

**Concluding Workshop on RETA 5869
Strengthening and Collection of Financial and Monetary Statistics
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Country Paper

**COMPILATION, ANALYSIS AND INTERPRETATION OF
COMMONLY AGREED MACRO PRUDENTIAL INDICATORS**

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1. INTRODUCTION

As a follow-up of Inception Workshop on RETA 5869: Strengthening and Collection of Financial and Monetary Statistics in Selected Developing Member Countries (DMCs) held in ADB Headquarters, Manila on 4-6 April 2000, a set of indicators have been introduced and they were commonly agreed to be assumed as a Macro Prudential Indicators (MPI). The MPI consists of 67 indicators, classified in 6 groups, as follows:

- a. External debt & Financial flows (6 indicators)
- b. Money (15 indicators)
- c. Banking (12 indicators)
- d. Interest Rates (8 indicators)
- e. Stock market and Bonds (7 indicators)
- f. Trade, Exchange and International Reserves (10 indicators)
- g. Business Survey Data (9 indicators)

In addition to those 67 core indicators, the workshop also introduced 43 additional indicators that were classified as follows:

- a. External debt and Financial flows (2 indicators)
- b. Money and Credit (2 indicators)
- c. Banking (7 indicators)
- d. Interest rates (4 indicators)
- e. Stock markets and Bonds (5 indicators)
- f. Business Survey Data (4 indicators)
- g. Supervisory Surveys (1 indicator)
- h. Additional topics from IMF indicator list (17 indicators)
- i. Other: Real Estate Price Index (1 indicator)

As discussed in the inception workshop, the purpose of MPI was to monitor the soundness of the monetary and financial sector in a country. In response to financial crises that experienced by Asian countries starting in 1997, there is an increasing need to a set of indicators that can monitor the upcoming crises, hence the country

can prepare the appropriate policy to anticipate the coming crises or to minimize the impact of crises.

2. COMPILATION OF MPI

a. Sources of Data

The data needed to build the indicators come from various sources. In Indonesia, there are several institutions that prepare/produce the data, particularly related to economic and monetary statistics, including Bank Indonesia (the central bank of Indonesia), Central Bureau of Statistics, Ministry of Finance and Capital Market Supervision Agency (namely BAPEPAM). The data related to monetary indicators and banking activities are produced by Bank Indonesia based on the balance sheet of Bank Indonesia as a monetary authority and banks financial reports submitted to Bank Indonesia monthly. The data for real sector indicators including gross domestic product (GDP), production index, wages, etc, are produced by Central Bureau of Statistics, while data related to fiscal sector are produced by Ministry of Finance. BAPEPAM produces data that related to activities in stock market and bond market.

In Bank Indonesia there are many directorates/divisions that collect and process data/information. Some of the data, especially macroeconomic and monetary statistics, have been already maintained in economic and monetary computer databases and files at the Directorate of Economic and Monetary Statistics. The rest are maintained at other divisions/directorates such as Directorate of Foreign Affairs for data related to external debt and Directorate of Banking Licencing and Information for data related to banking supervision.

With respect to MPI set by ADB (67 indicators), about 88% of total indicators complete and they have been sent to ADB. The rest can not be completed due to several reasons:

- The indicator of central bank lending rate (indicator # 34) is not relevant since the central bank is no longer extending credit to bank according to existing new law (law #23 of 1999).

- Indicator of USD-international market/Domestic Real Dep. Interest rate (indicator # 39) needs a clear definition about the component of the indicator.
- The rate of Bond/ Treasury Bill Yield (indicator #40) is also not relevant and inapplicable due to undeveloped bond market in Indonesia and unavailability of Treasury Bill instrument in Indonesia.
- Share of 10 largest Stocks in Trading (indicator #43) is not available.
- Composite Stock Price Index in USD (indicator #46) is not available, but it is available in domestic currency as shown in indicator # 44.
- Business survey is conducted by Bank Indonesia quarterly, and the result is concluded by using net balance method that calculates the difference between the percentage of respondents choosing the increase answer to those choosing decrease answer. With regard to MPI, the survey produces the indicator (in term of net balance) the assessment of current business situation (indicator #59), expectation on business situation in next quarter (indicator#60), and selling price as well as employment in future tendency as shown in indicator # 64 and 65 respectively. The other indicators as of assessment of order books (indicator#63), financial situation (indicator #66) and access to credit (indicator #67) are not available currently.

b. The Methodology

All data from various sources are obtained through email facility, except data from Directorate of Information Technology are obtained through online ftp transmission. Those various data are sent to Data Processing Division at Directorate of Economic and Monetary Statistics, where data are integrated, processed and converted into an excell format. Finally the excell format data are sent to ADB.

