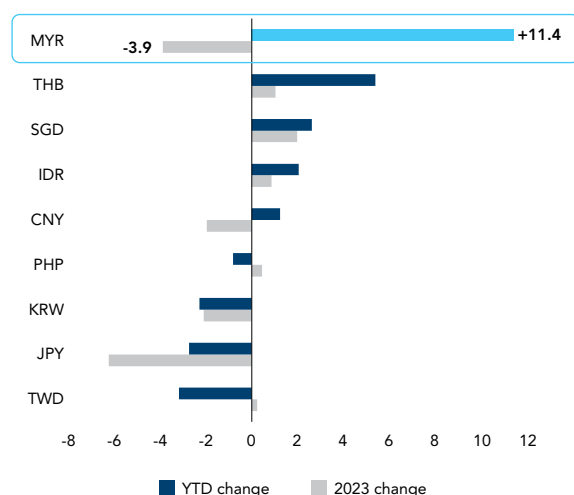
Corporate financing through capital markets has remained robust. Bond and sukuk markets remained a stable funding source for the Malaysian government and a select set of Malaysian corporates. Corporate bond issuance was steady, notably in the finance and real estate sectors. Equity and bond market capitalization reached an all-time high. Bond markets continued to attract foreign capital amid outflows in equity markets. Bond yields remained stable despite global volatility.

The Malaysian ringgit has appreciated more than 11 percent against the U.S. dollar (USD), rebounding from its depreciation in 2023 (Figure ES6). This makes the Malaysian ringgit one of the best-performing currencies in the EAP region this year. Much of this appreciation began in July 2024, driven by better-than-expected economic data in 2Q 2024, the easing of US monetary policy and coordinated efforts by the government and central bank to encourage more foreign exchange inflows.

FIGURE ES6

The Malaysian ringgit has been one of best-performing currencies against the U.S. dollar this year

Regional currencies against the USD, YTD change, Percentage



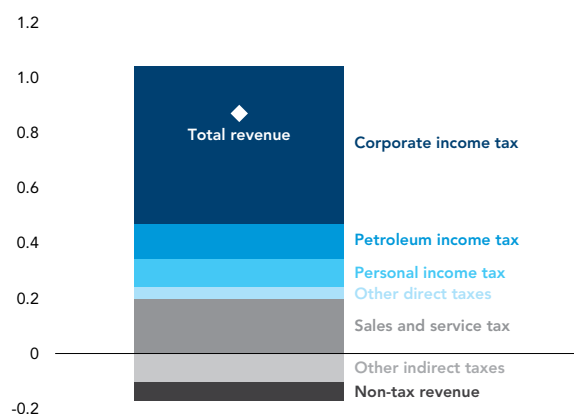
Source: World Bank staff calculations based on BNM data
Note: As of September 27, 2024

A combination of progressive taxes, well-targeted subsidies and adequate cash transfers can collectively benefit low-income groups while improving fiscal space.

FIGURE ES7

Total federal revenue increased in 2023 primarily due to higher corporate income tax collections

Changes in federal government revenue, Percentage of GDP



Source: World Bank staff calculations based on MOF data

The federal government is projected to remain on its fiscal consolidation path

Federal revenue and expenditures increased in 2023 amid higher corporate tax collections and subsidy spending.

In 2023, total federal government revenue rose to 17.3 percent of GDP, up from 16.4 percent in 2022, primarily due to increased corporate tax collections. Petroleum income tax (PITA) increased slightly to 1.4 percent of GDP, despite lower production and global oil prices. Indirect tax revenue also grew, with the sales and services tax (SST) rising from 1.7 percent to 1.9 percent of GDP, though other indirect taxes decreased. Non-tax revenue fell slightly to 4.7 percent of GDP due to reduced investment income. Federal operating expenditures (OE) also rose to 17.1 percent of GDP, driven by increased spending on subsidies and social assistance, which reached 4.3 percent of GDP—higher than the government's estimate of 3.5 percent.

The government expects lower spending on subsidies this year amid ongoing rationalization efforts.

In 2024, the government plans to reduce spending on subsidies and social assistance by RM11.5 billion or 0.6 percent of GDP. This cut follows several subsidy rationalization measures, including a diesel subsidy overhaul expected to save RM4 billion annually or 0.2 percent of GDP. The rationalization has led to fewer signs of smuggling and increased commercial diesel use. The government also adjusted subsidies for chicken and electricity for heavy users. While these efforts are expected to lower overall subsidy spending, achieving the full reduction outlined in Budget 2024 will require subsidy rationalization measures, while managing the impact on inflation and vulnerable populations.

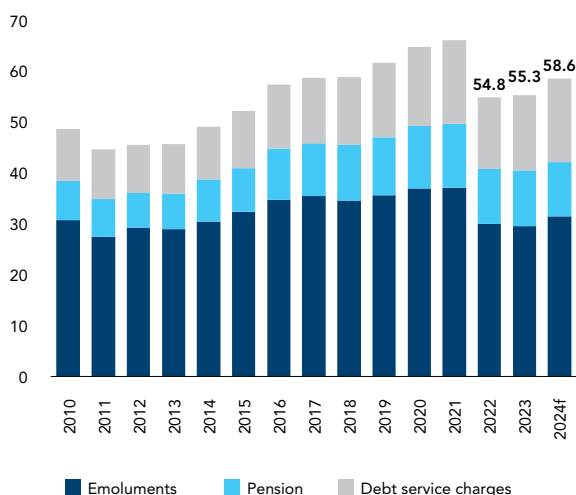
The share of rigid spending is expected to rise due to the government's announced salary adjustments.

Rigid spending, including salaries, pensions, and debt service charges, has been growing, reaching close to 60 percent as a share of total operating expenditures this year. Recent salary increases for civil servants are expected to add approximately RM10 billion annually, or about 0.5 percent of GDP (See Box 4 on Reforming the Public Sector Remuneration System). This rise in emoluments may also lead to higher future pension liabilities, underscoring the need for a defined contribution scheme for new civil servants. Malaysia allocates more fiscal resources to emoluments compared to regional peers, exerting pressure on fiscal resources for other expenditures amid ongoing fiscal consolidation.

FIGURE ES8

The share of rigid spending has increased over time

Rigid expenditures, Percentage of total operating expenditure



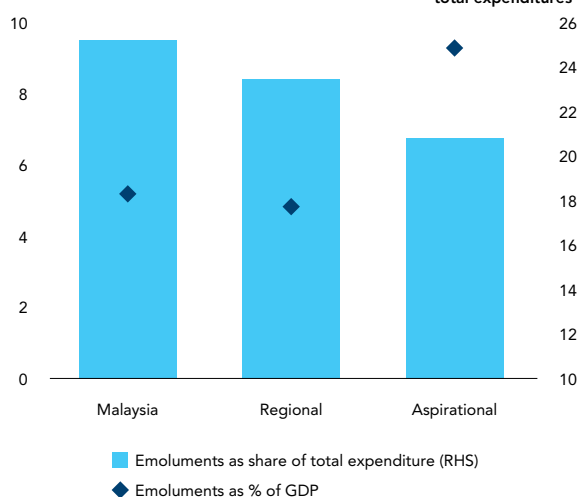
Source: World Bank staff calculations based on MOF data

Note: The lower share of rigid spending since 2022 reflects an increase in overall operating expenditure, driven mainly by higher spending on fuel subsidies.

FIGURE ES9

Malaysia allocates a higher portion of its fiscal spending to emoluments compared to its peer groups

Emoluments, Percentage of GDP



Note: Refer to the 2021 World Bank *Aiming High: Navigating the Next Stage of Malaysia's Development* for the complete list of peer groups. The figures above reflect the average for years 2021-2022.

Federal development expenditures for 2023 and 2024 are notably higher than those of regional peers but below those seen in aspirational countries. Much of this spending is allocated to key sectors such as transportation, education, defense, and

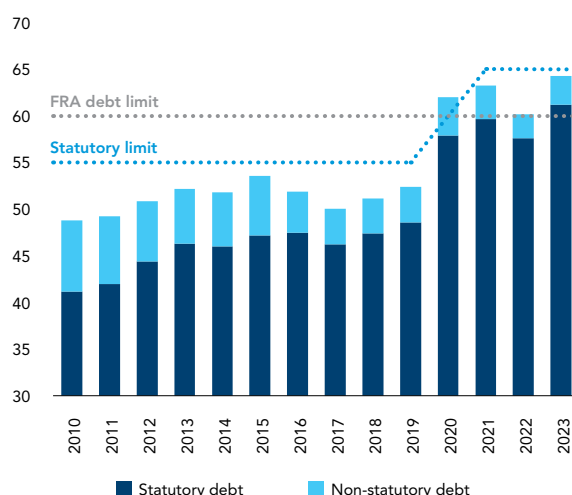
health. However, some challenges remain, including inefficiencies in budget execution, fragmented implementation of development programs, and institutional arrangements involving both federal and state agencies.

The higher debt ratio underscores the need for Malaysia to continue with its structural fiscal reforms. In 2023, the debt-to-GDP ratio rose to 64.3 percent from 60.2 percent in 2022, driven by persistent fiscal deficits. The overall fiscal deficit stood at 5.0 percent of GDP in 2023, with a forecast of 4.3 percent for 2024. Similarly, the primary deficit was 2.5 percent of GDP in 2023 and is expected to improve to 1.8 percent in 2024.

FIGURE ES10

Federal government debt increased over the years with a larger share of debt that is binding to the current statutory limit

Federal government debt, Percentage of GDP



Source: World Bank staff calculations based on MOF data

A comprehensive fiscal strategy that enhances government spending efficiency and revenue mobilization while protecting the poor is crucial for restoring fiscal space in Malaysia. A combination of progressive taxes, well-targeted subsidies and adequate cash transfers can collectively benefit low-income groups while improving fiscal space to sustainably finance its longer-term spending needs (see Box 5 on Future-Proofing Malaysia's Public Finances). Fiscal reform efforts must be complemented by effective policy communication and in-depth, two-way stakeholder engagement to secure broad-based public support for reform.

Economic outlook

Global growth is projected to stabilize at 2.6 percent in 2024 despite ongoing geopolitical tensions and high interest rates.

Advanced economies are expected to maintain a growth rate of 1.5 percent, consistent with 2023. The U.S. is expected to see moderation in growth as the labor market slows, while the Euro area and Japan anticipate a modest pickup with better domestic conditions. For EMDEs, growth is forecasted to moderate slightly from 4.2 percent in 2023 to 4.0 percent in 2024. Domestic demand in some large EMDEs is expected to slow due to specific factors, although many other economies will see increased growth. Global trade is anticipated to recover, with growth reaching 2.5 percent, driven by a rebound in demand for goods. Global inflation is expected to average at 3.5 percent this year, a slower moderation than previously anticipated due to rising commodity prices. Overall, global growth will remain below its pre-pandemic levels, with a slower pace in economies that make up over 80 percent of the global population.

In the EAP region, growth is projected to slow from 5.1 percent in 2023 to 4.8 percent in 2024, primarily due to a slowdown in China.

China's growth is expected to decelerate to 4.8 percent in 2024, as an expected uptick in goods exports and industrial activity supported by the global trade recovery is offset by weaker consumption. In contrast, the rest of the EAP region is forecasted to see growth rise to 4.7 percent, supported by domestic consumption, goods exports, and a revival in tourism. Significant growth accelerations are anticipated in export-oriented economies like Thailand and Vietnam. Over the next two years, EAP region growth is expected to continue moderating, reaching 4.2 percent in 2025 and 4.1 percent in 2026, as the slowdown in China impacts the region despite modest improvements elsewhere.

Malaysia's economy is expected to expand at a faster pace in 2024

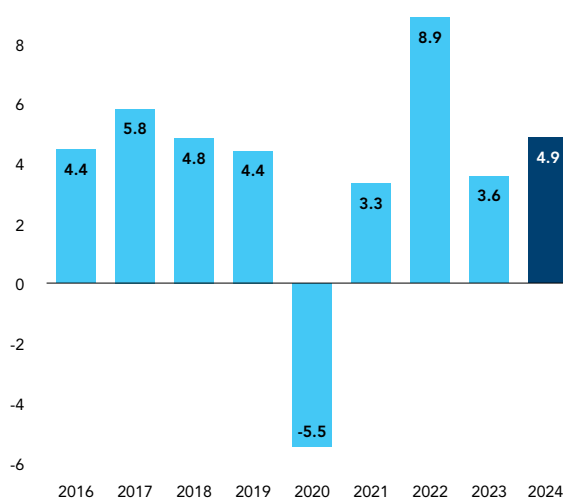
Malaysia's economy is expected to grow by 4.9 percent in 2024, up from 3.6 percent in 2023, following a stronger-than-anticipated performance in H1 2024 (Figure ES11). This revised forecast is 0.6 percentage points or 14 percent higher than previous forecasts, reflecting robust growth in consumption, investment, and trade activity. Private consumption is projected to rise by 5.5 percent this year, up from 4.7 percent in 2023, supported by improved labor market

conditions, wage growth, and ongoing government support such as the *Sumbangan Tunai Rahmah* (STR) cash aid. Public consumption is anticipated to grow at 3.9 percent, supported by salary increases for civil servants and higher spending on supplies and services.

FIGURE ES11

Malaysia's GDP growth is revised upward to 4.9 percent in 2024, following stronger-than-expected growth in Q2 2024

Real GDP, y/y, Percentage



Source: World Bank staff projections based on DOSM data

GFCF is projected to grow by 7.4 percent in 2024 (2023: 5.5 percent), a significant revision from the previous forecast of 5.1 percent.

This reassessment reflects stronger-than-expected investment activity in both the private and public sectors in H1 2024. Business investment will continue to be bolstered by ongoing projects and new investments in manufacturing and services, while government capital spending will focus on upgrading infrastructure in transportation, health, and education. Public corporation investments will be supported by strategic infrastructure projects such as the East Coast Rail Link (ECRL) and the Pan-Borneo Highway.

Malaysia's exports are set to benefit from a rebound in global goods trade following exceptional weakness last year.

Malaysia's exports are expected to recover to 5.9 percent growth in 2024 (2023: -8.1 percent), up from the previous forecast of 4.8 percent. This rebound is driven by improved global trade and demand for E&E exports. Additionally, the exports of services will be bolstered by a continued rise in international tourist arrivals from the surrounding region, including China. Imports are projected to grow by 6.7 percent, rebounding from a 7.4 percent contraction in

2023, reflecting the recovery in exports of goods, high share of intermediate inputs, and continued consumer spending and investment.

Headline consumer price inflation is projected to moderate to around 2 percent in 2024 (2023: 2.5 percent). The projection is 0.5 percentage points lower than the previous baseline forecast, reflecting softer global commodity prices and weaker-than-anticipated pass-through effects of recent policy changes on inflation.

Malaysia's baseline growth projections face several external and domestic risks

On the external front, weaker activity in major economies could dampen sentiment and trade prospects, while rising geopolitical tensions might lead to volatile commodity prices and trade disruptions. In the EAP region, China's growth

might suffer from a prolonged property downturn, rising debt and weak sentiment. Any of these risks, if materialized, could significantly impact Malaysia due to its global trade and financial connections. Conversely, faster global disinflation or stronger growth in major economies could enhance global growth and trade prospects, with positive spillovers to Malaysia.

On the domestic front, the primary downside risks relate to uncertainties over the strength of household consumption. Potential factors include weaker growth in real disposable income, and the lingering effects of post-pandemic monetary policy normalization, which could dampen private consumption more than currently assumed. Supply-side disruptions in commodity production, potentially due to unfavorable weather conditions, could also impede growth. On the upside, stronger-than-expected private investment and robust trade activities suggest that domestic economic performance could be more robust than currently projected.



Farming the Future: Harvesting Malaysia's Agricultural Resilience through Digital Technologies

Malaysia has made significant strides in modernizing its agrofood systems, but further efforts are essential in transitioning to a high-income country. The agricultural sector needs ambitious reforms and must establish a unique brand supported by a robust digital ecosystem. Currently, the agrofood sector faces several challenges, and it needs to boost agricultural productivity, reduce imperfect market competition, expand investments in agricultural research and development, increase output and resilience for primary producers, and increase adoption rates for new technologies. Malaysia's policies have historically favored rice production through subsidies and market protections, resulting in an input-based agrofood model. This model will not meet Malaysia's stated policy goal of transitioning toward high-income status. Such a transition will require sustainable and efficient agricultural production methods, with expanded support for agrofood research, innovation, and value chain upgrades. Recent reports have identified these challenges and proposed comprehensive policy reforms to transform Malaysia's agrofood sector into an engine of sustainable growth and poverty reduction.

The agriculture sector needs higher productivity, efficiency, and resilience to support broader economic growth and importantly, ensure Malaysia's food security amid growing demand and increasing climate change impact. Agricultural productivity in Malaysia is less than other high-income countries, and labor productivity in agriculture lags other key economic sectors and other Asian countries. This is reflected in both gender and rural versus urban divides. In 2022, overall labor productivity growth in agriculture was 0.7 percent compared with the national average of 5.4 percent. The Malaysian Productivity Corporation (2022) found that labor productivity in the agrofood sector is similar to the machinery and equipment (M&E) sector, but lower than in key sectors like electronics, electricals, and chemicals. However, the employment growth rate in the agrofood sector is still robust at approximately 4.2 percent. Compared to other Asian countries (except Singapore), Malaysia had the region's lowest labor productivity growth from 2010 to 2020, according to statistics from Asian Productivity Organization.

Consumer and stakeholder demand drives transformation in agrifood systems and determines climate impact. Food demand is influenced by factors such as population growth, changing dietary patterns, health issues, and trade and globalization. Food supply is related to both domestic production and imports, and weather and climate impacts in Malaysia and distant countries can affect supply. Malaysia's focus on supply stability and price control for key food items in terms of food security is now outdated. Moving forward, it is strategic for Malaysia to reshape and rebalance both demand and supply to enhance food security and increase climate resilience. The factors involved in such a rebalancing are demonstrated in Figure ES12.

FIGURE ES12
Key factors in rebalancing demand and supply in Malaysia's agrofood system

Predominant aspects		Rebalancing factors
Demand	Supply	
Equity	Environmental	• Expanded food output • Food security • Food sovereignty • Balanced food trade (import substitution and export expansion) • Climate adaptation and mitigation • Sustainable use of natural resource • Reduced food losses and waste • Gender balance • Efficient energy use • Increased employment • Reduced urban migration • Carbon finance • Improved nutrition • Enhanced consumer preference
Efficiency	Efficiency	
Employment	Employment	
	Export & competitiveness	

Digital agricultural technologies (DAT) present a transformative opportunity for Malaysia's agrofood sector, promising enhancements in productivity, efficiency, and sustainability. Global experiences illustrate how DAT can accelerate information flows, reduce information asymmetries and search costs, lower barriers to knowledge acquisition, decrease transaction costs, and expand market size. These advancements can lead to increased production and marketing efficiency, economies of scale, and broader access to productive resources. While there are risks associated with DAT, they can be managed effectively by properly monitoring DAT implementation.

The DAT-enabled transformation of the agriculture sector can:

- **Increase productivity and efficiency** by optimizing resource use, streamlining operations, and minimizing waste. Technologies such as precision farming and AI-driven insights will enable farmers to better manage crops, allocate resources, and use predictive decision-making to increase yields, resilience, and reduce costs;
- **Enhance export competitiveness** by improving quality standards, ensuring product traceability, and facilitating access to global markets. This will strengthen Malaysia's position in the global agricultural market, especially for key export products like palm oil and rubber;
- **Improve food security** by increasing productivity, efficiency, and resilience. DAT can help bridge the gap between food demand and supply, which is crucial given growing populations and rising food demand;
- **Increase climate resilience and support mitigation and adaptation** through a wide range of DAT innovations, such as improved information, insurance, support for targeted climate-smart agriculture (CSA) activities to optimize resource use through smart irrigation systems and precision farming techniques, and reduce emissions along value chains;
- **Support social equity and inclusivity** by empowering smallholder farmers, including women, with access to information, resources, and financial services, that will help reduce urban-rural disparities and promote inclusive growth in the agricultural sector.

A strategic approach that addresses the unique challenges facing Malaysia is needed to realize these benefits, including:

- **Bridging the gender and urban-rural digital divide.** This will ensure all farmers benefit from DAT and requires investments in infrastructure, broadband access, and digital literacy programs;
- **Improving scalability and accessibility** by making DAT accessible and affordable for diverse farming communities, particularly smallholders, to ensure DAT is widely adopted. This requires targeted socio-economic and policy interventions.

- **Enhancing the regulatory environment for data privacy and security** by ensuring agricultural data is responsibly used and protected. Robust data governance frameworks and cybersecurity measures are needed to safeguard sensitive information;
- **Enhancing integration and coordination** through effective collaboration between public and private sectors, including government agencies, research institutions, and agritech companies;
- **Improving capacity building** by providing farmers with training and education to effectively use DAT, including developing digital literacy skills and understanding the benefits and uses of various technologies.

Specific actions tailored to the needs of rural communities are required to ensure the rural economy and agrofood sectors benefit from DAT.

These actions, based on the enabling conditions identified in Chapter 2, are categorized under three pillars:

- **Invest in public goods** that provide sufficient resources for successful implementation of digital technologies. Strategies include addressing digital literacy and knowledge gaps, establishing digital identification systems, improving rural connectivity, and providing necessary infrastructure.
- **Invest in an innovation ecosystem** to create an environment that fosters innovation and supports the DAT development through strategies that may include establishing data platforms, using satellite imagery for monitoring and analysis, creating incubators to support digital agriculture startups, and supporting technical providers' business development services.
- **Create an enabling environment** by detailing clear and actionable strategies for data governance, privacy, security, and an incentive framework. Such strategies are crucial for building trust and ensuring that digital technology use is secure and beneficial for all stakeholders

Overall, to effectively fund and implement DATs, public expenditures should focus on providing public goods and avoid funding private goods unless clearly justified. Government policies and expenditures should complement private-sector investments, which are the primary drivers of DAT development. High-value public expenditures include infrastructure investments

to encourage tech companies to expand into rural areas and provide extension services to promote DAT adoption among farmers. The Malaysian government needs to develop effective policies to expand digital service availability, promote DAT adoption, and minimize related inequities, supported by a robust legal and regulatory framework for transparent data ownership and privacy rights. Investing in the innovation ecosystem is crucial, including creating data platforms, accessing satellite imagery, identifying and supporting DAT startups, and supporting business development for technical service providers. The

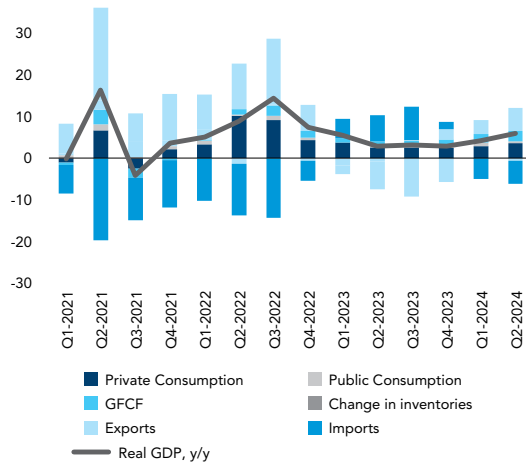
government can enhance planning, monitoring, and benefit transfers through digital platforms, following open data policies for public data like agricultural statistics. Digital platforms for fisheries management and GIS technologies for mapping fishing activities are also recommended. Incentives for data sharing, such as recognition and data monetization, will encourage participation and innovation. Expanding incubators and accelerators, implementing innovation challenges, and defining targeted programs for AgTech providers will further boost innovation in the sector.



Recent trends in Malaysia's economy

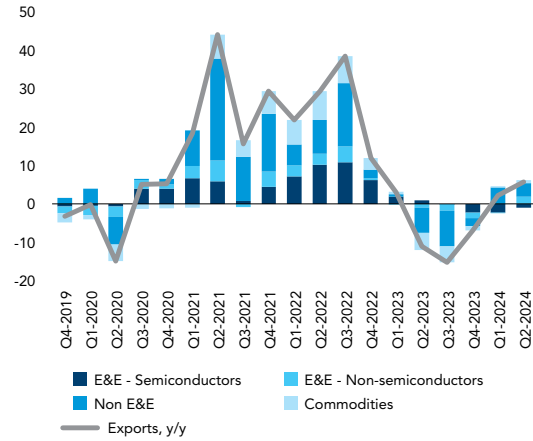
Growth in Q2 2024 was driven by robust household spending, increased investment, and improving export performance

Contribution to real GDP growth, y/y, Percentage



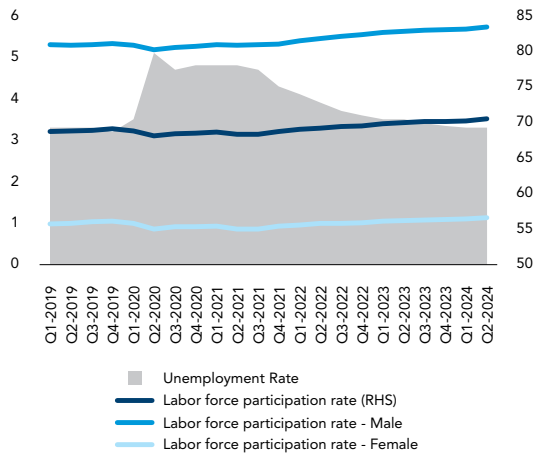
Exports growth rebounded, driven by improved demand for both E&E and non-E&E exports

Contribution to export growth, y/y, Percentage



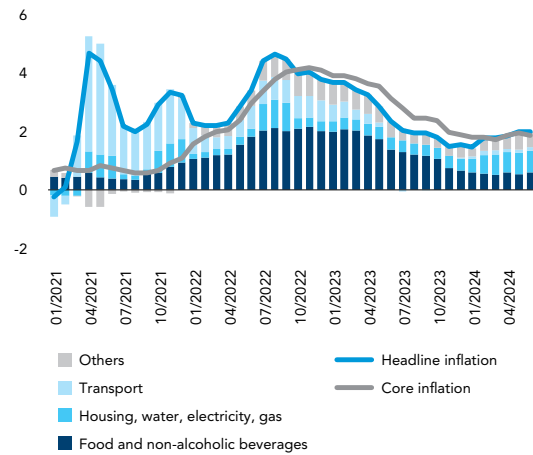
Labor force participation rate increased, while unemployment rate declined

Unemployment rate, labor force participation rate (RHS), Percentage



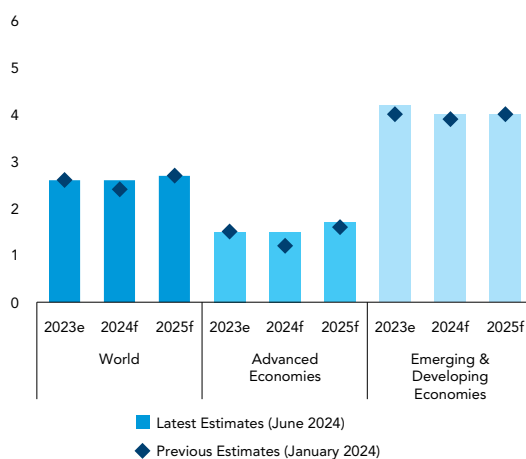
Headline inflation increased due to policy adjustments impacting utilities and transportation costs

CPI, y/y, Percentage



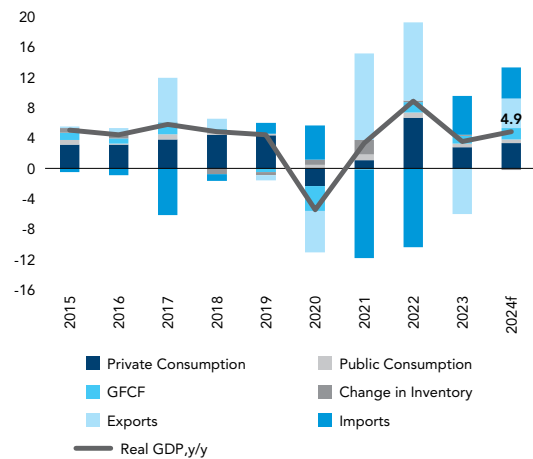
Global economic growth is expected to stabilize in 2024

Real GDP, y/y, Percentage



Malaysia's growth is revised upwards following stronger-than-expected activities in H1 2024

Contribution to real GDP, y/y, Percentage





PART ONE

Recent Economic Developments and Outlook



Recent Economic Developments

The global economy is stabilizing, following several years of negative shocks

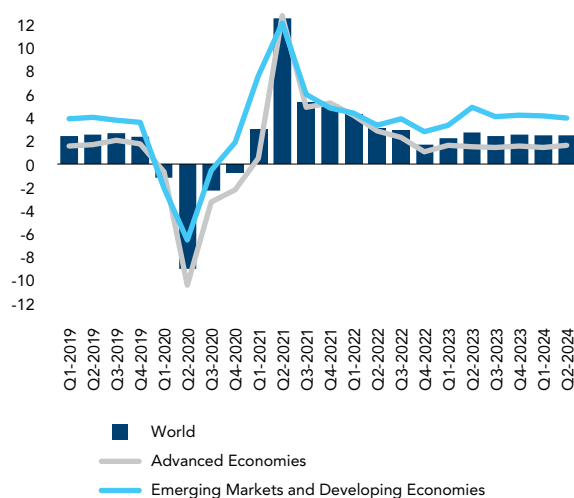
Despite elevated financing costs and heightened geopolitical tensions, global economic activity showed signs of stabilization (Figure 1). The global economy grew at a steady rate of 2.5 percent in H1 2024 (2023: 2.6 percent). In advanced economies (AE), economic activity grew steadily at 1.5 percent in H1 2024 (2023: 1.5 percent). In the U.S., recent data has been broadly in line with expectations of a slower growth in H1 2024, although activity in Q2 2024 held up better than expected. Services continue to lead the recovery in the Euro Area in Q2 2024, while industrial production and goods exports have been weak. Meanwhile, activity in EMDEs stabilized at 4.1 percent in H1 2024 (2023: 4.2 percent). Trade growth, which had stalled last year, is beginning to recover, driven by an uptick in goods trade. Commodity prices have retreated from their 2022 peaks, and supply-chain pressures have eased, helping to moderate global inflation. However, the pace of disinflation has slowed since last year, partly

due to a partial rebound in energy prices and a notable deceleration in the decline of core inflation.

The EAP region is growing faster than the rest of the world but slower than pre-pandemic levels (Figure 2). Overall, the EAP region grew at a moderated pace of 4.8 percent in H1 2024 (2023: 5.1 percent). Private consumption has sustained growth in most countries, but consumer spending and confidence are now less robust. Services exports have helped in tourism-dependent economies, and public investment in Indonesia. But private investment and goods exports remain weak in most countries amidst elevated debt and increased uncertainty. The revival of tourism has boosted services exports in some EAP economies, but tourist arrivals have only exceeded pre-pandemic levels in a few countries. Inflation had been declining across the EAP region, in response to lower commodity prices, and easing supply constraints.

FIGURE 1
Global activity showed signs of stabilization in H1 2024

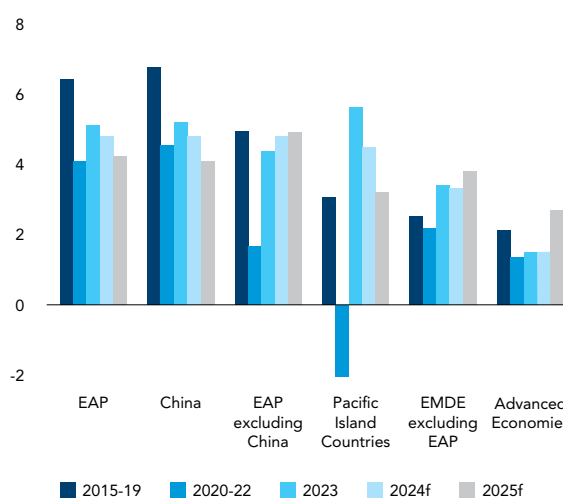
GDP, y/y, Percentage



Source: World Bank Global Economic Prospects

FIGURE 2
EAP region is growing faster than rest of the world but slower than pre-pandemic levels

GDP, y/y, Percentage



Source: World Bank Global Economic Prospects and Haver Analytics



Developments in the Malaysian Economy

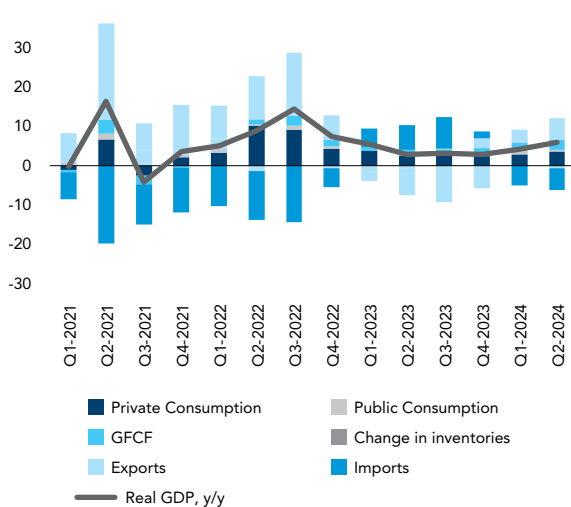
Malaysia experienced strong growth amid increased household consumption, investment and trade activity

The Malaysian economy experienced robust year-on-year growth of 5.9 percent in Q2 2024 (Q1 2024: 4.2 percent), aligning with growth trends in most regional economies. Malaysia's strong economic growth was driven by robust household spending, investments, as well as improvement in exports (Figure 3). Private consumption picked up by 6.0 percent in Q2 2024 (Q1 2024: 4.7 percent) supported by improved labor market conditions and continued government policy support. Meanwhile, public consumption grew at a more moderate rate of 3.6 percent (Q1 2024: 7.3 percent), driven by government spending on emoluments as well as supplies and services. GFCF

recorded a strong growth rate of 11.5 percent in Q2 2024 (Q1 2024: 9.6 percent), driven by robust private capital spending in the manufacturing and services sectors and increased spending on fixed assets by the government and public corporations (Figure 5). Net export growth for Malaysia also rebounded to 3.4 percent (Q1 2024: -24.5 percent), thanks to improving international goods trade and a global technological upswing. On a quarter-on-quarter seasonally adjusted basis, the economy grew by 2.9 percent (Q1 2024: 1.5 percent). Malaysia's GDP per capita is now approximately 12 percent above the pre-COVID level, outperforming many ASEAN peers.

