Annexes: Selected Issues

1. Spurring Growth through Productivity Enhancements in Brunei[53]

1. Sustaining long-term economic growth requires a strong focus on productivity improvements. For resource-rich economies like Brunei, prioritizing this is vital to mitigate the risks associated with the exhaustibility of non-renewable resources (Auty 1993; Sachs and Warner 1995; Gylfason 2005; Van der Ploeg 2010). By investing in technology diffusion and fostering innovation, resource-rich economies can leverage their resource wealth to diversify their economies, while creating productivity spillovers across various sectors. In the context of Brunei's aging population, enhancing both total factor productivity (TFP) and labor productivity becomes especially fundamental to unlock new growth potential, shifting the focus from not just increasing primary inputs—like labor and capital—to prioritizing the adoption and spread of innovative technologies.

Key Drivers of Productivity Shifts in Brunei: 2005–2023

2. Output decomposition using the production function approach reveals that between 2005 and 2019, Brunei's economic growth was largely driven by increases in primary inputs (Figure A1.1). Labor played a key role, supported by peak labor force participation rates and robust employment growth, particularly in the mid-2000s. Similarly, capital stock expanded significantly, spurred by substantial investments in downstream fertilizer and petrochemical projects. However, while the volume of labor and capital input grew sharply during this period, TFP was a drag on overall output growth.[54]

3. Similarly, factor decomposition revealed that even though increased investments in capital goods—such as machinery and equipment—supported gains in labor productivity (i.e., capital deepening), TFP consistently weighed on labor productivity throughout most of the pre-pandemic years (Figure A1.2a). Sectoral analysis showed that the oil and gas (O&G) sector, despite being a central pillar of Brunei's economy, struggled with declining output resulting from maturing fields and aging infrastructure that led to negative labor productivity growth (Figure A1.2b). The non-O&G sector also faced challenges, such as shortages of skilled labor and slower technology adoption especially among smaller enterprises. These findings highlight the challenges to technological innovation and efficiency improvements in Brunei (Cheong (2013); Koh (2014)).

4. Encouragingly, between 2020 and 2023, Brunei achieved significant gains in TFP, driven by rapid digital transformation that accompanied the transition to the post-pandemic environment. The swift adoption of digital tools, automation, and e-commerce platforms allowed businesses to maintain operations despite mobility restrictions— a trend that has continued to drive efficiencies until today. The non-O&G sector saw the most pronounced TFP improvements. The sector was supported by government-led initiatives such as the BRUHealth system and the Smart Nation projects, which significantly modernized

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[53] Prepared by Anthony Tan, Mission Chief, and Lay Lay Aung, Associate.
[54] The growth accounting framework, based on the Cobb-Douglas production function, has some limitations. It treats productivity as a residual, which can overlook the effects of important factors like institutional quality, infrastructure improvements, and spillovers. For example, positive spillovers from technology adoption or negative ones like environmental damage may not be fully captured, resulting in an incomplete picture of the actual drivers behind economic growth and efficiency.
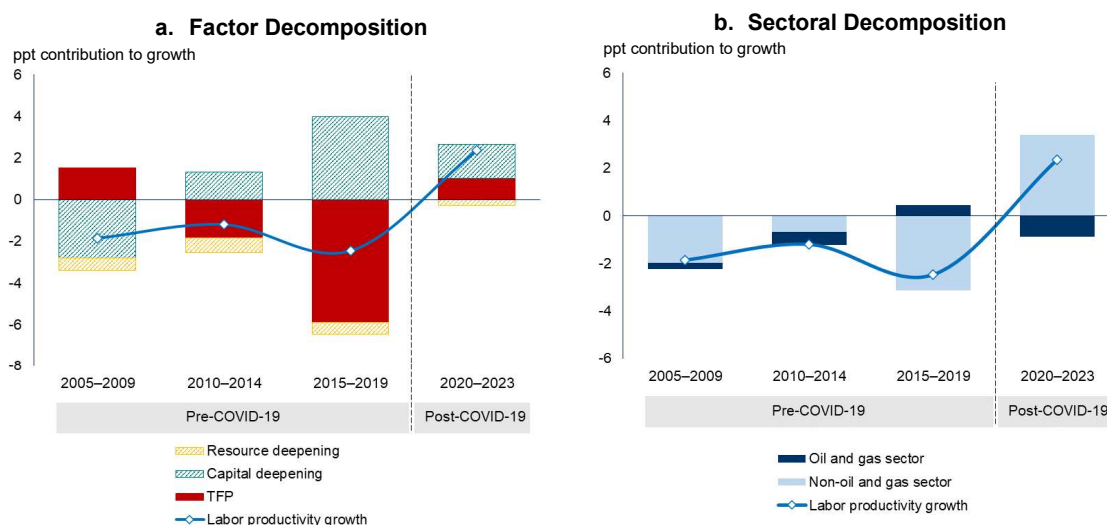
Brunei's digital infrastructure. These advancements not only streamlined service delivery and enhanced connectivity but also laid the groundwork for sustainable productivity growth across various sectors. As a result, the economy is better positioned to leverage technology for economic diversification, reducing its dependency on O&G while fostering long-term resilience.

