

# Which Data is Useful in Quickly Estimating Economic Trends?

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## 1. Introduction

1. In order to actively cope with the negative effects of a recent financial crisis, it is important for policy makers and analysts not only to understand short-term and long-term trends of their economies but also to identify sources, developmental processes, and economic impacts of the crisis.

2. The present financial crisis has been characterized by spreading its impacts synchronously over developed, developing and emerging market countries. The crisis seems to be different from past experiences with economic effects limited to a few countries or confined regions. These features seemed to have originated from weakened regulations of capital transfer and the international integration of financial markets through globalization.

3. Since the cessation of the Cold War, globalization has progressed toward the way that financial assets and derivatives are pegged or linked gradually with the US dollar. Emerging markets and BRICs economies have been incorporated quickly into the world economy, and the volume of world trade and the scope of financial markets have expanded. Under these circumstances, the US financial crisis, which seems to have stemmed from the collapse of bubbles in housing prices, has been circulated into regional financial markets in Europe, Latin America, and Asia through de-leveraging effects of foreign exchanges and financial assets. At the present, most countries are suffering from a severe economic recession, which is regarded as a negative influence of this crisis.

4. For minimizing the impact of an economic crisis, policy makers and analysts have to identify its symptoms in advance and also tackle its shocks positively with swift and adequate measures. If they do this work program, they should check economic situations and estimate short-term trends quickly and periodically on the basis of rapid indicators related to the crisis. On the other hand, the policy authorities' understanding

about current economic trends and its communication may be contributed to stabilizing economic turmoil because these actions help economic agents decide executable projects and make their investment schedules.

5. In Korea, the Ministry of Strategy and Finance (MSF) lists a daily table on economic rapid indicators, and publishes a monthly report about current economic trends. The MSF makes comments including explanations about released principal indicators by NSOs – for example, industrial activity and economically active population – and even about economic outlooks by the OECD and IMF. Also, the MSF often releases policy reports on policy directions and action plans.

## **2. Financial Crisis and Early Warning System**

### **2.1 Financial Crisis and Rapid Indicator**

6. Generally, a financial crisis may occur endogenously within the domestic sector or introduced exogenously from the foreign sector. The recent financial crisis is included in the latter case because the economic crisis took place in the US economy, and was transmitted to other countries through the integrated worldwide financial mechanism.

7. In the case of the domestic sector, a sharp decline in housing prices or a shocking contraction of household credit may lead to a financial crisis. A burst in the housing market bubble gives rise to negative impacts on households, housing and real estate companies, and their related financial companies through reciprocally trading and financing mechanisms. Also, an unexpected shrinking of household's financing limits contracts households' balance of savings and assets due to paying back mechanism of personal debts. As a result, shrinking shocks of housing sector and household sector give a negative effect on a whole economy including financial institutions. In Korea, there was a collapse of bubbles in personal credit markets in 2003, which was caused by excessive usages of personal credit cards.

8. With the rapid indicators of the real estate market and financial market for households, it is possible to monitor symptoms of bubbles in housing prices and household's liabilities, and also to actively identify a risk of the bubble collapse.

Examples of rapid indicators include housing prices, mortgage loans, households' loans and credit.

9. On the side of the foreign sector, a shortage of foreign exchange or a shock of an unstable world financial system may also bring about such a financial crisis. For instance, export curtailment or mass outflow of capital due to reimbursement of short-term external debts would provoke a supply shortage at a low balance situation of foreign exchanges. While many foreign assets are exchanged into the US dollar or Japanese yen and moved backward under an insecure financial environment, another shortage of foreign exchange may also be incurred in developing and emerging countries. These shortages cause foreign exchange rates and market interests to increase and stock prices to fall. Hence, financial markets become much more unstable and vulnerable than no shortage. As a result, investment and production activities shrink and consumption expenditures of households become tight due to high prices, presenting the risk of an overall economy falling into a severe recession.