FIGURE 3
Growth in Q2 2024 was driven by stronger household spending, increased investment activities, and improving export performance

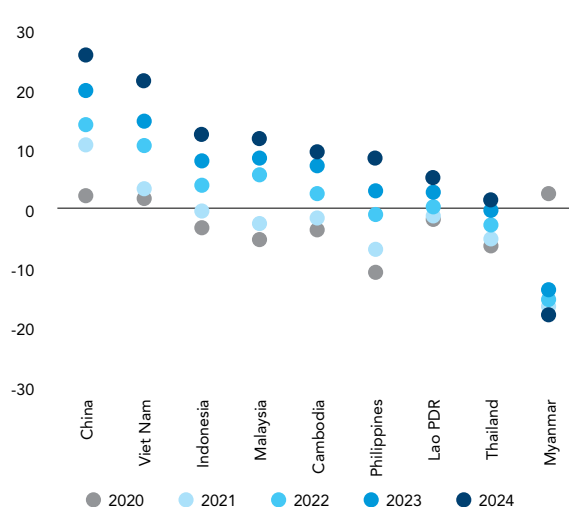
Contribution to real GDP growth, y/y, Percentage



Source: World Bank staff calculations based on DOSM data

FIGURE 4
Per capita output in Malaysia is now about 12 percent above the pre-COVID level, outperforming many ASEAN peers

Evolution of GDP per capita compared to 2019, Percentage



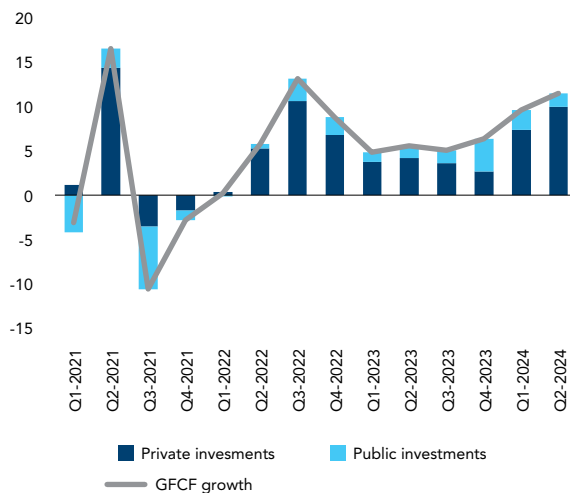
Source: October 2024 EAP Economic Update

On the supply side, there was an acceleration in growth across most economic sectors in Q2 2024, particularly in the construction and agriculture sectors (Figure 6). The construction sector experienced a robust growth of 17.3 percent (Q1 2024: 11.9 percent) thanks to increased activities especially in the civil engineering and specialized construction subsectors¹. Growth in the agriculture sector rebounded to 7.2 percent in Q2 2024 after a moderation in the first quarter due to slower rubber and food crops production amid adverse weather conditions (Q1 2024: 1.7 percent). The

rebound was driven by increased production in the oil palm and fisheries subsector. The services sector grew by 5.9 percent in Q2 2024 (Q1 2024: 4.8 percent) driven by improvement across consumer and business-related services, while the manufacturing sector continued to expand at 4.7 percent (Q1 2024: 1.9 percent) amid resilient growth in both export-oriented and domestic-oriented industries. Meanwhile, the mining sector experienced a decline in growth of 2.7 percent (Q1 2024: 5.7 percent) due to production disruptions in the oil and gas subsector.

FIGURE 5
Expansion in investment activity was mainly driven by higher private capital spending

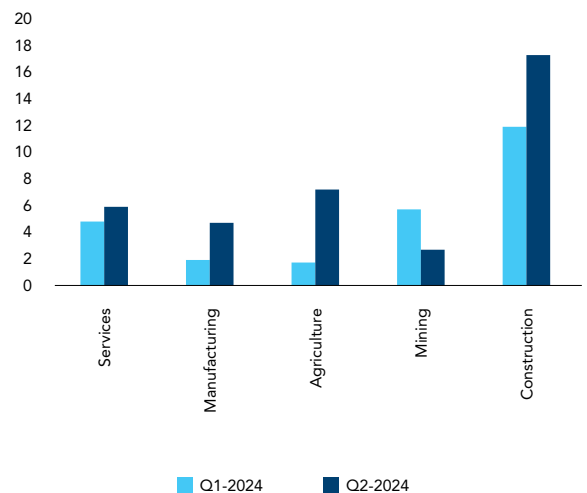
Contribution to GFCF growth, y/y, Percentage



Source: World Bank staff calculations based on DOSM data

FIGURE 6
Most sectors experienced higher growth in Q2 2024

GDP growth by sector, y/y, Percentage



Source: DOSM

Exports experienced a positive turnaround amidst strengthening external demand

Following contractions in 2023, export growth rebounded in Q1 and Q2 2024, driven by stronger external demand for both E&E and non-E&E exports, along with rising commodity prices. Year-on-year growth for gross exports improved to 2.0 percent in Q1 2024 and further by 5.8 percent in Q2 2024 (Q4 2023: -6.9 percent), primarily due to sustained demand for non-E&E exports such as machinery, equipment and parts, as well as optical and scientific equipment (Figure

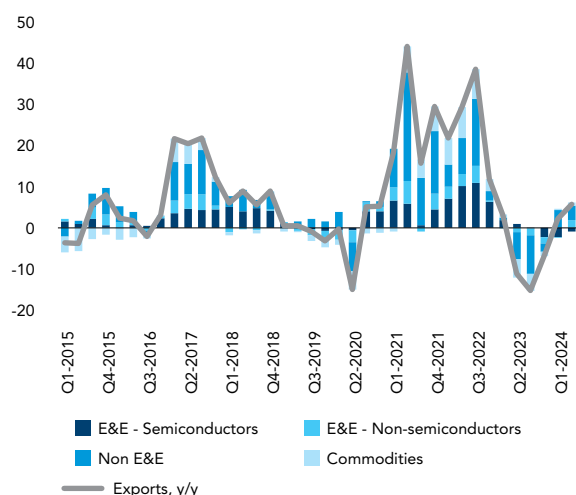
7). The rebound in the tech cycle lifted exports of E&E products, while the turnaround in commodity exports was supported by improving commodity prices. Meanwhile, gross imports experienced a strong year-on-year growth of 12.5 percent and 15.0 percent in Q1 and Q2 2024 respectively (Q4 2023: 1.3 percent), driven by higher intermediate imports and robust domestic demand for capital and consumption goods.

¹ Includes demolition, sites preparation, electrical installation, plumbing, heat and air-conditioning installation, building completion and finishing, and other specialized construction activities

FIGURE 7

Export growth rebounded in H1 2024, driven by improved demand for both E&E and non-E&E exports

Contribution to export growth, y/y, Percentage



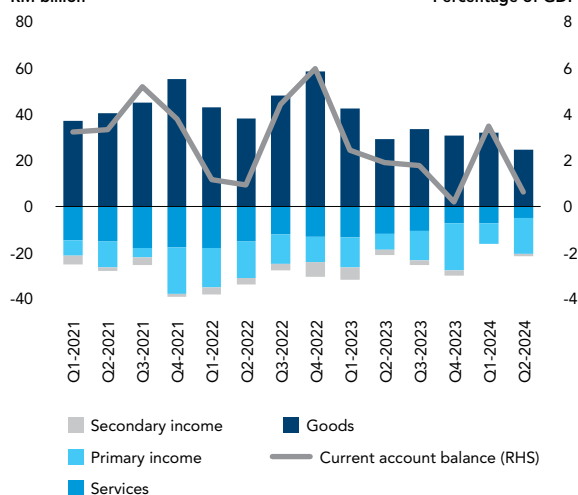
Source: World Bank staff calculations based on DOSM data

FIGURE 8

Current account surplus improved in Q1 2024, primarily due to a decrease in primary income deficit

Current account balance, RM billion

Current account, Percentage of GDP



Source: World Bank staff calculations based on DOSM data

The current account surplus narrowed in Q2 2024 to 0.6 percent of GDP following a sharp rebound to 3.5 percent of GDP in Q1 2024 (Q4 2023: 0.2 percent) (Figure 16). The rebound of the current account in the first quarter was contributed by a narrower primary income deficit, a shift in secondary income into a surplus, expanded goods surplus, and a smaller

services deficit from increased tourism. Meanwhile, the narrowing of the current account in the second quarter was driven by a higher primary income deficit offsetting the goods surplus and the smaller services deficit. The goods surplus is sustained by the rebound in exports, while the service deficit continues to narrow with higher revenues from travel and transport services.

TABLE 1

Current account surplus narrowed in Q2 2024 after experiencing a rebound in Q1 2024

	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Q1 2024	Q2 2024
Balance of Goods & Services (% of GDP)	6.8	7.1	8.8	5.9	5.1	7.8	9.7	6.6	4.0	5.0	4.9	5.3	4.2	4.9
Current Account Balance (% of GDP)	3.3	5.2	3.8	1.2	0.9	4.4	6.0	2.4	1.9	1.8	0.2	3.5	0.6	0.1
Total Exports (% of GDP)	70.7	72.6	72.6	72.2	76.8	80.7	77.3	68.7	68.8	67.4	69.5	70.5	71.3	69.5
Total Imports (% of GDP)	64.0	65.5	63.7	66.3	71.7	72.9	67.6	62.1	64.9	62.4	64.5	65.2	67.1	64.5
Net Portfolio Investment (RM billion)	20.2	-3.9	2.6	-7.6	-16.0	-0.7	-25.8	-29.8	12.9	-13.4	-6.0	-23.7	-21.7	-6.4
Net Official Reserves (RM billion)	461.6	482.5	486.8	485.8	480.1	491.9	503.3	509.9	522.1	517.1	520.8	539.0	537.3	529.7
Net Official Reserves (US\$ billion)	111.1	115.2	116.9	115.6	109.0	106.1	114.6	115.5	111.4	110.1	113.5	113.8	113.8	111.4

Source: World Bank Staff calculations based on BNM and DOSM data

The services sector and the manufacturing sector dominate foreign and domestic investments

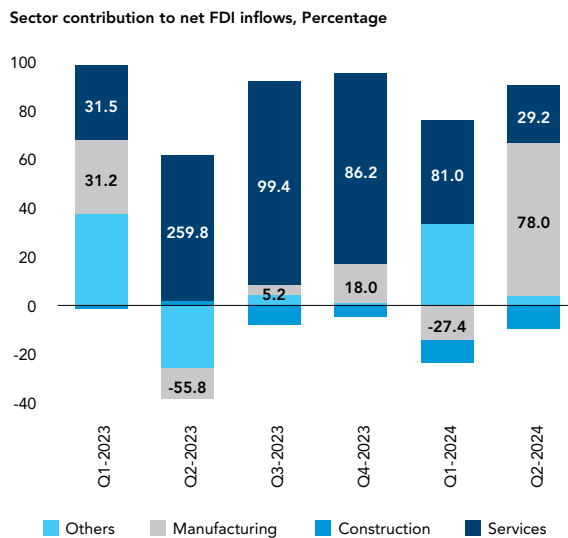
Net FDI inflow amounted to RM 5.5 billion in Q1 2024 and RM 9.1 billion in Q2 2024, driven by equity injections and a turnaround in reinvested earnings.

The net FDI inflow in Q1 2024 was primarily directed in the services sector, particularly in information and communication services, as well as the mining and quarrying sector (Figure 9). The major sources of inflow were from Hong Kong SAR, China, followed by the U.S. and Germany. In Q2 2024, it was mainly channeled into the manufacturing sector. The sources of inflow were mainly from Japan, Singapore, and Hong Kong SAR. Malaysia also registered a 16.7 percent year-on-year

increase in approved FDIs in H1 2024, totaling at RM 74.6 billion (H1 2023: RM 63.9 billion) (see Box 1 on Malaysia's FDI Dynamics: Challenges and Opportunities). Meanwhile, approved DDIs increased by 19.1 percent in H1 2024. 82.5 percent of the total approved DDIs were also in the services sector, particularly in real estate, and information and communication services (Figure 10). Domestic investment was supported by a stable economic environment and other government policies including incentives, national initiatives for digital transformation and infrastructure improvement, and policies that support local business growth.

FIGURE 9

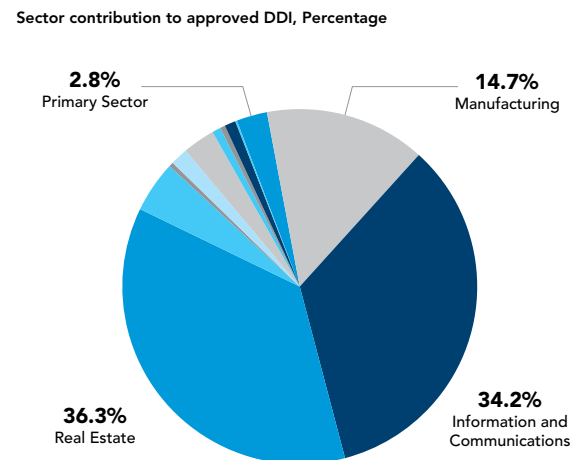
Net FDI inflows were primarily channeled into the services sector in Q1 2024 and manufacturing in Q2 2024



Source: World Bank staff calculations based on BNM and DOSM data

FIGURE 10

Approved DDIs for H1 2024 were also primarily channeled into services (mainly in real estate and information & communication services)



Source: World Bank staff calculations based on MIDA data

BOX 1

Malaysia's FDI dynamics: Challenges and opportunities

Malaysia has successfully grown its inward FDI stock over the last few decades but is facing stiffer competition from regional peers in recent years.

Investment policy reforms starting in the early 1970s coupled with a conducive environment for business have laid the foundations for attracting foreign investments into Malaysia.² Prior to 2000, Malaysia's FDI inflows and stocks as a share of GDP were the highest amongst its ASEAN-5 peers. In the past two decades, however, Thailand and Vietnam have been catching up (Figures 11 and 12).

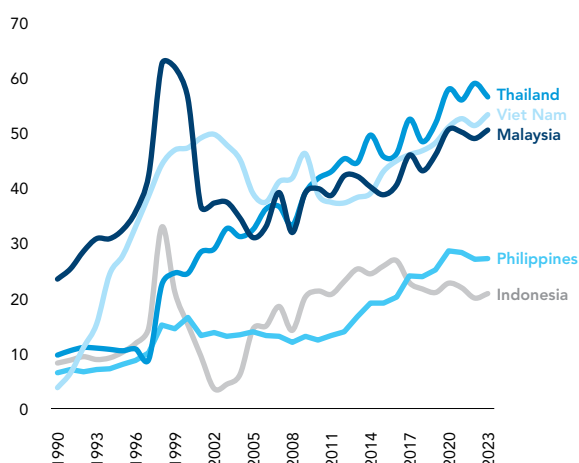
Restrictions to FDI inflows predominantly affect upstream rather than downstream sectors. The FDI restrictiveness index developed by the Organization for Economic Co-operation and Development (OECD)³, measures the extent to which policies restrict FDI inflows in four dimensions: foreign equity restrictions,

discriminatory screening or approval mechanisms, restriction on key foreign personnel, and operational restrictions. These restrictions can act as entry barriers or additional costs to foreign investors. Based on this index, Malaysia and Thailand had similar levels of restrictions on FDI, were less restrictive than Indonesia and the Philippines, but significantly more restrictive relative to Vietnam (Figure 13). The aggressive implementation of investment reforms to attract FDI in manufacturing led to low restrictions in that sector (particularly in E&E). However, restrictions are substantial in primary and upstream sectors such as distribution, electricity and financial services sectors. Because these restrictions limit competition and innovation, imposing them on upstream sectors have substantial negative effects on productivity of downstream sectors that demand inputs from them (Figure 14).

FIGURE 11

Malaysia has successfully grown its inward FDI stock but is facing stiffer competition in recent years

FDI inward stock, Percentage of GDP

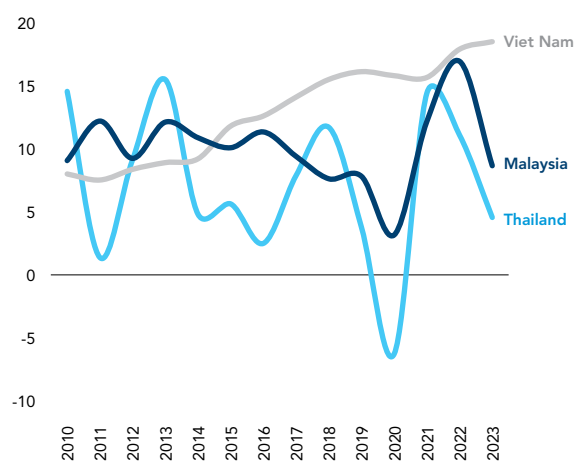


Source: World Bank staff calculations based on United Nation Conference on Trade and Development (UNCTAD) data

FIGURE 12

Vietnam has consistently surpassed Malaysia in attracting FDI inward flows in the last decade

FDI inflows, USD billion



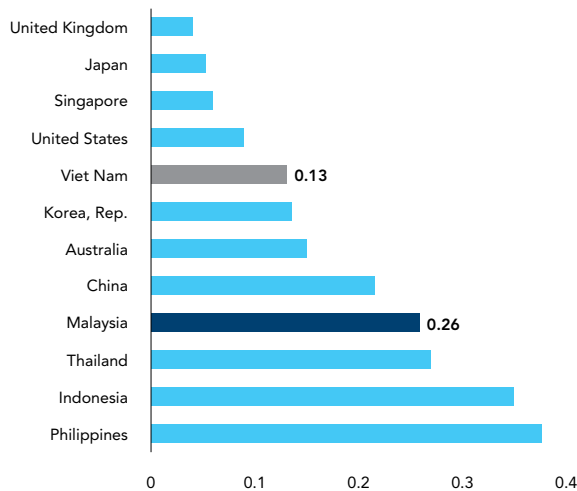
Source: UNCTAD World Investment Report database

2 Investment policies including the establishment of free trade zones and licensed manufacturing warehouses, provision of generous investment incentives since the 1970s, coupled with an English-speaking, low-cost labor force has helped Malaysia laid the foundation to attract foreign investors.

3 Implementation issues are not addressed and factors such as the degree of transparency or discretion in granting approvals are not taken into account (Source: OECD)

FIGURE 13
Malaysia has room to improve on FDI restrictiveness compared to Vietnam

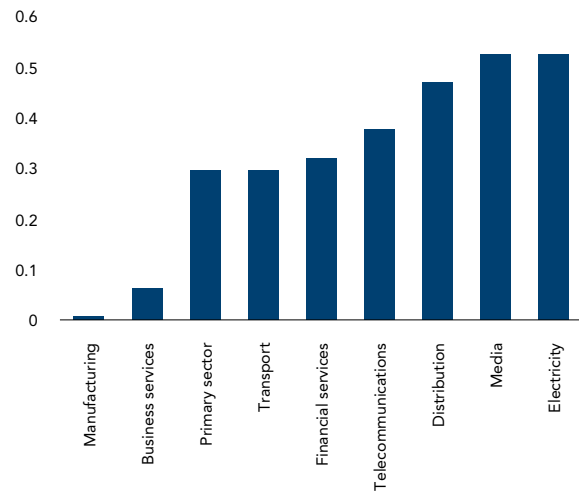
FDI restrictiveness index, 2020



Source: World Bank staff calculations based on OECD FDI restrictiveness index

FIGURE 14
There are variations across sectors in FDI restrictiveness in Malaysia

Malaysia FDI restrictiveness by sector, 2020



Source: World Bank staff calculations based on OECD FDI restrictiveness index

International experience shows that liberalizing upstream sectors, like logistics or finance, helps boost productivity downstream (in manufacturing).

Restrictions on investments in Malaysia's upstream sectors can affect supply of goods and services as input provision to firms operating in downstream manufacturing. Given this input-output linkage, a growing body of empirical research suggests that reducing distortions in these upstream sectors can improve productivity growth in downstream sectors. For instance, Duggan et. al. (2013) finds that relaxing policies towards FDI in the service sector in Indonesia accounted for 8 percent of the observed increase in manufacturers' total factor productivity (TFP) between 1997-2009; Fernandes and Paunov (2012) show that forward linkages from FDI in services explain 7 percent of the observed increase in Chile's manufacturing users' TFP; Arnold et. al. (2016) finds that banking, telecommunications, insurance and transport reforms in India all had significant positive effects on the productivity of manufacturing firms. Malaysia can learn from these experiences and lower FDI restrictiveness in its upstream sectors to boost productivity in its downstream sectors.

The government's ongoing efforts in reducing operational restrictions could help minimize FDI restrictiveness, and can be targeted at specific sectors.

For instance, Malaysia recently introduced a dedicated visa facilitation service for strategic investors identified by the Malaysian Investment Development Authority (MIDA) to facilitate investments into the country. In 2021, the ASEAN Investment Facilitation Framework (AIFF) was adopted by ASEAN members to enhance investment attraction by increasing transparency, streamlining administrative procedures, promoting policy alignment, and building the capacity of investment-related agencies. One of the notable initiatives by Malaysia was implementing fast-track "green" lanes and simplified processes to ease investment. Investment portals and digital platforms were also developed for e-payment and acceptance of electronic documents and certificates (UNCTAD World Investment Report 2023). These efforts can be targeted at Malaysia's upstream sectors which is relatively restrictive to harness productivity gains in the downstream.



Harnessing domestic liquidity to stimulate investment in Malaysia can provide notable benefits by mobilizing substantial financial resources and aligning investments with national development objectives.

Recently, the government introduced Government-linked Enterprises Activation and Reform Program (GEAR-up), a program aimed at catalyzing growth in key economic sectors through DDIs. Six government-linked investment companies (GLICs) have pledged to invest RM120 billion—or 6.6 percent of Malaysia’s current GDP—in DDIs over the next five years under the program. The government can encourage GLICs to prioritize high-quality investments and innovation, which are crucial for Malaysia’s transition to a high-income economy. However, policymakers must also be vigilant against potential market distortions and establish clear parameters to ensure these investments complement, rather than compete with, private firms. While GLICs should remain focused on their core mandates, they must be cautious of potential mission creep, particularly if new ventures diverge significantly from their current operations. Additionally, it is essential to ensure these entities possess the necessary technical capabilities to undertake these investments effectively.

The development of SEZs, if successful, can be a key driver of trade and investments into Malaysia.

Since the 2000s, Malaysia has introduced regional economic corridors—a new type of special economic zones—to boost development in rural areas. Malaysia has successfully attracted FDIs into these SEZs, focusing on higher value-added and technology-intensive industries like E&E, services, and software development. Over the years, Malaysia has also shifted its SEZ strategy towards a comprehensive cluster development model, creating a framework that supports strategic sectors while minimizing trade distortions. Greater focus has been given to developing small and medium-sized enterprises (SMEs). For example, Penang hosts one of the country’s most advanced technology clusters in semiconductor-based electronics manufacturing.⁴ Malaysia will be signing the Johor-Singapore Special Economic Zone (JS-SEZ) agreement with Singapore in end of 2024 to foster greater economic connectivity, enhance cross-border trade, and boost investments between the two countries. The success of JS-SEZ will largely depend on the type of incentives provided under the SEZ and how they are being implemented (see Box 2 on Special Economic Zones - Key Policy Lessons from Global Experience).

⁴ See “ASEAN Guidelines for Special Economic Zones (SEZs) Development and Collaboration” <https://asean.org/wp-content/uploads/2020/12/Adopted-ASEAN-Guidelines-for-Special-Economic-Zone-SEZ-Development-and-Collaboration.pdf>

BOX 2

Special Economic Zones - Key policy lessons from global experience

Special Economic Zones (SEZs) have been widely used worldwide as tools for industrialization and attracting FDI. Yet, their success varies significantly. Regions like East Asia have seen notable successes, while others, such as Sub-Saharan Africa, continue to struggle. Even within the same country, SEZ outcomes can vary. To ensure effective SEZ development, several key lessons from global experiences must be integrated from the outset:

- 1. Develop a predictable legal and regulatory framework.** Establish a transparent, streamlined legal structure for SEZs that clearly defines the roles and responsibilities of stakeholders (World Bank Group, 2021; Zeng, 2022). This framework should provide certainty and protection for developers and investors, particularly in cross-border zones, like the one planned for Johor-Singapore, which require harmonized customs, trade, and labor regulations to succeed.
- 2. Align SEZs with national development strategies.** Integrate SEZ initiatives into the broader national development plan, ensuring alignment with overall economic objectives. Successful SEZs, like the Shenzhen SEZ in China, have been used to pilot key policy reforms, then adopted nation-wide (Zeng, 2021b). This 'lab' approach helps overcome the challenges the political economy, create a more liberal business environment, and ensure that SEZs contribute meaningfully to national growth.
- 3. Ensure strong market demand and private sector engagement.** Conduct a rigorous market demand assessment and identify the right sectors based on local competitive advantages. Engaging the private sector early, either through direct development or public-private partnerships (e.g., Panama Pacifico SEZ), can enhance operational efficiency and align SEZ development with investor needs.
- 4. Prioritize high-quality infrastructure over fiscal incentives.** SEZs should focus on providing world-class infrastructure both on-site and off-site rather than offering extensive tax breaks (Zeng,

2021a; World Bank Group, 2021). Government-led off-site infrastructure and developer-led on-site infrastructure are essential for creating a business-friendly environment.

- 5. Select strategic locations.** The right location is crucial. Successful zones like the Shannon Free Zone (Ireland) and Jurong Industrial Park (Singapore) are situated in areas with excellent connectivity to local, regional, and international markets (Zeng, 2021a). Avoid politically driven site selections that compromise business viability.
- 6. Invest in skills development.** Support workforce training that meets the needs of SEZ businesses. Collaborations like the Penang Skills Development Center (Malaysia) and Sino-Singapore Suzhou Industrial Park have shown that aligning skills programs with industry needs can significantly improve SEZ productivity and attract investors.
- 7. Strengthen zone-level governance.** Effective SEZ governance is key to success. Zones with strong management structures, such as the Jurong Town Corporation (Singapore), consistently outperform others. Governments should leverage private sector expertise where possible to bring capital and specialized know-how, particularly in new SEZ initiatives.
- 8. Adopt eco-industrial principles.** Embed sustainable practices into SEZ operations by adopting the Eco-Industrial Park (EIP) framework (World Bank, 2021b). Integrating economic, social, and environmental considerations—as seen in Kalundborg (Denmark)—enhances long-term viability and aligns with the Sustainable Development Goals, attracting environmentally conscious investors.
- 9. Monitor and adapt for continuous improvement.** Establish robust monitoring and evaluation systems from the beginning. The Tanger-Med SEZ (Morocco) illustrates the value of phased development and continuous assessment, allowing flexibility to adapt to changes and improve effectiveness over time.

The labor market continues to improve, with notable increases in formal sector wages

Key labor market indicators have shown improvements over the past quarters.

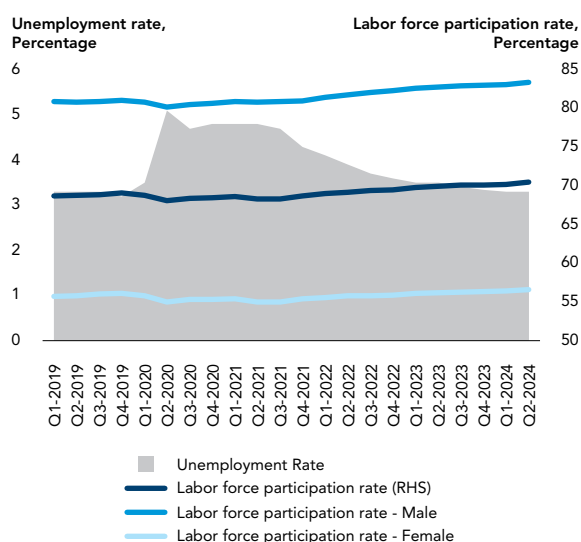
The national unemployment rate has remained at 3.3 percent in Q2 2024 (Q1 2024: 3.3 percent), similar to pre-pandemic levels (Figure 15). The unemployment rate is slightly higher for females than for males, at 3.5 percent versus 3.1 percent in Q2 2024. The unemployment rate for younger cohorts (aged 15-24 and 25-34) has continued to gradually improve in the labor force⁵, from 10 percent (2.2 percent) in Q1 2024 to 9.9 percent (2.1 percent) in Q2 2024 (Figure 16). However, the unemployment rate for the oldest cohort (aged 55-64) has increased in the long term, from 1.9 percent (Q2 2023) to 3.3 percent (Q2 2024). This could be partly explained by the slight uptick in labor force participation rate of this age group during the same time frame. The overall labor force participation rate has also shown moderate improvements, increasing from 70.2 percent in Q1 2024 to 70.5 percent in Q2 2024. The gender gap in labor force participation rate remains large and unimproved, at 26.8 percent in Q2 2024 (Q1 2024: 26.7 percent).

Labor market tightness, as reflected in the rate of job vacancies per unemployed person, has increased over the past year (Figure 17).

Since 2019, the labor market tightness indicator has been below one—meaning that there are more unemployed persons than there are jobs available. In 2019, the rate stood at 0.4 and dropped significantly to its lowest at 0.2 during the pandemic, due to a large pool of unemployed or retrenched workers relative to the number of vacancies. More recently, it has remained at 0.34 in Q2 2024 (Q1 2024: 0.34), with 191,442 job vacancies in the labor market and 557,800 unemployed individuals. At 0.34, the rate is considerably lower than that of many advanced countries such as the U.S. where the indicator is close to or above one (MGI 2024). Thus, this does not suggest an unsustainable rate of employment growth, coupled with the fact that Malaysia is experiencing strong economic growth. In Q2 2024, 55.8 percent of all job vacancies were for semi-skilled jobs, followed by 25 percent for high-skilled and 19.1 percent for low-skilled jobs⁶. This trend has been consistent since 2019

FIGURE 15

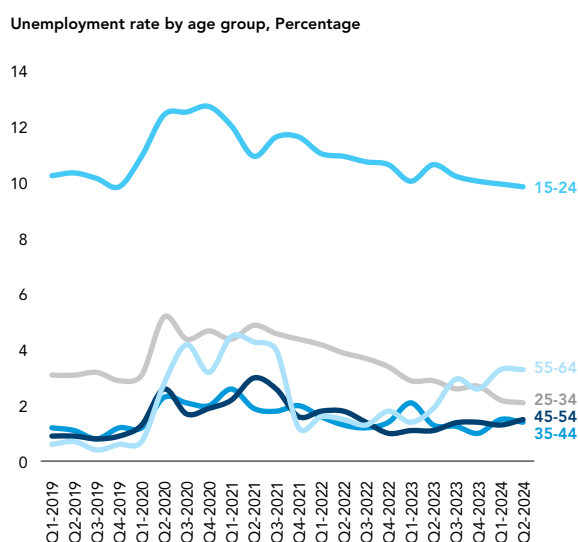
Labor force participation rate increased, while overall unemployment rate declined...



Source: DOSM

FIGURE 16

...however, the unemployment rate for the oldest age-group has seen a slight uptick



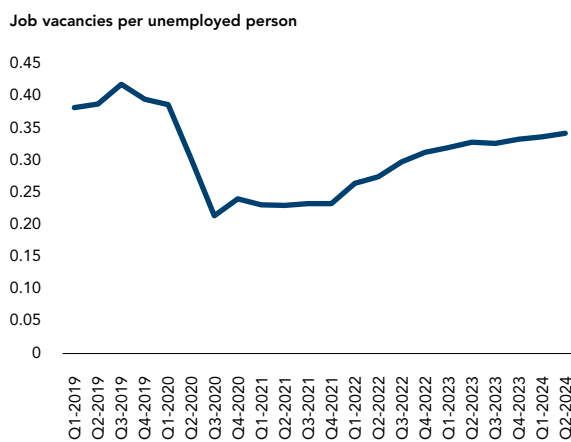
Source: DOSM

⁵ In Q2 2024, the labor force comprised of 17.2 percent aged 15-24, 33.7 percent aged 25-34, 24.8 percent aged 35-44, 16.4 percent aged 45-54 and 7.9 percent aged 55-64.

⁶ According to DOSM (2022), occupational categories have been consolidated into three skill levels according to the Malaysia Standard Classification of Occupations (MASCO) 2013, which are: high-skilled workers (Managers, Professionals, and Technicians and Associate Professionals), semi-skilled workers (Clerical Support Workers, Service and Sales Workers, Skilled Agricultural, Forestry, Livestock, and Fishery Workers, Craft and Related Trades Workers, and Plant and Machine Operators and Assemblers) and low-skilled workers (Elementary Occupations).

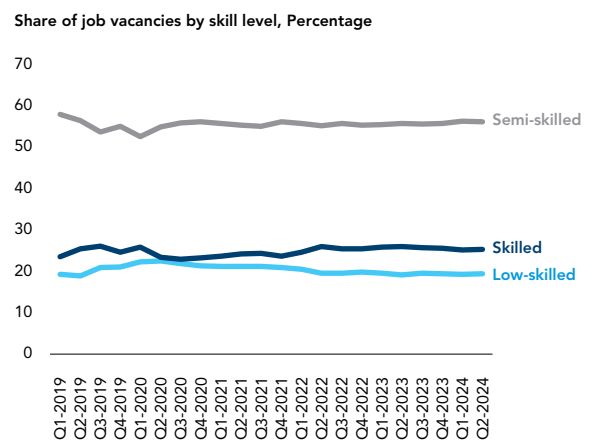
(Figure 18). When looking at job vacancy by sector, the manufacturing sector had the most vacancies in Q2 2024 at 56.6 percent of all vacancies (relative to 16.4 percent of total employment), followed by the agriculture sector (16.6 percent; 9.1 percent of employment) and the construction sector (13.6 percent, 8.1 percent of employment) (Figure 19). Notably, the manufacturing sector has consistently held the highest number of vacancies since 2019, indicating ongoing structural

FIGURE 17
Labor market tightness increased over the past year...



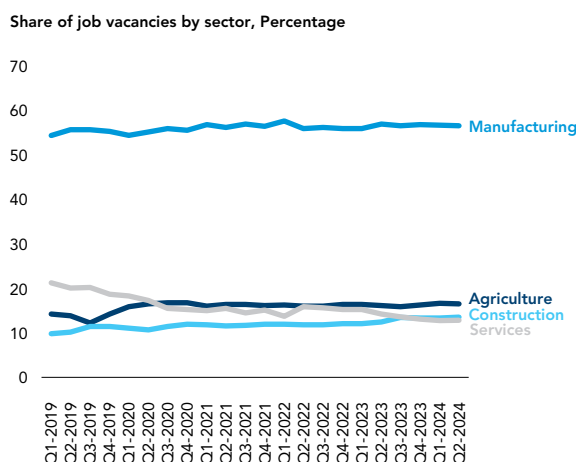
Source: DOSM

FIGURE 18
...with most vacancies in the labor market being for semi-skilled jobs



Source: DOSM

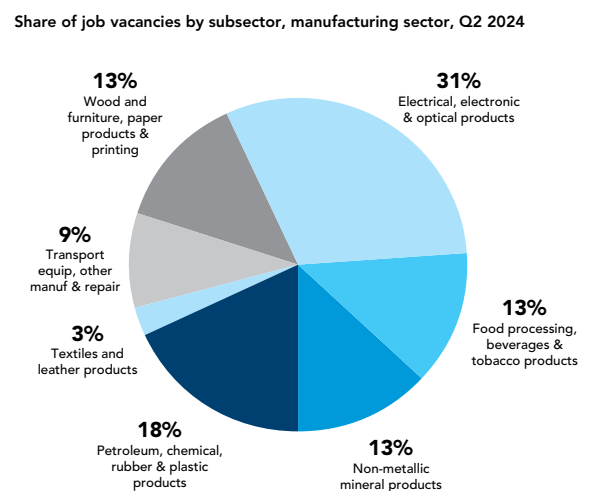
FIGURE 19
More than half of all vacancies are in the manufacturing sector...



Source: DOSM

Note: The mining and quarrying sector is excluded due to its relatively small share of workers (0.6 percent of total employment in 2023)

FIGURE 20
...with the E&E subsector offering a third of all vacancies in the manufacturing sector



Source: DOSM

7 The Edge Malaysia (2024). "Manufacturers asks for govt support to boost talent pool". Retrieved from: <https://theedgemaalaysia.com/node/710951>

Labor productivity growth has picked up and employment growth has recovered.

Year-on-year labor productivity growth stood at 3.1 percent in Q2 2024, higher than in the last three quarters. The uptick in labor productivity growth can be attributed to a large boost in labor productivity growth in the construction sector, which saw a growth of 16.3 percent in Q2 2024 (Q1 2024: 10.7 percent), while other sectors also experienced positive labor productivity growth in Q2 2024 (Figure 21). Meanwhile, year-on-year employment growth recovered at 2.8 percent in Q2 2024 (Q1 2024: 2.1 percent) following a decline in employment growth in the previous quarters (Figure 22). The services sector

experienced the largest improvement at 3.7 percent employment growth in Q2 2024 (Q1 2024: 2.8 percent). This is followed by the agriculture and mining sectors, at 1.1 percent and 0.2 percent (Q1 2024: 0.1 percent and 0.1 percent) respectively.

