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INDONESIA

TECHNICAL ASSISTANCE REPORT—RESIDENTIAL PROPERTY PRICE STATISTICS CAPACITY DEVELOPMENT MISSION

June 2018

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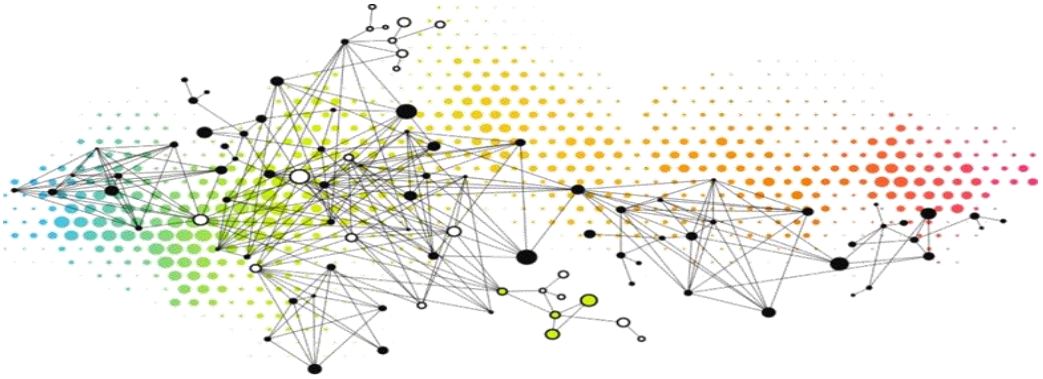

INDONESIA

APRIL
2018

REPORT ON RESIDENTIAL PROPERTY PRICE STATISTICS CAPACITY DEVELOPMENT MISSION (FEBRUARY 7–9, 2018)

Prepared by Niall O'Hanlon

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Glossary

BI	Bank Indonesia
CPPI	Commercial Property Price Index
RPPI	Residential Property Price Index
TA	Technical Assistance

SUMMARY OF MISSION OUTCOMES AND PRIORITY RECOMMENDATIONS

A Technical Assistance (TA) mission was conducted during February 7–9, 2018, to assist the Bank Indonesia (BI) with the ongoing development of the residential property price index (RPPI). The mission also provided advice on the commercial property price index (CPPI).

Reliable property price indexes and other indicators of real estate markets are essential to the BI's assessment of developments and risks in property markets, and understanding of the linkages between property markets and financial soundness, as well as to IMF surveillance. The BI compiles and disseminates a RPPI based on data collected from surveys of major developers.

There is scope to build upon improvements to the survey that were introduced in 2016 by redeveloping the weighting of component indexes to the national total. In the short-term, the authorities should assess the potential for using mortgage data to compile weights, based on the aggregated value of mortgage drawdowns in different regions and for different property types. In the longer-term, it might be possible to use taxation data to more broadly represent the structure of the market.

The BI should continue the work on developing an alternative RPPI using Big Data (listings) from real estate web portals in response to challenges to the current RPPI. The Big Data project offers considerable potential for the compilation of robust asking price indexes for the secondary market, following a hedonic methodology. This is particularly the case given the unavailability of suitable price observation data from administrative sources. The BI should continue to follow the survey based approach for the primary market, in the absence of suitable alternative source data. The survey-based approach implicitly follows a matched-model methodology; therefore, it is not necessary to perform any hedonic "in-strata" property mix-adjustment.

The BI also publishes statistics on the commercial property sector based on appraisal data provided by external property market experts. The headline index in the CPPI publication is an index of activity rather than a pure sale price index, since it takes market capitalization rates and rent prices into account. The BI could expand the published statistics on the commercial property sector to include a national sale price index and a rent price index. The compilation of a broad range of indicators is in line with the data requirements for the formulation of macro-prudential policy. The BI needs to exclude apartments data from the future commercial property price index and include them in the RPPI instead.

To support progress in the above work areas, the mission recommended an action plan with the following priority recommendations:

Table 1. Priority Recommendations

Target Date	Priority Recommendation	Responsible Institutions
August 2018	Develop a strategy for accessing taxation data on property transfers.	**BI**
September 2018	Assess the potential for using mortgage data to support the implementation of improved weighting for property price indexes for the primary market.	**BI**
December 2018	Compile prototype hedonic RPPIs using listings data for the secondary market in the capital city (Jakarta).	**BI**
May 2019	Extend the current CPPI publication to include aggregate pure sales price and rent price indexes.	**BI**

The BI compiles and disseminates a broad range of indicators covering the real estate market. The authorities are strongly committed to further developing these indicators as part of a broader effort to assess developments and risks in property markets, and to better understand the linkages between property markets and financial soundness. **Further details on the priority recommendations and the related actions/milestones can be found in the action plan under *Detailed Technical Assessment and Recommendations*.**

DETAILED TECHNICAL ASSESSMENT AND RECOMMENDATIONS

The action plan shown below reflects the plans for the further development of real estate price indexes for Indonesia.