In Directorate of Economic and Monetary Statistics, the hardware used is H50 IBM RISC 6000, Operating System is AIX, database is Oracle version 8 i. There are also ms-excell programs and files in personal computers used in other divisions within the Directorate.

In Directorate of Information Technology, the hardware is Mainframe CMOS/IBM, Operating System is VSM, and flat files.

In Directorate of Banking Licence and Information, the hardware is S80/IBM, Operating System is AIX, database is Oracle version 8 i.

The Directorate of Foreign Affairs use ms-excell programs and files to process their data.

c. Problems

Mostly problems occur in collecting data because data come from various sources and they are processed in different databases or systems that take place in different directorates within Bank Indonesia (as mentioned above) and different agencies/institutions outside Bank Indonesia. This condition also causes different data time-lag for particular data. In this regard, extra effort is needed to obtain the data and to keep the timeliness of the data. The problem will be heavier if the data is an unpublished data or treated as a temporary confidential.

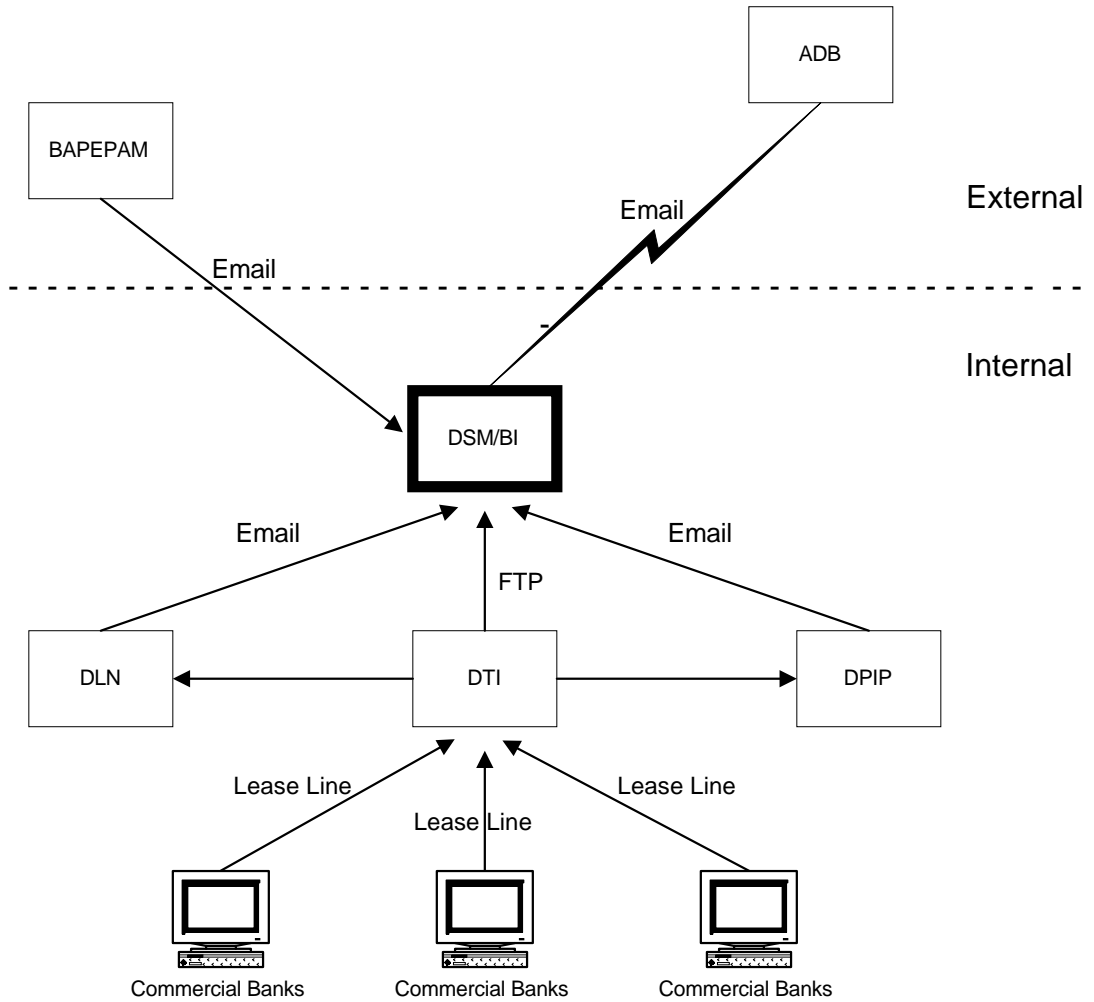
Another problem is that different definition of an terminology might be applied by different source of data. As an example, the term **credit** might have different definition according to bank supervision and monetary concept. In this regard, the compiler of MPI should have the knowledge to identify those two concepts