10. Negative shocks of these foreign exchange shortages have a stronger influence particularly on small open economies with relatively significant external trade. Hence, it is necessary to carefully monitor short-term trends of rapid indicators related to financial markets and exchange markets, in order to identify a risk of such a shortage. Examples of related rapid indicators include transactions in securities, issuance and balance of bonds, external debts and assets, foreign currency reserves, stock price index, and exchange rates.

11. Additionally, a sharp increase in the prices of oil or principal raw materials may lead to an inflationary shock and even have a recessive impact on economies with insufficient natural resources such as the oil shocks of the 1970s. If this inflationary shock happened simultaneously with a financial crisis, an economic recession would be more severe. Hence, it is necessary to collect price indicators of domestic and world markets, and to identify the symptoms behind sudden movements in price fluctuations.

## **2.2 Early Warning System**

12. For maintaining a stable and robustly growing economy, it is essential to identify symptoms of an economic crisis in advance and remove or weaken the risk of a crisis. An Early Warning System (EWS) makes it possible to execute this strategy. The

EWS is a procedure in which a set of rapid indicators or econometric models are designed to diagnose an economic crisis, and the probability of a crisis risk is suggested by the Early Warning Indexes (EWI).

13. A compiling process of the EWI is divided into 4 steps. First, raw data is collected concerning leading variables related to an economic crisis. Second, seasonal and irregular variations are removed from the raw data for smoothing, and then, standardized series are calculated by means or standard deviations. Third, a composite index is computed by a simple arithmetic average technique. Finally, an EWI is compiled by transforming the composite index into a scale of scores from 0 to 5. This transformation is required to show the level of crisis risk, which corresponds to 5 distinct situations; normal (0-1), concern (1-2), care (2-3), caution (3-4) and danger (4-5).

14. While designing an EWS for an individual economic sector, it is very important to select predictable variables as a component indicator. Typically, an EWS has 2 to 7 sub-sectors, and each sub-sector has 2 to 10 variables which have a high probability to reveal symptoms of an economic crisis. Therefore, it is recommended that an EWS have 10 to 30 indicators for easy compilation and interpretation.

15. Since the Asian economic crisis, the EWS has been designed for external trade sector and financial market sector against a foreign exchange shortage and a financial crisis. A beneficial strategy might be for the EWS to be additively designed for other sectors such as crude oils and raw materials, real estate including housing, labor demand and supply. A number of economic sectors for the EWS depend on financial and historical environments of each country. In this case, an EWI is calculated respectively for each individual business sector. And then, an integrated EWI is compiled by aggregating EWIs of all economic sectors and becomes a valuable indicator which makes it possible to identify a crisis risk of an economy

16. Of course, when an integrated EWI is computed, an ideal weight may be given to each variable or sub-sector according to its economic importance. If so, the weight should have reasonable and acceptable sources. If not, the arithmetic average technique is recommended. However, for an efficient EWS, it is very important for the compiler to know that component variables should be tested periodically for predicting for probability of an economic crisis.

### 3. Case Study for Useful Data

#### 3.1 Flash Estimates

17. A flash estimate is defined as a value compiled with restricted data within 30 days after the reference period to meet the need of timeliness for a rapid indicator which is released over one month later. Here, the meaning of estimating is different from forecasting or projecting future situations from a point that an economic performance during the recent past is estimated as a rapid indicator on the basis of incomplete data and other useful information.

18. To quickly estimate economic trends is dependent on how fast related useful data is collected. Moreover, the quality of flash estimates may be high or low according to the types of basic data. In other words, the accuracy and timeliness of flash estimates rely on whether they are flow variables or stock/situation variables. Flow variables can not be measured until the conclusion of the reference period. Hence, their actual indicators tend to be released with some delay, because much effort and time are required to collect, transmit, and process data such as production, sales, and income. On the other hand, administrative records can be used with sufficient information and with high coverage because these records are collected by various efficient reporting systems such as approval and registration. Most of them seem to be stock or situation variables available immediately after the completion of the reference period like assets, debts, and unemployment.