A. Action Plan

Priority	Action/Milestone	Risk Assumptions/ Verifiable Indicators	Target Completion Date	Actual Completion Date	Implementation Status
Outcome: Improved price statistics for Indonesia					
H	Develop a strategy to secure access to taxation data on property transfers.	BI ready to engage with taxation authorities.	August 2018		

Priority	Action/Milestone	Risk Assumptions/ Verifiable Indicators	Target Completion Date	Actual Completion Date	Implementation Status
H	Assess the potential for using mortgage data to support the implementation of improved weighting for property price indexes.	Analytical weights are developed.	September 2018		
H	Subset residential listings data to include only first instances of each listing.	New dataset ready for analysis.	April 2018		
H	Develop prototype hedonic RPPI for Jakarta.	Index compiled.	December 2018		
H	Extend prototype to other cities (3 cities, Surabaya, Medan, and Makassar).	Indexes compiled.	December 2019		
H	Prepare strategy for further development of RPPI.	Strategy outlined.	March 2020		
H	Extend current CPPI publication to include aggregate pure sales price and rent price indexes.	Additional indicators published.	May 2019		

B. Introduction

1. A TA mission was conducted during February 7–9, 2018, to assist the BI with the ongoing development of the RPPI. The mission also provided advice on the commercial

property price index (CPPI) and followed a diagnostic mission to the BI during October 14–16, 2014, that discussed data needs and plans for the development of property price indexes.

2. The BI compiles and disseminates a broad range of indicators covering the real estate market. The authorities are strongly committed to further developing these indicators as part of a broader effort to assess developments and risks in property markets, and to better understand the linkages between property markets and financial soundness. Staff from the Real Sector Statistics Division and the Big Data team were very well prepared for the visit and participated effectively and openly in the discussions.

C. Residential Property Price Index

3. The BI compiles and disseminates a series of residential property price indexes (RPPIs) based on data collected from quarterly surveys of major developers. The index covers the primary (new) market for single-unit dwellings (houses) in 16 cities with an additional two other cities currently being added. Respondents provide detail residential market activity including price developments, the number of units built and sold, expectations for further prices, and other qualitative data. Data are collected through face-to-face interviews.

4. The survey-based approach implicitly follows a matched-model methodology since respondents report prices on a fixed panel of properties. Consequently, it is not necessary to perform any hedonic "in-strata" property mix-adjustment. The current stratification design appears reasonable, as does the index compilation formula.

5. The BI has also compiled a series for the secondary (existing) residential property market. The series are based on appraised values collected from a survey of sellers and real estate agents in 10 major cities. To date, the series have not been published.

6. A survey based approach is currently used as administrative data (taxation administration records and mortgage data) are unsuited to use as price observations in the compilation of property mix-adjusted indexes. While property sale prices are recorded in the taxation system, these records do not include the necessary detail on property characteristics to facilitate an adequate level of property mix-adjustment. Furthermore, the taxation system in Indonesia is decentralized to 34 municipal agencies, complicating the potential for the further development and provision of data to the BI. Data are likely to be non-standardized in respect of collection, processing, and storage.

7. The BI introduced improvements to the residential property survey in 2016, by including more detail on property characteristics, and there is scope to build on these improvements by redeveloping the weighting of component indexes to the national total. In the short-term the authorities should assess the potential for using mortgage data to compile weights, based on the aggregated value of mortgage drawdowns in different regions and for

different property types. These data would therefore, be used as weighting observations (which require less granularity and property characteristics), rather than price observations.

8. In the longer-term, the BI could assess the potential for using taxation data to compile weights, based on the recorded value of residential property transactions in different regions and for different property types. To this end, the mission recommended that the BI develop a strategy for the potential use of taxation data, including how efforts to develop and collect data could be coordinated across the decentralized system. Enhanced taxation records could, for example, include some limited additional property characteristics such as property type and vintage (primary, secondary). However, the mission noted that the potential use of taxation data might be predicated on the introduction of a harmonized administration system. Therefore, a key objective of the strategy would to establish at an early stage if the approach is feasible, since if the challenges are too large the authorities should focus on other approaches.