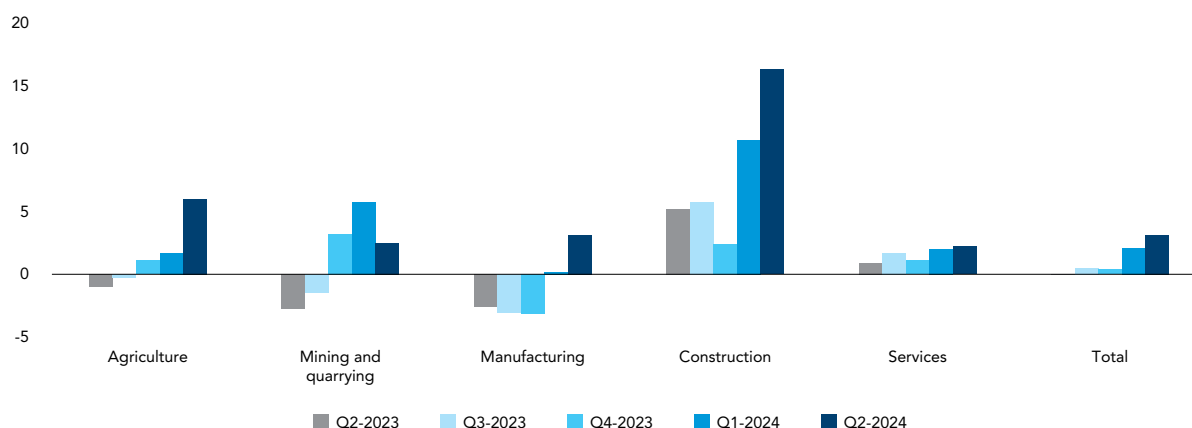
Median wages for employees in the formal sector⁸ are on an upward trajectory.

The median wage for formal employees was RM2,844 in March 2024 (March 2023: RM2,600). This reflects strong growth in real median wages, which stood at 7.5 percent in March 2024, following strong growth in wages in previous months (Figure 23). While both men and women

FIGURE 21

Overall labor productivity has improved when compared with previous quarters

Labor productivity by sector, y/y, Percentage change

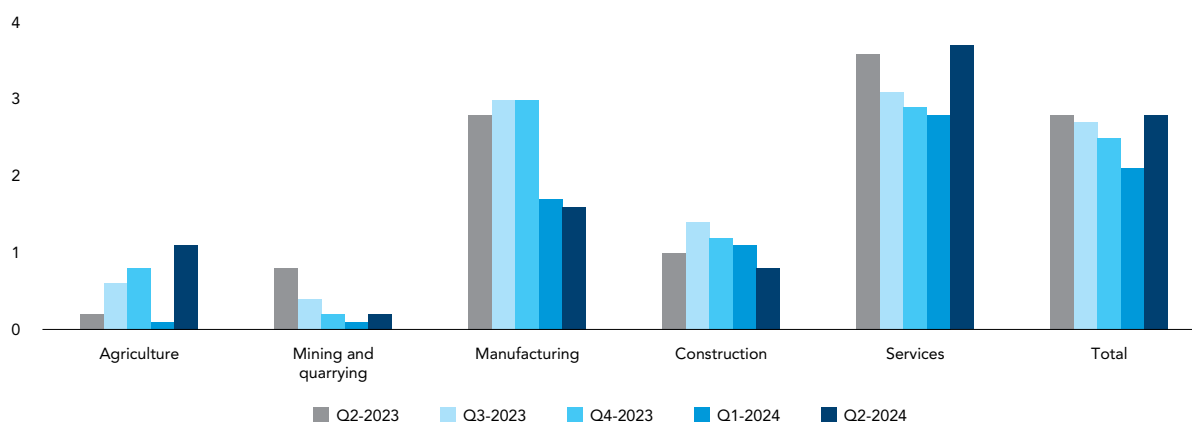


Source: DOSM

FIGURE 22

Employment growth has been on a downward trajectory but has since recovered

Employment growth by sector, y/y, Percentage



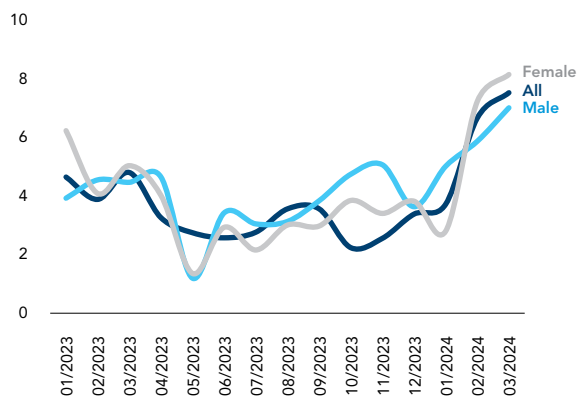
Source: DOSM

⁸ Data on wages are retrieved from the Employee Wages Statistics (Formal Sector) Report by DOSM. In the first quarter of 2024, 62.6 percent of citizens who are employees were in the formal sector, excluding public sector workers. Different to the Salaries and Wages Survey reported by DOSM annually, the Employee Wages Statistics use administrative data from sources such as the Employees Provident Fund (EPF) and the Social Security Organization (SOCSCO) to produce more up-to-date wages data.

experienced positive wage growth, the median wage for men is slightly higher than that for women at RM2,900 and RM2,800 respectively in March 2024. The gender gap in median wages has been persistent since at least 2022 (Figure 24).⁹ Across sectors, the construction and services sectors registered the highest median wages in March 2024, at RM2,964 and RM2,882 respectively

FIGURE 23
Strong year-on-year real wage growth for all genders

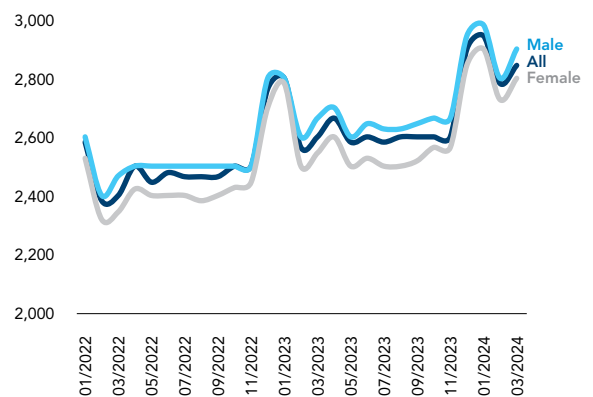
Real median wage growth by gender, y/y, Percentage



Source: DOSM

FIGURE 24
Monthly median wages have been on an upward trend since 2022, for both men and women

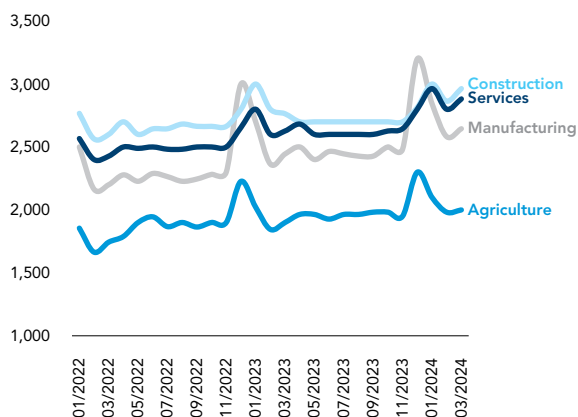
Monthly median wage by gender, RM



Source: DOSM

FIGURE 25
Construction and services sectors registered highest wages in March 2024...

Monthly median wage by sector, RM

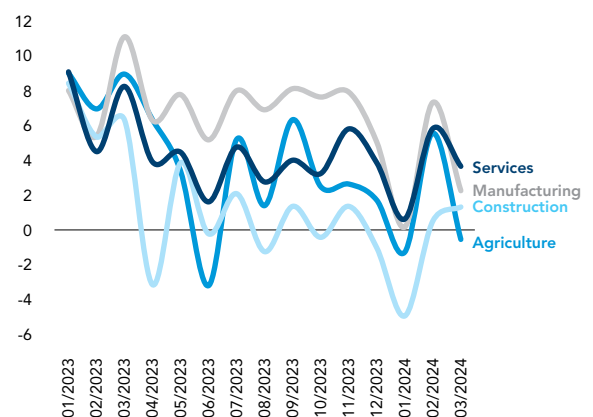


Source: DOSM Employee Wages Statistics (Formal Sector) Report First Quarter 2024

Note: The mining and quarrying sector is excluded due to exceptionally high median wages accrued to a very small share of workers (0.6 percent of total employment in 2023)

FIGURE 26
...while agriculture exhibited negative real wage growth year-on-year

Real median wage growth by sector, y/y, Percentage



Source: DOSM Employee Wages Statistics (Formal Sector) Report First Quarter 2024

Note: Real wages are computed with 2010 as the reference year. The mining and quarrying sector is excluded due to exceptionally high median wages accrued to a very small share of workers (0.6 percent of total employment in 2023)

⁹ The gender gap in earnings in Malaysia has been long documented. A statistical decomposition suggests that the gender gap in earnings is largely unexplained by sociodemographic productive characteristics such as ethnicity, age, educational attainment, urban-rural location, and sector of employment, suggesting the possibility of discrimination (World Bank 2019). Additionally, there is evidence that the gap in earnings between formal and informally employed women is larger than that for men, with a similar decomposition suggesting that a higher share of the formality premium is unexplained for women, compared to that for men (World Bank 2024).

BOX 3

A deep dive into skill-related underemployment

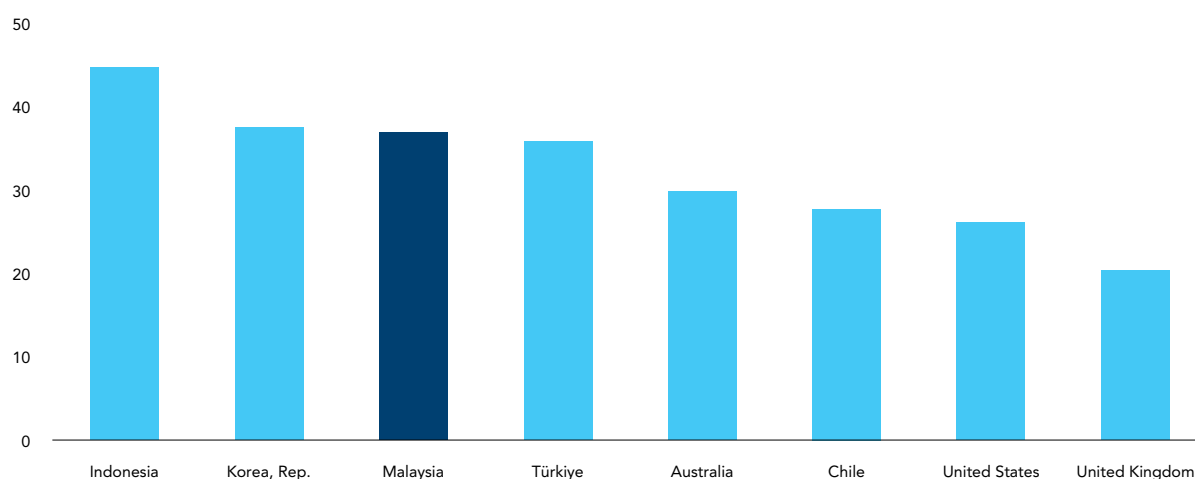
Due to its increasing trend, skill-related underemployment is a major concern for policymakers. In 2010, the rate of skill-related underemployment, defined as those with tertiary¹⁰ education working in semi-skilled or low-skilled jobs, stood at 27.2 percent. By 2022, this rate reached 37.3 percent, equivalent to more than two million workers (DOSM, 2024). The situation is not unique to Malaysia. SRU is also observed in other countries, including high-income countries such as Korea, Rep., Australia, United Kingdom and the U.S. (Figure 27).

The higher the level of education, the lower the rate of underemployment. Those with *Sijil Tinggi Persekolahan Malaysia* (STPM)¹¹ and equivalent qualifications, certificates and diploma have higher incidences of SRU compared with degree (and above) holders at 55.8 percent, 52.3 percent, 42.3 percent and 26.9 percent respectively in 2022 (Figure 28).

Having said that, there has been an increasing trend of underemployment among degree holders, where 8.6 percent were underemployed in 2010, and eventually rising to 26.9 percent in 2022. This is significant as degree holders represented 48.6 percent of the tertiary educated workforce in 2022. Similarly, SRU among diploma holders has also been on an upward trend, while SRU among STPM holders has improved. By field of study, general programs and services¹² exhibit some of the highest SRU rates, at 74.5 percent and 58.7 percent respectively (Figure 29)—though these fields only represent a small proportion of total graduates, at 7.9 percent and 6.0 percent respectively. In contrast, fields like health and social services and education exhibit the lowest SRU rates, at 13.9 percent and 8.0 percent respectively. This could be due to the public-sector nature of these fields. For example, medical graduates are obliged to complete their compulsory housemanship for three years at a public hospital upon

FIGURE 27
Skill-related underemployment by selected countries

Skill-related underemployment rate, Percentage



Source: DOSM (2024) and World Bank staff calculations based on ILOSTAT for latest available year

Note: The skill-related underemployment rate for other countries is measured as the share of those with post-secondary education and above in low and medium skill occupations (skill level 1 and level 2)

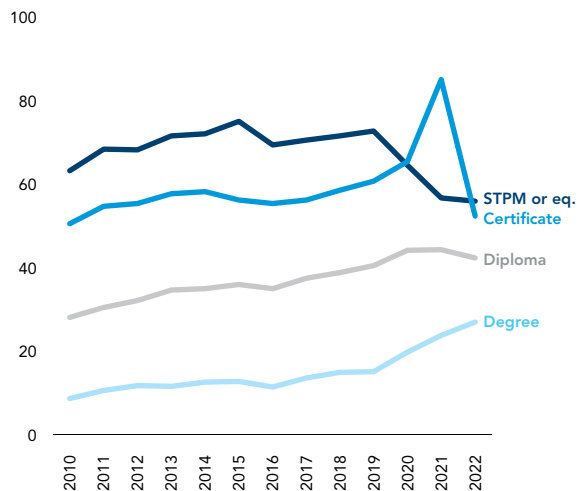
10 Following the Labor Force Survey Report Malaysia (2023) by DOSM, those with tertiary education refers to those with more than a secondary (Form 5) education (post-secondary and above).

11 The *Sijil Tinggi Persekolahan Malaysia* (STPM) is regarded as being on par with the General Certificate of Education Advanced Level (A-level) qualifications.

12 General programs include broader programs that do not fall into other specified categories, such as personal skills. Those in General Programs typically graduate at the Certificate level. Services programs include programs on travel, tourism and leisure; hotel, restaurant and catering; and sports.

FIGURE 28
The rate of SRU among degree and diploma holders have increased...

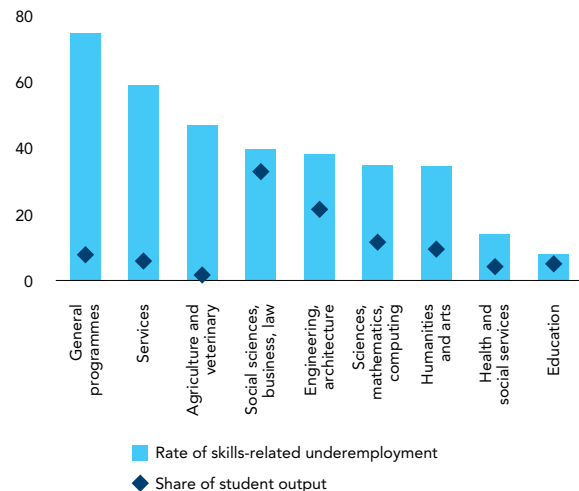
Rate of skills-related underemployment by level of qualification, Percentage



Source: World Bank staff calculations based on LFS 2010-2022 (DOSM)
Note: Degree includes Bachelor's degree, Master's degree, and Doctoral degree

FIGURE 29
...while by field of study, more generic programs had higher levels of SRU by field of study

Rate of skills-related underemployment by field of study and share of graduate output



Source: World Bank staff calculations based on Labor Force Survey (LFS) 2020 (DOSM) and Ministry of Higher Education (MOHE) (2020)

Note: Rate of SRU by field of study refers to those in tertiary education (STPM and above). Graduate output refers to the total number of students who had completed pre-university or foundation, professional, certificate, diploma, advanced diploma, Bachelor's degree, postgraduate diploma, Master's degree, and Doctor of Philosophy programs

graduation. Teachers in public schools are also seen to be in high demand.¹³

Younger individuals, especially women and those from lagging states are more likely to be underemployed. A closer look at the profile of those who are underemployed shows that the rate of SRU is highest for the youngest in the workforce, at 63.5 percent for the 15-24 age group in 2022. An increasing share of young graduates are also found to be in non-standard forms of employment such as contract work or self-employment, without access to employment protection, leaving them with weaker job security, sluggish wage growth and limited upward career mobility (KRI 2024). Moreover, the SRU rate is negatively correlated with age, and is lower for older age groups (aged 55-64), where the SRU rate stood at 21.5 percent. This finding is unsurprising for several reasons. Higher levels of education take a longer time to acquire, which means that older workers are more likely to hold a degree compared with their younger counterparts. Similarly, younger people are more likely to be employed in entry level positions, where

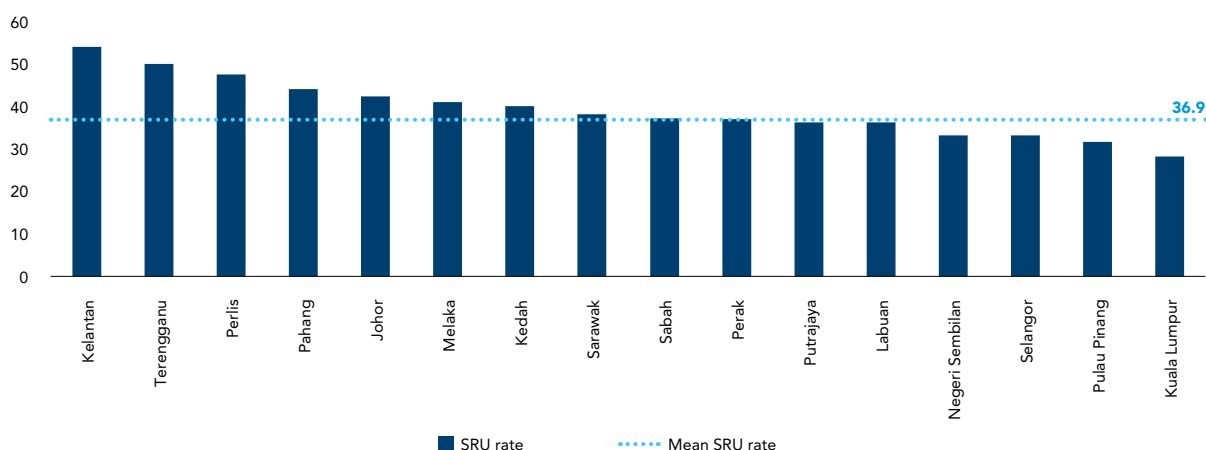
their skills may not be fully utilized. Women also face a higher SRU rate compared with men, at 42.0 percent and 32.5 percent in 2022 respectively. Numbers by state show that Kuala Lumpur, Penang and Selangor had the lowest SRU rates, whereas lagging states such as Kelantan, Terengganu and Perlis had the highest SRU rates (Figure 30), indicating limited high-skilled job opportunities in these states.

There are various factors driving the SRU rate and a more detailed understanding of them requires a comprehensive skills assessment of the labor market. An underlying reason for the rising SRU is that an insufficient number of high-skilled jobs are being created for tertiary educated workers. Evidence of this is shown in Figure 31, comparing graduate output and number of high-skilled job vacancies. Other factors include inefficiencies in job matching, a mismatch in areas of study and the jobs available, reflecting poor links between industry and higher education institutions, or a lack of skills that do not relate to formal education qualifications (KRI 2024, World Bank 2023). Rising SRU could also be due to a mismatch between

13 The Star (2024). "Education Ministry has already filled 20,000 teaching positions to address shortages, says Fadhlina". Retrieved from: <https://www.thestar.com.my/news/nation/2024/04/01/education-ministry-has-already-filled-20000-teaching-positions-to-address-shortages-says-fadhlina>

FIGURE 30
SRU is higher for lagging states

Rate of skills-related underemployment by state, 2022, Percentage



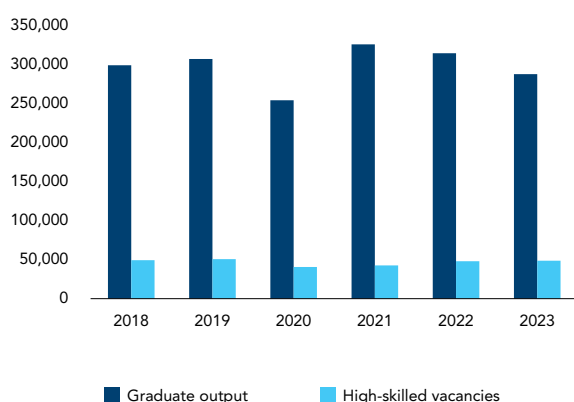
Source: World Bank staff calculations based on LFS (DOSM)

jobseekers' preferences of job characteristics such as working hours and work location that are currently being offered by employers. Understanding the main drivers of SRU requires a comprehensive assessment through a nationwide skills survey of labor supply and demand, as demonstrated in several OECD countries. Nevertheless, the high and increasing prevalence of skill-related underemployment indicates an underutilization

of labor, representing a loss of human capital. Some key strategies that could address these challenges include aligning educational curricula with industry needs, strengthening Malaysia's competitiveness to attract quality investments and promote high-skill job creation, and providing lifelong skills that will help weather the changing nature of work (World Bank 2021).

FIGURE 31
The number of high-skilled jobs available are not keeping pace with the number of graduates produced...

Number of graduates and high-skilled vacancies, 2018-2023

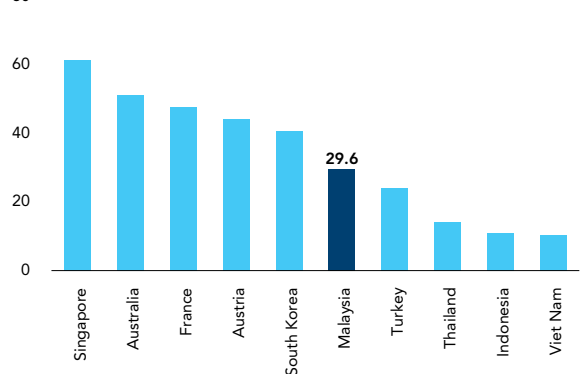


Source: DOSM and MOHE (various years)

Note: Graduate output refers to the total number of students who had completed pre-university or foundation, professional, certificate, diploma, advanced diploma, Bachelor's degree, postgraduate diploma, Master's degree, and Doctor of Philosophy programs. High-skilled vacancies for each year are calculated by taking the average of quarterly data on vacancies

FIGURE 32
...and Malaysia has a lower share of workers in high-skilled jobs compared with aspirational peers

Share of workers in high-skilled occupations, by selected countries, Percentage



Source: ILOSTAT for latest available year, DOSM

Absolute poverty remains a concern

Malaysia's hardcore poverty is almost non-existent, but absolute poverty still remains a concern, particularly in rural areas and among the Bumiputera population. Hardcore poverty¹⁴ in Malaysia stood at a mere 0.2 percent at the national level in 2022, and some states have reached the government's target of zero percent. However, about 6.2 percent of Malaysian households, or approximately 490,000 households, lived below the national average poverty line of RM2,589 per month in 2022. Despite declining faster than urban poverty, rural poverty remained predominant, with 12 percent of rural households, compared to 4.5 percent of urban households, still having insufficient income to meet minimum living standards in 2022. Furthermore, the large incidence of absolute poverty in Sabah (19.7 percent) and among the Bumiputera population (7.9 percent) highlights the significant role that regional and ethnic income disparities play in poverty dynamics in the country.¹⁵

Income inequality persists, and current levels are still high compared to advanced economies.

Income inequality, measured by the Gini index based on household gross income, stood at 40.4 percent in 2022. While the income gaps across main ethnic groups have narrowed in recent years, spatial disparities between the states in East Malaysia and Peninsular regions persist. Mean incomes across states have not converged because average incomes in the richest states have grown faster than those in the poorest states, particularly in Sabah and Sarawak. At the current levels, income inequality in Malaysia do not differ widely from other countries in the region. However, while Malaysia is close to becoming a high-income economy, the current level of inequality is still high compared to both transitioned and established high-income countries.

Inflation edged higher in recent quarters but remains moderate

Headline inflation edged higher in the last two quarters, primarily due to policy adjustments, though remaining at moderate levels. In Q1 2024 and Q2 2024, headline inflation rates were 1.7 percent and 1.9 percent respectively (Q4 2023: 1.6 percent). This modest increase in headline inflation mainly reflects policy adjustments affecting utilities and transportation items (Figure 33). These adjustments include changes to water tariffs in February, an increase in services tax for high-usage electricity in March, and the rationalization of diesel subsidies in June. However, inflation remained at moderate levels, in line with the levels observed in other countries in the region (Figure 34). Meanwhile, core inflation moderated to 1.8 percent in Q1 2024 (Q4 2023: 2.0 percent), primarily due to continued easing in the food and beverages segment. It edged slightly higher to 1.9 percent in Q2 2024, mainly driven by higher inflation in the food-away-from-home segment.

There were more extensive price increases in H1 2024. Inflation pervasiveness¹⁶ increased in the last two quarters as the share of CPI items recording

monthly price increases rose to 44.2 percent and 49.4 percent in Q1 2024 and Q2 2024 respectively (Q4 2023: 36.3 percent). The data for the latest quarter is above its historical long-term average of 43.9 percent from 2011 to 2019. The increased inflation pervasiveness indicates that a broader range of goods and services are experiencing price increases, albeit at varying magnitudes.

OPR was kept at 3.00 percent, with the central bank anticipating higher inflation in H2 2024.

The Monetary Policy Committee (MPC) maintained the policy rate during its meetings in May, July, and September 2024. The central bank expects inflation to increase in the latter half of the year, partly due to the recent rationalization of diesel subsidies. The potential for inflation to increase further depends on the spillover effects of additional domestic policy measures on subsidies and price controls, as well as global commodity prices and financial market conditions. The central bank expects headline and core inflation to average within its previously projected

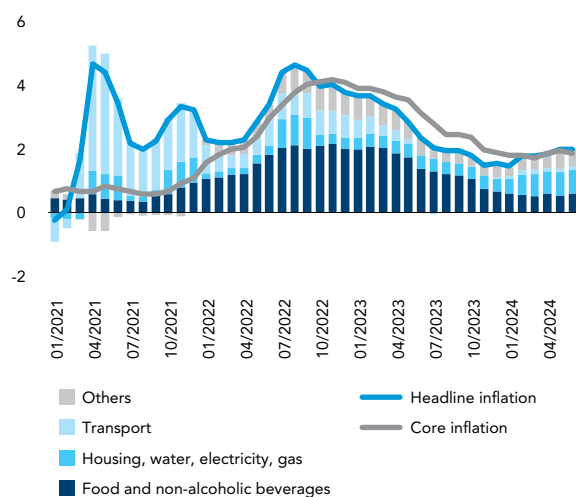
¹⁴ At the national average food poverty line income of RM1,198. Source: Department of Statistics Malaysia, Poverty in Malaysia 2022.

¹⁵ Department of Statistics Malaysia, Poverty in Malaysia.

FIGURE 33

Headline inflation edged higher in H1 2024, primarily driven by policy adjustments impacting utilities and transportation prices

Contribution to CPI, y/y, Percentage

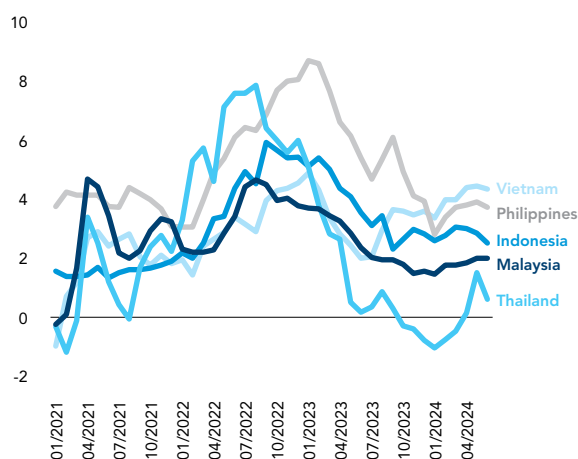


Source: World Bank staff calculations based on DOSM

FIGURE 34

Inflation remains contained across regional countries

CPI, y/y, Percentage



Source: World Bank staff calculations based on DOSM

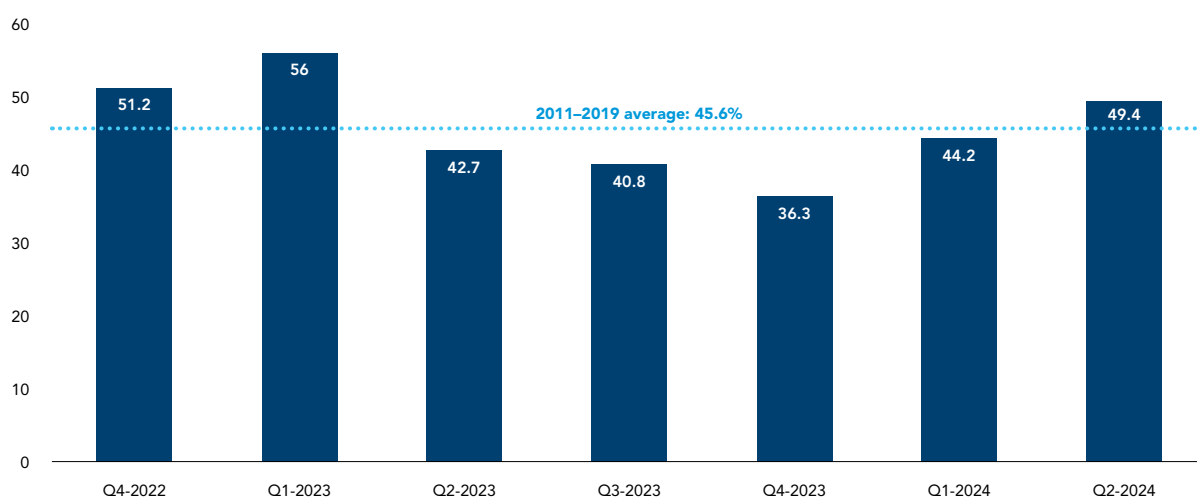
ranges of 2 percent to 3.5 percent and 2 percent to 3 percent respectively for 2024. At this OPR level, the monetary policy stance is supportive of the economy. Beyond 2024, the recent announcement of salary increases for civil servants may create some inflationary

pressure. However, the phased implementation over 14 months, combined with the central bank's credibility of maintaining price stability, suggests that the impact on inflation will be manageable.

FIGURE 35

Inflation pervasiveness has increased in recent quarters

CPI, y/y, Percentage



Source: World Bank staff calculations based on DOSM data

Note: Second quarter average from 2011-2019: 43.9%

16 Inflation pervasiveness refers to the extent to which inflation is spread throughout the economy. When inflation is pervasive, it means rising prices are not limited to specific items or areas but are affecting a broader range of products and services.

The Malaysian banking sector has maintained adequate capital and funding positions

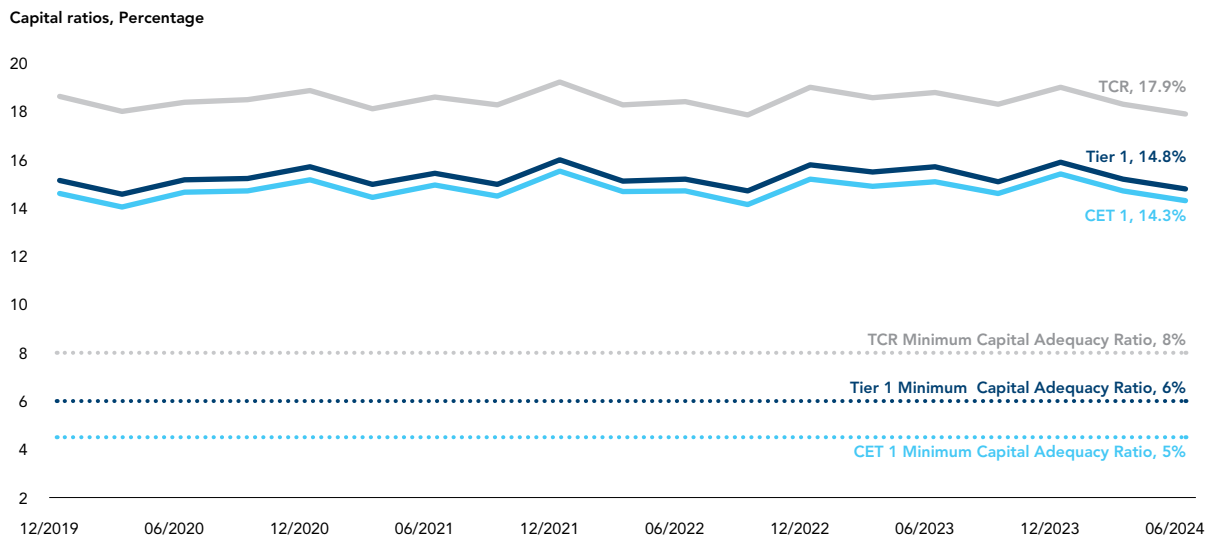
The Malaysian banking sector has maintained adequate capital buffers. The total capital ratio (TCR) and Tier 1 capital ratio remained above the regulatory minimum ratio at 17.9 percent and 14.8 percent respectively, as of June 2024 (Figure 36). However, the ratios are slightly lower than those observed in June 2023 (TCR: 18.8 percent and Tier 1: 15.7 percent).¹⁷ These changes reflect an increase in risk-weighted assets (RM1,972.7 billion as of June 2024 vs. RM1,858.5 billion as of June 2023) that outpaced the increase in total capital (up from RM350.0 billion to RM353.8 billion) year-on-year.

The banking system has also maintained adequate liquidity and funding positions in H1 2024. The liquidity coverage ratio (LCR) for the banking system

climbed to 155.2 percent as of June 2024 from 154.7 percent in June 2023, remaining well above the regulatory requirement of 100 percent. Bank deposits increased by 4.9 percent year-on-year to RM2,516.7 billion as of June 2024, while the loan-to-deposit ratio rose to 86.8 percent (June 2023: 85.6 percent). Bank holdings of high-quality liquid assets (HQLA) also increased, reaching RM762.7 billion as of June 2024, 2.5 percent higher than in June 2023. In December 2023, Bank Negara Malaysia (BNM) conducted a stress test assessment covering a three-year horizon up until end of 2026. Results indicated that the banking sector had sufficient capital to absorb losses from various simulated conditions such as elevated interest rate environment and inflationary pressures.¹⁸

FIGURE 36

The Malaysian banking sector has maintained adequate capital positions



17 As defined by BNM: (i) Common Equity Tier 1 (CET1) refers to capital comprising ordinary shares issued by a banking institution, retained earnings, and other reserves; (ii) Tier 1 Capital is the sum of CET1 and Additional Tier 1 Capital which includes instruments that are not included in CET1, is perpetual and can be written down or converted into ordinary shares if the bank encounters financial distress; and (iii) Total Capital is the sum of Tier 1 Capital and Tier 2 Capital which includes instruments that are not included in Tier 1 and have maturities of five years or more. Each capital ratio is the respective capital balance in question scaled by Risk-Weighted Assets.

18 BNM's stress test results were published in its H2 2023 FSR, under the section "Assessing the Resilience of Financial Institutions."