19. The basic data for estimating can be often gathered from an administrative procedure or electric records on trade, economic agents' transaction statements on behalf of their benefits. Well-defined data is released such as monthly reports on automobile sales, new automobile registration, and electric power sales. Among them, data on credit card sales and cash receipt issuance is useful for estimating consumption trends. In addition, records on exports and imports can become flash estimates for external trade.

#### 3.2 Data on Credit Card Sales and Cash Receipt Issuance

20. Credit card or cash is regarded as a means of payment for goods and services. In Korea, personal records on payment by credit card and cash are required for the

year-end tax adjustment, and related documents should be reported to the National Tax Service (NTS) for tax return benefits. Therefore, it is advantageous for consumers to document their payment records such as credit card statements and cash receipts.

21. According to the credit card payment system, sales records concerning goods and services are transmitted into accounts of credit card companies by an electrical mechanism. Hence, payment records of credit cards can be easily transformed into sales data of retail and service establishments. The credit finance association is responsible for the collection and classification of these payment records. On the other hand, the NTS has permitted cash receipts issued by establishments as documents for tax adjustment sources. And the NTS has stipulated that establishments not only issue payment receipts for cash purchases in case of a purchasers' request, but also report receipt records to data collection agencies. As a result, detailed data on establishments' sales by credit card and cash are collected through these mechanisms.

22. The official report pertaining to credit card sales and cash receipt issuance during 2007 was released at the end of 2008. In this report, records on sales are classified by region of merchant and by industry of merchant. While quarterly data is published as aggregated indicators, monthly data is not available. The coverage of this data is shown to be about 70% of the national consumption expenditure of the household sector in the 4<sup>th</sup> quarter of 2008.

23. Nevertheless, monthly data with detailed items may be used internally in order to monitor short-term trends of retail sales or household consumption expenditures. If the coverage and payment ratio by credit card and cash are known, this data would be very useful in estimating retail sales indicators, which are released as survey results at the end of the following month. Particularly, credit card sales data regarding sales stores can be alternative indicators of retail sales indexes. In practice, when this data is compared with corresponding retail sales indexes, department stores, large scale-markets, and supermarkets have high coverage and display significantly consistent trends.

### **3.3 Records on Export and Import**

24. Records on exports and imports by a customs clearance procedure can be transformed rapidly into statistical data, because the E-customs system makes it

possible to collect data swiftly in Korea. Hence, rapid indicators for exports and imports can be compiled faster than other economic indicators. In practice, flash estimates and final indicators regarding export and import trends are released respectively in the beginning and in the middle of the following month. In addition, a report on the balance of payment is published at the end of the following month.

25. First flash estimates of export and import trends are released on the first business day of the following month by the Ministry of Knowledge Economy (MKE). The MKE compiles these estimates on the basis of records stated at the time of customs clearance. A released document includes average export and import data per day. This data is regarded as indicators that a part of seasonal and calendar factors is removed from aggregate data for smoothing. The gap between export and import amounts is regarded as the first rapid estimate related to the trade balance for commodities. This trade balance is the most important source of foreign exchanges. However, data with detailed items and regions can be available only with imperfect information, because detailed items are summed up to the 20<sup>th</sup> day of the month.

26. In the released document by the MKE, import records about crude oil including petroleum products and gas are suggested as rapid estimates because the Korean economy is very sensitive to energy resources. The volume and unit price of crude oil are also reported on a monthly basis. To monitor essential contents of export trends, export records concerning major items are estimated on the basis of summed data to the 20<sup>th</sup> day of the month and other information related to their trends. Major export items are as follows; petroleum products, petrochemicals, steel products, machinery, computers, semiconductors, electronics, wireless communication devices, automobile, automotive parts, and ships.