d. Data dissemination

The Economic and Monetary data and information are disseminated in the form of hard copy/publication and through Bank Indonesia's website and intranet. The commonly agreed indicators or Macro Prudential indicators are sent to ADB through email. We have just developed datawarehouse where data can be accessed and analyzed freely by internal users and reports can be disseminated through web technology. Because the datawarehouse is still in its early stage, the data coverage is limited to few indicators only and data needed for MPI are not yet

populated into the datawarehouse. Therefore the preparation of MPI data still involve meticulous manual procedures.

FLOW CHART OF MPI DATA



DSM : Directorate of Economic Monetary Statistics
 DLN : Directorate of Foreign Affairs
 DTI : Directorate of Information Technology
 DPIP : Directorate of Banking Licence & Information
 BAPEPAM : Capital Market Supervisory Agency

3. ANALYSIS AND INTERPRETATION

a. Analysis

Basically, the indicators can be analyzed into 2 different approach, namely quantitative analysis and qualitative analysis. Quantitative analysis use statistical method or econometric model. Qualitative analysis does not need mathematics or econometric model. No single approach of analysis is the best for all. Each of them has its strengths and weaknesses. The best approach is a combination of both of them.

With regard to MPI indicators, they can be analyzed in two ways as of time series data analysis and cross section data analysis. Time series analysis describe the movement of indicators in a certain period of time. Moreover by using an econometric tool, the estimated of the indicator could also be predicted. Cross section analysis need the ability of the analyst to analyze the inter- relationship between one indicator to another indicator, and also the inter- relationship among indicators. It needs the comprehensive outlook of an analyst and a knowledge to investigate the relationship among sectors (as of real sector, monetary sector, fiscal sector and external sector) in macro economic activity.

Before analyzing the indicators, analyst should understand how the indicators (in term of ratio) were constructed and how the data for ratio were defined. The analyst should realize the limitation of the aggregated data and he or she also has to keep in mind that due to specific characteristics of the country, the potential bias might arise if the indicators of a country will be compared to those of other countries.

b. Interpretation

The interpretation of MPI can be described as follow:

- **External debt & financial flows**

The ratio of total debt to GDP indicates the solvability of a country, particularly the ability to repay total external debt using one year income

namely GDP. Elaboration of the ratio into public debt and private gives an idea about the liability of both agents. The ratio of long term debt to total debt will inform the safety rate of the debt with respect to the liquidity problem (in one year) and the ratio of short term debt to GDP gives warning about the absorption GDP for short term debt repayment. The ratio IMFcredit used to GDP reflected the dependency of a country to IMF. The ratio of Foreign Direct Investment (FDI) and Portfolio Investment (both of them are referred to GDP) not only reflects the capital inflow as a source of fund to invest, but also reflects the perception of investor about prospect of domestic economy.

- **Money**

The growth of money either M1(narrow money) or M2(broad money) describes the development of liquidity in the economy, while money multiplier indicates velocity of money. Using Keynes formula as of $MV=PY$ where M = money, V= velocity of money, P= price and Y= real output, the interrelationship of those variables can be analyzed. The ratio of M2 to International reserve and the growth of M2 over International reserve shows the portion of broad money that is supported by international reserve or vice versa and this portion moves over time. Another concept of money is base money or reserve money or money base (M0). Money base growth shows the movement of money base over time. One of the factors that affects money base is central bank credit to the banking system. This indicator shows how “the money” is created by central bank and distributes it to banking system.. Banking system could also allocate credit, either to public sector or private sector or both. The composition of credit to both sector will be reflected by the ratio of credit to public sector and to private sector, both are in percentage of GDP.