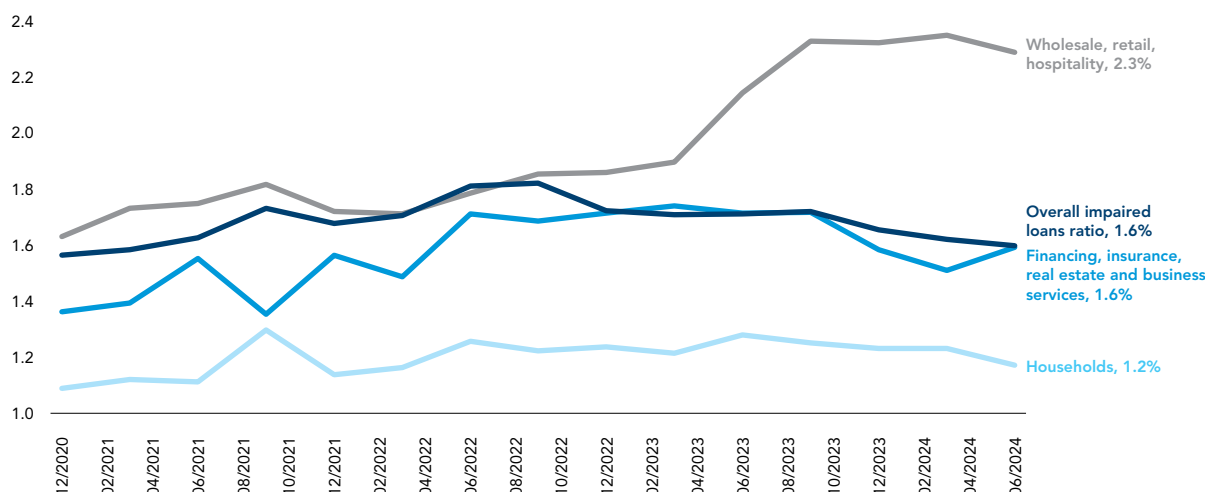
Bank asset quality has remained solid. The gross impaired loans ratio decreased by 11 basis points year-on-year to 1.6 percent at the end of June 2024 (Figure 37), registering its lowest level since the end of March 2021.¹⁹ Malaysia's gross impaired loans ratio remained low compared to regional peers (Table 2). Provisioning coverage remained stable. Total provisions stood at RM32.0 billion as of June 2024 versus RM33.1 billion as of June 2023, accounting for 91.7 percent of impaired loans (excluding regulatory reserves).

At the same time, the profitability of the banking sector has remained broadly stable during the second quarter of 2024. Pre-tax profits in the second quarter of 2024 amounted to RM13.0 billion, higher than the RM11.0 billion in profits observed during the same period in 2023. Simultaneously, the return on equity (ROE) also remained relatively stable at 12.0 percent (June 2023: 11.5 percent), and so did the return on assets (ROA) at 1.3 percent (June 2023: 1.3 percent).

FIGURE 37

Top three sectors and overall impaired loans ratio remained stable²⁰

Gross impaired loans ratio, Percentage



Source: BNM

TABLE 2

Malaysia has among the lowest gross impaired loans ratio in the ASEAN region*

	Malaysia (June 2024)	Thailand (March 2024)	Singapore (March 2024)	Indonesia (March 2024)	Philippines (March 2024)
Gross impaired loans ratio (%)	1.6	2.8	1.7	2.0	3.3

Source: BNM, International Monetary Fund (IMF), Haver Analytics, national sources

*Figures are based on the latest available data.

¹⁹ Malaysia uses the impaired loans classification by the Malaysian equivalent of the International Financial Reporting Standards (IFRS) 9 Financial Instruments. The standard uses a three-stage impairment model based on changes in credit quality.

²⁰ The top 3 sectors by outstanding loans collectively comprise approximately 80 percent of total outstanding loans.

Bank credit has expanded at a steady pace in 2024

Credit to the private sector has expanded at a steady pace throughout 2024 (Figure 38).²¹ Total outstanding loans grew by 6.0 percent, reaching RM2.2 trillion by the end of June 2024 in relative to the same period in 2023. This pace of credit growth is in line with levels witnessed in H1 2024, which is significantly higher than the average growth observed throughout 2023.

The household sector remained the largest and fastest-growing borrowing segment. It represented 64 percent of the total outstanding loan volume as of June 2024. Household debt grew by 6.2 percent year-on-year in June 2024, reaching RM1.4 trillion, amid sustained growth in housing and vehicle loans.²² However, household loan applications and disbursements have remained relatively stable over the past 18 months, in contrast to the rapid growth observed during 2022 (Figure 39). Outstanding business loans accounting for the remaining 36 percent of total credit to the private non-financial sector, grew 5.6 percent year-on-year as of June 2024. While this was higher than the same period in 2023 (0.6 percent), it was similar to the growth rate observed throughout 2024. The increase was supported by growth in both

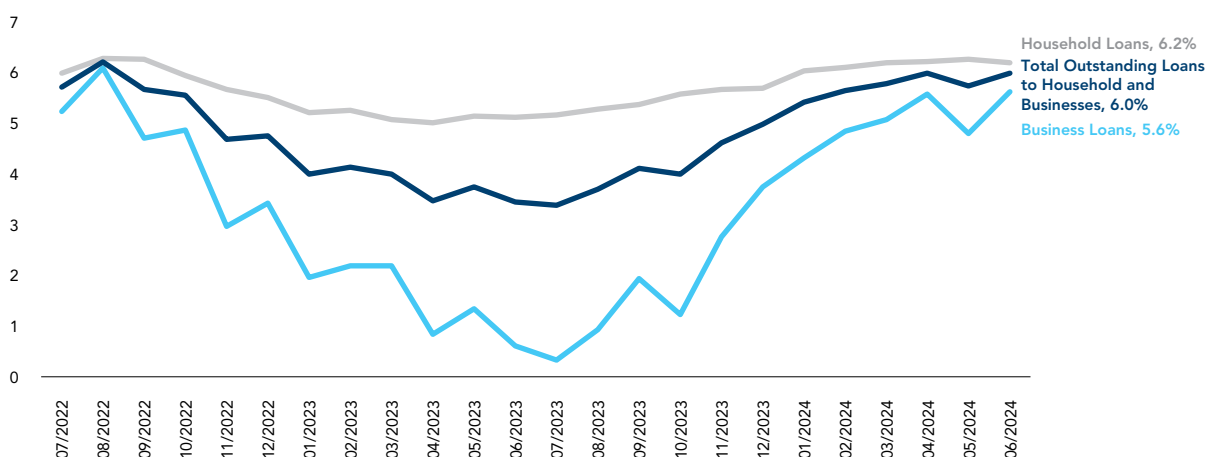
Higher business loan growth rates within the banking system were observed across the financing, insurance, real estate, business services sector and the wholesale, retail, and hospitality sector.

working capital and investment-related loans. Higher business loan growth rates within the banking system were observed across the financing, insurance, real estate, and business services sector and the wholesale, retail, and hospitality sector, which grew 12.4 percent and 10.5 percent year-on-year respectively, as of June 2024.

FIGURE 38

Credit to the private sector has continued to expand at a steady pace in 2024

Annual growth of outstanding loans to households and businesses, Percentage



Source: BNM

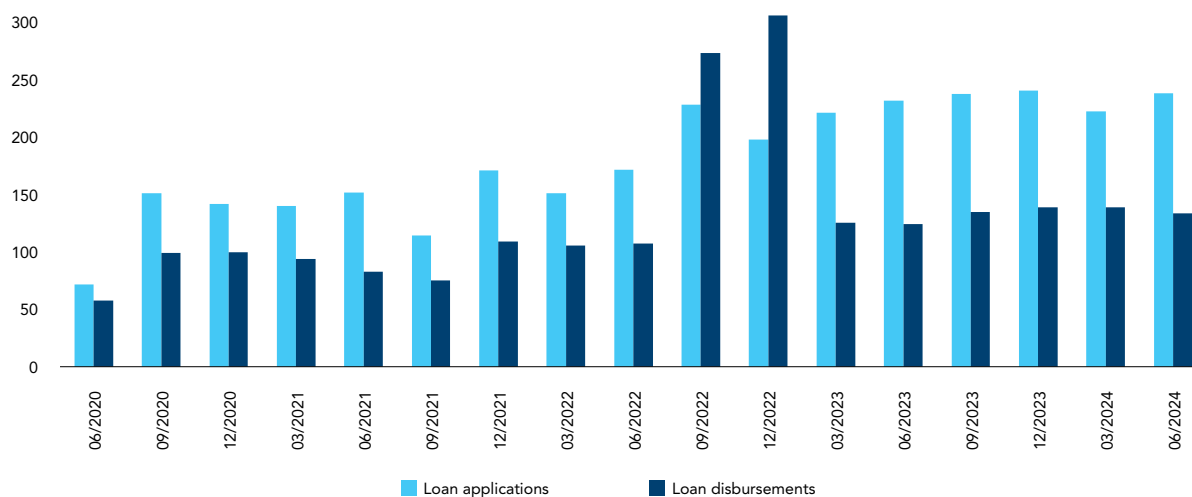
²¹ Refers to loans by the banking system, development financial institutions (DFIs), and corporate bonds issued by non-financial corporations (including short-term papers).

²² Household debt includes loans from banks and development financial institutions (DFIs). To note, the household debt-to-GDP ratio stood at 84.2 percent as at Dec 2023 (Source: BNM).

FIGURE 39

Household loan applications and loan disbursements remained relatively stable over the past 18 months

Household loan applications and disbursements, RM billion



Source: BNM

Corporate financing through capital markets has remained robust

Bond and sukuk markets remained a stable funding source for the Malaysian government and a select set of Malaysian corporates. Capital raising through bond and sukuk markets totaled RM251.7 billion in H1 2024, up from RM216.9 billion during the same period in 2023. After factoring in redemptions, total net issuances of bonds and sukuk for H1 2024

stood at RM53.0 billion, with corporates issuing a net RM11.6 billion and the government issuing a net RM41.4 billion.²³ While the government accounted for the bulk of the new capital raising activity, 100 Malaysian corporates raised RM52.2 billion in these markets (Table 3). While the volume of corporate debt issuance was comparable to that observed over the

TABLE 3

Capital raising activity in the Malaysian capital markets remained robust

Period	Debt (Bond and Sukuk) Fundraising			Equity Fundraising			
	Value of funds raised (RM billion)		Number of Corporate Debt Issuers	Value of funds raised (RM billion)		Number of IPOs	Number of Companies Undertaking Secondary Issuances
	Government	Corporate		IPO	Secondary Issuances		
2021	263.1	114.3	121	2.8	14.3	25	237
2022	281.8	153.3	142	3.5	22.6	32	110
2023	429.2	118.3	149	3.6	5.8	31	134
H1 2024	199.5	52.2	100	2.2	4.2	21	46

Source: BNM, SC, Bursa Malaysia, BIX Malaysia and Bloomberg

23 Source: SC Bond and Sukuk Statistics and Quarterly Reports.

24 Source: SC's Quarterly Report, 2nd Quarter 2023.

25 Source: Bursa Malaysia H1 2024 Financial Results.

same period in 2023 (H1 2023: RM52.4 billion), more corporates raised capital in the marketplace (H1 2023: 84 corporates).²⁴ Among corporates, firms in the finance, insurance, real estate, and business services sectors accounted for 62 percent of the new bond and sukuk issuances in H1 2024, with RM37.2 billion in new issuances.

Malaysian corporations have also continued to raise equity capital in domestic markets. In H1 2024, there were 21 initial public offerings (IPOs) on Bursa Malaysia (H1 2023: 16), with capital raising totaling RM2.2 billion (H1 2023: RM2.3 billion).²⁵ Out of these IPOs, 16 took place on the ACE Market, four on the main market, and one on the Leading Entrepreneur Accelerator Platform

(LEAP) market. The robustness of IPOs in Malaysia is in contrast with trends in the broader Southeast Asian region. For instance, Indonesia, Philippines, Singapore, Thailand, and Vietnam combined witnessed a 21 percent drop in IPOs and a decline of 59 percent in total capital raised from IPOs in H1 2024 compared to H1 2023. The value of equity fundraising by listed corporates has also remained comparable to levels seen in 2023, but well below the peak volumes observed during 2021-2022. For instance, corporates raised RM4.2 billion during H1 2024, matching the RM4.2 billion for H1 2023. However, significantly fewer corporates went to raise equity in the marketplace, with 46 corporates in H1 2024 in comparison with 83 corporates in H1 2023.

Equity and bond market capitalization reached an all-time high

The total stock market capitalization increased by 12.9 percent since the end of 2023 to an all-time high of over RM2.0 trillion. Malaysia's benchmark FTSE Bursa Malaysia Kuala Lumpur Composite Index (FBMKLCI) outperformed the other key ASEAN markets, with a 9.3 percent gain during H1 2024 (Figure 40). Globally, the MSCI All-Country World Index advanced 10.3 percent during the same period, amid the continued recovery trajectory of the global economy, with developed market equities (MSCI World Index: 10.8 percent gain in H1 2024) outperforming their emerging market counterparts (MSCI Emerging Markets Index: 6.1 percent gain in H1 2024).

The increase in domestic equity market capitalization was broad-based. Domestically, 12 out of 13 sectors tracked on Bursa Malaysia registered gains in H1 2024 (Figure 41). The best-performing sectors were construction (37.4 percent gain) and utilities (34.9 percent gain), both of which are expected to benefit from new orders for data centers.²⁶ Property (25.4 percent gain) followed suit amid indications of improvements in Malaysia's real estate market. Turnover was also higher in H1 2024, with daily value traded averaging RM3.5 billion compared to RM2.1 billion in H1 2023.

Malaysia's benchmark FTSE Bursa Malaysia Kuala Lumpur Composite Index outperformed the other key ASEAN markets.

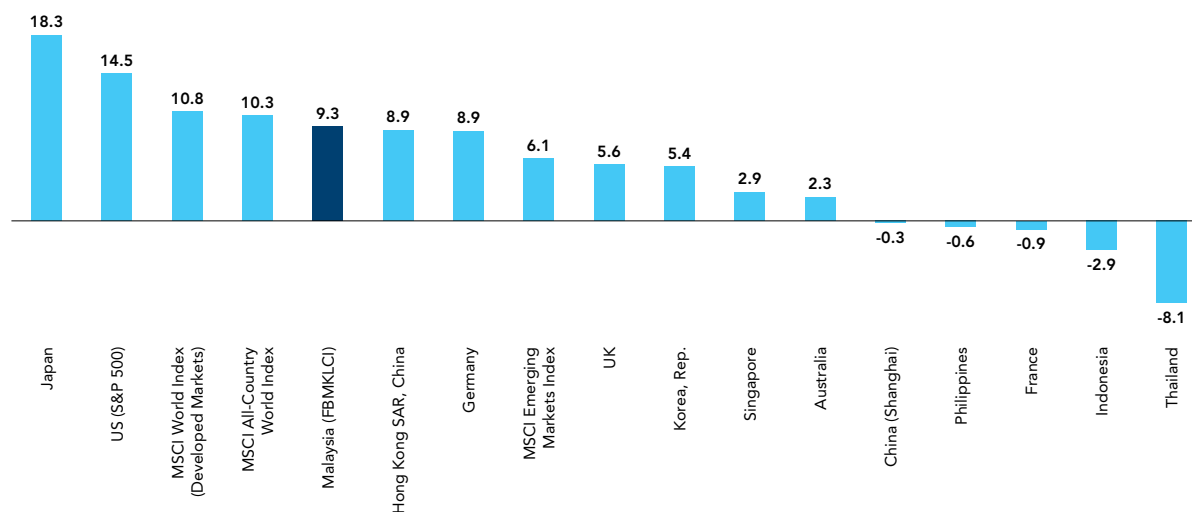
Malaysia's bond and sukuk market capitalization also expanded in H1 2024. The total outstanding value of bonds and sukuk as of June 2024 stood at RM2.1 trillion, an increase of 2.6 percent from the end of 2023 (Figure 42). This growth is comparable to the growth in capitalization in local currency of bond markets in the Philippines (1.9 percent), but lower than in Indonesia and Singapore (6.1 percent and 5.4 percent respectively). The government accounted for more than half of Malaysia's total value outstanding debt (RM1.2 trillion), while corporates accounted for RM848.3 billion.²⁷ As noted above, government issuances accounted for about 80 percent of the capital-raising activity during H1 2024.

²⁶ See for example, <https://www.thestar.com.my/business/business-news/2024/04/04/huge-orders-forecast-to-drive-building-industry> and <https://www.bloomberg.com/news/articles/2024-05-29/ai-buzz-political-calm-woo-foreigners-back-to-malaysian-stocks>.

²⁷ Source: BNM and BIX Malaysia.

FIGURE 40**Malaysia's FBMKLCI outperformed other key ASEAN countries in H1 2024**

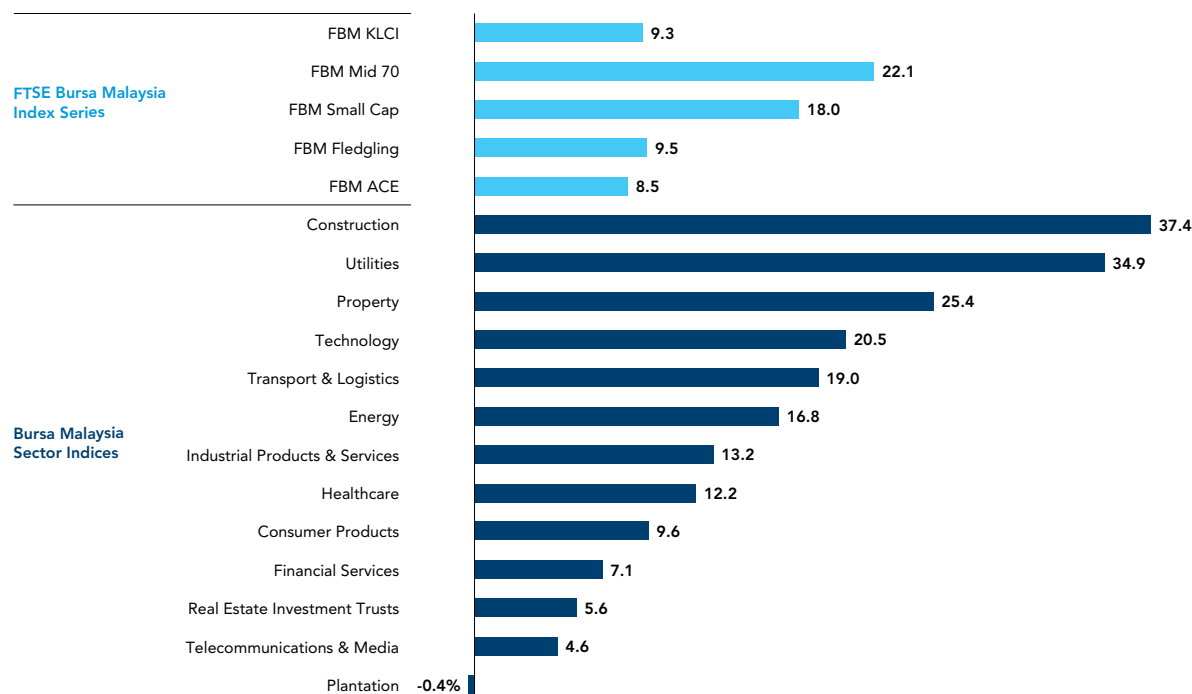
Percentage change since 31 December 2023, as of 30 June 2024



Source: Bloomberg

FIGURE 41**Bursa Malaysia indices and sectors registered broad-based gains in H1 2024**

Change in stock indices, Percentage

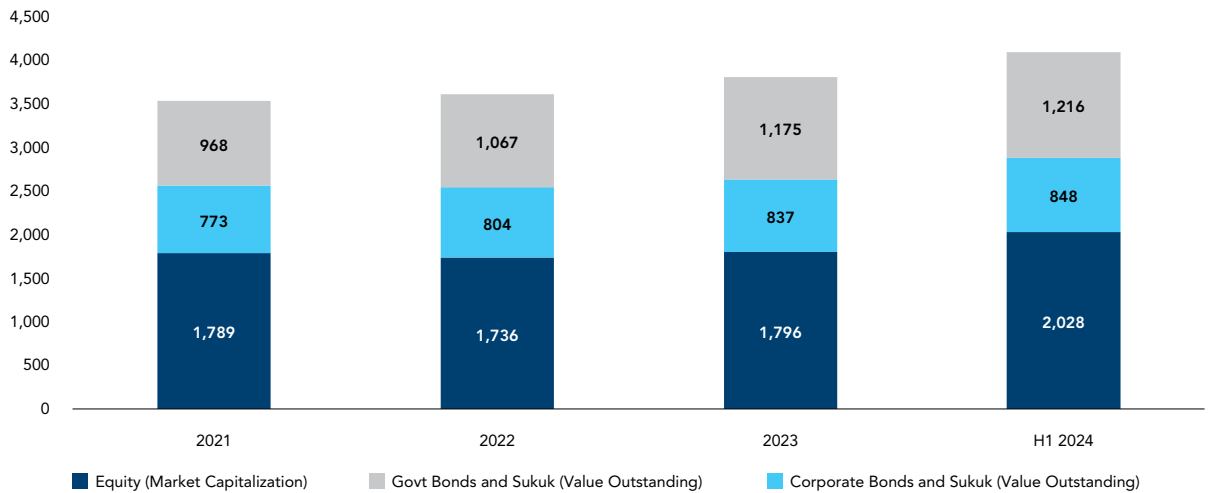


Source: Bursa Malaysia

Note: Percentage change since 31 December 2023, as of 30 June 2024

FIGURE 42**Malaysia's debt and equity market capitalization grew to all-time highs**

Outstanding debt and equity market capitalization, RM billion



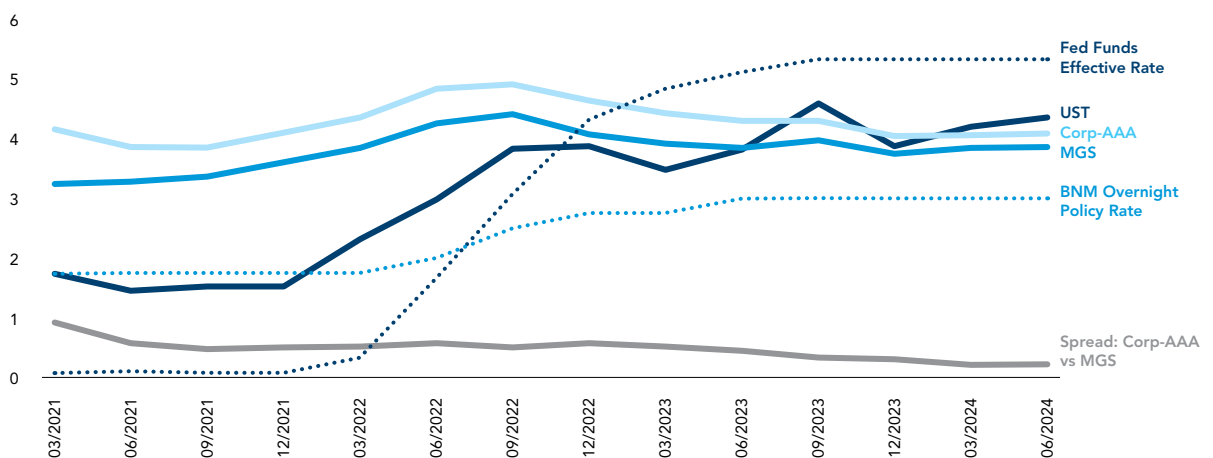
Source: SC

Corporate and sovereign yields remained broadly stable despite volatility in U.S. Treasury (UST) markets, while corporate spreads narrowed. Yields on 10-year Malaysian Government Securities (MGS) have remained in a tight range since 2023 and stood at 3.9 percent at the end of June 2024 (end of 2023: 3.7 percent) (Figure 43). Yields on AAA-rated Malaysian

corporate bonds (Corp-AAA) have been on a modest downward trend since 2023 but appear to have stabilized throughout 2024 (June 2024: 4.1 percent). Overall, Malaysian bond yields have been detached from the trend in yields in UST markets, which have been on an upward trend since 2022.

FIGURE 43**Malaysian bond yields remained broadly stable despite volatility in 10-year UST yields**

Bond yields and credit spread, Percentage



Source: BIX Malaysia, Board of Governors of the Federal Reserve System (US), BNM

Bond markets continued to attract foreign capital amid outflows in equity markets

Malaysian capital markets attracted foreign net inflows of US\$18.4 million in H1 2024 (Figure 44A).

Inflows into the bond market have been decelerating since early 2023, but rebounded in Q2 2024, mirroring trends in other key ASEAN countries (Figure 44B). The first six months of the year registered net inflows into Malaysian bonds of US\$191.0 million, which helped

offset net outflows from the equity market of US\$172.6 million. The equity outflows of the past months are broadly in line with other regional peers (Figure 44C). Foreign ownership of Malaysian equities has declined slightly from 20.7 percent at the end of 2020 to 19.7 percent in June 2024.

FIGURE 44A

Overall foreign portfolio flows into Malaysia remained in line with comparator ASEAN countries and historical trends

Quarterly net purchases of equities and bonds by foreigners, US\$ billion

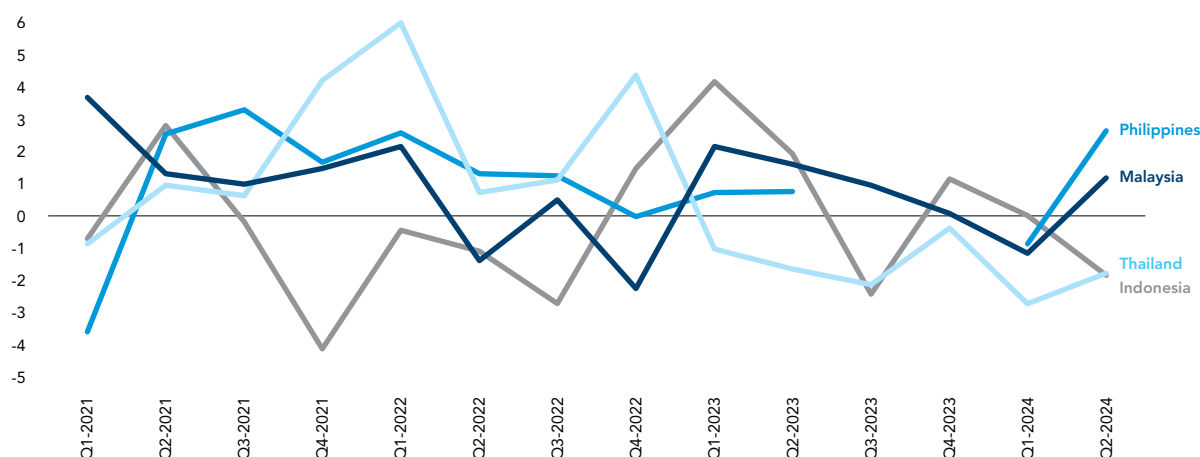


FIGURE 44B

Bond inflows ticked higher in Q2 2024

Quarterly net purchases of bonds by foreigners, US\$ billion

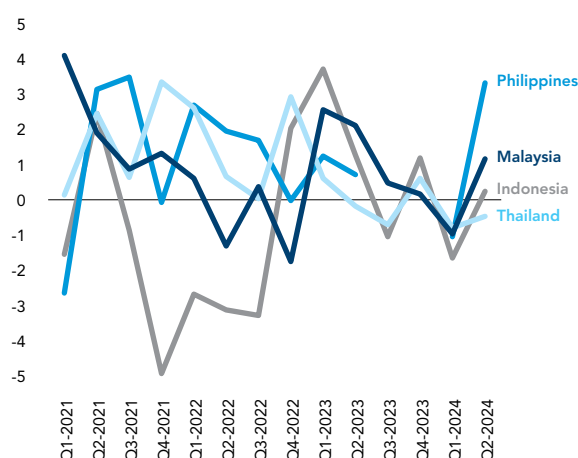
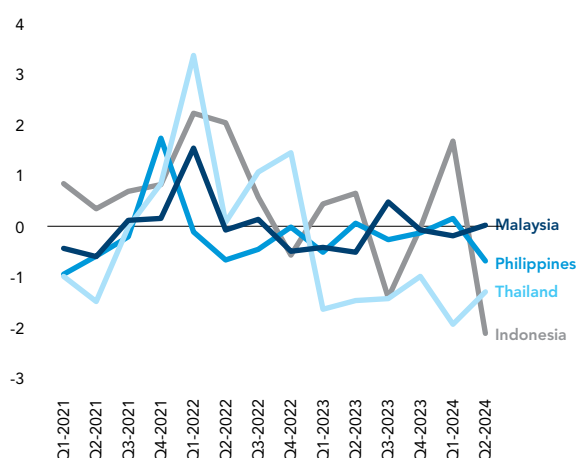


FIGURE 44C

Equity flows remained stable in H1 2024

Quarterly net purchases of equities by foreigners, US\$ billion



Source: Bloomberg²⁸

28 Philippines Q3 2023 and Q4 2023 bond and total portfolio flows were not reported as data for July 2023 and October 2023 is not readily available.

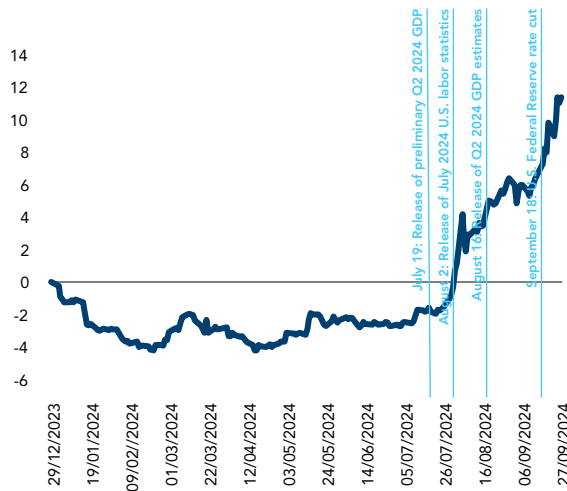
Meanwhile, the Malaysian ringgit experienced a strong rebound, appreciating 11.4 year-to-date against the USD percent as of September 27 (Figure 45). This makes the ringgit one of the best performing currencies in the region this year, following a depreciation of 3.9 percent in 2023 (Figure 46). Much of the appreciation began in July 2024, largely reflecting

improved investor sentiment on the back of better-than-expected economic data in 2Q 2024, the easing of US monetary policy, and coordinated initiatives from the government and BNM with government-linked companies (GLCs) and GLICs to encourage inflows into the foreign exchange market.

FIGURE 45

The ringgit appreciated 11.4 percent year-to-date against the USD in September...

USD/MYR exchange rate, YTD change, Percentage

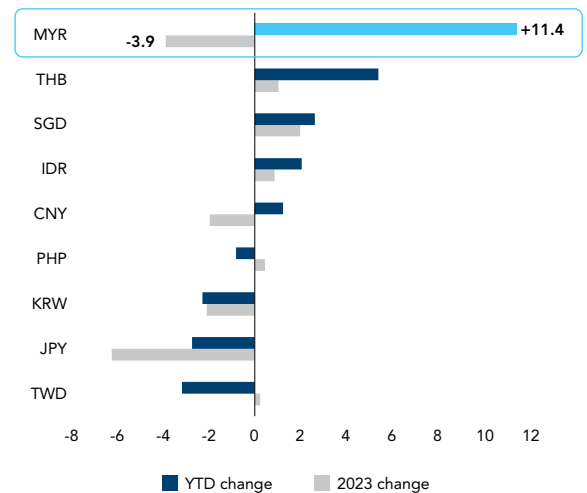


Source: World Bank staff calculations based on BNM data

FIGURE 46

...making it one of the best performing currencies in the region this year

Regional currencies against the USD, YTD change, Percentage



Source: World Bank staff calculations based on BNM data
Note: YTD as of 27 September 2024



The federal government undertook efforts to rationalize subsidies in the first half of 2024

Total federal government revenue increased in 2023 due to higher tax collections. Actual federal government revenue increased to 17.3 percent of GDP in 2023 (2022: 16.4 percent), with higher corporate tax collection partly attributed to the Prosperity Tax which generated RM6 billion or 0.3 percent of GDP in revenue last year²⁹ (Figure 47). Petroleum income tax also recorded a slight increase to 1.4 percent of GDP in 2023 (2022: 1.3 percent) amid the depreciation of the ringgit during the year, despite lower global oil prices and stable productions of petroleum products.³⁰ Meanwhile, indirect tax collections saw a slight increase, with proceeds from SST rising from 1.7 percent of GDP in 2022 to 1.9 percent in 2023, partially offset by lower collections from other indirect taxes such as export and import duties. Non-tax revenue registered a slight decline in 2023 at 4.7 percent of GDP (2022: 4.8

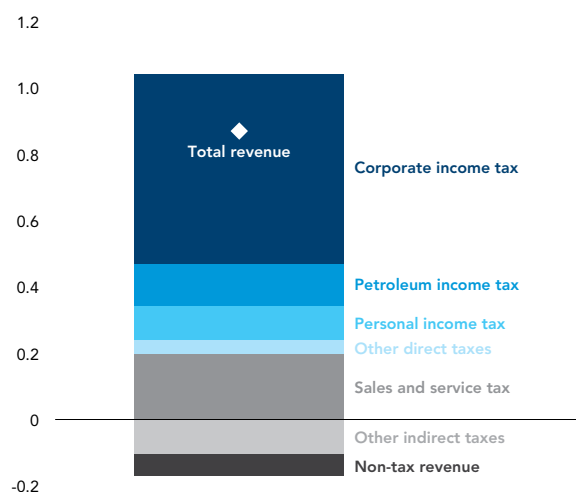
percent), given the lower investment income during the year (2023: 3.1 percent of GDP, 2022: 3.2 percent).

Federal government operating expenditures increased in 2023, with higher spending on subsidies and social assistance. Operating expenditure increased to 17.1 percent of GDP (2022: 16.3 percent) due to higher spending on subsidies and social assistance programs. Overall spending on these programs increased to 4.3 percent of GDP in 2023 (2022: 3.8 percent), mainly due to the delayed implementation of the targeted fuel subsidy mechanism. This figure exceeds the government's estimate of 3.5 percent of GDP for 2023 as indicated during the tabling of Budget 2024 and its initial budgeted amount of 3.1 percent (Figure 48).

FIGURE 47

Total federal revenue increased in 2023 primarily due to higher corporate income tax collections

Changes in federal government revenue, Percentage of GDP

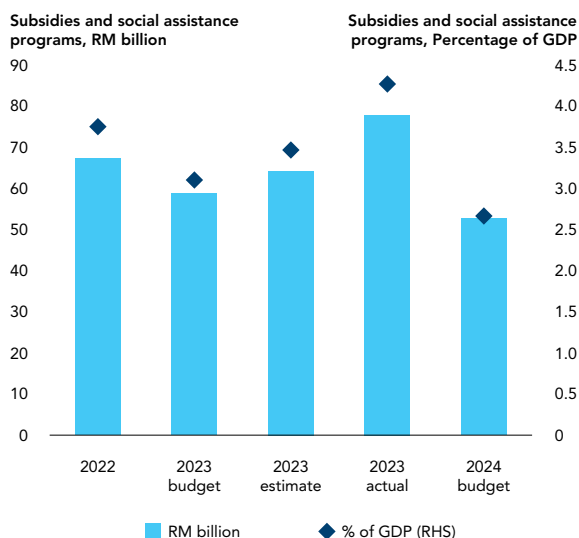


Source: World Bank staff calculations based on MOF data

Note: Other direct taxes include stamp duties, withholding taxes and real property gains taxes. Other indirect taxes include revenues related to import and export duties, excise taxes, and tourism tax. Non-tax revenues include interest and investment income, receipts from licenses and permits, and petroleum royalties.

FIGURE 48

Actual spending on subsidies and social assistance programs in 2023 exceeded the government's estimated and budgeted figures



Source: World Bank staff calculations based on MOF data

29 Higher corporate tax collection is mainly attributed to the Prosperity Tax and strong business activities in the petroleum-related and banking sectors. Under the Prosperity Tax, companies with taxable income exceeding RM 100 million were subject to an additional 9 percent on the corporate tax rate.

30 The exchange rate for MYR/USD was 4.41 in 2022 and 4.59 in 2023 (Source: Bank Negara Malaysia). Malaysia's daily petroleum and other liquids production remained stable in 2022 and 2023, averaging 603,000 and 597,000 barrels per day, respectively (Source: U.S. Energy Information Administration). During the same period, the global prices for Brent crude oil were USD 100.9 per barrel in 2022 and USD 82.5 per barrel in 2023, indicating an approximately 18 percent annual decline in average oil prices (Source: U.S. Energy Information Administration).



