

Economic Activity Index for the Republic of Korea

The indicator selection process for constructing an Economic Activity Index (EAI) for the Republic of Korea (ROK) is based on an automatic variable selection process. The approach uses statistical techniques to guide the identification of the basic set of indicators. To improve the EAI's accuracy in tracking the economic cycle in the ROK, the possible inclusion or exclusion of indicators are also explored. The indicator selection procedures for the ROK are:

- i. Monthly indicators are extracted. For the ROK, the monthly data for estimating the EAI start in 2000. Data starting after 2000 are excluded. These include household lending by depository corporations and domestic credit card usage, which start in 2003; central government debt, which starts in 2012; foreign purchases of stocks and bonds, which start in 2010; and house sales prices, which start in 2011.
- ii. Further treatment to the data is applied as needed:
 - a. Series with different base years are spliced to have a common base year. The latest base year is always used as the rule of thumb.
 - b. Series with obvious seasonal patterns are adjusted to remove seasonality using the X-13 ARIMA package in EViews.
 - c. All series in levels are converted into log values. Variables already in percentages or rates of change are retained for the estimation.
 - d. An autoregressive of order one—AR(1)—procedure is applied to complete the series in the dataset to the latest month of observation to deal with ragged ends.
 - e. All indicators are rescaled to have a mean zero and standard deviation of one.
- iii. To identify the relevant indicators for inclusion in constructing the EAI for the ROK, three alternative filters are used:
 - a. Correlation method: The correlation of each indicator with the gross domestic product (GDP) growth rate is computed using Pearson's correlation, and those indicators with less than 50% correlation are removed. This set of indicators are called GDP growth-correlated indicators.
 - b. Model averaging techniques: The two most common ways of model averaging—Bayesian model averaging and weighted-average least squares—are used. These averaging techniques help determine the set of indicators for constructing the EAI.
- iv. For the ROK, weighted-average least squares produced the EAI with the best fit in tracking the growth cycles.
- v. To improve the fit, an ad hoc examination—using economy-specific knowledge—of the existing set of indicators was conducted. The following steps were taken:
 - a. Indicators that did not closely co-move with the growth cycle, such as the unemployment rate, were removed; this improved the EAI's performance in tracking the growth cycle.
 - b. The US Industrial Production Index and US Federal Funds Rate were added to capture the external effect on the economy. Both indicators were preselected by the growth correlation method.

List of Selected Indicators

CATEGORY	ECONOMIC INDICATOR
CONSUMPTION	<p>Name: CPI: All Items excluding Agricultural Products & Oil (NSA)</p> <p>Description: CPI measures the average change in prices over time that consumers pay for a basket of goods and services, commonly known as inflation</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1975</p> <p>Unit: 2015=100</p> <p>Source: HAVER/Statistics Korea</p> <p>Data transformation: SA, Log</p>
CONSUMPTION	<p>Name: House Purchase Price Composite Index</p> <p>Description: The House Price Index (HPI) is a broad measure of the movement of single-family property prices in South Korea. Aside from serving as an indicator of house price trends, it also functions as an analytical tool for estimating changes in the rates of mortgage defaults, prepayments, and housing affordability.</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1986</p> <p>Unit: Jan-19=100</p> <p>Source: HAVER/Kookmin Bank</p> <p>Data transformation: SA, Log</p>
CONSUMPTION	<p>Name: Retail Sales Value Index (NSA)</p> <p>Description: Retail trade is the sale of goods for personal or household consumption and the repair of personal and household goods. The volume index is calculated by deflator which is the weighted average in accordance with classification of the Wholesale and Retail Sales Indexes to each item for the Producer Price Index and the Consumer Price Index.</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1995</p> <p>Unit: 2015=100</p> <p>Source: HAVER/Statistics Korea</p> <p>Data transformation: Log</p>
INVESTMENT	<p>Name: All Industry Production including Construction (SA)</p> <p>Description: The Industrial Production Index (IPI) measures on a monthly basis the change in output in South Korea's mining (B), manufacturing (C), electricity and gas (D), and publishing (58) industries. Output refers to the production of goods and generation of power for domestic sales in Korea and for exports. The index is helpful in illuminating structural developments in the economy.</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-2000</p> <p>Unit: 2015=100</p> <p>Source: HAVER/Statistics Korea</p> <p>Data transformation: SA, Log</p>