- **Banking**

Banking indicators describe banking condition in a country. The indicators that relate to capital (capital adequacy ratio and bank capital to total asset ratio), asset quality (as indicated by non-performing loan ratio), earning (net

profit ratio) and liquidity (liquidity ratio and loan to deposit ratio) give the indication about the soundness of banking system in the country. The share of 3 largest banks (as % of total) indicates the distribution of banking system. Besides showing the soundness of banking system, the banking indicators also describe the composition of credit channeled by banks (industrial credit ratio and real estate credit ratio) and how the banks finance their placement with respect to international borrowing (short term or long term borrowing).

- **Interest Rates**

Interest rate (as well as exchange rate and inflation rate) is one of indicators that indicates the upcoming financial crises obviously. High depreciation of domestic currency (for country that implement the free floating rate system) followed by increasing in prices (particularly due to imported inflation) will affect an unavoidable tight monetary policy with a result of increasing domestic interest rate. There are some indicators that related to domestic interest rate as shown in MPI. However, the money market interest rate is an indicator that firstly tends to react to the crises. The other rates, such as lending rate and deposit rate also react but with a time lag.

- **Stock Markets and Bonds.**

Stock markets and Bonds are the alternative sources of financing. The indicators of composite Stock Price Index reflect the activity of the markets. The foreign share in trading (% total volume in trading) not only indicates the openness of the market, but it also could give the signal regarding foreign investor perception on the domestic economy. The distribution of stocks in trading can be described by the share of 10 largest stock in trading.

- **Trade, Exchange Rate and International Reserve**

As explained before , exchange rate is one of the indicators that could give the signal about the potential crises obviously. With respect to monitoring the financial crises, the exchange rate indicator should be overseen in more

frequent basis. In anticipating the currency crises, the external sector of macroeconomic indicator should be evaluated, such as export growth, import growth, trade balance , current account balance and international reserve.

- **Business Survey Data**

Business survey, based on the opinion of businessmen of all sectors in the economy, gives information about business activities during the survey period (current quarter) and the estimated business activities in the next period (next quarter). The indicator could give signal about economic activity and it also can be used as a proxy of gross domestic product. The survey includes various information related to business activity (some of them are not ready) such as limitations to business, stock of finish product, assessment of order book, selling price, employment, financial situation and access to credit.

4. IMF-MPI SURVEY (MPIs SURVEY)

For the purpose of monitoring the financial condition of its member countries, the Fund needs a core set of indicators. In this regard, the Fund has proposed and introduced Macro Prudential Indicators (MPIs). The MPIs comprises both aggregate micro prudential indicators of the health/soundness of financial institution and macroeconomic variables associated with financial system vulnerability. The aggregate micro prudential indicators consist of 5 groups of indicators, as of capital adequacy, asset quality, profitability, liquidity and sensitivity to market risk. Each group of indicators describes the related aspect of financial condition of the financial institution. The amount of indicators in each group varies from one group to another.

The macroeconomic indicators aim at capturing events that can become a source of vulnerability for financial system, assuming that macroeconomic developments have often preceded banking crises. With this regard, selected macroeconomic variables will be evaluated, particularly the indicators that can be described as factors that affect an economy's sensitivity to capital flow reversals and currency crises, such as trends in economic growth and balance of payment, level and volatility of prices, interest and exchange rate, etc.

MPIs Survey Result

MPIs survey had been conducted by Bank Indonesia in response to IMF letter dated on June 2000 about the MPI survey. The questionnaires were distributed to several institutions that represent financial sector supervisor, analyst and policy officials within central bank, financial market participants and analyst in academia. The response from academia was not received. The survey result concluded that the availability of MPIs would be needed by respondent. They considered the indicators were either useful or very useful and could be provided regularly. Additional information from the survey are as follows:

- a. The respondents are doing research on the health/soundness and stability of the financial system and focusing mainly on the banking sector. In this regard, they use trend and aggregate data of financial sector and employ statistical method such as forecasting the economic indicators to assess the risk of banks.
- b. Although there are many kinds of financial institutions other than depository corporations in Indonesia, such as capital market, pension funds, insurance companies, brokerages, the focus of the research was only on banks and capital market, due to their significant roles in the soundness of financial system and the availability of the data. Respondent from banking supervision sector mentioned that in addition to aggregation method, analysis on group of banks is needed to be explored. They adopt analysis not only using CAMEL, but also incorporating risk assessment for market risk using statistical method.
- c. Adjusted international standard is a preferable norm to be used for MPIs.
- d. For presentation of MPI, respondents prefer single point estimations and ratios.
- e. Composite measures is also needed as an addition tool.
- f. For a comparison and as an additional information, business survey result is also used to supplement the analysis of MPIs.