In 2024, the government anticipates lower spending on subsidies and social assistance programs, following the implementation of several subsidy rationalization initiatives. During the tabling of the Budget 2024, the government announced its plans to cut subsidies and social assistance programs by RM11.5 billion (0.6 percent of GDP)³¹ to RM52.8 billion (2.7 percent of GDP) in 2024. The government has since implemented diesel subsidy rationalization that is estimated to generate about RM4 billion in annual savings³² (0.2 percent of GDP). It has shown some initial positive impacts in addition to fiscal savings. These include reduced signs of smuggling and increased consumption of commercial diesel by the industrial sector instead of subsidized retail diesel.³³ Selected sectors have been approved to purchase diesel at subsidized rates to mitigate the impact on domestic prices.³⁴ The government also rationalized subsidies for chicken and electricity for heavy domestic users.³⁵ However, the government's plan of scaling back subsidies to the extent indicated during Budget 2024 will not be fully realized without some degree of rationalization of the RON95 subsidy.³⁶ The government

could pursue a broader scale of subsidy rationalization, with increased targeted transfers to offset its impact on inflation and the vulnerable segments of the population.

The share of rigid operating expenditure is expected to rise due to the government's announced salary adjustments. Rigid spending, which includes payments for salaries, pensions, and debt service charges, has generally been on an upward trend as a share of total operating expenditures over the years (Figure 49). These structural expenditures are likely to increase further, mainly driven by higher spending on emoluments. The salary adjustments for civil servants announced recently are projected to add roughly RM10 billion annually (about 0.5 percent of GDP or 10.5 percent of budgeted emoluments in 2024) to emolument (See Box 4 on Reforming the Public Sector Remuneration System). In the long term, higher emoluments are expected to increase future pension liabilities, highlighting the need for a defined contribution scheme for newly hired civil servants - as announced by the government - to manage such liabilities more effectively.³⁷

31 GDP refers to the 2024 forecasted nominal GDP as stated in the 2024 Fiscal Outlook and Federal Government Revenue Estimates (Source: Ministry of Finance).

32 With its implementation on June 10, 2024, the prorated savings are estimated to be approximately RM2.2 billion for 2024 (Source: Ministry of Finance and World Bank staff calculations).

33 Retail diesel sales at petrol stations decreased by 8 million liters, or approximately 30 percent, in the first week following the announcement of the diesel price float compared to the week before. In contrast, commercial diesel sales increased by about 4 million liters during the same period. The MOF suggests that these changes in diesel consumption patterns indicate that some industrial sectors, which should be purchasing diesel at market prices, may have been consuming subsidized retail diesel. Diesel sales at the border also declined by 40 percent (Source: MOF, July 1, 2024).

34 Fishermen will benefit from the lowest diesel rate at RM1.65 per liter, followed by RM1.88 per liter for land public transport under the Subsidized Diesel Control System (SKDS) 1.0, and RM2.15 per liter for eligible logistics vehicles through a fleet card mechanism under SKDS 2.0. Additionally, under the Budi Madani cash assistance scheme, eligible individuals, small farmers, and smallholders with non-luxury diesel-powered vehicles will receive a monthly aid of RM200 (Source: MOF, June 9, 2024).

35 In early 2024, the government removed the rebate for households consuming between 600 kilowatt-hours (kWh) and 1,500 kWh of electricity monthly, translating to a bill of between RM220 and RM707. These households will no longer qualify for the RM0.02 per kWh rebate. In July 2023, the government introduced a surcharge of RM0.10/kWh for domestic consumers using high levels of electricity, exceeding 1500 kWh, which corresponds to a minimum monthly electricity bill of RM708. For commercial users, the surcharges associated with electricity usage were reduced in the second half of 2023 and again in the second half of 2024.

36 To date, the government has announced several subsidy rationalization programs estimated to incur approximately RM7.9 billion (0.4 percentage of GDP) in fiscal savings for 2024. These include the rationalization of the diesel subsidy (RM2.2 billion, 0.11 percentage of GDP), the removal of the chicken subsidy (RM1.2 billion, 0.06 percentage of GDP), and the implementation of a targeted electricity subsidy (RM4.5 billion, 0.23 percentage of GDP) (Source: MOF and World Bank staff calculations).

37 Source: April 2024 Malaysia Economic Monitor: Bending Bamboo Shoots: Strengthening Foundational Skills

BOX 4

Reforming the public sector remuneration system



As part of a reform of the public sector remuneration system, all civil servants will have their salaries increased in two phases, starting 1 December 2024. The salary adjustments are part of a broader job and pay grading reform aimed at addressing long-standing issues of fairness and equity in the civil service. The revamped Public Service Remuneration System (*Sistem Saraan Perkhidmatan Awam, SPPA*) will replace the Malaysian Remuneration System (*Sistem Saraan Malaysia, SSM*), and revise the salaries for the nation’s 1.6 million civil servants. The adjustments will be as

follows: a 15% increase for those in the Implementing, Management, and Professional groups, and a 7% increase for the Top Management group (see Table 4).

The salary adjustments are expected to alleviate cost-of-living pressures, reduce internal inequities, and enhance public sector productivity. Although civil servants have received an annual 3% salary increase since 2015, this marks the first comprehensive structural review of civil service compensation in 12 years (Stratsea, 2023). This reform specifically targets weaknesses in

TABLE 4
Phases and Scales of Salary Adjustments for Civil Servants Under the SSPA

	Implementing, Management and Professional Groups	Top Management Group
Phase 1 (1 December 2024)	8%	4%
Phase 2 (1 January 2026)	7%	3%
Total increase from both phases	15%	7%

Source: PMO, 2024.

the existing wage policies, ensuring that adjustments better align with job roles and performance. Therefore, this restructuring is seen as timely and could ease living costs for civil servants while potentially encouraging the private sector to follow suit (Tan, 2024). The higher adjustments for the Implementing, Management, and Professional groups, compared to Top Management, may also help address internal inequities. Additionally, the salary hike will benefit teachers and healthcare workers, who have faced challenges due to low salaries and heavy workloads (NST, 2023; The Star, 2024). The Prime Minister has emphasized that the new system will be performance-based, which could boost productivity and efficiency in the civil service. However, details on how performance will be measured and rewarded are still pending.

A well-designed remuneration system can yield positive outcomes within fiscal constraints. With over RM10 billion (about 0.5 percent of GDP) allocated for the salary hikes and Malaysia's fiscal limitations, it is crucial that the new remuneration system is well-planned to address civil servants' needs in a fiscally responsible and sustainable manner. Thus, it is imperative to strengthen the civil service performance management system and implement a compensation framework that is in line with the future needs of the government. Several measures can be undertaken to achieve this:

- 1. Ensure the upcoming reform includes a rigorous review of public sector wage policies:** Conduct a thorough review of public sector wage policies to identify the drivers of emolument growth, and then develop an evidence-based reform roadmap with phased measures to restore equity across occupations within the public service and ensure competitiveness with the private sector.
- 2. Strengthen performance management and incentives:** Ensure that performance management systems, including evaluations are effectively designed to differentiate between high and low performers. Career advancement and salary increases should be systematically linked to performance, and not driven by seniority, tenure, or political pressure. This includes aligning organizational and individual goals, using diverse information sources for assessments, and motivating staff with intrinsic and extrinsic incentives.

Effective measures should be instituted to reward performance while maintaining the aggregate wage bill. World Bank (2021)³⁸ provides a detailed roadmap for designing effective performance management systems. In addition, performance measurement rules should be established clearly and transparently to ensure consistency, remove distortions and motivate workers.

3. Strengthen remuneration oversight: Currently, the Remuneration Division of the Public Service Department has the mandate to formulate, implement, and monitor the management of the government's remuneration system. Its functions can be strengthened in three ways:

- First, by regularly researching and analyzing civil service pay and benefits, both on internal equity and on competitiveness with the private sector. In Ireland, the Public Sector Pay Commission not only reviews public sector wages policies within the local labor market but additionally takes into account the international competitiveness of wages, especially for internationally traded skill sets.
- Second, the division should be strengthened to advise on job evaluation and wage systems, including, for example, to ensure that base pay is linked to job complexity. When large gaps emerge between the de jure job and pay grading structure and the evolving requirements of jobs, ad hoc allowances usually creep into the system, making wage policies opaquer and weakening the importance of base wage in total compensation. Countries such as Ireland, Switzerland, and Germany have routinely revised the job and pay structures for their civil service, resulting in base wages accounting for 98 percent, 94 percent, and 92 percent, respectively.
- Third, developing a formal mechanism for providing periodic cost-of-living adjustments to salaries that not only accounts for labor market conditions and realized inflation rates but also government fiscal space to provide legitimacy to government pay reform while remaining fiscally sustainable.

38 World Bank. 2021. Performance Management in the Public Administration — Seven Success Factors. EFi Insight-Governance. Washington, DC: World Bank.

Malaysia allocates a higher portion of its fiscal resources to emoluments compared to its peers.

Malaysia's emoluments are comparable to those of regional peers and lower than those of aspirational peer groups when expressed as a percentage of GDP, in line with the country's lower fiscal revenue³⁹ (Figure 50). However, when measured as a share of total public expenditure, Malaysia's emoluments are higher than those of its peers. Emoluments tend to be rigid due to the often-sticky nature of wage bill expenditures. This rigidity could constrain fiscal resources for other operating and development expenditures, particularly amidst fiscal consolidation efforts, unless there are increased efforts to enhance revenue mobilization.

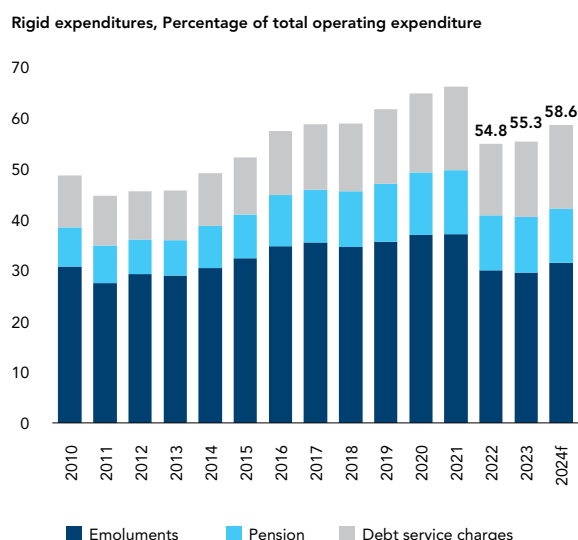
Federal government development expenditures are higher than those of regional countries but below to those seen in aspirational countries.

Gross development expenditure (DE) in 2023 was 4.6 percent of GDP⁴⁰, with the figure forecasted to be 4.6 percent in 2024. More than half of the DE is allocated for the

transportation, education, defense and security, and health sectors (Figure 51). DE has increased in recent years in line with higher allocations as outlined in the Malaysia Plans. The recent DE expenditure levels are higher than those of regional peers (3 percent of GDP) but below to those seen in aspirational countries (5 percent of GDP)⁴¹. Out of the RM415 billion allocated under the 12th Malaysia Plan (12MP) for DE, 56 percent has been utilized within the first three years.⁴² In the past, challenges in DE have stemmed from inefficiencies in executing allocated budgets, with gaps in budget planning and fragmented implementation of development programs.⁴³ This fragmentation arises in part from Malaysia's institutional arrangements where various implementing agencies fall under the jurisdiction of either the federal or state governments.⁴⁴ Additionally, the already high debt levels nearing the debt ceiling may restrict the government's ability to increase borrowings to fund further development spending (Figure 52).

FIGURE 49

The share of rigid spending has increased over time

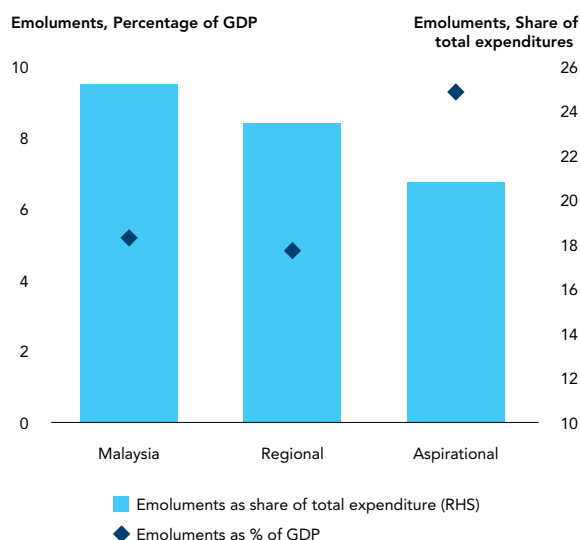


Source: World Bank staff calculations based on MOF data

Note: The lower share of rigid spending since 2022 reflects the increase in overall operating expenditure, mainly from higher spending on fuel subsidies

FIGURE 50

Malaysia allocates a higher portion of its fiscal spending to emoluments compared to its peer groups



Source: World Bank staff calculations based on MOF data

Note: Refer to the 2021 World Bank Aiming High: Navigating the Next Stage of Malaysia's Development for the complete list of peer groups. The figures above reflect the average for years 2021-2022

39 On revenue analysis, please refer to the October 2023 World Bank Malaysia Economic Monitor, "Raising the Tide, Lifting All Boats."

40 Excluding payments related to the redemption of the 1MDB bond.

41 The figures for regional and aspirational peers reflect the average of 2021 to 2022.

42 The utilization rate of development expenditure under the 11th Malaysia Plan was 55% for the first three years, with an overall utilization rate of 96%.

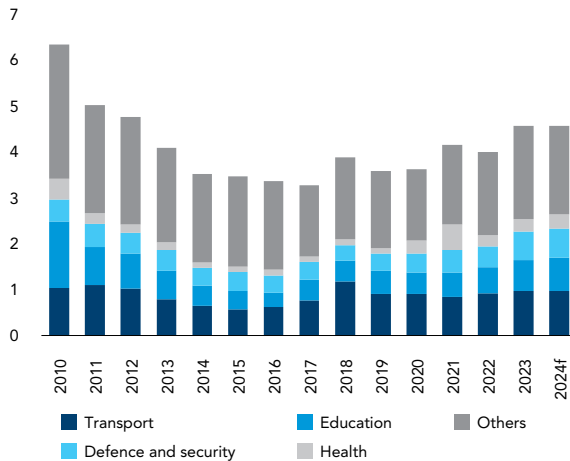
43 2017 Public Investment Management Assessment (PIMA) exercise conducted by the IMF and the World Bank highlighted that the absence of multi-year budgeting complicates effective capital investment planning for line ministries.

44 Source: Malaysia Voluntary National Review (2021).

FIGURE 51

Transportation, education, defense and security, and health sectors are the largest recipients of DE by sector

Development expenditure, Percentage of GDP



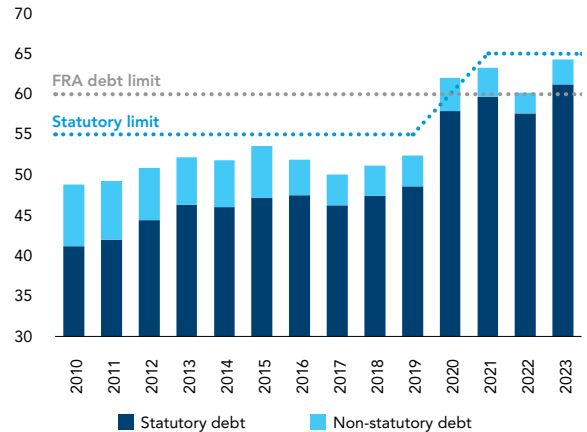
Source: World Bank staff calculations based on MOF data

Note: The 2023 figure excludes payments related to the redemption of the 1MDB bond amounting to US\$3 billion (approximately RM13 billion or 0.7 percent of GDP)

FIGURE 52

Federal government debt increased over the years with a larger share of debt that is binding to the current statutory limit

Federal government debt, Percentage of GDP



Source: World Bank staff calculations based on MOF data

Note: The statutory debt refers to the outstanding amounts for MGS, Malaysian Government Investment Issues (MGII), and Malaysian Islamic Treasury Bills (MITB) at the end of the corresponding years. These are the only debt instruments that are subject to the latest statutory limit of 65 percent of GDP under the Loan (Local) (Statutory Ceiling for Borrowing) and Government Funding (Statutory Ceiling of Moneys Received) Order 2022 [P.U. (A) 399/2022], effective 1 January 2023. Meanwhile, other debt include offshore borrowings and Malaysian Treasury Bills (MTB) are governed under the External Loans Act 1963 [Act 403] and Treasury Bills (Local) Act 1946 [Act 188], respectively. The Public Finance and Fiscal Responsibility Act 2023 (FRA) stipulates a debt ceiling of 60 percent of GDP, which will become effective in the medium term covering all federal government debt instruments.

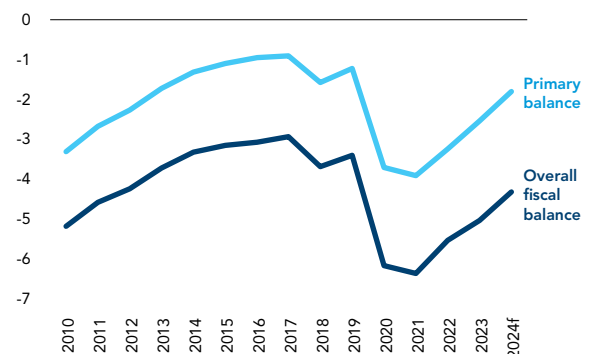
Higher federal government debt highlights the need for continued fiscal consolidation in Malaysia

The federal government debt-to-GDP ratio increased in 2023 as deficits continued to add to the debt stock. The overall fiscal deficit declined to 5.0 percent of GDP in 2023 (2022: -5.6 percent), with the forecast for 2024 projected at 4.3 percent of GDP. The primary balance mirrors the trend of the overall fiscal deficit, registering -2.5 percent of GDP in 2023 (2022: -3.2 percent), and is forecasted to decline to -1.8 percent of GDP in 2024 (Figure 53). Meanwhile, outstanding federal government debt rose to 64.3 percent of GDP in 2023, up from 60.2 percent in 2022, as the additions to debt stock from deficits outpaced nominal growth. The higher debt ratio underscores the need for Malaysia to persist with its fiscal consolidation efforts to ensure debt is on a firmer downward trajectory.

FIGURE 53

The government is expected to remain on its fiscal consolidation path

Fiscal balances, Percentage of GDP



Source: World Bank staff calculations based on MOF data

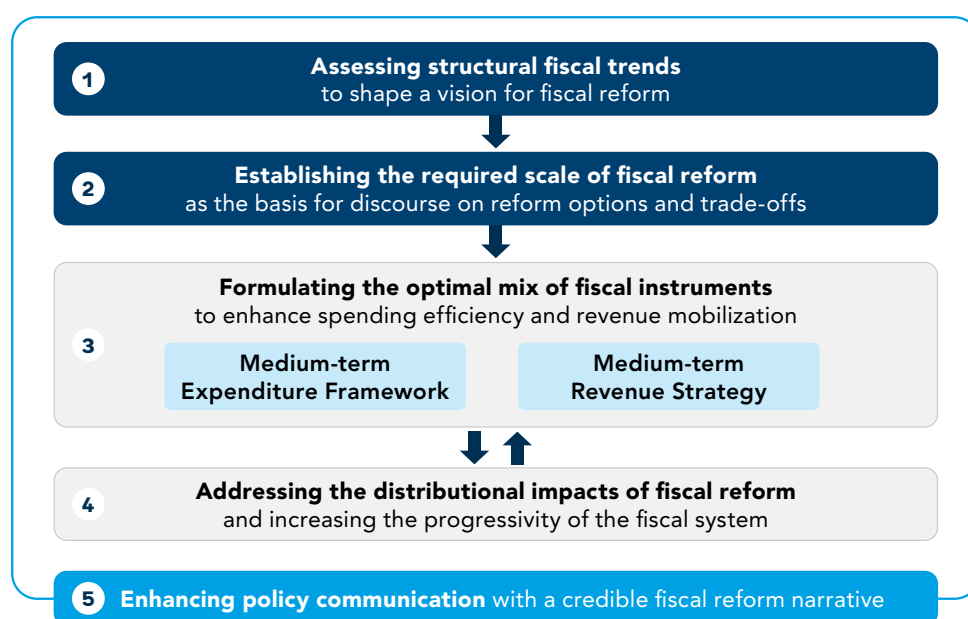
BOX 5

Future-proofing Malaysia's public finances

A forward-looking fiscal strategy is crucial to building broad support for fiscal reforms in Malaysia. Structural fiscal reforms to enhance revenue mobilization and spending efficiency are needed to durably finance Malaysia's current and future spending needs while improving its fiscal position. However, they are among the most politically difficult reforms the government can undertake, especially if they involve rationalizing entrenched spending and raising broad-based taxes. To build trust and generate broad support for such reforms, the government could consider formulating a longer-term fiscal strategy based on a more forward view of structural fiscal trends. This box provides more detail on this thinking across five key building blocks for a forward-looking fiscal strategy in Malaysia, as presented in Figure 54 below:

FIGURE 54

Five key building blocks for a forward-looking fiscal strategy in Malaysia



1. Addressing adverse structural headwinds will require more spending...

Taking a longer view of public finances can strengthen the case for fiscal reform. Structural headwinds of population aging, slowing productivity growth, changing climate and an increasingly uncertain geopolitical landscape have profound implications for Malaysia's fiscal trajectory. For example, World Bank projections indicate that Malaysia's age-related public expenditures will increase by up to 0.8 percent of GDP yearly between 2023 and 2030, and by an additional 0.5 percent of GDP every year by 2035, and adaptation measures to increase flood resilience could cost up to 0.2 percent of annual GDP.⁴⁵ Significant development spending to enhance both human and physical capital is also essential to boost productivity growth and facilitate Malaysia's transition to a high-income nation in coming years. Such structural expenditure pressures will continue to grow over time and place significant demands on Malaysia's public finances in the not-too-distant future, and thus it becomes vital to measure and plan for them as most advanced countries do.

45 World Bank and BNM, 2024, Managing Flood Risks: Leveraging Finance for Business Resilience in Malaysia.

2. ...clarifying spending needs can help ascertain the scale of fiscal adjustment

The desirability of potential reform options varies considerably depending on the extent of fiscal reform required. Once a funding gap is established, explicit revenue and spending targets (e.g., a certain percentage of GDP by 2030) could be set based on the magnitude of the current and future spending needs. The options for achieving the targets could be made public to better inform policymakers and citizens about the relative merits and trade-offs of different reform options in achieving the targets. This, in turn, could help anchor, rationalize and discipline the process of fiscal reform, promote accountability and good governance of fiscal policymaking, and thereby build trust in the government and foster stability in policy implementation.

3. ...which in turn can better help formulate an optimal mix of fiscal instruments

Integrating a forward-looking approach to budget planning and tax reform into the existing Medium-Term Expenditure Framework (MTEF) and the Medium-Term Revenue Strategy (MTRS) can help overcome shortcomings of annual budgeting by achieving budget realism, ensuring spending is driven by medium-term sector strategies, and creating greater fiscal transparency and accountability.⁴⁶ Similarly, a more forward-looking tax reform roadmap enables the government to have greater clarity of its likely revenues over a meaningful planning period, consistent with structural spending needs to support economic and social development. Taxpayers will have greater certainty on how they will be treated and what the tax implications of their decisions will be. It will also help identify coherent and well-sequenced changes to tax policy, administration, and the legal framework to leverage synergies across the three pillars.⁴⁷

4. ...but it is equally important to both measure and address the distributional impact of fiscal reform

Designing effective compensation mechanisms to offset the impact of fiscal reforms on vulnerable groups requires systematic analysis of the distributional effects of taxes and spending. Regressivity concerns around fiscal reforms are well-recognized in Malaysia and should be addressed with visible, actionable measures. By using a systematic fiscal incidence analysis, different revenue and spending combinations could be assessed for their net distributional effects to inform which option best achieves both development and equity objectives. The government can then consider devising a medium-term plan—with explicit targets and concrete, visible measures—to increase the share of public spending benefiting targeted groups and enhance the progressivity of the overall fiscal system.⁴⁸

5. ...effective policy communication is key for broad-based public support and buy-in

Transparent communications that address stakeholder concerns and highlight the long-term benefits of reform are essential to securing broad-based political support.^{49,50} Public acceptance and support for fiscal reform are often driven by the extent to which taxpayers (and citizens more broadly) believe the government is putting public resources to good use and whether the fiscal system is considered fair and equitable. Accordingly, credible and easy-to-understand information on how fiscal systems work and the need for reform is an important component of effective communication.⁵¹ Highlighting structural weaknesses of the current fiscal system, realistic long-term benefits of reforms, and planned mitigation measures for the vulnerable through strategic communications can also counteract negative narratives that might otherwise take hold. By considering the biases and other psychological factors that shape decision-making, addressing stakeholder concerns, and correcting misconceptions proactively, these communications can build a broader base of support and help overcome vested interests.

46 World Bank, 2012, What Are MTEFs and What Can They Do?. Washington, DC: The World Bank

47 Breuer, Luis E., Jaime Guajardo, and Tidiane Kinda, eds. 2018. Realizing Indonesia's Economic Potential. Washington, DC: International Monetary Fund.

48 The net fiscal impact on poorer households from the new taxes and spending would ideally be income increasing, while those in the middle of the distribution might be making new net payments but clearly benefit from new services, with the largest net contributions coming from the richest households.

49 Brys, B. (2011). Making fundamental tax reform happen. OECD Taxation Working Papers, No. 3, OECD Publishing, Paris.

50 Swistak, A., & de la Feria, R. (2024). Designing a Progressive VAT. IMF Working Papers, 2024(078), A001.

51 The International, Ibero-American Foundation for Administration, and Public Policies. Building Tax Culture, Compliance and Citizenship: A Global Source Book on Taxpayer Education: A Global Source Book on Taxpayer Education. OECD Publishing, 2015.



Economic Outlook

Despite improved near-term prospects, the global outlook remains subdued by historical standards

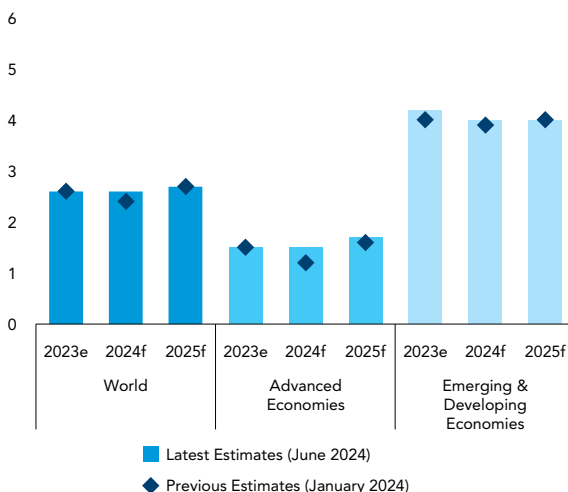
Global growth is projected to stabilize at 2.6 percent in 2024 despite ongoing geopolitical tensions and high interest rates (Figure 55). Advanced economies are expected to see aggregate growth remain at 1.5 percent (2023e: 1.5 percent), though activity in key economies will continue to diverge. The U.S. is expected to see moderation in growth as the labor market slows, while the Euro area and Japan anticipate a modest pickup with better domestic conditions. Growth in EMDEs is forecast to moderate slightly from 4.2 percent in 2023 to 4.0 percent in 2024. While domestic demand growth is expected to slow in some large EMDEs due to idiosyncratic factors, it is projected to pick up in many other economies. Global trade growth is expected to reach 2.5 percent this year (2023e: 0.1 percent), driven by a rebound in global goods demand. Global inflation is anticipated to moderate more slowly than previously expected, averaging 3.5 percent this year, due to an increase in aggregate commodity prices since late last year. Despite improvements, global growth over the forecast horizon is expected to be nearly half a percentage point below its 2010-19 average, with a

slower pace of expansion in economies comprising over 80 percent of the global population.

The EAP region is projected to grow by 4.8 percent in 2024, slightly down from 5.1 percent in 2023, with domestic demand driving growth in most economies (Figure 56). In China, growth is expected to slow to 4.8 percent in 2024 (2023: 5.2 percent), as a softening labor market and hence household incomes is likely to limit consumption while contraction in the property sector dampens investment. In the EAP region excluding China, growth is projected to rise to 4.7 percent in 2024 (2023e: 4.3 percent), with larger economies such as Indonesia, the Philippines, Thailand, and Vietnam, as well as smaller economies like Mongolia, Cambodia, and Myanmar, benefiting from domestic consumption, goods exports, and a revival in tourism. Over the next two years, growth in the EAP region is projected to continue moderating, reaching 4.2 percent in 2025 and 4.1 percent in 2026, as further slowdown in China offsets modest pickups elsewhere in the region.

FIGURE 55
Global economic growth is expected to stabilize in 2024

GDP, y/y, Percentage



Source: World Bank staff projections based on DOSM data

FIGURE 56
Growth in developing EAP is forecast to slow this year

GDP, y/y, Percentage



Source: World Bank staff projections based on DOSM data

Malaysia's economy is expected to expand at a faster pace in 2024

Following weaker-than-expected growth in 2023, Malaysia's economy is forecast to expand by 4.9 percent in 2024 (2023: 3.6 percent).

This represents an increase of 0.6 percentage points from the earlier forecast in April 2024, reflecting stronger-than-expected consumption, as well as increased investment and trade activities in the first half of 2024 (Figure 58). Private consumption is projected to rise by 5.5 percent this year, up from 4.7 percent in 2023 and 0.3 percentage points higher than the previous forecast, supported by further improvement in labor market conditions and wage growth, as well as continued government household income support, including the *Sumbangan Tunai Rahmah* cash aid. Meanwhile, public consumption is projected to grow at 3.9 percent this year, up from 3.3 percent in 2023. This growth is supported by annual salary increments for civil servants and higher spending on supplies and services.

GFCF is expected to grow at a faster pace of 7.4 percent in 2024 (2023: 5.5 percent), a significant revision from the previous forecast of 5.1 percent.

This reassessment reflects stronger-than-expected investment activity in private and public sectors in H1 2024. Business investment will continue to be supported by ongoing multi-year projects and the realization of recently approved investments in the

manufacturing and services sectors. Government capital spending will focus on upgrading public infrastructure in transportation, health, and education. Additionally, public corporation investment activity will be supported by strategic infrastructure projects such as the ECRL, the Rapid Transit System (RTS) Link, and the Sabah-Sarawak Pan-Borneo Highway.

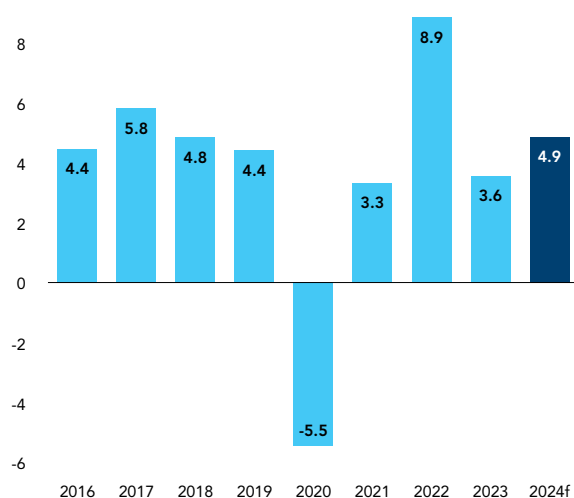
Malaysia's exports are set to benefit from a rebound in global goods trade following exceptional weakness last year.

After contracting by 8.1 percent in 2023, export growth is projected to recover to 5.9 percent this year, up from the previous forecast of 4.8 percent. Malaysia's exports of goods are expected to maintain strong growth through H2 2024, driven by improved global activity and goods trade, particularly in the technology sector. Additionally, the exports of services will be bolstered by a continued rise in international tourist arrivals from the surrounding region, including China. Malaysia's imports are expected to grow by 6.7 percent this year, marking a sharp rebound from a contraction of 7.4 percent in 2023. This increase is in line with the recovery of exports of goods, given the high share of intermediate inputs in Malaysia's imports, as well as continued consumer spending and sustained investment activity.

FIGURE 57

Malaysia's GDP growth is revised upward to 4.9 percent in 2024...

Real GDP, y/y, Percentage

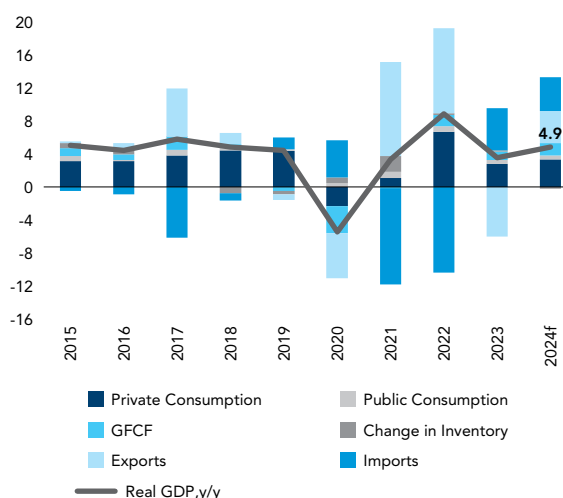


Source: World Bank staff projections based on DOSM data

FIGURE 58

...due to stronger-than-expected consumption, investment and trade activities in H1 2024

Contribution to real GDP, y/y, Percentage



Source: World Bank staff projections based on DOSM data

Headline consumer price inflation is projected to moderate to around 2 percent in 2024 (2023: 2.5 percent), 0.4 percentage points lower than the previous baseline forecast. The revision largely reflects softer global commodity prices and weaker-than-anticipated passthrough effects of recent policy changes on inflation. However, several risks could drive

inflation higher. These include potential domestic policy adjustments, such as changes to subsidies and price controls, which may affect broader price trends. Moreover, volatility in global commodity prices and shifts in financial markets could also intensify inflationary pressures.

TABLE 5
Malaysia's GDP growth is expected to pick up in 2024

Real GDP Growth, y/y, Percentage					Contribution to Real GDP Growth, y/y, Percentage point				
	2021	2022	2023	2024f		2021	2022	2023	2024f
GDP	3.3	8.9	3.6	4.9					
Domestic Demand (including stocks)	3.8	9.5	4.7	5.4	Domestic Demand (including stocks)	3.6	9.0	4.4	5.1
Private Consumption	1.8	11.3	4.7	5.5	Private Consumption	1.1	6.6	2.8	3.3
Public Consumption	5.8	5.1	3.3	3.9	Public Consumption	0.8	0.7	0.4	0.5
Gross Fixed Capital Formation	-0.7	6.8	5.5	7.4	Gross Fixed Capital Formation	-0.1	1.4	1.1	1.5
External Demand					External Demand				
Exports of Goods & Services	18.5	14.5	-8.1	5.9	Exports of Goods & Services	11.4	10.3	-6.0	3.9
Imports of Goods & Services	21.2	16.0	-7.4	6.7	Imports of Goods & Services	11.7	10.4	-5.1	4.1

Source: World Bank staff projections based on DOSM data

Malaysia's growth outlook is subject to downside risks

Malaysia's baseline growth projections face several external and domestic risks. On the external front, weaker-than-expected activity in advanced economies could depress sentiment and lower trade prospects. At the same time, escalating geopolitical tensions could cause volatile commodity prices and further trade fragmentation, disrupting trade and investment networks. In the EAP region, China's growth may underperform if a prolonged property sector downturn, rising debt, and weak sentiment hinder private sector activity. Any of these risks could significantly impact Malaysia due to its global trade and financial connections. On the upside, faster-than-expected global disinflation could lead to faster monetary policy easing, and growth in the major economies could be

stronger than expected, boosting global growth and trade prospects.

On the domestic front, the primary downside risks concern the strength of household consumption. Potential factors include slower growth in real disposable income and the lingering effects of post-pandemic monetary policy normalization, which could dampen private consumption more than currently assumed. Supply-side disruptions in commodity production, potentially due to unfavorable weather conditions, could also impede growth. On the upside, stronger-than-expected private investment and robust tourism activity suggest that domestic economic performance could be more robust than currently projected.