CATEGORY	ECONOMIC INDICATOR
INVESTMENT	<p>Name: Building Permits (NSA)</p> <p>Description: Building Permit is a permission by a local authority to carry out a building project in which a living area or other useful area is created or altered. Since obtaining a permit is usually the first legally required step for a construction project, Building Permits statistics serve as a leading indicator of activity in the construction sector. It is also sometimes used as a proxy for trends in economic growth as a whole since building construction is often supported by other economic activities including financing, legal services, real estate service, retail etc.</p> <p>Frequency: Monthly</p> <p>Start Date: Oct-1979</p> <p>Unit: Units</p> <p>Source: HAVER/BoK/Ministry of Land Transport Maritime Affairs</p> <p>Data transformation: Log</p>
INVESTMENT	<p>Name: Capacity Util Index: Manufacturing (SA)</p> <p>Description: The capacity utilization rate for manufacturing measures the proportion of potential economic output that is actually realized. Displayed as a percentage, the capacity utilization level provides insight into the overall slack that is in an economy at a given point in time.</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1980</p> <p>Unit: 2015=100</p> <p>Source: CEIC/Statistics Korea</p> <p>Data transformation: Log</p>
INVESTMENT	<p>Name: Electricity Consumption (NSA, Thous. KWH)</p> <p>Description: Electricity production is measured at the terminals of all alternator sets in a station. In addition to hydropower, coal, oil, gas, and nuclear power generation, it covers generation by geothermal, solar, wind, and tide and wave energy, as well as that from combustible renewables and waste. Production includes the output of electricity plants that are designed to produce electricity only as well as that of combined heat and power plants</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1988</p> <p>Unit: Units</p> <p>Source: HAVER/Korea Electric Power Corporation</p> <p>Data transformation: SA, Log</p>
INVESTMENT	<p>Name: Imports: KCS: Capital Goods</p> <p>Description: Imports are goods which are produced or manufactured in place outside the jurisdiction of South Korea and brought into South Korea for domestic use. Their values are recorded on c.i.f. (cost, insurance and freight) basis. Capital goods are goods used by one business to help another business produce consumer goods i.e. buildings, machinery and tools. The system of commodity classification for trade statistics is the Standard International Trade Classification (SITC).</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1990</p> <p>Unit: USD mn</p> <p>Source: CEIC/Korea Customs Service</p> <p>Data transformation: Log</p>

CATEGORY	ECONOMIC INDICATOR	
INVESTMENT	Name:	Index of Equipment Investment: Commodities (SA)
	Description:	Equipment investment includes all the machinery and transport equipment used in facility investment. The index provides fundamental data substantial for identifying relevant government policy and corporate management plan. The method is based on "Commodity Flow Method" where Equipment Investment is defined: $\text{Equipment Investment} = \text{Total Supply (Domestic Production + Imports)} - \text{Intermediate Demand} - (\text{Consumption} + \text{Changes in Inventories} + \text{Exports})$. The results of the previous month are surveyed from the 1st toward the end of each month.
	Frequency:	Monthly
	Start Date:	Feb-1995
	Unit:	2015=100
	Source:	HAVER/Statistics Korea
	Data transformation:	SA, Log
INVESTMENT	Name:	Production Capacity Index (NSA)
	Description:	Productive Capacities Index (PCI) is a dynamic and practical tool to support developing countries in understanding the status of their productive capacity and how this can be improved.
	Frequency:	Monthly
	Start Date:	Jan-1971
	Unit:	2015=100
	Source:	HAVER/Statistics Korea
	Data transformation:	Log
INVESTMENT	Name:	Volume Index of Services: All Industries (SA)
	Description:	Service Industry Activity Index measures changes over time in the volume of output of the service sector by the base period. (Currently 2015)
	Frequency:	Monthly
	Start Date:	Jan-2000
	Unit:	2015=100
	Source:	CEIC/Statistics Korea
	Data transformation:	Log
TRADE	Name:	Exports: KCS: Heavy Industry Products
	Description:	Exports are goods exported from South Korea (including exports of temporarily imported goods for inward processing, re-exports of previously imported goods, exports of goods from free warehouses, free customs zones, tax free shops and goods exported for a lease for more than one year) to be traded with the rest of the world. In Korea, heavy industries are often divided into heavy equipment, heavy machinery, and vessels (shipbuilding and offshore). The system of commodity classification for trade statistics is the Standard International Trade Classification (SITC).
	Frequency:	Monthly
	Start Date:	Jan-1990
	Unit:	USD mn
	Source:	CEIC/Korea Customs Service
	Data transformation:	Log