Figure A1.1. Decomposition of Output Growth

ppt contribution to growth
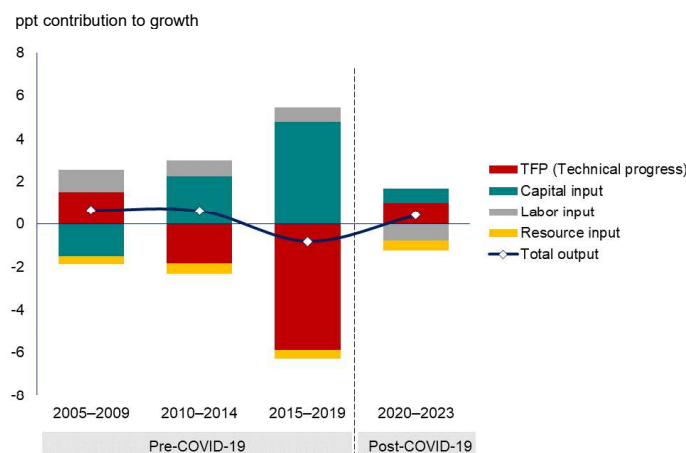
Source: National authorities; Penn World Tables; United Nations Development Program; World Bank; AMRO staff estimates
Note: TFP = total factor productivity. The decomposition of output growth is estimated using the extended Cobb-Douglas production function, which incorporates natural resources as an additional factor of production. This extended model is better suited for analyzing growth in economies where natural resources—such as oil, gas, and minerals—are central to output (Tan and Aung 2025).

Figure A1.2. Decomposition of Labor Productivity Growth

a. Factor Decomposition

ppt contribution to growth

b. Sectoral Decomposition

ppt contribution to growth

Source: National authorities; PWT; UNDP; World Bank; AMRO staff estimates.

Strategic Approaches and Policy Priorities for Enhancing Productivity Growth

5. Brunei's focus on enhancing productivity has been a key priority since the early days of its national development plans. The emphasis on productivity can be traced back to the 2nd National Development Plan, which is aligned with the Wawasan Brunei 2035 (also known as Brunei Vision 2035). While the government has made strides in targeting labor market efficiency, human capital development, and private sector innovation, there is significant potential for further progress in these three areas.