PART TWO

Farming the Future: Harvesting Malaysia's Agricultural Resilience through Digital Technologies

Farming the Future: Harvesting Malaysia's Agricultural Resilience through Digital Technologies

As Malaysia aspires to achieve high-income status, it needs to implement policy reforms to transform its agriculture sector into a sustainable growth engine. According to the Government's Vision strategy⁵², Malaysia's agrofood system aims to achieve three key objectives: (i) become a highly competitive and innovative globally; (ii) increase the wellbeing and inclusivity of food producers while supplying affordable and nutritious food to consumers; and (iii) reduce environmental footprint of the sector. As Malaysia is gearing up to achieve this vision, addressing the challenge of imbalance between food demand and supply remains a critical priority, especially in light of changing demand for food driven by urbanization. Addressing this imbalance requires reducing transaction costs and information asymmetries that negatively affect farmers' decisions regarding inputs, land, labor, capital, and outputs. It also impacts consumers' choices about food attributes, including prices, production practices, and environmental impacts. High transaction costs are significant barriers in agricultural supply chains, often excluding farmers from profitable markets and contributing to information asymmetry.

Digital agricultural technologies present a transformative opportunity for Malaysia's agriculture sector, offering solutions to both supply and demand challenges while supporting broader economic growth. This chapter explores the current state of agriculture in Malaysia and the potential impact

This chapter explores the current state of agriculture in Malaysia and the potential impact of DAT on the nation's food security and economic development.

of DAT on the nation's food security and economic development. It examines agriculture's role in the Malaysian economy and the challenges it faces, before delving into the potential role of DAT in addressing challenges facing the sector. It does so by presenting the benefits of DAT on increased agricultural productivity, improvements in labor conditions and wages, enhanced equity, strengthened export competitiveness, and support for climate adaptation and mitigation efforts. It presents a strategic framework on how to scale up DAT adoption based on international experiences. The paper concludes with actionable recommendations to reinforce three foundational pillars: public goods investment, innovation ecosystem development, and the creation of an enabling environment. This approach aims to position Malaysia at the forefront of agricultural innovation, addressing both supply-side efficiencies and demand-side dynamics to create a more resilient and productive agriculture sector that can contribute to Malaysia's economic growth.



52 National Agrofood Policy 2021-2030 (NAP2.0)

Transforming potential: The pivotal role of agriculture in Malaysia's economic growth

The agrofood sector plays a significant role in supporting Malaysia's economy, contributing **11.6 percent to the national GDP in 2023**. Although the agrofood GDP share has declined by 3.9 percent since 2010, the sector's total value added grew by 4.0 percent over the past decade. The agrofood industry's average yearly value added growth is projected at 4.5 percent in 2025 (2019: 3.1 percent), and further at 5.0 percent in 2030. Projections also suggest that the sector will contribute to 4.3 percent of GDP by 2030. About 1.87 million people were employed in the agriculture sector in 2023, contributing to approximately 10.0 percent of the total Malaysian workforce, a sizeable share of Malaysia's workforce

Malaysia's economy has shifted from resource-based agriculture in the 1960s to manufacturing by the late 1980s (Figure 59). The share of agricultural GDP declined from 1962 to 2019. Many countries have had a similar shift from agriculture to other sectors as economies mature and diversify. While Malaysia has done this, increasing food supply and security remain as key objectives.

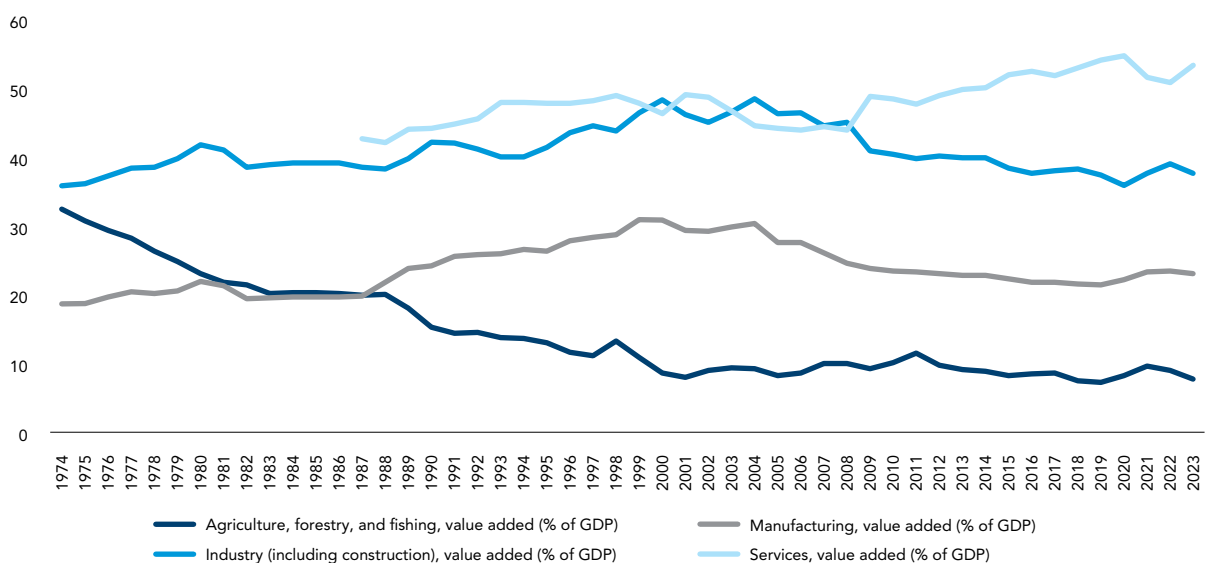
Malaysia, as an open economy, relies on exports to drive economic growth and maintain trade balances.

The agriculture sector, which includes key products like palm oil, rubber, and the agrofood sector, play a crucial role in the country's exports portfolio (Figure 60). Agriculture has historically been a significant source of foreign exchange earnings, with agricultural raw material exports growing by over 99.0 percent between 1974 and 2022. Since 2011, the exports of food items specifically have increased by 12.0 percent. Malaysia's palm oil exports totaled 17.7 billion USD—31 percent of global export—in 2022, positioning the country as the world's second-largest palm oil exporter.

Food consumption in Malaysia is undergoing a significant transition. On one hand, projected population increase from 33.4 million in 2023 to 38.9 million by 2030 is expected to increase aggregate demand for food. On the other hand, rapid urbanization from 75 percent in 2020 to 80 in 2030 accompanied with income growth is changing consumer preferences for food. According to Engels Law and Bennet's Law, as people become wealthier, they tend to spend more on

FIGURE 59
Malaysia's progress towards agricultural transformation

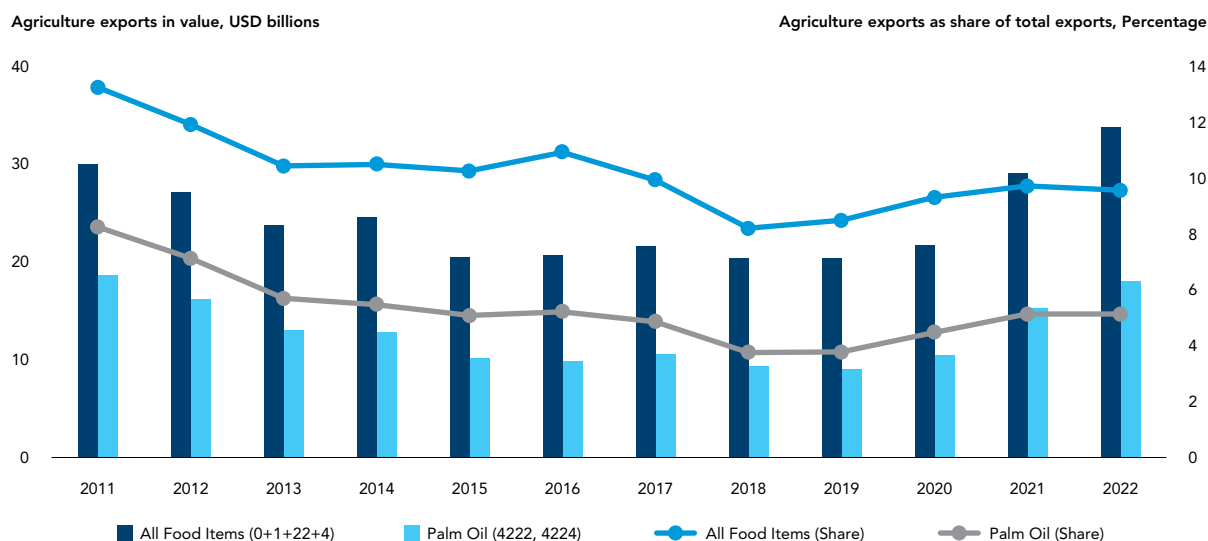
Contribution to GDP, Percentage



Source: World Development Indicator

FIGURE 60

Agriculture exports (in all food items) are increasing in value yet contribute less than 10.0 percent of Malaysia's total exports



Source: UNCOMTRADE database

Note: All food items include: SITC 0 - Food and live animals, 1 - Beverages and tobacco, 2 - Oil seeds and oleaginous fruits, and 4 - Animal and vegetable oils, fats, and waxes. Classification found here

higher-quality and imported foods. This is evidenced by the Household Expenditure Survey (HES), which shows that Malaysians are consuming more expensive foods and less rice, opting instead for more meat and other premium products. The 2022 Monthly Household Consumption HES revealed that the largest portions of food expenses were allocated to fish and seafood (23.5%), meat (14.6%), and vegetables (10.6%), among others. Furthermore, younger generations are increasingly concerned about food traceability, safety,

and production methods, further influencing food demand in Malaysia. Malaysia has also committed to increasing domestic food production to replace some exports and to support its food processing sector. These factors above collectively highlight the dynamic nature of food consumption patterns in the country and the role of the agriculture sector in supplying safer and more sustainable food to the population. To achieve this, the agrofood system needs to overcome key challenges outlined in the next section.

Navigating key challenges in Malaysia's agriculture

Malaysia's agriculture sector faces a number of challenges that are preventing it from fulfilling its growth potential. These challenges affect the transitions underway in both food demand and supply, which requires balancing changing consumption patterns with increasingly constrained sectoral supply responses. These key challenges are discussed below.

Firstly, the agriculture sector is facing low productivity growth. Current productivity levels are less than 50 percent of the average for high-income countries, hindering Malaysia's national economic growth (World Bank 2021a). Except for 2020, agriculture

labor productivity has lagged in other key sectors. In 2022, agriculture labor productivity grew by only 0.7 percent, significantly lower than Malaysia's average productivity growth of 5.4 percent in other sectors. The Asian Productivity Organization reports that labor productivity growth in Malaysia was the lowest in the region (excluding Singapore) from 2010 to 2020. The Malaysian Productivity Corporation analysis in 2022 showed that labor productivity in the agrofood sector is similar to the machinery and equipment sector, but lower than other sectors such as E&E and chemicals. While the average varies, agriculture had the lowest productivity growth among these sectors in 2021

and ranked third in average productivity growth from 2017 to 2021. The overall labor productivity growth in agriculture (0.7 percent) is also significantly lower than the average Malaysian growth (5.4 percent) in 2022 (Figure 61).

The low productivity is driven by a few key overlapping challenges. This includes low production efficiency and high production cost affecting farmers' income, lack of diversification to high value-added produce and products, unconducive business environment, and threats from natural disasters, pest diseases, unsustainable farming practices, and more. Apart from the first pandemic year (2020), labor productivity in the agriculture sector has always been lower than in other key sectors.

Malaysia's GDP per worker, a measure of agricultural productivity, underperforms in its potential contribution to the national economy. Between 2011 and 2020, the agrofood sector contributed an average of 6.8 percent to the Malaysian GDP (KPKM 2021) and then increased slightly from 7.2 percent in 2019 to 8.2 percent in 2020 (World Bank 2022). The manufacturing sector contributed an average of 22.3 percent to GDP during the same period, while the service sector provided 51.5 percent on average (WDI 2022).

Secondly, stagnant agricultural productivity threatens wage growth. Without productivity improvements, wage growth in agriculture may remain low, reducing competitiveness compared

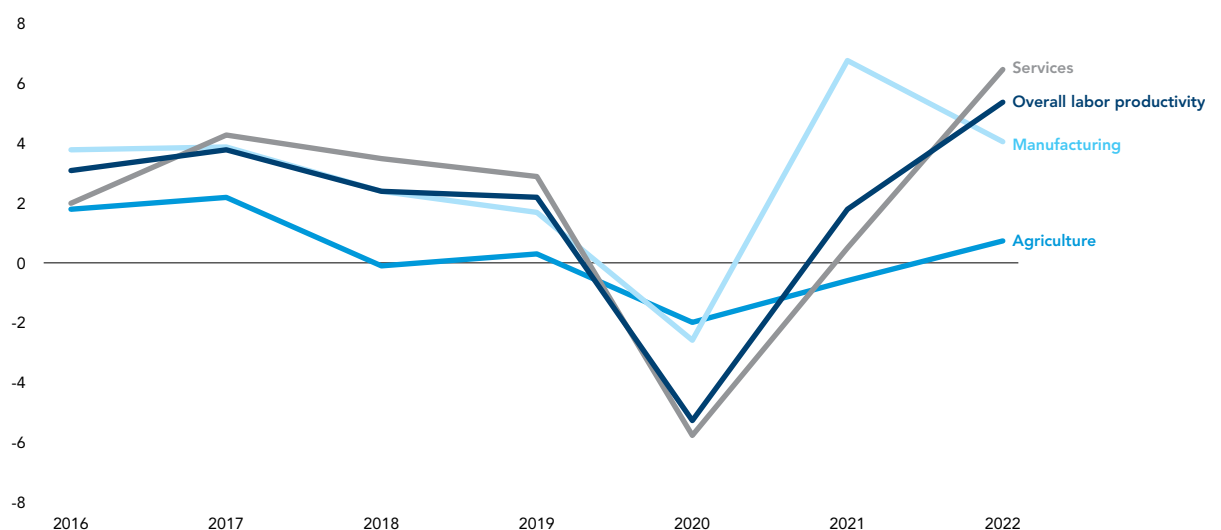
to other industries. The decline in value added per hour worked, from RM25.2 in 2015 to RM24.8 in 2023 (Figure 62) shows potential stagnation or lower worker efficiency. This trend could directly affect agricultural wages, as wages often correlate with productivity. Sectors like manufacturing and services, with increased value added per hour, might experience wage growth, reflecting their rising productivity. This divergence could widen wage disparities, worsening income inequality, especially in rural areas where agriculture is the main employment source. However, the sector has shown a robust employment growth rate of about 4.2 percent.

Thirdly, Malaysia demonstrates strong performance in various digital competitiveness indices, but its agriculture sector still falls behind other industries in using digital solutions. Data on computer and internet usage, as well as web presence (see Figure 63), reveal that agricultural establishments use computers significantly less than other sectors. Only 72.0 percent of them use the internet, compared to 93.0 percent in manufacturing. Despite having an internet penetration rate exceeding 90 percent of households—comparable to high-income nations—Malaysia still struggles with this significant digital disparity. Poor connectivity and network coverage in rural areas, along with a lack of digital literacy among smallholder farming communities, continue to slow the widespread adoption and use of digital tools in agriculture. Smartphones are used to access the internet by over 93.0 percent of the population, which could potentially be one of the

FIGURE 61

Annual labor productivity

Value added per employment by economic activity growth, 2016-2022, Percentage

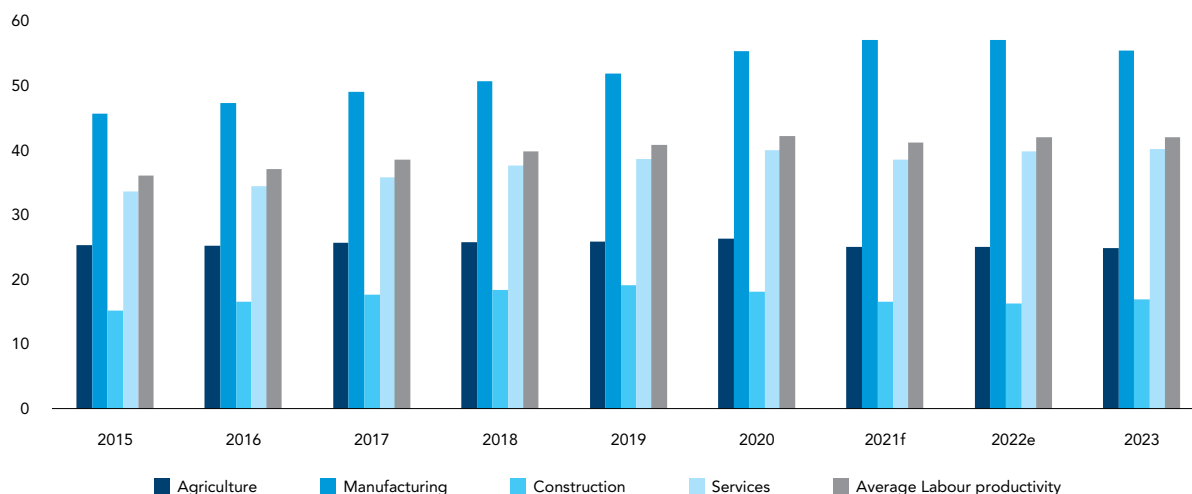


Source: DOSM (2023)

FIGURE 62

Workforce productivity is lower than other sectors, implying higher labor intensity and lower digitalization

Value added per hour worked, RM



Source: DOSM

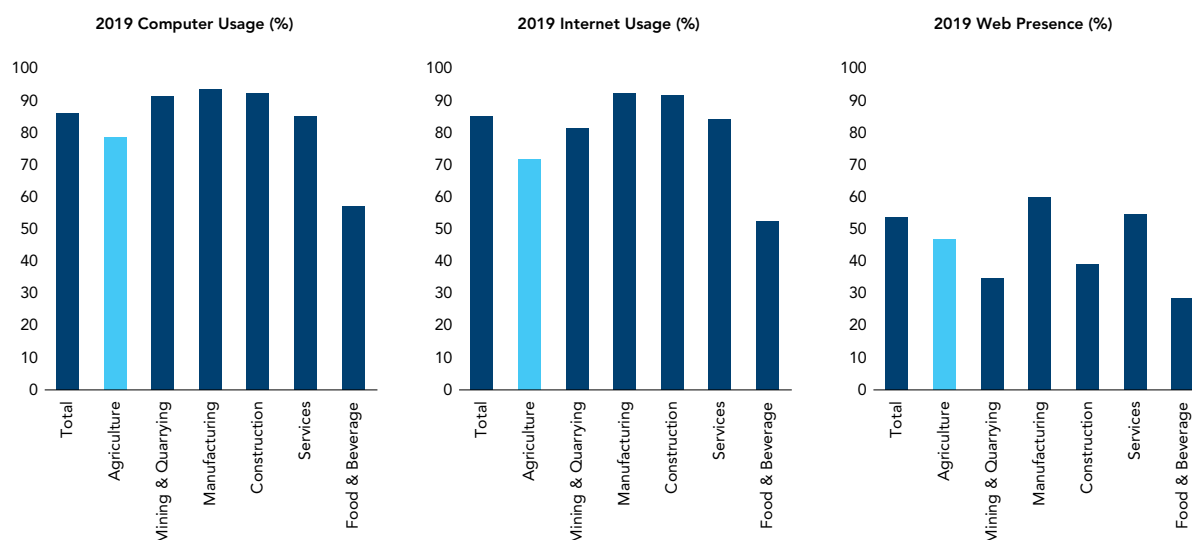
ways for Malaysia to roll out DAT. Yet the limitations faced in agriculture and the rural sector underscore the need for initiatives like the “MyDIGITAL” plan to drive advancements in the sector. Small-scale farmers in Malaysia often struggle to adopt new technologies in a financially sustainable manner. Some of the barriers include a lack of capital such as access to credit and savings, and market constraints like weak supply chains. Farmers may also be unwilling to change their farming

practices because they lack vital information about the profitability of new technologies.

Finally, climate change poses a significant threat to Malaysia's agriculture, negatively impacting crop yields, water availability, soil health and increasing shocks, especially to smallholders. Among the most frequent challenges are the increasing incidence and intensity of extreme weather events, alongside the rise

FIGURE 63

Usage of digital tools and platforms as a share of total business establishments operating having internet



Source: DOSM

of crop diseases and pests, and shifts in temperature and rainfall patterns. Warmer temperatures and altered precipitation patterns can lead to more frequent droughts and floods that will disrupt farming activities. These changes threaten staple crops such as rice, which rely on predictable weather for optimal growth. For example, rising temperatures can reduce rice yields by increasing water evaporation and heat stress during the flowering period, which is critical for rice production (FAO 2022). Changing rainfall patterns that result in more frequent and severe droughts have

a direct impact on water-intensive crops such as rice and oil palm. Unpredictable rainfall can disrupt planting schedules and reduce rubber latex yield due to increased disease prevalence and waterlogging (IPCC 2023). Rising sea levels may cause saltwater intrusion in coastal agricultural lands, further reducing arable land and productivity (IPCC 2023). These challenges highlight the need for adaptive strategies and resilient crop varieties to sustain agricultural productivity in Malaysia (World Bank 2023).

Summary of challenges and their implications

Malaysia's domestic food production faces a complex set of interconnected challenges. The scarcity of arable land, exacerbated by urbanization and industrial development, poses constraints on agricultural expansion. Climate change impacts, including extreme weather events and increasing temperatures are putting pressures on productivity growth. The country's reliance on food imports affects both food security and price stability, while productivity gaps in key crops struggle to meet growing demand. Balancing increased production with environmental sustainability remains a critical concern, particularly in light of international standards and the competition for resources between food crops and cash crops like palm oil.

Food imports and production are influenced by demographic changes, low productivity growth, and climate change impacts. Supply declines when agricultural productivity declines due to weather, shocks, and climate impacts. Higher production would lower the inflationary pressure on (real) food prices by

improving yield and availability (supply) of food. This would increase food security for the estimated 15.4 percent that were moderately or severely insecure from 2019-2021. Further, environmental damage, such as lower soil productivity, is increasing, also lowering yield.

As the agriculture sector grapples with these challenges, the emergence of DATs has become an opportunity to address the widening gap between food supply and demand, when combined with needed policy and institutional reforms. Addressing these multifaceted challenges requires a comprehensive approach involving innovation, policy support, and widespread implementation of DAT to enhance the resilience and productivity of Malaysia's domestic food production system. As described in the next section, DAT supports improved productivity by better use of inputs and sustainable intensification, so that there is less need for agricultural land expansion. It also builds climate resilience throughout the agrofood system, reducing potential spikes and price shocks.



Premise of digitalization for agriculture and food systems

DATs' broad benefits to Malaysia

Digital agriculture technologies are already transforming the global agrofood system. By expanding the use of DATs in Malaysia, agriculture can become more profitable for farmers, competitive in global markets, enhance domestic food security, and promote environmental sustainability and climate resilience. Good governance is crucial for maximizing the benefits of DAT adoption across value chains and is necessary for expanding DAT use. DATs offer substantial advantages across five "E" dimensions: efficiency, equity, employment, export competitiveness, and environmental sustainability. DATs have the ability to improve efficiency by promoting good agricultural practices, increasing yields, reducing production costs, and minimizing food losses. DATs can also enhance equity by enabling farmers to achieve higher prices, reduce risks, access better marketing opportunities, and increase sales volumes. Environmentally, DATs can help reduce water usage, lower fertilizer and pesticide application, decrease greenhouse gas emissions, and minimize food waste. By aligning with Malaysia's sustainability goals, particularly in climate adaptation, mitigation, and resilience, DATs offer a pathway towards a more sustainable future for the nation's agriculture sector.

The digitalization of agriculture presents Malaysia with a valuable opportunity to enhance its agricultural contribution to GDP.

DATs can transform agriculture by minimizing environmental impact while enhancing product traceability, value, sustainability, and safety. Global examples highlight their ability to accelerate information exchange, bridge information gaps, lower search costs, and improve knowledge access. This, in turn, leads to lower transaction costs, more market reach, improved production and marketing efficiency, economies of scale, and better access to resources. While DATs may present certain risks, careful planning can effectively mitigate these challenges. Moreover, DATs have the potential to create new, higher-skilled employment

opportunities across the agricultural value chain, from farming and food processing to retail. By enhancing product quality and traceability, DATs can also help meet export standards, including environmental and social requirements.

Digital agricultural technologies are key enablers of growth that will help increase the agricultural sector's productivity, efficiency, and market access. The digitalization of agriculture presents Malaysia with a valuable opportunity to enhance its agricultural contribution to GDP by improving labor productivity, driving wage growth, and increasing output. Furthermore, it strengthens the sector's competitiveness by boosting efficiency, cutting costs, elevating product quality, and opening access to global markets. Adopting digital tools such as precision farming, e-commerce platforms, traceability systems, blockchain for supply chain transparency, digital lending, and data-driven crop insurance can help Malaysia meet international market demands, improve productivity (supply), and raise quality standards, therefore solidifying its global agricultural standing. Technologies such as precision farming, the internet of things (IoT), and AI helps optimize resource use, streamline operations, and reduce waste. With AI-driven insights, farmers can make predictive decisions to improve yields and lower costs. Besides enhancing productivity, these innovations will also contribute to higher wages and economic growth by transforming traditional farming into a more efficient and profitable sector.

DATs encompass a range of innovations with the potential to transform Malaysia's agrofood sector. By improving productivity and optimizing resource use, DATs can increase food supply, improve market access, and enhance export competitiveness. These technologies offer a multitude of benefits, including:

- **Enhanced sustainability and traceability:** Reducing waste, pollution, and greenhouse gas (GHG) emissions while improving product traceability, value, sustainability, and safety.
- **Improved market access and efficiency:** Optimizing market access, reducing information disparities, and lowering search costs for farmers.
- **Increased knowledge and productivity:** Facilitating easier access to knowledge, cutting

transaction costs, expanding market reach, and ultimately improving production and marketing efficiency for better economies of scale.

- **Greater resilience and adaptation to climate change:** DAT can support food security by increasing agricultural resilience to climate impacts while enhancing mitigation and adaptation.

DATs offer significant social and equity benefits beyond the economic gains described above. By attracting and retaining youths, digitalization can address the challenges of an aging workforce and urban migration. Moreover, bridging the digital divide through DATs empowers women in the food system and reduce inequalities across value chains. In essence, DATs pave the way for a more efficient, sustainable, and globally competitive agricultural landscape. The following section will delve into how successful DAT implementation can deliver these broad benefits.

DAT services fall into six broad categories, supported by three foundational pillars. These categories include data platforms and satellite imagery, digital or e-advisory services, precision agriculture, fintech (finance and insurance), e-marketplaces, and food e-traceability, quality, and safety (see Figure 64). They form critical components of digital transformation in the agriculture sector, offering targeted solutions to various challenges in the agricultural value chain. DAT

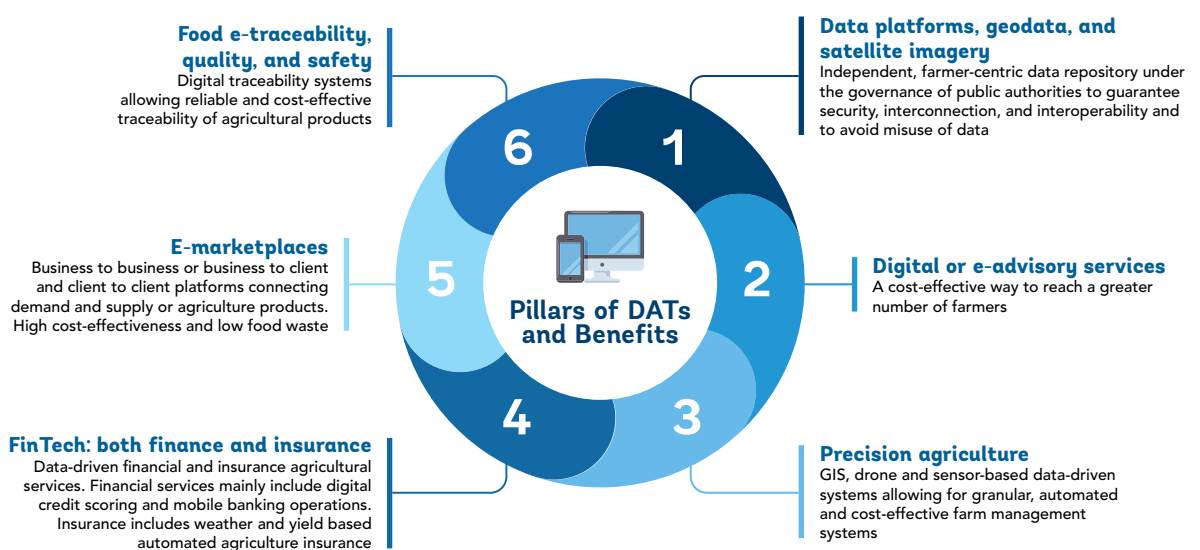
adoption varies across regions based on their context, including in Malaysia, where DAT and related services are often integrated into national agricultural strategies.

These six categories rely on the power of monitoring, collecting, analyzing, and storing a large amount of data from a variety of sources (Lyotos et al., 2020; Osinga et al., 2022). These technologies support data collection, analysis, and decision-making, to address socio-economic and environmental factors. Digital tools automate data collection, provide stakeholders with aggregated information like market prices for products, trigger alerts for urgent actions such as extreme weather events or deforestation, and enable continuous monitoring of agricultural factors, such as soil moisture, nutrient levels, weather conditions, and plant physiology. Examples include remote sensing for evapotranspiration, sap flow, and photosynthesis. While there are many examples, the ones below focus on DAT actions that also support sustainability.

Finally, DAT influences resilient agrofood systems across five key dimensions, namely efficiency, equity, employment, export, and environment—also known as the “5E’s.” Digital technologies process and analyze data to boost production efficiency, support equitable market access, enhance skills for better employment, increase export competitiveness through improved agricultural value chain traceability, and provide incentives and tools for environmentally sustainable practices.

FIGURE 64

The key categories of DAT and its benefits



Source: World Bank

1 Data platforms, geodata and satellite imagery

There are many types of data platforms, georeferenced data, and satellite imagery that provide valuable information to DAT. Climate monitoring and early warning systems, supported by digital technologies, are crucial for climate- and disaster-resilient agriculture. These systems predict climatic and environmental stress factors, enabling prompt responses from farmers and stakeholders. Advanced climate monitoring uses satellite data and other instruments to predict events like droughts, floods, and extreme heat. Digital solutions provide real-time, tailored forecasts and decision-support systems that integrate various information sources, including social networks and public weather services. These systems deliver targeted warnings and assess risks to enhance agricultural resilience (Nakalembe et al., 2021; Gettelman et al., 2022; Berger et al., 2022; Crocetti et al., 2020). The Malaysian Department of Agriculture (DOA) and Malaysian Space Agency (MYSA) are collaborating on using satellite imagery for both paddy monitoring (MakGeoPadi) and agriculture water resources management (MakGeoHidro).

2 Digital or e-advisory services

Digital and e-advisory services in agriculture are technology-driven platforms that provide farmers with expert guidance and information to enhance productivity and sustainability. These services use digital tools such as mobile apps, SMS, and online portals to deliver tailored advice on crop management, pest control, weather forecasting, and soil health. By integrating data analytics and machine learning, they offer predictive insights and personalized recommendations. E-advisory services also support knowledge sharing through virtual training sessions, webinars, and community forums. This approach empowers farmers with real-time decision-making support and connects them with agricultural experts and resources to help them improve farm management and efficiency. Ethiopia's e-advisory example is notable for providing smallholder farmers with real-time help. Farmers dial a special number for advisories on good agricultural practices for all major cereal, pulses, and high-value crops. Farmers can register and set preferences for the crops they grow, their location, language, and topics of interest. The hotline has sent over two million alerts, many of which are on crop diseases. This service also enables direct communication between farmers and local agents. These are efforts Malaysia can learn from and expand upon. In Malaysia, the DOA has developed several systems for

agricultural extension services and technology transfer to farmers, including the ePengembangan system, Agrisgeoportal, and Geotanaman system. Geotanaman and ePengembangan are digital advisory services that provide farmers with real-time data. Other Malaysian examples that are attracting the interest of younger farmers are DAT and smart agriculture along the rice value chain under the SMART Sawah Berskala Besar (SMART SBB) initiatives of KPKM. Another standout example is Malaysia's MyKad digital ID system, which is used for land registration to greatly reduce fraud.

3 Precision agriculture

Precision farming uses advanced digital technologies to improve decision-making and resource management in agriculture. Since the 1980s, tools like GPS, robotics, and satellite monitoring have enhanced input allocation, reduced costs, and minimized environmental impact. Technologies such as GPS-guided tractors, irrigation systems, and data-driven decision-making have improved crop and livestock production. Precision farming aims to maximize efficiency, yield, and product quality while reducing nutrient and pesticide use. This approach integrates technological, socio-economic, and environmental dimensions to enhance overall farming practices (Barna et al., 2020; Katkani et al., 2022; Sharma and Shivandu 2024). For example, a Vietnamese startup called Mimosatek delivers precision agriculture solutions to rice farmers using large amounts of water and high levels of greenhouse gases during paddy production. The company also allows farmers to remotely monitor and control parts of their farming operations, including soil moisture levels, weather conditions, and water use. Sensors collect and send data to the cloud, where it is analyzed to provide real-time recommendations on the best time to irrigate and the amount of water to apply. With this technology, farmers can manage irrigation manually or through a mobile application. Statistics show that farmers using the Mimosatek service in 2019 used 13.0 to 20.0 percent less water than other farmers with conventional techniques.

4 Fintech: Finance and insurance

Digital credit and lending services can help smallholder farmers invest in climate-resistant inputs, like hybrid seeds, to boost productivity and build resilience to climate crises (Mhlanga, 2022; Hussain et al., 2021). Greater availability of digital data on farmers' activities and expanded digital service channels will make formal agricultural credit more scalable, while aligning loan disbursement and

repayment with planting and harvest schedules can enhance credit impact. Providing credit during the lean season allows efficient labor allocation and reduces food insecurity. Financial services can be targeted to farmers individually, or in specific areas, to encourage investments in eco-friendly practices at lower costs, to reduce environmental damage (Azadi et al., 2021; Barasa et al., 2021). These services are especially beneficial for low-income individuals, offering benefits such as payment for ecosystem services, “green loans” for solar technology adoption, and access to solar energy microgrids. An Indonesian startup, CrowdE, offers a peer-to-peer (P2P) lending platform and market linkage services, providing farmers with up to IDR 100.0 million backed by crowdsourced investors and distributed to approved farmers via its cashless network. Capital can be used for high-quality inputs, labor, access to production facilities or to finance other farming needs. CrowdE also connects farmers with distributors and agents to sell extra crops. The platform has distributed IDR 81.0 billion (6.0 million USD) in loans to over 17,000 farmers with a 97.0 percent success rate for repayment within 90 days. Farmer loans are further enabled by subsidies from state-owned Bank Mandiri and other local lenders.

Malaysia's fintech sector has developed faster than other DAT pillars. In 2020, there were 233 fintech companies⁵⁹ playing a pivotal role in financing, especially to micro, small, and medium enterprises. Agrobank is the main public financial institution in Malaysian agriculture and is promoting digitalization especially on input supply and production. There are opportunities within the fintech sector to expand agricultural index insurance, especially as climate change impact increases in frequency and intensity.

Agricultural index insurance uses digital data sources, such as automated weather stations and remote sensing data, for risk and claims assessment. This method is more cost-effective and scalable than traditional insurance, which requires on-site visits to determine premiums and process claims (Benami et al., 2021; Hu et al., 2023). Mobile money networks can deliver insurance services to smallholder farmers, insuring their operations against climate-related threats like droughts, rising water levels, and disease, which is crucial to alleviate poverty. Weather index insurance is an innovative financial product that benefits smallholder farmers by paying out claims for damages such as excessive rainfall or drought. Studies show that farmers with subsidized insurance are more likely to invest in their farms and increase productivity. While cash or credit can facilitate investments, they don't provide protection for weather-related risks. Despite limited commercial demand, weather index

insurance can be a policy tool for governments to encourage agricultural investments. While outcomes of bundling credit with insurance vary, flexible repayment schedules can assist farmers in facing natural disasters or unforeseen events.

