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Measuring R&D in the Era of Industrial Revolution 4.0: Issues and Challenges, A Case Study of Indonesia

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Key Issues of the Paper

1. R&D is a key driver of economic development in Indonesia; including the nation's entrance into the new Industrial Revolution 4.0 era.

2. R&D, is an integral element of national sustainable development strategies; with R&D nation benchmarking through SDGs Goals 9.5.1, 9.5.2 and 9.b.1.

3. Measurement of R&D has proven to be challenging for many developing countries, including Indonesia. Have been previous measurement attempts made by BPS and also other government ministries.

4. This study highlights the importance of quality R&D data to Indonesia, the numerous improvements made by BPS, but also limitations in current R&D measurement practices, such as:
   - Data collection difficulties (both logistical and conceptual understanding across industries);
   - Lack of a sufficient frame;
   - Statistical system lack of maturity.

Main Findings/Results

1. Measurement of R&D in Indonesia is mainly based on the R&D concept as defined by the Frascati Manual.

2. BPS R&D survey development, collection, processing and dissemination was done end-to-end following the GSBPM. The ABS provided some support in this area as part of ABS-BPS cooperation in Statistical Capability building.

3. Estimates show that provinces with a lower number of R&D performing business generally have a lower level of GDP.

4. Estimates of BERD --Business Expenditure on R&D as a proportion of GDP-- was 0.018 percent in 2017, and 0.02 in 2018.

Conclusion

1. Quality R&D data is an essential statistical requirement for BPS; as an input to national accounts, input to SDGs and as a key driver of the future economic prosperity of Indonesians.

2. Measurement of R&D in Indonesia was conducted by BPS – National Statistics Office of Indonesia through a Pilot Survey of R&D in the Business Sector in 2017 and a Survey of R&D in selected Business Sectors in 2018.

3. Establishing a quality benchmark to measure R&D is still difficult due to some issues in conceptual/definitional understanding, sampling frame requirements, and wider issues pertaining to the strengthening of BPS' statistical system.

4. BPS will be looking to address the issues such as enumerator capability/training and digital data collection for future iterations of BPS's R&D survey.