With regard to component of MPIs, particularly the 5 groups of aggregate micro prudential indicators, some comments are as follows:

- a. The Basle Tier III Capital Adequacy Ratio currently is not available

- b. Regarding the asset quality indicators, it should be noted that aggregation method is hardly contributing an accurate analysis. Aggregation by group of banks will be more useful. Related to ratio number 2.7 (Ratio of credit to related entities to total credit), the aggregation method will eradicate the meaning of legal lending limit for related party.
- c. Ratio number 2.15 (Ratio of household total debt to GDP) currently is not available and it is considered inapplicable from supervision point of view. This ratio enriches the analysis of macroeconomic policy only.
- d. Indicator number 2.16 (Number of applications for protection from creditors) is not available.
- e. Although ratio number 3.1 (Ratio of change in number of depository corporations) can be considered as a good indicator, the indicator hardly changes in short term of period.
- f. Ratio number 4.7 (Average daily turnover in the T-bill or central bank bill) currently is not available or if available, it is rare to trade.
- g. Due to the existing new Law, Bank Indonesia is no longer extending credit to banks. Hence, ratio numbers 4.9 (Ratio of central bank credit to depository corporation to depository corporations' total liabilities) is not relevant anymore.
- h. Most of indicators that relate to sensitivity to market risk (indicator number 5.1 to 5.10) are not available.

The Feasibility of MPIs

MPIs might be useful both for IMF and for member countries. The Fund staff would make use of the MPIs for monitoring financial condition of member countries. Member countries might use the MPIs for analysis financial condition of the country as well as to predict and to prevent economic crises. However, criticism (if any) should be taken into account and it could be useful as an input for improving the MPIs. Some critical view might arise, as follows:

- a. The MPIs could not be used as a single tool to compare the financial condition of a country to those of another. Each country has its own prudential regulation and the regulation is defined according to the view that is specific only to the country's

situation. In this regard, the MPIs should be developed continually on the basis of evidence of best practices that are comparable across countries.

- b. Since the MPIs is using aggregation method, it should be noted that the information would be probably misleading. The aggregation for groups of banks might be used as an alternative to avoid misleading conclusion.
- c. Due to limitations in information system, some information might not be available currently in some countries. For example, information of borrowing institutions (including households) might not be available, or if they are available they could not be provided regularly.
- d. Due to incomplete data, some information might be treated as temporary confidential information. The information might be misleading and it could give the bias perception on banking sector.

5. FUTURE PLAN ACTIVITIES

There is no doubt that the workshop as an activity of Regional Technical Assistance (RETA) 5869 on strengthening and collection of financial monetary statistics is important and very useful for participants. Each participant can share and exchange his experience in strengthening and collection of financial and monetary statistics as well as identifying the set of indicators that can monitor the soundness of monetary and financial sector, namely MPI. With respect to achieving an effective MPI to monitor the upcoming crisis, some follow-up activities are needed , as follows:

- a. Test the Commonly Macro Prudential Indicators (MPI) .
MPI should be tested whether it can give the signs of up-coming financial crises. The test might be done for a certain period of time.
- b. Evaluate the relevancy and adequacy of the indicators.
The indicators should be evaluated for their relevancy in describing financial condition whether the amount of indicators is enough to give signals on financial and currency crises.
- c. Dissemination of MPI indicators must not be done before they can be concluded as best indicators.

Some indicators of MPI might be biased and they could give the wrong signal and its impact to market perception. In this regard, we suggest the MPI should be used for internal analyst only and no dissemination is done until it can be well assured that MPI is unbiased and it is feasible for external use

- d. In addition to point c above, with our experience with SDDS, it is quite difficult to maintain the observance to the IMF-SDDS requirements especially in the aspects of data timeliness and periodicity. The SDDS data source is also spread out to various agencies/ institutions and internal directorates. With this condition, it is not easy for a country coordinator to compile data from various sources although the related agencies/institutions have the commitment to release the data according to SDDS requirement. In this regard, we recommend that MPI indicators are not to be disseminated too soon in the near future, as to give time to the participating countries and the source data providers to improve their respective information and dissemination systems.