CATEGORY	ECONOMIC INDICATOR
TRADE	<p>Name: Exports: KCS: Light Industry Products</p> <p>Description: Exports are goods exported from South Korea (including exports of temporarily imported goods for inward processing, re-exports of previously imported goods, exports of goods from free warehouses, free customs zones, tax free shops and goods exported for a lease for more than one year) to be traded with the rest of the world..The light industry products are fabric and clothing, later supplemented by assembly-line production of electronic products like radios or black-and-white television sets. The system of commodity classification for trade statistics is the Standard International Trade Classification (SITC).</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1990</p> <p>Unit: USD mn</p> <p>Source: CEIC/Korea Customs Service</p> <p>Data transformation: Log</p>
TRADE	<p>Name: Imports: KCS: Consumer Goods</p> <p>Description: Imports are goods which are produced or manufactured in place outside the jurisdiction of South Korea and brought into South Korea for domestic use. Their values are recorded on c.i.f. (cost, insurance and freight) basis. Consumer goods are goods bought and used by consumers, rather than by manufacturers for producing other goods. The system of commodity classification for trade statistics is the Standard International Trade Classification (SITC).</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1990</p> <p>Unit: USD mn</p> <p>Source: CEIC/Korea Customs Service</p> <p>Data transformation: Log</p>
TRADE	<p>Name: Producers' Shipment Index (SA)</p> <p>Description: The producer shipment index shows sales activities of producers and shipment trends in Mining, Manufacturing and Electricity, Gas and Water Supply industries. Shipment volume and value of establishments are compiled. Shipment includes ① domestically produced or purchased products that are shipped to domestic vendors, other establishments, institutions, organizations or consumers / products that are shipped to be used as part of export products to other establishments ② products that are exported directly to overseas markets or indirectly via other exporters / products that are shipped to foreign troops in Korea or duty-free shops and ③ products that are shipped to another factory in the same company that produces the same survey product / products that are shipped as gifts or samples / products that are shipped for exhibitions, product packaging, equipment maintenance, etc.</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1980</p> <p>Unit: 2015=100</p> <p>Source: CEIC/Statistics Korea</p> <p>Data transformation: Log</p>

CATEGORY	ECONOMIC INDICATOR
FINANCIAL	<p>Name: Private Sector Credit (EOP, NSA)</p> <p>Description: Domestic credit to private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks), such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1991</p> <p>Unit: KRW bn</p> <p>Source: HAVER/Bank of Korea/Haver Analytics</p> <p>Data transformation: SA, Log</p>
EXTERNAL SECTOR	<p>Name: Policy Rate: Month End: Effective Federal Funds Rate</p> <p>Description: Federal funds rate is the target interest rate set by the Federal Open Market Committee (FOMC) at which commercial banks borrow and lend their excess reserves to each other overnight</p> <p>Frequency: Monthly</p> <p>Start Date: Jul-1954</p> <p>Unit: % pa</p> <p>Source: HAVER/Federal Reserve Board</p> <p>Data transformation: none</p>
EXTERNAL SECTOR	<p>Name: US Industrial Production Index</p> <p>Description: The Industrial Production Index (IPI) is an economic indicator published by the Federal Reserve Board of the United States that measures the real production output of manufacturing, mining, and utilities. Production indices are computed mainly as fisher indexes with the weights based on annual estimates of value added.</p> <p>Frequency: Monthly</p> <p>Start Date: Jan-1920</p> <p>Unit: INDEX/Yoy</p> <p>Source: HAVER/Federal Reserve Board</p> <p>Data transformation: none</p>