27. Final rapid indicators of export and import trends are released in the middle of the following month by the Korea Customs Service (KCS). These indicators reflect corrections and withdrawals of export and import items which are stated early at customs clearance. In this released report by the KCS, two types of indicators are suggested; one is compiled on the basis of data recorded at customs clearance, while the other is estimated with data collected according to the date of port departure. However, for the user's convenience, this report has an attached document concerning two differences including their sources; one is the difference between flash estimates and final indicators, while the other is the difference between two types of indicators. In

practice, the rapid indicator based on date of port departure can be used for estimating current account surplus / deficit in the balance of payment report.

### **3.4 Inventory of Rapid Indicators**

28. In order to diagnose the present and future situations of business trends in an economic crisis, it is necessary to gather and review various types of rapid indicators about economic performances or financial situations. Presently, an inventory of rapid indicators could be assembled to monitor the situation and the development of the economic crisis. The inventory is regarded as a set of rapid indicators like data, records, indicators, and even estimates.

29. For selecting rapid indicators in the inventory, a few features of indicators should be taken into account. First, a comprehensive and representative indicator is considered as the first indicator for each economic sector. Second, preference is given to a high-frequency indicator because of its timeliness and sufficient information. Third, an indicator that includes the symptoms of an economic crisis becomes an ideal indicator for the inventory.

30. According to Korea's experience, an ideal inventory of rapid indicators can be designed to monitor current economic trends. The inventory consists of 6 economic sectors as follows; 1) real economy sector including production, sales, investment, and consumption, 2) business cycle sector with cyclical components and business tendency data, 3) foreign trade sector including external trades of commodities, services, and capital, 4) financial system sector with financing market and exchange market, 5) inflation sector including prices of crude oil and raw materials in world market, and 6) economic performance sector with comprehensive indicators such as national accounts and employment.

## **4. Conclusion and Remark**

31. Each country or international organization, as mentioned earlier, can design an inventory of rapid indicators including flash estimates for identifying an economic crisis. An early warning system can also be available with useful economic variables related to the crisis. In this case, policy makers and analysts could get very important information

not only in the process of managing the inventory of rapid indicators and monitoring the business trends but also from internally or officially operating the EWS and identifying symptoms or risk of the crisis. Especially, the EWS may include unofficially released but internally useful administrative data with high quality to satisfy user's timeliness.

32. There is a trade-off relationship between the timeliness and the accuracy for rapid indicators or flash estimates. However, there is a possible strategy to solve this difficulty. First, flash indicators need to be estimated by using available survey data and relevant administrative data to meet the user's timeliness. Next, the accuracy of these indicators should be improved through developments in compiling or estimating methods by the quality control. In Korea, quarterly national accounts are released as flash estimates on approximately the 25<sup>th</sup> day after the reference period, but there are only very little differences as compared with the preliminary indicators on approximately the 70<sup>th</sup> day. Perhaps, this constructive performance seems to be caused by utilizing various methods as follows; various rapid survey indicators and administrative data, econometric techniques like time series models and regression models, and even benchmarking with released news and flash data about strikes and business conditions.

33. On the other hand, various types of business cycle indicators are required to forecast future business conditions. Leading composite indexes on business conditions, which are compiled in the USA, Japan, Korea, and OECD, are worth benchmarking in other countries. Diffusion indexes or composite economic sentiment indexes can also be available as separate business cycle indicators with leading power. In Korea, the monthly diffusion index of production activity is released quarterly. This index is compiled with 165 sub-industry production data including service industry and NSO-CIS software program.

34. To improve the timeliness of rapid indicators, low frequency indicators are necessary to be transformed into high frequency data. For example, annual indicators may be divided into quarterly data or quarterly indicators may be disaggregated into monthly data through developments of quarterly or monthly surveys or with high-frequency administrative data. As a high frequency indicator, a monthly index of all industry activity is released as a comprehensive indicator about economic performance in Japan. Also, a monthly GDP is published in Canada Statistics. Now, the KNSO is developing a monthly production index in all industry similar to Japan's indicator, and a monthly GDP is expected to be a challenge in the future.