5 Market linkages

Digital platforms that provide market information and communication systems are essential for increasing farm profitability and farmer incomes (Mapiye et al., 2023; Hashem et al., 2021; Xie et al., 2021). Access to timely and accurate information on market conditions, including input and output prices, empowers farmers to make informed production and marketing decisions. This enhanced transparency and efficiency, facilitated by market information systems, social media, and e-commerce platforms, benefit all actors along the value chain. Improved communication between buyers and sellers further strengthens value chain efficiency and profitability. Higher incomes enhance the resilience of agricultural actors, enabling them to better withstand climate-related shocks and invest in emission-reducing technologies. Moreover, increased efficiency and information access along the value chain can reduce food losses, contributing to greenhouse gas mitigation efforts (Benyam et al., 2021; Cattaneo et al., 2021). For example, the Kenya Unified Agriculture Data Platform (KUADP) enables farmers and policymakers to make data-driven decisions in the agriculture sector. It supports Kenyan actions to increase household food resilience, reduce food-insecure households, and protect against environmental and fiscal shocks. KUADP merges fragmented data sources and provides quality data and analytical capabilities to farmers to support production and increase yields. It sets standards and protocols for data sharing and access to ensure seamless data exchange, stimulate innovation, and enhance farmer support.

E-marketplaces in agriculture are digital platforms that facilitate efficient transactions between farmers, suppliers, and buyers. They offer services such as product listings, secure payment systems, and logistics coordination. By connecting multiple stakeholders, these platforms streamline supply chains, reduce transaction costs, and enhance market transparency, giving farmers access to a wider market for selling produce, sourcing inputs, and accessing real-time market information. E-marketplaces also support the adoption of digital innovations, such as precision agriculture tools and blockchain for traceability to ultimately improve productivity and sustainability in the agriculture sector. Indonesia's TaniHub is an excellent example of a digital marketplace app that directly links

crop producers and buyers. TaniHub helps farmers secure fair prices, provides reliable payment service, and reduces costs associated with internal marketing or sourcing for buyers. Buyers include commodity buyers that need to supplement procurement volumes, supermarket chains, and hotels. TaniHub also operates a logistics service, TaniXpress, to collect and distribute crops across a network of producers and buyers. TaniFund is the company's lending platform that connects investors with agricultural programs, providing farmers with the capital needed for marketing and selling agricultural produce, as well as new plantation development. TaniHub has helped more than 17,000 farmers sell their crops by listing over 60 kinds of fresh produce to more than 60 institutional buyers. On the input side, Malaysia's eAGRO is the first online marketplace targeting paddy growers and other smallholders with premium fertilizers, and information and best practices (e-advisory).

6 Food traceability, quality, and safety

Digital agricultural technologies enhance food traceability, quality, and safety by utilizing advanced tools such as blockchain, IoT sensors, and data analytics. Blockchain technology ensures transparent and tamper-proof records of every step in the supply chain, from farm to consumer. IoT refers to

a network of interconnected devices that communicate and exchange data over the internet. These devices, equipped with sensors and software, can collect and transmit data autonomously. In agriculture, IoT monitors environmental conditions and crop health by looking at conditions such as soil moisture and temperature. This real-time data enables precise and efficient farm management by helping farmers make informed decisions, optimize resource use, and improve productivity. DAT enables rapid responses to food safety issues, improves quality control, and builds consumer trust by offering verifiable information on food product origin and handling. DAT also tracks product movement by providing real-time data on temperature, humidity, and location. Data analytics processes this information to identify potential risks and ensure compliance with safety standards. One notable regional example is Koltiva, an Indonesian agritech company offering innovative digital traceability solutions. These solutions enable farmers and other stakeholders to monitor products as they move from farm to market. Koltiva's services are crucial for ensuring food safety, adhering to regulatory standards, and enhancing supply chain transparency and accountability. Koltiva's multi-crop platform, KoltiTrace, is used in the cocoa, coffee, and palm industries to provide visibility across the supply chain, from farm to end consumer. It combines mobile applications, sensors, and blockchain technologies, to capture supply chain data, and provide real-time tracking and monitoring.

Transformative impacts of digital technologies on the agrofood system

DATs offer transformative potential for the agriculture sector and broader economic development for Malaysia. On a macro level, DAT adoption can enhance a nation's export competitiveness in agricultural products by improving quality, consistency, and traceability. As these technologies integrate into the agricultural value chain, they stimulate innovation in adjacent sectors and contribute to overall economic growth. DATs also enhance climate resilience, mitigation, and adaptation within the agriculture sector by reducing production risks and minimizing climate-related losses, thereby improving food security and bolstering the resilience of Malaysia's economy. Collectively, these advancements demonstrate the transformative potential of DAT to strengthen the food supply chain by reducing transaction costs and improving information flow.

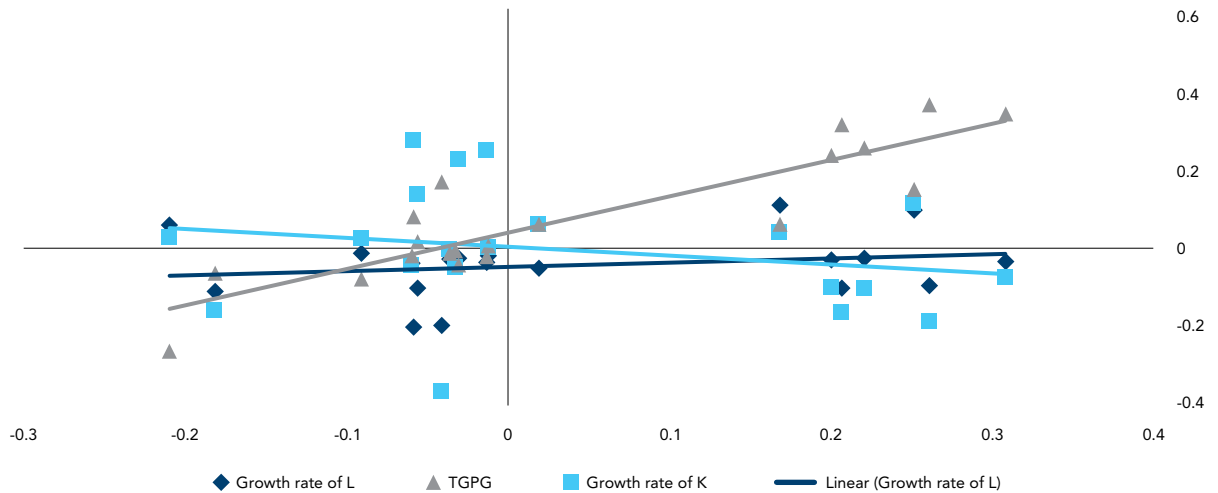
1. Digitalization increases agricultural output and productivity

Technological advancements are key drivers of agricultural output and productivity. In Malaysia, studies have shown a strong positive correlation between technological progress and efficiency improvements with increased agricultural output. Total factor productivity growth (TFPG) measures how efficiently an economy uses its inputs, such as labor and capital, to produce output. It reflects improvements in production beyond simply increasing input quantities. It is also a proxy for technology and efficiency improvements. For example, Malaysia's agricultural TFPG has increased from 0.24 in 2020 to 0.32 in 2021 (Figure 65). This growth shows that technological improvements or more efficient resource use enabled

FIGURE 65

Technology (proxy by TFPG) is a strong driver of agriculture output, along with labor growth. The sector is still low in capital-driven growth (i.e. machines, IoT, etc.)

Growth of factors of production and productivity (2017-2021), Percentage



Source: World bank staff calculations based on DOSM AES (Agriculture 2022)

greater agricultural output without increasing inputs proportionally.

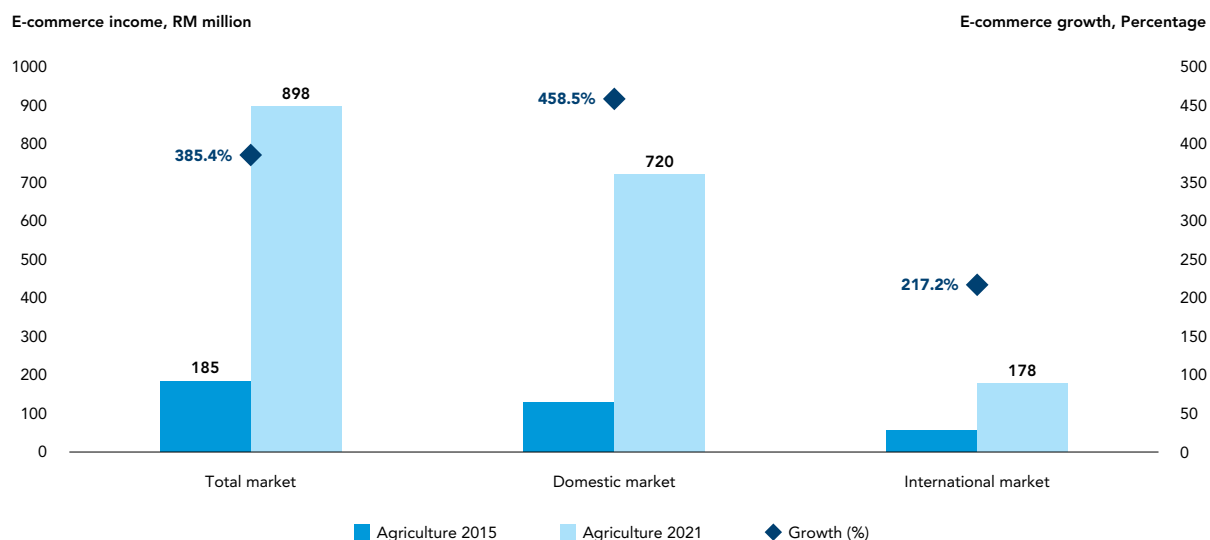
Technology (TFPG) and labor growth are positively correlated with agricultural value-added output, highlighting the benefits of technological advancements and effective labor use in boosting productivity. Yet TFPG and labor growth are negatively correlated with capital growth, highlighting the complexities of integrating new technologies and the need to align capital investments with technological and labor improvements. Digitalization enhances productivity by improving resource use and efficiency, but its benefits are greatest when capital investments are well-supported by training, technology integration, and appropriate labor practices, particularly a skilled and adaptable workforce. Digital skills and training are essential for maximizing the benefits of DAT, as strong human capital can effectively capitalize on digital infrastructure and its tools and services. For example, these skills are needed to handle drones used in production, support intelligent production control, or leverage “big data” for marketing.

2. Digitalization can increase labor productivity, leading to higher-quality jobs, better income growth and wage growth

DAT can greatly support higher productivity and income growth if broadly implemented. For example,

the growth rate of e-commerce income in agriculture is based on the total income of establishments with e-commerce transactions. The e-commerce sector in agriculture demonstrated impressive growth, increasing by 385.4 percent between 2015 and 2021 (765), suggesting that there is demand for e-commerce in the agriculture sector. However, the absolute income value generated by agricultural e-commerce remains relatively modest compared to that of manufacturing and services. Domestic e-commerce income rose by 458.5 percent, underscoring digitalization's effectiveness in transforming agricultural industries. The agriculture sector is increasingly adopting digital tools like online marketplaces, precision farming technologies, and mobile platforms for trading and disseminating information. These innovations enable farmers to reach broader markets, improve efficiency, and enhance income potential. The substantial growth in e-commerce income reflects the sector's ability to capitalize on digital opportunities, positioning it as a vital player in the digital economy.

Overall, e-commerce activities in the agriculture sector contribute a small but growing share of Malaysia's economic output. The gross value added (GVA) to GDP from agricultural e-commerce increased nearly threefold from RM155.0 million in 2015 to RM441.0 million in 2022. Though this is smaller than the manufacturing and services sector, the rising information and communications technology (ICT) share of GDP (23.2 percent in 2022) suggests digitalization benefits for agriculture and the small e-commerce

FIGURE 66**Agriculture has had high domestic e-commerce income growth**

Source: Malaysia Digital Economy 2023, DOSM

value shows significant untapped potential. Integrating technologies like online marketplaces and data-driven farming could enhance efficiency, market reach, and profitability, therefore modernizing the sector and boosting economic contributions.

3. Digitalization can support equity

Equity in agriculture ensures all stakeholders, regardless of size or location, have access to the benefits of digitalization. Digital tools promote equity by providing smallholder farmers—including women—with critical information on weather, market prices, crop management, and best practices. These tools help overcome both urban-rural and gender disparities by offering equal opportunities to take part in and benefit from agricultural activities. For example, precision farming technologies help improve resource use, reduce farmer costs, and increase sustainability, while improved market access through platforms connects farmers with buyers, giving them better access to boost sales and pricing. Digital platforms can empower small farmers by expanding access to financial services and providing education and training opportunities through online platforms and mobile apps.

Malaysia's agricultural workforce exhibits a significant gender imbalance, with a higher number of men compared to women. This disparity is particularly evident in the crops subsector, where men outnumber women by a significant margin of 362.4

thousand compared to 86.9 thousand females. Despite this imbalance, women are most likely to work in the crops subsector of agriculture. Furthermore, women generally earn less than their male counterparts but only in selected sectors. For instance, in the crops sector, females earned an average of RM 16,300 per worker annually in 2022, compared to RM 17,300 per worker for males. However, in some subsectors, the data suggests that women have higher salaries per worker than men, likely reflecting differing skill requirements and market demands for these jobs. With DAT, the participation rate of women will rise.

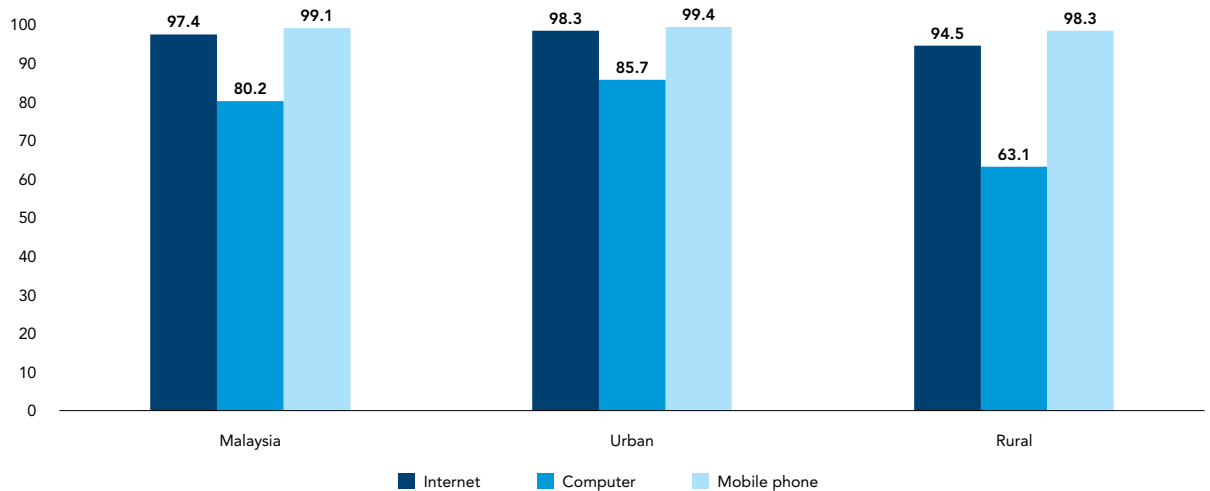
Digitalization in agriculture bridges the urban-rural divide by providing farmers in remote areas with access to essential resources and services.

Digital financial services, such as microfinance, mobile payments, digital loans, and data-driven insurance, provide access to credit and insurance in remote areas. They enable financial institutions to operate remotely without direct physical interaction, resulting in significant savings on transaction costs and the potential for expanded outreach. Similarly, remote training and e-learning platforms allow farmers to adopt modern techniques and stay competitive.

Bridging these divides is crucial for ensuring that rural farmers can fully benefit from digital advancements. The 2022 data reveals a continued digital divide between urban and rural areas in Malaysia, with significant disparities in internet and computer access. Urban areas have nearly universal internet usage

FIGURE 67
The digital divide in urban and rural areas in Malaysia

Individuals using ICT services and equipment by strata 2022, Percentage



Source: DOSM, Malaysia Economy 2023

(98.3 percent) and superior computer access (85.7 percent), compared to 94.5 percent and 63.1 percent in rural areas, respectively. These gaps are particularly concerning for the agriculture sector, where rural areas rely heavily on digital tools to improve productivity and gain market access. Enhancing infrastructure, expanding broadband access, and promoting digital literacy in rural areas will help integrate agricultural practices with modern technology, fostering inclusive growth and reducing disparities in agricultural efficiency and opportunity. Overall, digitalization fosters inclusivity and sustainable development by ensuring equal access to resources, knowledge, and financial services for all farmers, regardless of gender or location.

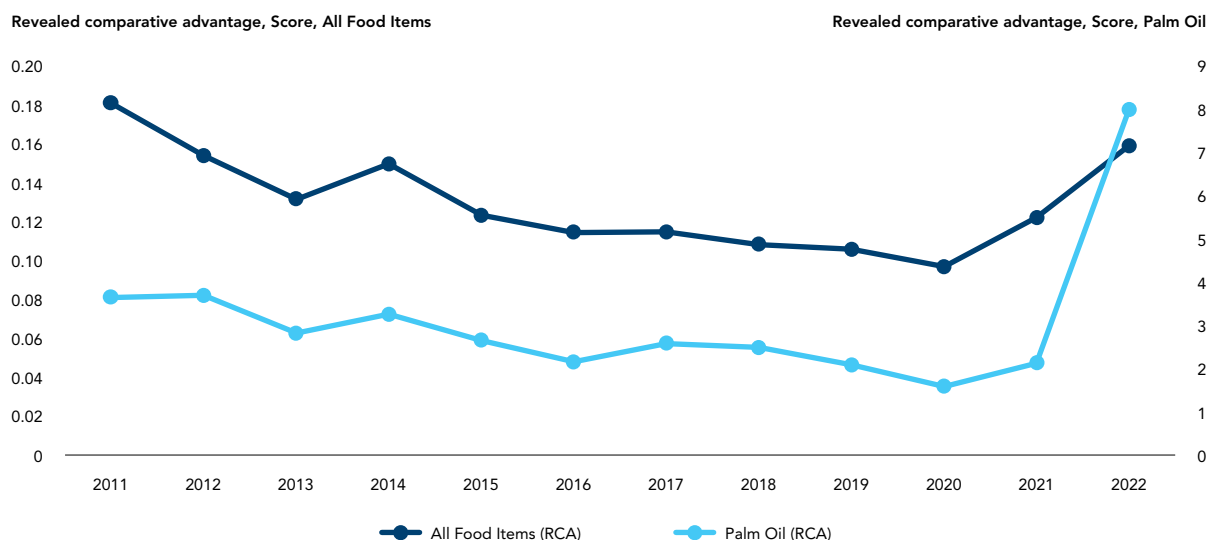
The poor often disproportionately bear the impacts of climate-related shocks and DATs offer several avenues for mitigating these impacts. Access to timely information, such as early warning systems (e.g. for storms or drought) can increase preparedness. Digital advisories help level the playing field by providing information for sound decision-making and climate smart technologies to all farmers. Access to financial services can be instrumental in helping farmers build resilience to climate-related shocks. This is particularly crucial for those living in poverty who often lack resources to address the health and economic challenges brought about by climate change. Studies have shown that formal financial services, including insurance, savings, and loans, can significantly aid the poor in managing unexpected setbacks and maintaining stable consumption (Jordan 2021).

4. Digitalization can enhance export competitiveness

To enhance export competitiveness, farmers and exporters aiming for global trade must increase production and export volumes, elevate quality, advance product sophistication, prioritize sustainability and comply with traceability requirements. Importing nations are enacting stricter and more complex food safety standards across a wider range of products, making compliance increasingly difficult. Meeting these standards have shifted from simple border checks to comprehensive oversight encompassing the entire supply chain, from cultivation and harvesting to processing and transportation. Malaysia is less competitive in exports of the broader food sector (within agricultural exports), except for palm oil, where it is highly competitive in the global market (Figure 68). However, EU restrictions could potentially change that.

Tracing product origin and monitoring and reporting on environmental and social standards are rapidly becoming critical within global trade. The European Union's Regulation on Deforestation-Free Products (EUDR), effective January 1, 2025, exemplifies the importance of traceability. This regulation mandates that commodities imported into the EU must: 1) be legally produced on deforestation-free land; 2) provide the geolocation of the production area; 3) verify that production occurred on land not deforested after December 31, 2020 (through due diligence) and follows

FIGURE 68
RCA between Malaysia's food items and palm oil



Source: World Bank staff calculations based on UNCOMTRADE database

the origin country's laws; 4) remain separate from other goods during trade and shipping. Compliance with the EUDR requires a digital traceability system, as paper-based systems are not possible or acceptable.

Export traceability systems provide a wide variety of benefits to different users. Traceability systems can address food safety and quality requirements, build consumer confidence and trust, enhance supply chain efficiency, manage food safety incidents, prevent fraud, mitigate biosecurity threats, and differentiate commercial products via verifiable information on product origin and production practices.

5. Digitalization can support climate adaptation and mitigation

Agriculture relies on a strong environmental foundation, and digitalization supports environmental sustainability by promoting eco-friendly practices. Climate-smart agriculture is a strategic approach designed to sustainably increase agricultural productivity and incomes, increase climate resilience, and reduce or remove greenhouse gas emissions (FAO 2021; World Bank 2024). Yet its success relies on context-specific practices and processes, and DAT can play a crucial role in addressing its diverse challenges. However, adaptation in CSA involves adjusting farming practices and systems to better handle changing climate conditions. This can include

selecting crops suited to local environments, using irrigation to address water shortages, and adopting conservation techniques to reduce soil erosion and maintain soil health. Digital technologies play a crucial role in climate-smart farming, aiding both response and recovery efforts. In response to extreme weather events, such as floods or droughts, emergency measures may be taken, like building flood barriers or providing emergency feed for livestock. Recovery efforts focus on restoring farming systems after such events, which may involve accessing insurance or credit, repairing infrastructure, or diversifying farming practices to minimize future risks (GSMA 2021).

Digital technologies enhance access to reliable weather forecasts, enabling better decision-making in agriculture as climate change increases weather-related risks. These decisions can range from short-term actions, like determining the best planting times, to long-term investments in infrastructure. Improved weather data can also support the development of better agricultural insurance products, such as index-based insurance that compensates farmers during extreme weather events. In the context of climate-related disaster preparedness, digital early warning systems, advisory services, and mobile payment systems can reduce damage and accelerate recovery. Additionally, electronic registries of farmers can improve the efficiency and targeting of government disaster relief efforts in rural areas.

Successful and timely adoption of precision agriculture technologies within CSA requires addressing the challenges farmers face in adopting digital technology and the opportunities these advancements present. Research indicates that farmers encounter similar obstacles when adopting digital technologies, which can be categorized into technical and non-technical factors. Technical challenges include the cost of digital tools and their applications, climate resilience, perceived profitability, the capacity to understand technology, and crop-specific bio-physical characteristics. Non-technical barriers are often related to social contexts, such as the acceptance of new technologies, the need for updated knowledge and skills, issues with digital devices in remote areas, poor connectivity, and a lack of technical support and intuitive learning resources.

Agriculture is the second largest global contributor to greenhouse gases after electricity and heat production. In Malaysia, the agriculture sector with 9.921.7 Gg carbon dioxide equivalent (CO₂eq) was calculated as one of the lowest contributors of GHGs (3.0 percent) in 2019 after energy (78.0 percent), IPPU (10.0 percent), and waste (8.0 percent), although this excludes land use and land use changes (ASEAN 2023). Overall agricultural emissions have increased, largely driven by rising nitrous oxide (N₂O) emissions from increased fertilizer use and shifts in land management. Figure 69 shows greenhouse gas emissions from

agriculture in Malaysia, measured in CO₂eq from 2002 to 2019, revealing distinct patterns for total emissions, methane (CH₄), and N₂O. The agriculture sector in Malaysia contributes significantly to GHG emissions. Overall agricultural emissions increased steadily from 2002, peaked in 2008, followed by fluctuations and a slight decline after 2016. Methane emissions have remained relatively stable with only minor fluctuations, suggesting consistent livestock populations or effective methane management practices.

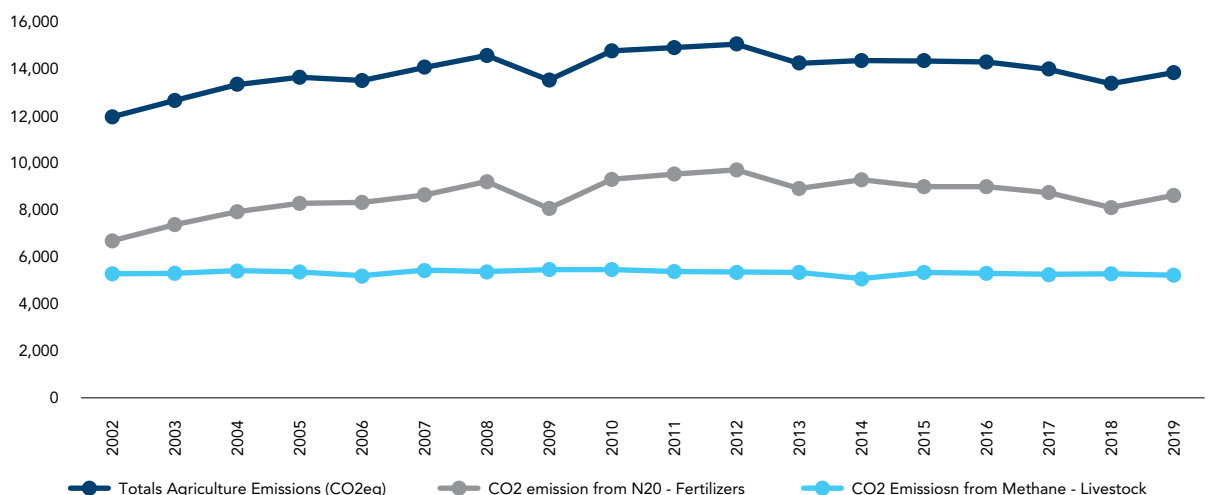
N₂O emissions showed a more pronounced upward trend, especially from 2002 to 2008, driven likely by increased fertilizer use or changes in soil management. The peak in total emissions around 2008 aligns closely with the peak in N₂O emissions, underscoring the significant role of N₂O in driving overall agricultural emissions. The slight decline in N₂O emissions post-2016 suggests potential improvements in nitrogen use efficiency or changes in agricultural practices.

Digital solutions can reduce greenhouse gas emissions in several ways: Digital platforms can monitor livestock health, diet, and productivity, to enable more efficient feeding practices. This greatly reduces methane emissions from livestock by optimizing feed conversion and reducing waste. AI and machine learning can forecast weather patterns, predict disease outbreaks, and optimize planting schedules, which

FIGURE 69

Total agricultural emissions have generally increased over the years, mainly due to rising N₂O emissions from increased fertilizer use in Malaysia

GHG emissions from agriculture activities, Kilotonnes



Source: World Bank Group's Climate Change and Development Portal (CCDR)

Note: Emissions (CO₂eq) (AR5)-IPCC Agriculture refers to total greenhouse gas emissions from agricultural activities, expressed in carbon dioxide equivalent, using methodologies from the IPCC's Fifth Assessment Report (AR5). CH₄ refers to methane and N₂O refers to nitrous oxide



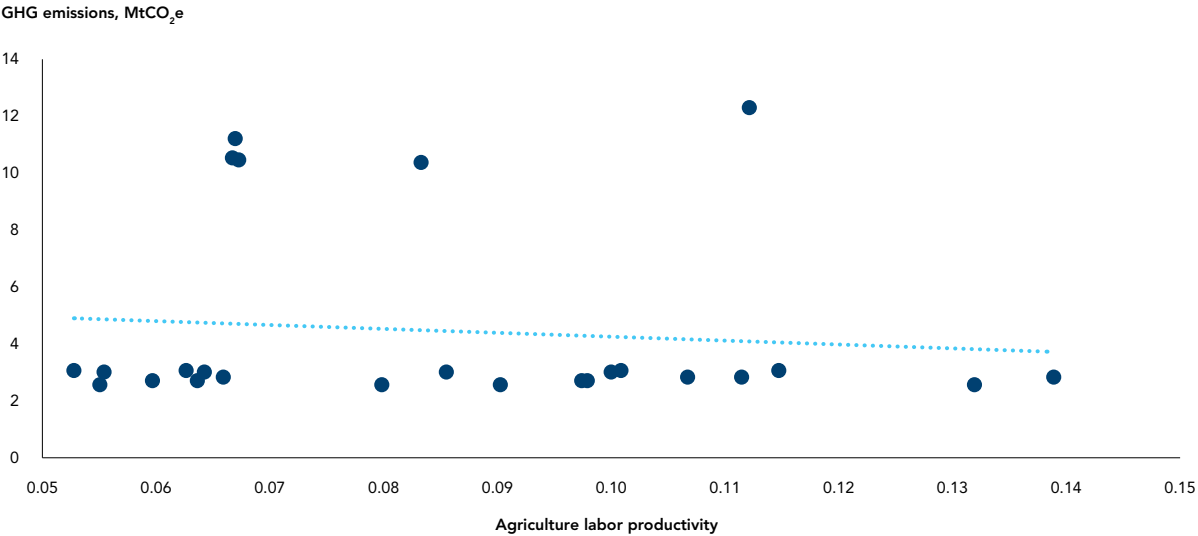
leads to more efficient use of land and resources, and therefore reducing the carbon footprint of agricultural practices. Digital platforms and blockchain technology can also improve supply chain transparency and traceability, by reducing food spoilage and waste. Less waste means less GHG emissions from decomposing organic material in landfills.

Digital technologies enhance energy efficiency by enabling machinery maintenance and operations through smart systems, reducing fuel consumption and emissions. Innovations such as solar-powered irrigation systems guided by digital controls further boost efficiency. In livestock management, digital tools help improve feeding strategies and manure management, significantly reducing methane

emissions. By integrating digitalization with skilled labor, agriculture can achieve both higher productivity and a lower carbon footprint.

More productive labor in agriculture resulting from digitalization contributes to reduced GHG emissions through several key practices (Figure 70). Digital tools enable precise resource management, optimizing the use of water, fertilizers, and pesticides, which in turn minimizes waste and lowers emissions. Skilled workers, empowered by digital platforms, can more effectively adopt sustainable practices like crop rotation to reduce soil disturbance and chemical use. Digitalization also supports better waste management and reduced emissions by making it easier to compost crop residues instead of burning them.

FIGURE 70
More productive labor in agriculture contributes to mitigation efforts



Source: World Bank staff calculations based on emission data from Our World in Data and DOSM AES (Agriculture 2022)

Pathways of implementing DAT: Scaling up pilots and learning from global experiences

To effectively implement DATs, the Malaysian government can pursue two simultaneous strategies: building DAT pilot programs for selected crops and adapting successful experiences from other countries to the Malaysian context.

Implementing a series of pilot programs is crucial for gathering practical experience and generating valuable lessons for subsequent DAT rollouts. These initial pilots can inform public investment decisions and help identify the enabling environment needed for successful DAT adoption, as discussed in the final section. While distinct, pilot programs and the adaptation of global best practices are interconnected strategies that should be pursued in tandem. This approach will enable Malaysia to learn from both its own experiences and international successes, accelerating the effective rollout of DAT across the agricultural sector.

Scaling pilot projects

DAT in Malaysia is financially viable, offers numerous benefits, and has the potential for rapid expansion through strategic pilot programs.⁵³ The feasibility and viability of DATs in Malaysia were assessed through five case studies, including: (i) digital advisory for paddy production using precision agriculture data, yield prediction, and yield gap analysis; (ii) fully controlled environments for chili cultivation; (iii) drone use for agrochemical spraying on pineapples; (iv) sensor-based

irrigation and drone-based pesticide application in durian plantations; (v) intensive shrimp farming.

The example of pilot projects in shrimp farming illustrates how DAT implementation can transform baseline operations, leading to significant productivity gains and rapid cost recovery. This program is in line with Malaysia's Agrofood Value Chain Modernization Program (PMRNA) through the Digital AgTech initiative to develop digital farmers, address food safety, support food security, and boost the country's digital economic growth. The case study in Box 6 shows how DAT would be used in a super intensive white shrimp farming pilot project (see Box 6 on Pilot project of digital solutions for super-intensive white shrimp farming).

An economic and financial analysis demonstrates how these pilot programs can effectively address major supply side constraints. Six pilot projects were analyzed to assess the potential of DATs, considering both financial and non-financial drivers. Financial returns were evaluated using standard cost-benefit analysis for both users/clients and providers (where feasible). DAT costs included development and establishment cost, deployment cost, user fees and recurrent costs. Benefits for users included increased productivity, higher quality and farmgate price, increased sale volume, reduced losses, and mortality rates. On the other hand, benefits for providers include income from sustainable service



53 Some successful pilots for reference are (i) Plant factory developed by Agroz Group (<https://agrozgroup.com/>) (ii) Close house system by Leong Hup International (<https://www.leonghupinternational.com/>) (iii) BoomGrow's 5G-Connected Vertical Farms (<https://boomgrowfarms.com/>) and (iv) Smart Tani (<https://singularityaerotech.asia/smart-tani/>)

BOX 6

Pilot project of digital solutions for super-intensive white shrimp farming

Super-intensive shrimp farming is a technology developed based on high-density shrimp farming research conducted by Fisheries Research Institute under Department of Fisheries Malaysia (DOFM) in Gelang Patah (2016-2019). Typically, each hectare of farming area only yields between 10.0 to 15.0 tons of white shrimp, while the super-intensive technology produces up to 40.0 tons in the same area.

PILOT DESIGN: MARINE AQUACULTURE

FARM PROFILE

Land area: 1.2 acres of private ownership

Facilities:

- a) Tanks 1,000 m² @ 0.1 ha: 4 units (1 unit under construction)
- b) Tanks 500 m² @ 0.05 ha: 2 units (1 unit under construction)
- c) Tanks 300 m² @ 0.03 ha: 2 units
- d) Treatment pond 2,000 m² @ 0.2 ha: 1 unit

Tank structure:

BRC A10 steel frame, 4 x 4 concrete pillars, 1.0 mm HDPE lining

Stocking density: 300-400 super PL per m²

Rearing period: 2-3 months

Survival rate: 70-80%

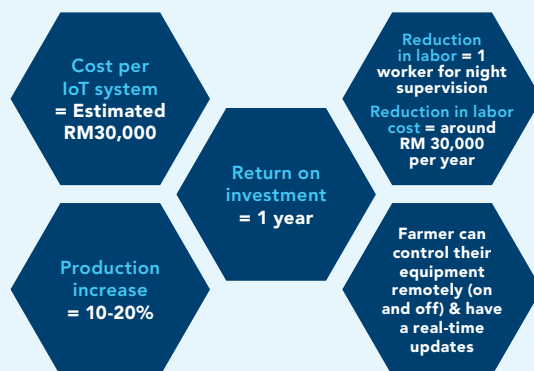
Size: 50-60 shrimps per kg or 16.7-20.0 grams per shrimp

Tank size, release rate, and yield:

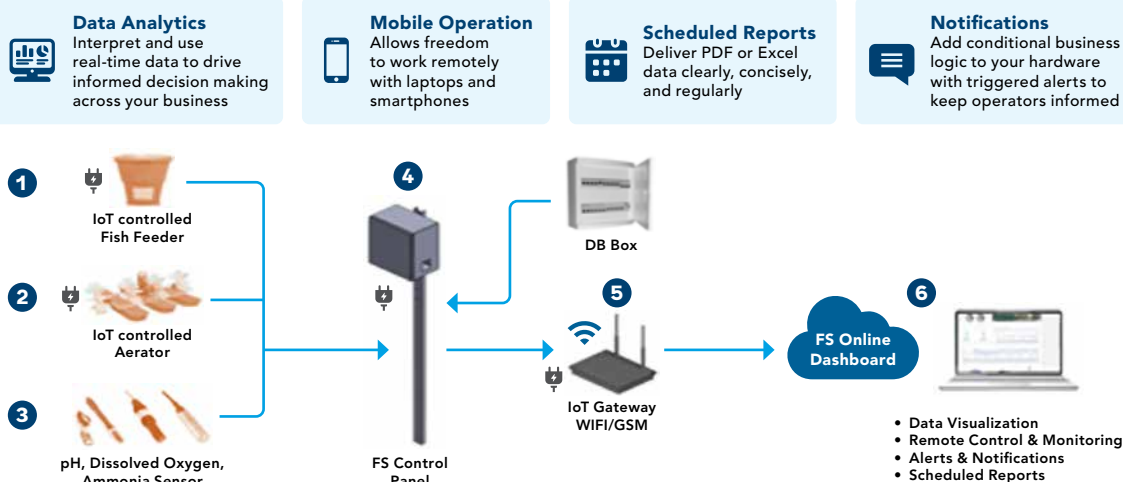
- a) 1,000 m² @ 0.1 ha: 300,000-400,000 super PL: 3.0-4.0 MT
 - b) 300 m² @ 0.03 ha: 100,000-120,000 super PL: 1.0-1.8 MT
- Production: 15 MT (April-September 2021)
 Production targets (per cycle): 4 MT (0.05 ha tanks), 8 MT (0.1 ha tanks)
 Number of employees: 14 people
 Technology: IoT system (trial phase)

THE BASELINE SITUATION

IoT System that manages the shrimp farm and adheres to the MyGAP Certification Scheme
 (MS 1998:2007 - Good Aquaculture Practice (GAqP) - Aquaculture Farm General Guidelines) under DOFM



KEY FEATURES



Source: Department of Fishery (DOF)

Note: This technology is a component of the Smart Aquaculture System, provided to selected industries by the Malaysia Digital Economy Corporation (MDEC) in collaboration with DOFM.

provision and the potential for expansion and scaling up. Box 7 summarizes the financial analysis results of these pilot programs (see Box 7 on Pilot program financial results).