Recommended actions:

- Assess the potential for using mortgage data to compile weights, based on the aggregated value of mortgage drawdowns in different regions and for different property types.
- Develop a strategy for securing access to taxation data on property transfers.

D. The Big Data Project

9. The BI is currently at the early stages of developing an alternative RPPI using Big Data from property advertisement web portals. Currently three real estate web portals supply data covering 50 cities to the BI monthly. These data are individual property listings and include detail on offer type (rent or sale), asking price, property type, lot size, dwelling size, number of bedrooms, number of bathrooms, and address as well as any additional characteristics that are recorded as "free-text" (such as garage, gated property, swimming pool). To date, work has focused on data preparation and extraction, and the compilation of prototype indexes using a simple mix-adjustment by stratification methodology. The staff working on the project has a very good understanding of the processing requirements in respect of data preparation and already made significant progress.

10. The BI should continue the Big Data project as it offers considerable potential for the compilation of robust asking price indexes following a hedonic methodology. This is particularly the case given the unavailability of suitable price observation data from administrative sources. The BI noted that listings data primarily cover the secondary market only and it was agreed that the Big Data project therefore should focus on that market. The BI should continue to follow the survey based approach for the primary market, in the absence of suitable alternative source data.

11. The dataset of listings should be subset to include only first instances of listings for each property at a unique price. In other words, a listing should only be included in the first month in which it appears, unless the list price is revised – in this case the update listing should be included in the month of update also. The same listing price for a property offer should not be included for more than one month since to do so would implicitly give a larger weight to those properties which take longer to sell. Listings for property rental should be distinguished from sale offers and apartment listings need to be distinguished from landed houses

12. The BI could target the compilation of a prototype hedonic sale price index for Jakarta by the end of 2018. Focusing on one region will allow the staff to develop an understanding of the regression-based approach before applying new skills and experiences to other regions. Similarly, the staff should initially work on one hedonic methodology only – the semi-log rolling-window time dummy method is particularly well suited to the initial "learning and testing" phase since the rate of price change is a direct output of the regression models. The mission detailed steps that the compilation process could follow:

- Subset the listings to include only first instances of sales listings for each property at a unique price;
- Focus initially on the Jakarta region and the semi-log rolling window time-dummy method;
- For the initial stage of development use core property characteristics only. There might be potential to use free-text reported characteristics at a later stage;
- Compile and analyze summary statistics for prices and property characteristics to understand data distributions and the requirements for potential edit checks and thresholds;
- Develop an appropriate level of locational stratification and compile and analyze summary statistics. Balance granularity with the requirement for sufficient observations in each stratum;
- Run regressions for 12-month windows and check the consistency of regression diagnostics across different windows;
- Use dummy variables for categorical values and test the impact of grouping continuous values as dummies (for example group age according to new/1-5 years/6-11 years etc.);
- Apply an appropriate test for the identification of outliers - Cook's distance is a good first option. Run the regression a first time to identify outliers and then a second time with the outliers removed;
- Check the plausibility and significance of the coefficients, as well as the overall fit and diagnostics for the model; and
- Weight component indexes by the value of advertised properties.

Recommended actions:

- Continue the Big Data project, guided by the detailed steps outlined by the mission.

E. The Commercial Property Price Index

13. The BI also publishes statistics on the commercial property sector based on appraisal data provided by external property market experts. The CPPI covers 7 segments (offices, retail, apartments, hotels, industrial estates, convention halls, and warehouses) in 10 major cities, with an 11th currently being added.) Data are collected via face-to-face interviews with more than 2,700 respondents covering property supply, occupancy as well as sales and rents. International experience to date suggests that private sector data, such as the use of expert appraisals, currently offer the best potential in respect of source data for CPPI compilation. However, the BI should keep an open mind as to the possible development and use of administrative data sources in the future.

14. Rent-price and sales-price indexes are compiled for the different market segments in each region and these are weighted to a national index using market capitalization values. The headline index (the CPPI), is an index of activity rather than a pure sales-price index, since it takes market capitalization rates and rent prices into account.

15. The BI should extend the published statistics on the commercial property sector to include a national sale price index and a rent price index. The compilation of a broad range of indicators is in line with the data requirements for the formulation of macro-prudential policy. The mission and the authorities agreed on a target of Quarter 1, 2019, for the publication of an expanded statistical release.

Recommended action:

- Extend the current CPPI publication to include a national sale price index and a rent price index.

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