Promoting greater labor market competition and flexibility. Addressing structural rigidities in the labor market remains key to promoting labor market competition and flexibility. This would require a suite of complementary and market-based policies. A persistent structural challenge in Brunei's labor market lies in the disconnect between employer requirements and jobseeker expectations, particularly around compensation and career progression. To address this misalignment, the introduction of the Salary Guideline provides greater transparency in wage structures across sectors and occupations, helping to reduce information asymmetries and enhance labor market efficiency. This, alongside the phased implementation of the Employment (Minimum Wage) Order—launched in 2023 with plans for broader sectoral application by 2025—marks significant progress toward fostering a more inclusive and dynamic labor market.

Addressing staffing gaps. To close the talent gap, deliberate and targeted policies to align educational and training programs with industry needs are key priorities. Brunei is doing well in this area, as evident by the various strategic initiatives established between the tripartite partners, particularly in the area ICT. Some of the notable achievements are:

- **Brunei ICT Industry Competency Framework (BIICF):** Launched in August 2022, the BIICF identifies 79 technical and soft skill competencies across 20 ICT job roles in six sub-sectors, including IT services, telecommunications, and data analytics. It serves as a guide for aligning workforce skills with industry needs, supporting career planning, training, and talent development.

- **Digital Upskilling Training Programme:** The Authority for Info-communications Technology Industry (AITI) introduced this programme to equip local youth and the workforce with industry-relevant ICT skills. The training covers areas such as data analytics, AI, cybersecurity, and cloud computing, aiming to increase employability and support Brunei's digital economy goals.

- **TechXPLORE Digital Apprenticeship Programme:** This initiative offers local ICT graduates overseas work experience, enhancing their employability and preparing them to contribute effectively to Brunei's ICT sector and future growth.

- **iSkill Programme:** Developed in collaboration with the Institute of Brunei Technical Education (IBTE), iSkill aligns training with industry demands in sectors like oil and gas. It offers comprehensive training and industry placements in various technical fields, aiming to fill 13,000 skilled jobs over five years.

- **UBD-IBM Centre:** A collaboration between Universiti Brunei Darussalam and IBM, this centre focuses on research in high-performance computing and data analytics, supporting innovation and technological advancement in Brunei.

Promoting technological innovation. To drive productivity in non-O&G sectors, a "whole-of-nation" approach needs to be geared toward enhancing digital infrastructure and innovation. The Digital Economy Masterplan 2025 serves as a key national framework, outlining strategic priorities such as enhancing digital infrastructure, developing future-ready talent, and fostering innovation-led economic diversification. Continued investment in emerging technologies—

including cloud computing, artificial intelligence (AI), Internet of Things (IoT), and cybersecurity—will be essential for modernizing industries and creating high-value job opportunities, particularly in sectors such as logistics, finance, and healthcare. To support these ambitions, a more innovation-friendly policy environment is critical. This includes expanding access to innovation financing, such as grants and risk capital for startups and tech-driven MSMEs; offering tax incentives for R&D spending; and streamlining regulatory approval processes for new technologies and digital services. Additionally, the government could strengthen collaboration with global tech firms and academic institutions to facilitate technology transfer, pilot emerging solutions, and build local innovation capacity.

- At the enterprise level, accelerating digital transformation amongst MSMEs is crucial. Many MSMEs still face challenges in adopting digital tools due to capacity gaps, limited technical knowledge, or cost barriers. Government support programs—such as digital readiness assessments, targeted upskilling, and subsidized access to productivity-enhancing software—would continue to remain key in helping firms transition toward digital operations. Further, open innovation platforms and public-private partnerships can encourage the co-creation of digital solutions tailored to Brunei's development needs.

- To sustain innovation momentum, investments in digital literacy and entrepreneurial talent must continue, especially through initiatives that engage youth, women, and underrepresented groups in the tech sector. Enhancing STEM education, expanding coding and data science training, and supporting digital entrepreneurship incubators will help build a future-ready workforce and unlock the full potential of Brunei's digital economy.

By working to solve structural challenges using targeted strategies, Brunei can make significant strides toward enhancing overall productivity, supporting economic diversification, and achieving the ambitious goals outlined in Wawasan Brunei 2035.

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