Pilot programs are essential for evaluating digital technologies in real-world settings and establishing the necessary conditions for their successful and widespread adoption nationwide. By generating

crucial data on these technologies and their enabling conditions, these pilots will inform a scale-up strategy grounded in rigorous impact assessment. Furthermore, they can help define the necessary institutional framework (spanning multiple factors and sectors), public-private partnerships, and funding mechanisms for effective digitalization. The following section will delve deeper into these critical aspects.

BOX 7

Pilot program financial results

Productivity increases are high across all pilots: paddy (19 percent), durian (25 percent), shrimp (26 percent), chili (63 percent), and poultry (83 percent). While pineapple yield did not increase, mortality rates dropped by 5 percent. Financial rates of return were 20 percent for durian, 28 percent for poultry, and 89 percent for pineapple, while net incremental benefits per cycle were RM1,030 for paddy, RM930,000 for chili, and RM40,000 for shrimp. Initial capital investments were high for durian (RM88,000 per hectare), shrimp (RM84,600 per 1,000m² pond), chili (RM250,000 for a 20,000m² greenhouse), and poultry (RM600,000 for one closed automated house). Paddy and pineapple farming did not need capital investment since DATs are recurring and offer affordable services, with payback periods from one crop cycle for paddy to 15 years for durian.

TABLE 6

Analyzing productivity, costs and returns from DATs in six Malaysian cases

Case Studies	Productivity Increase (%)	FIRR (%) or Net Incremental Benefit per cycle (RM)	Initial Investment (RM)	Payback Time (years)
Paddy	19%	RM 1,030	Service cost RM 50 per crop cycle	1 crop cycle
Chilli	65%	RM 930,000	RM 500,000	Less than 1 year
Pineapple	5% reduced mortality	89%	RM 36,000	1 crop cycle
Durian	25%	20%	RM 8,777,000	15 years
Poultry	83%	28%	RM 640,000	4 years
Shrimp	26%	RM 40,000	RM 846,000	1.7 years

Source: World Bank, FAO

There were positive financial impacts for both DAT users and providers in the six agricultural value chains (paddy, chili, pineapple, durian, fisheries, and poultry) analyzed. Users experienced increased yields and farmgate prices, reduced production costs and risks, improved marketing, and higher sales volumes. Providers benefited from increased commercial profits through service delivery and long-term advantages such as service sustainability and scalability. Sensitivity analysis showed that durian had the most robust financial outcomes against varying model parameters. Paddy showed sensitivity to changes in area and fee assumptions, while chili, despite sensitivity to key parameters like yield and price, maintained overall financial viability.

Learning from global examples

Malaysia can accelerate DAT development by leveraging existing knowledge and best practices in DAT implementation. There is a wealth of information from other countries that can provide vital lessons and be adapted to the Malaysian context. A few of these are summarized in this section.

Lessons from other countries expanding DAT adoption highlight crucial prerequisites, including broad support for digital literacy, establishing digital identification systems, and enabling service providers to “bundle” multiple DAT services. Developing a reliable farmer registry is essential to support various systems and programs—both agricultural and non-agricultural—including e-extension systems, land registration, electronic payment systems, and support mechanism reforms. To bolster the entire

agrofood value chain, the government could prioritize developing agricultural financial technology, finance, and insurance (FINTECH) and e-advisory services in the short term, as these offer broad sectoral benefits alongside other DAT components. Bundling allows one or more digital services to be included with conventional agricultural products or services. For example, advisory services can be provided with agricultural inputs or finance (see Box 8 Bundling in digital agriculture – an example from India).

International good practices impart key lessons to enhance e-agriculture by expanding the coordination between public and private sector activity. Malaysia can benefit from international digital agriculture examples by adapting them to local needs. This involves using South-South exchange,

BOX 8

Bundling in digital agriculture – an example from India

DeHaat is a technology-based farmers' marketplace offering end-to-end services to farmers.

The company aims to maximize farmers' income by bundling accessible and affordable technology-led interventions to address farmers' agricultural needs. The company plans to serve 2.5 million farmers in 1,800 centers by 2024. It expects to earn US\$450 million and claims to have raised US\$250 million in venture capital, with US\$100 million cash in hand. 60.0 percent of DeHaat's revenue comes from input suppliers, 35 percent from aggregators and the remaining 5.0 percent from financial institutions.

DeHaat digitizes public information from India's national agriculture extension system and provides this as agro-advisory services to farmers in local languages through mobile apps and call centers. Farmers can go to the DeHaat center to get inputs, trade outputs, soil tests, or apply for a loan. DeHaat centers are the business drivers, establishing the last mile delivery for 1200–1400 farmers in a 3–5 km catchment area. It can take two to three seasons of close communication for farmers to establish trust in DeHaat services. Once trust is established, a “network effect” will happen with more farmers joining the DeHaat platform, creating more business for DeHaat and other value chain actors.

All services to farmers are free of charge and DeHaat only charges a fee to other value chain actors such as agro-dealers, agribusiness and aggregators and financial institutions that benefit from the transactions. DeHaat's major cost centers are (by importance): (a) collection/service centers typically leased out but require storage and warehousing upgrades; (b) human resources to run the supply chains and build business relations with farmers; and (c) technology. Each center typically has enough transactions to break even on its own in two to three years.

consultations, workshops, and study tours to effectively implement promising technologies. Public policies should encourage a dual approach to digital agricultural innovation by supporting the adaptation of successful imported models while also fostering the development of solutions unique to Malaysia. This approach will ensure good governance and sectoral representation. Key actions include strengthening digital infrastructure and expanding DAT components to guide decision-making and address short-term priorities. International

case studies can provide valuable insights for Malaysia to learn, adapt, and implement digital agriculture policies tailored to its unique needs. Malaysian experts, both within and outside the government, should evaluate which examples and models are best suited for the country's needs. Box 9 gives two examples of DAT innovations that could potentially be adopted to optimize private sector investments for the Malaysian context (See Box 9 on DAT innovations to optimize private sector investments – experiences from other countries).

BOX 9

DAT innovations to optimize private sector investments – experiences from other countries

Thailand: End-to end digital agricultural transformation

Thailand's commitment to embracing digitalization has yielded significant results, showcasing the potential for Malaysia to achieve similar success. Its approach highlights the value of a multi-pronged strategy that includes robust digital infrastructure and connectivity, particularly in rural areas, to ensure farmers have access to crucial information, market prices, and weather forecasts. Developing agricultural data platforms, such as the National Agriculture Big Data Platform (NABDP), allows for data-driven decision-making that optimizes crop yields and resource management. Thailand's investment in agricultural extension services and training also empowers farmers with the knowledge and skills to effectively use digital tools. Finally, Thailand's collaboration with the private sector, particularly agritech startups, has fostered innovation and brought tailored solutions to the agriculture sector. Malaysia can learn from Thailand's experience and pave the way for successful digital agricultural transformation. This holds the key to ensuring food security, modernizing farming practices, and improving the welfare of its farming communities.

Indonesia: Revolutionizing the digital financial services (DFS) ecosystem

DFS has significantly enhanced financial access for smallholder farmers and other agricultural stakeholders in many countries. Many smallholders lack sufficient funds to invest in their farms, hampering productivity and market connectivity. To enhance DFS in agriculture, a coalition of governments, donors, non-governmental organizations (NGOs), and the private sector must collaborate to build the ecosystem. For instance, CrowdE, an Indonesian startup, offers a P2P lending platform and market linkage services, to provide farmers with up to IDR 100 million in capital, backed by crowdsourced investors and distributed to approved farmers via its cashless network. This capital can be used for high-quality inputs, labor, access to production facilities, or other farming needs. CrowdE also connects farmers with distributors and agents to sell surplus crops. Since its inception, the platform has distributed IDR 81 billion (US\$6 million) in loans to over 17,000 farmers, boasting a 97 percent repayment success rate within 90 days and offering two loan repayment options: interest repayment or profit-sharing. Farmer loans are also supported by subsidies from state-owned Bank Mandiri and other local lenders.

Public sector investments in research and innovation, and an enabling environment for private sector efforts are extremely important.

An enabling environment for private sector coupled with public sector investments in research and innovation have significantly contributed to productivity growth in the agricultural sectors of both Thailand and Indonesia (Warr, 2023). This substantial impact is reflected in the sustained pace of total factor productivity (TFP) growth observed in both countries (Figure 71). Specifically, these investments have led to advancements in agricultural technologies, improved crop varieties, and enhanced farming practices, which collectively drive higher yields and efficiency.

The scale-up process should leverage Malaysia's dynamic private sector by fostering public-private partnerships focused on two main objectives:

delivering sound and relevant DATs for the food system, and ensuring the necessary public investment and policies are in place to bridge the digital divide and improve incentives for DAT adoption. Johor has examples of successful public-private partnerships such as Kulim Plantations' collaboration with Greenheart Farms for chili production in a fully controlled environment⁵⁴ or with Aerodyne for drone-assisted pesticide spraying on pineapples. Other countries in the region are actively expanding DAT adoption, leveraging public support to fuel significant growth in agritech, as shown in Box 10. Malaysia has a valuable opportunity to follow suit by embracing a wider variety of DATs, including advisory services, financial services, digital marketplaces, and traceability. This expansion holds potential to enhance efficiency, equity,

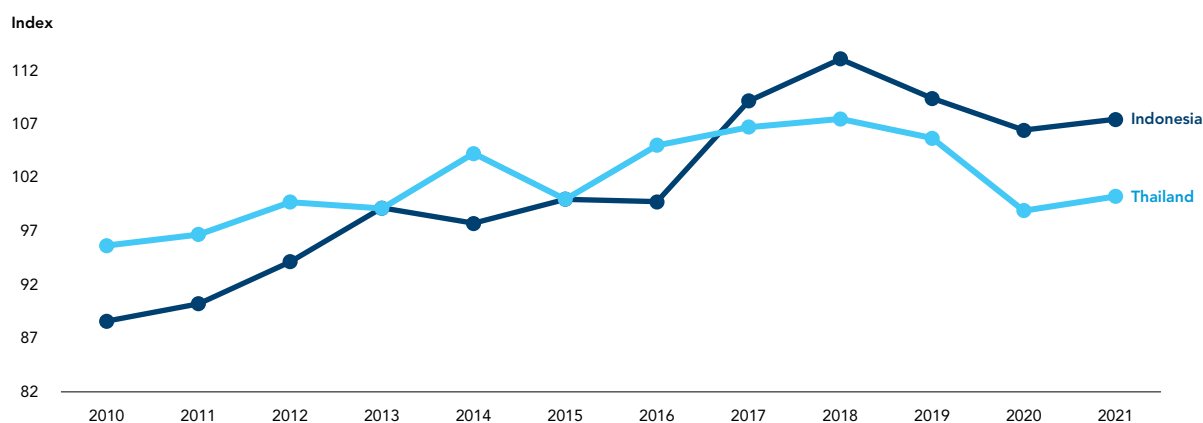
environmental sustainability, employment, and export competitiveness.

Implementing DAT pilot demonstration projects, coupled with adapting lessons from global experiences, offers a strategic pathway to address Malaysia's food supply and demand challenges.

These pilot projects can serve as real-world laboratories, allowing policymakers and stakeholders to assess the effectiveness of various DAT solutions within the specific context of Malaysia's agricultural landscape. By carefully building on the findings of the proposed pilot projects, Malaysia can determine the feasibility and speed of scaling up new ventures for different crops across the country. This process will generate valuable insights into how DAT can optimize resource use, increase yields, and inform necessary public investments and public-private partnerships. Simultaneously, studying and adapting successful DAT innovations from other countries can accelerate Malaysia's learning curve, avoid potential pitfalls and adopt best practices. This approach enables the tailoring of DAT solutions to national needs, addressing supply-side issues such as improving yields and reducing crop losses through disease detection, while tackling demand-side challenges like improving product traceability, expanding market access, and smoothing seasonal demands. The data and experiences gathered from these pilots can inform evidence-based policies and actions (discussed in the next section), guide larger-scale DAT adoption, and ultimately contribute to a more robust, efficient, and responsive agriculture sector that better aligns supply with demand in the Malaysian food system.

FIGURE 71

Investments in research and innovation support TFP growth Index in Indonesia and Thailand



Source: USDA, World Bank

⁵⁴ Pesticide free

BOX 10

Government-supported efforts to expand DAT and create an agritech sector



India is leading the region in agritech innovation with over 1,000 agritech startups as of 2022, supported by robust government policies like Startup India and Digital India. The Indian government has introduced initiatives such as the Agritech Accelerator Fund and eNAM (National Agriculture Market), which are critical to the sector's digital transformation. India's agritech startups have attracted more than \$1.2 billion in venture capital in 2022, with a focus on precision farming, digital platforms, and supply chain optimization. Two key initiatives are the Agritech Accelerator Fund, approved in 2023 to encourage agritech startups and digital solutions; and eNAM, a digital trading platform connecting over 1,000 regulated wholesale markets, to boost transparency and farmer incomes. India's agritech ecosystem is one of the most advanced globally, driven by strong venture capital inflows and government policies. The country's vast agricultural base offers enormous potential for scaling agritech solutions.⁵⁵

Indonesia's agritech sector is growing rapidly, with strong government backing under initiatives such as Indonesia 4.0. The country is focused on integrating IoT solutions and digital platforms to modernize agriculture. Despite limited data on startup numbers, Indonesia's large agricultural base makes it well-positioned for further agritech innovation, particularly in digital marketplaces and logistics. One key initiative is Indonesia 4.0, a national initiative designed to promote innovation across industries, including agriculture. Through government-supported projects focused on digital farming, Indonesia 4.0 is driving growth in the sector. This shows that the Indonesian government's commitment to DAT provides a strong foundation for Indonesia's agritech ecosystem to continue developing.⁵⁶

Thailand's agritech ecosystem is currently emerging, as outlined by the National Innovation Agency's (NIA) Agriculture 4.0 policy. The country is fostering innovation through its Thailand AgTech Startup Ecosystem Development White Paper (ASEWDP), which named over 53 agritech startups by 2020. Thailand still faces challenges in attracting investment, especially compared to regional peers like Indonesia and Malaysia. Key initiatives are the National Innovation Agency, which aims to build a robust agritech startup ecosystem, with early investments in farm management software, IoT, and biotechnology; and the ASEWDP, which provides a framework for collaboration and innovation to modernize Thailand's agriculture through technology. Thailand's ecosystem is in its early stages but has strong governmental support. The pace of innovation and investment is slower than in neighboring countries, but the foundation for growth is being put into place.⁵⁷

⁵⁵ <https://www.mckinsey.com/industries/agriculture/our-insights/how-agtech-is-poised-to-transform-india-into-a-farming-powerhouse>

⁵⁶ <https://www.mckinsey.com/featured-insights/asia-pacific/ten-ideas-to-unlock-indonesias-growth-after-covid-19>

⁵⁷ <https://technode.global/2021/09/10/pioneering-thailands-agtech-startup-ecosystem-towards-agriculture-transformation/>

Recommendations for scaling up DAT adoption in Malaysia

Successful implementation of DATs requires addressing foundational issues. For Malaysia to effectively leverage DATs, it must prioritize three key pillars: strategic investments in public goods, fostering innovative ecosystems, and cultivating an enabling environment. Strategic investments in public goods include implementing actionable strategies that will bridge digital literacy gaps, establishing digital identification systems, improving rural connectivity, and providing necessary infrastructure. Fostering an innovative ecosystem requires establishing data platforms, using satellite imagery for monitoring, creating incubators for startups, and aiding technical providers with business development. The third pillar focuses on cultivating an enabling environment. This requires clear strategies and actions that foster data governance, privacy, security, while also providing

incentives to build trust and ensure secure, beneficial use of digital technology for all stakeholders. The implementation timeline for each pillar will vary. Some strategies and investments, particularly those of a more technical nature, can be implemented relatively quickly. Others, however, will require the involvement of various institutions and government agencies and a broad consultation process to progress.

To effectively scale up the adoption of DATs, the Malaysian government should undertake two simultaneous activities: implementing pilot programs and executing specific actions under the three foundational pillars. These activities are interrelated and should be part of an overall strategy to scale up DATs.

1 Implementing pilot programs

Pilot programs are essential for testing and refining DATs in real-world settings. They provide valuable lessons that can be integrated into subsequent initiatives, ensuring effective and scalable adoption. The following steps are recommended:

a) Launch pilot projects:

- **Digital advisory for paddy production:** Utilize precision agriculture data, yield prediction, and yield gap analysis.
- **Controlled environments for chili cultivation:** Implement fully controlled environments to optimize growth conditions.
- **Drone use for agrochemical spraying:** Apply drones for efficient agrochemical spraying on pineapples.
- **Sensor-based irrigation and drone-based pesticide application:** Use these technologies in durian plantations.
- **Intensive shrimp farming:** Implement super-intensive white shrimp farming to demonstrate significant productivity gains and rapid cost recovery.

b) Objectives of pilot programs:

- **Test digital technologies:** Evaluate the feasibility and effectiveness of various DATs in real-world agricultural settings.
- **Establish enabling conditions:** Identify and create the necessary conditions for the successful adoption of DATs, as outlined in the digitalization strategy pillars.
- **Learn and adapt:** Use pilot programs as learning platforms to refine the scaling-up pathway and minimize risks.
- **Refine institutional framework:** Adjust the institutional and public-private partnership frameworks based on evidence from pilot programs.
- **Fine-tune funding strategies:** Develop funding strategies involving public financial institutions, private funding, international grants, and specialized entities like accelerators and incubators.



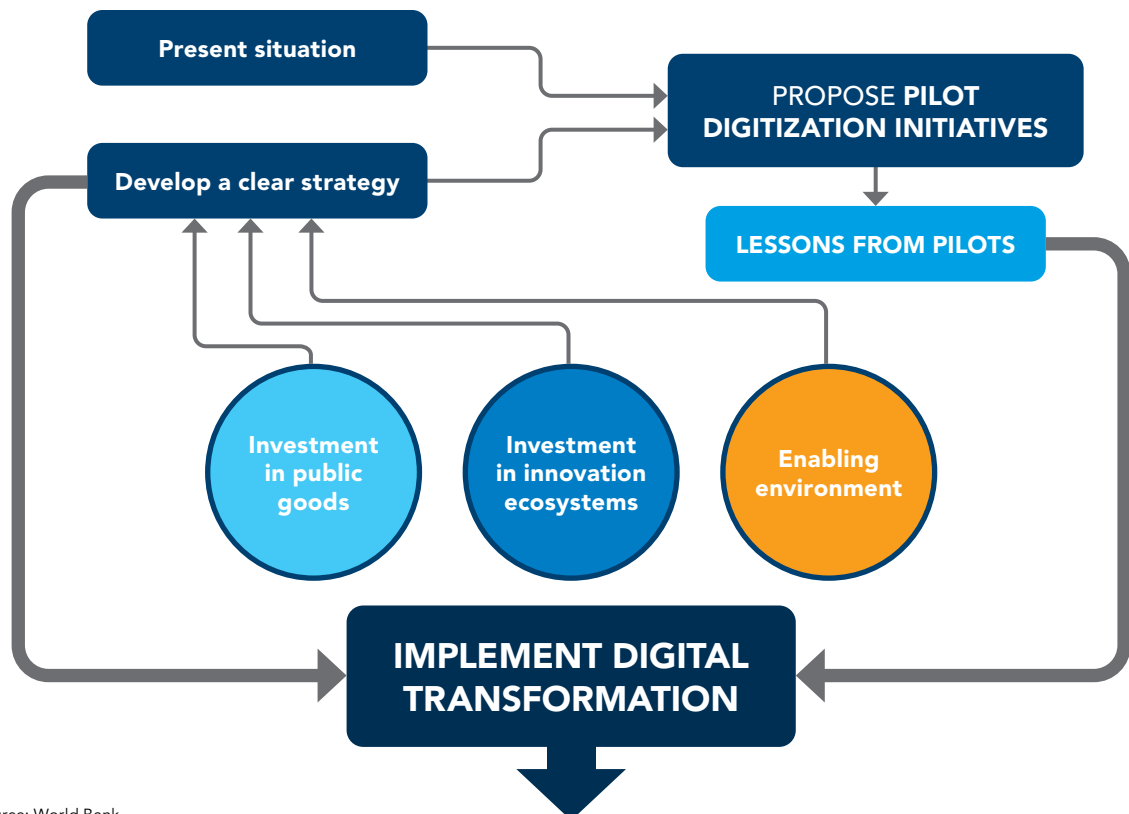
2 Executing actions under the three foundational pillars

Supporting DAT adoption in Malaysia aligns with global trends and underscores the need for government intervention. This support can be realized through targeted policy measures and public investments in line with the three foundational pillars of DAT outlined in Figure 72 below: 1) investing in public goods such as rural connectivity, digital literacy, and farmer digital identification; 2) improving the innovation ecosystem through data platforms and incubation and

acceleration services; and 3) enhancing the enabling environment through data governance and incentive frameworks. This can be done simultaneously with implementing pilot programs so that the results can define pathways for scaling digitalization in Malaysia's food system. Essential measures include undertaking a multifaceted approach that can meet the different elements shown below.

FIGURE 72

The DAT scaling up pathway requires appropriate policies, pilots, and strategies



Source: World Bank

PILLAR
1
Investing in public goods

Investing in public goods is fundamental for successfully implementing digital technologies in agriculture. The Malaysian government should focus on the following actions:

a) Enhance digital literacy and knowledge:

- **National digital literacy program:** Implement a national digital literacy program for farmers and integrate DATs into school curricula, especially in rural areas.
- **Deploy promotional campaigns and training for farmers:** Combine incentives, financial inclusion and access to capital to support adoption of climate smart technologies.
- **Knowledge exchange:** Foster knowledge exchange between tech companies, farmers, and rural residents by sharing best practices and experiences with other countries.
- **Entrepreneurship programs:** Promote entrepreneurship programs in DATs to encourage innovation and adoption.
- **E-extension services:** Accelerate the shift to e-extension services, focusing on digital information dissemination and training rural residents in using digital technologies. E-advisory services, coupled with improved connectivity, can be quickly implemented with wide benefits.

b) Strengthen digital identification:

- **Digitize land records and farmer registries:** Implement digital IDs and direct deposits for government payments to farmers.
- **Blockchain technology:** Utilize blockchain technology for traceability of seafood, poultry, and horticulture products, integrating with existing systems like the Malaysia Animal Traceability System (MATs).
- **Support systems and regulations:** Foster a conducive environment for DAT providers by enhancing rural area connectivity and simplifying business registration and licensing for tech startups.
- **Public-private partnerships:** Promote and

expand public-private partnerships with private sector champions, including mobile network operators, to improve rural digital coverage.

c) Improve rural connectivity:

- **Address digital divide:** Implement connectivity solutions to address the digital divide caused by market failures such as risk aversion, information asymmetries, and limited access to capital and digital skills.
- **Policy responses:** Develop effective policy responses to expand digital service availability, promote DAT adoption, and minimize related inequities.
- **Legal and regulatory framework:** Ensure transparent data ownership and privacy rights through a robust legal and regulatory framework. The Ministry of Agriculture and Food Security should play a key role in crafting relevant regulations.

d) Prioritize public expenditures:

- **Infrastructure investments:** Prioritize public expenditures on infrastructure that encourage tech companies to expand into rural areas and provide extension services to promote DAT adoption among farmers.
- **Complement private investments:** Government policies and expenditures should complement and leverage private-sector investments, the primary drivers of DAT development.

PILLAR
2
Investing in the innovation ecosystem

Creating an environment that supports innovation and DAT development is crucial. The Malaysian government should focus on the following actions:

a) Establish data platforms and satellite imagery:

- **Digital platforms:** Establish or strengthen digital platforms to enhance government planning, monitoring, and benefit transfers, ensuring foundational data accessibility and promoting data sharing.
- **Open data policies:** Digitize and make

government data available to the public, such as agricultural statistics and agrochemical data.

- **Fisheries management:** Implement digital platforms for fisheries management, including fish stock assessment, catch reporting, and compliance monitoring.
- **Geographic information system (GIS) technologies:** Use GIS technologies for mapping and analyzing fishing activities.
- **Data sharing incentives:** Design and set up data sharing incentives, such as recognition, mutual data access, and data monetization, to encourage participation and innovation.

b) Support incubators and accelerators:

- **Expand incubators and accelerators:** Expand the scope of incubators and accelerators to support agrofood tech startups.
- **Innovation challenges:** Implement innovation challenges to boost the supply of relevant digital solutions.
- **Targeted programs:** Define and implement targeted programs tailored to the needs of agritech providers to boost innovation.
- **Agri fintech innovation ecosystem:** Develop an agri fintech innovation ecosystem through incubators, accelerators, and venture financing, building on digital innovation ecosystems, and providing adequate attention to young farmers in Malaysia.

PILLAR 3

Creating an enabling environment

Establishing clear policies on data governance, privacy, and security, along with implementing supporting incentives, is essential for creating an enabling environment for DATs. The Malaysian government should focus on the following actions:

a) Data governance, privacy, and security:

- **Transparency and control:** Implement regulations that mandate transparency in data collection and give individuals control over how their data is used.

- **Data-sharing models:** Create data-sharing models that benefit both suppliers and users.

- **Personal Data Protection Act:** Address disadvantages posed by the Personal Data Protection Act to agricultural producers by providing adequate recourse in cases of data breaches involving government-held information.

b) Incentive framework:

- **Repurpose input subsidies:** Repurpose input subsidies to fund DAT initiatives.
- **Integrate DAT solutions:** Integrate DAT solutions into climate change strategies.
- **Public expenditures:** Use public expenditures for infrastructure and knowledge dissemination to enhance farmers' gains from digital technologies.
- **Tailored financial products:** Develop financial products tailored to meet the specific needs of both users and providers of digital technologies.

c) Coordination across ministries:

- **Cross-sectoral coordination:** Ensure greater coordination across relevant ministries and agencies to effectively implement DAT solutions.
- **Climate change strategies:** Identify how DAT solutions can support government strategies on climate change, maximizing both financial and economic benefits.

By implementing pilot programs and executing actions under the three foundational pillars, Malaysia can effectively scale up the adoption of DATs. These efforts will provide crucial data, refine strategies, and establish the necessary conditions for a successful digital transformation in the agricultural sector. The lessons learned from pilot programs will guide the national digitalization strategy, ensuring that Malaysia's agriculture sector can achieve significant productivity gains and contribute to the country's economic growth.



Annex: Roadmap for enabling conditions for digital transformation (policy action plan)⁵⁸

 PILLAR 1 INVEST IN PUBLIC GOODS			
	A DIGITAL LITERACY & KNOWLEDGE (7 Actions)	B DIGITAL IDENTIFICATION (3 Actions)	C RURAL CONNECTIVITY FOR DAT (4 Actions)
Time to implement	4 years	3 years	1 year
Technical difficulty	High	High	Low
Magnitude of impact	Moderate	High	High
Impact time horizon	Medium-to-long-term	≥ 4 years	3 years
Implementing ministries and relevant agencies therein	TWG, MOHE, MOSTI, KPKM, DP*	KPKM	Government-wide regulation, with input from KPKM
	Increase knowledge: - Promote a national digital literacy program for farmers and other actors in the food system (mainly train farmers on digital and financial literacy with content tailored to farmers' skill levels and access channels) - In school curricula at a national scale and especially in rural areas, possibly in partnership with tech companies or via and by using or organizing farmer's groups - Of best practices and experiences in DAT by sharing, cooperating, and collaborating with other countries - Of DAT potential via knowledge sharing between tech companies, farmers, and other rural residents, possibly in partnership with tech companies or by using or organizing farmer's groups - Via entrepreneurship programs aimed at DAT for the agrofood sector (mentoring, coaching, finance access) Increase DAT use in extension by: - Identifying and accelerating the shift to e-extension, including digital dissemination of information (e.g., weather) - Extending outreach programs to disseminate information about digital technologies and train rural residents on their use	- Digitizing land records and farmer registry - Using digital ID and direct deposit for all government payments to farmers - Blockchain for traceability: This technology can be used to trace seafood⁵, poultry (integrated with the existing Malaysia Animal Traceability System and horticulture products.	Review and revise: - Infrastructure regulations on enabling rural area connectivity to ensure they are not unnecessarily burdensome - Startup-friendly regulations to simplify business registration and licensing process for tech start-ups - Regulations and support systems to streamline a conducive environment for digital agriculture providers - Promote and expand PPP use with private sector champions and mobile network operators in view of improving rural digital coverage

⁵⁸ KPKM and World Bank forthcoming.



PILLAR 2 INVEST IN INNOVATION ECOSYSTEMS

	A	DATA PLATFORMS & SATELLITE IMAGERY (5 Actions)	B	INCUBATORS, ACCELERATOR FOR TECH PROVIDERS (3 Actions)
Time to implement	3 years		2 years	
Technical difficulty	Moderate		Medium	
Magnitude of impact	High		High	
Impact time horizon	≥ 4 years		≥ 2 years	
Implementing ministries and relevant agencies therein	Government-wide regulation, with input from KPKM		Inter-agency and ministerial working group with KPKM participation	
	1. Establish (or strengthen existing) digital platforms for planning, monitoring, and benefit transfer by the government (strengthening access to foundational data and promoting data sharing) 2. Digitize and make government data available (agricultural stats, agrochemical data) based on “open data” policies 3. Use digital platforms that assist in fisheries management, including fish stock assessment, catch reporting, and compliance monitoring 4. Geographic Information System (GIS) technologies for mapping and analyzing fishing activities 5. Provide data sharing incentives (design and set up data sharing incentives, e.g., recognition, access other’s data, monetize data)		1. Expand the scope of incubators and accelerators to agrofood techs 2. Implement innovation challenges to increase the supply of relevant digital solutions 3. Define and implement targeted programs for agritech providers	



PILLAR 3

CREATE ENABLING ENVIRONMENT



	A	DATA GOVERNANCE, PRIVACY & SECURITY (2 actions)	B	INCENTIVE FRAMEWORK (4 actions)
Time to implement		2 years		2 years
Technical difficulty		High		High
Magnitude of impact		High		High
Impact time horizon		≥ 4 years		≥ 4 years
Implementing ministries and relevant agencies therein		Government-wide		Government-wide
	Review and revise: - Regulations on data ownership and privacy, ensuring consistency with principles to build user confidence, including: - Data collection should be transparent (i.e., individuals know if someone is collecting their data) - Individuals should know and have a voice in how their data is used - Data-sharing models should work for both data suppliers (individuals) and users (enterprises/ companies) - Malaysia’s Personal Data Protection Act places agricultural producers at a disadvantage, as the law limits their proper recourse in instances of data breaches related to government-held information		- Repurpose input subsidies to fund DAT - Review government strategy on climate change to fully incorporate DAT solutions - Focus public expenditures on public goods that increase value to farmers from using digital techs (e.g., infrastructure, knowledge dissemination) rather than policies that undermine farmers’ incentives to adopt DAT (e.g., input subsidies) - Tailor financial products to the needs of users and providers of digital techs	

References

- Chen, Yun-Chung. 2008. "Why Do Multinational Corporations Locate Their Advanced R&D Centres in Beijing?" *The Journal of Development Studies* 44 (5): 622-644.
- DOSM (Department of Statistics Malaysia). 2023. Labor Force Survey Report Malaysia 2022. Putrajaya: Department of Statistics Malaysia.
- DOSM (Department of Statistics Malaysia). 2024. Labor Force Survey Report Malaysia 2023. Putrajaya: Department of Statistics Malaysia.
- Kee, Hiau Looi, and Tang, Heiwai. 2016. "Domestic Value Added in Exports: Theory and Firm Evidence from China." *American Economic Review* 106 (6): 1402-1436.
- Khazanah Research Institute. 2024. Shifting Tides: Charting Career Progression of Malaysia's Skilled Talents. Kuala Lumpur: Khazanah Research Institute.
- McKinsey Global Institute. 2024. "Help Wanted: Charting the Challenge of Tight Labor Markets in Advanced Economies." Accessed at: <https://www.mckinsey.com/mgi/our-research/help-wanted-charting-the-challenge-of-tight-labor-markets-in-advanced-economies#/>.
- New Straits Time. 2023. "Docs in Public Healthcare Are Overworked, Underpaid." Accessed at: <https://www.nst.com.my/news/nation/2023/02/879632/docs-public-healthcare-are-overworked-underpaid>.
- PMO (Prime Minister's Office of Malaysia). 2024. Teks Ucapan Yab Perdana Menteri: Majlis Amanat Perdana Perkhidmatan Awam Ke-19 Tahun 2024. Accessed at: <https://www.pmo.gov.my/2024/08/teks-ucapan-yab-perdana-menteri-majlis-amanat-perdana-perkhidmatan-awam-ke-19-tahun-2024/>.
- Stratsea. 2023. "The Case for Reviewing Malaysian Civil Servants' Salary." Accessed at: <https://stratsea.com/the-case-for-reviewing-malaysian-civil-servants-salary/>.
- Tan, Josephine. 2024. "Malaysia's Public Sector Wage Hike Sparks Private Sector Wage Debate." Accessed at: <https://hrmasia.com/malaysias-public-sector-wage-hike-sparks-private-sector-wage-debate/>.
- The Star. 2024. "Better Pay for Teachers, Please." Accessed at: <https://www.thestar.com.my/news/education/2024/04/28/better-pay-for-teachers-please>.
- World Bank. 2019a. Breaking Barriers: Toward Better Economic Opportunities for Women in Malaysia. Washington, DC: The World Bank.
- World Bank. 2019b. World Development Report 2020: Trading for Development in the Age of Global Value Chains. Washington, DC: The World Bank.
- World Bank. 2021. Aiming High: Navigating the Next Stage of Malaysia's Development, Country Economic Memorandum. Washington, DC: The World Bank.
- World Bank. 2023. Malaysia Economic Monitor: Raising the Tide, Lifting All Boats (October 2023). Washington, DC: The World Bank.
- World Bank. 2024. Informal Employment in Malaysia: Trends, Challenges and Opportunities for Reform. Washington, DC: The World Bank.
- Zeng, D.Z. 2021a. "The Past, Present, and Future of SEZs and Their Impact." *Journal of International Economic Law*, 24 (4).
- Zeng, D.Z. 2021b. "The Dos and Don'ts of SEZs", EFI Note, Washington, DC: The World Bank.
- Zeng, D.Z. 2022. "What Determines the Heterogeneous Performance of Special Economic Zones?" *Global Policy*, 13 (4).



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