

COSTA RICA'S MONTHLY INDEX OF ECONOMIC ACTIVITY (IMAE)

TECHNICAL NOTE

NATIONAL ACCOUNTS

Definition

The BCCR compiles the IMAE using a chained monthly Laspeyres-type index, it has as reference year 2012. Is a short-term indicator intended to approximate the progress of the gross value to a given month for the different industries included in the calculation of the Gross Domestic Product (GDP) at basic prices.

Output box

The economic activity is posted according the grouped¹ of the sections defined in the International Standard Industrial Classification of All Economic Activities (ISIC), revision 4.

SECTION	DESCRIPTION OF THE CLASS
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D,E	Electricity, water supply, sewerage, waste management and remediation activities.
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M,N	Professional, scientific, technical, administrative and support service activities
O	Public administration; compulsory social security
P,Q	Education and human health and social work activities
R,S,T,U	Other activities

Each section comprised the various productive activities which are part of the supply and use table (SUT). In total, the SUT includes 136 economic activities.

The BCCR has indicators for some activities integrated into the supply and use table. The cases to which no indicator is available, a monthly value of the gross value of chained production is made using the Denton method.

¹ The same grouping is used for the National Accounts both annually and quarterly.

Basic Data Sources

For some private non-financial corporations, information is available by conducting economic surveys. Administrative records are available for institutional sectors of general government, public non-financial corporations, financial corporations and some private non-financial corporations. For activities without basic information, a monthly estimate of the gross annual production value is attributed using the Denton method².

Economic indicators

Direct indicator: Shows a high correlation (greater than 80%) with the gross value of the economic activity under study.

Indirect indicator: Has a correlation lower than 80% with the gross value of production of the activity under study.

Annual chained volume of gross value: In case not direct or indirect indicator is available, the chained volume of the annual gross production value is used, but is necessary to make a monthly allocation. The monthly allocation was carried out with the Denton method.

Indicator frequency

The indicator can have monthly, quarterly, semiannual or annual frequency. If the frequency is greater than the monthly, the Denton method is used to transform it into a monthly indicator.

Time series components

The whole time series is showed in their four components:

- **Trend:** A trend exists when there is a long-term increase or decrease in the data. A trend can be positive or negative depending on whether the time series exhibits an increasing or a decreasing long-term pattern.
- **Cyclical component:** Any pattern showing an up and down movement to a given trend is identified as a cyclical pattern. The duration of a cycle depends on the type of business or industry being analyzed.
- **Irregular component:** This component is unpredictable.
- **Seasonal component:** Seasonality occurs when the time series exhibits regular fluctuations during the same month (or months) every year, or during the same quarter every year.

Products

- **Chained volume index (original series)**
- **Cycle trend indicator**

² The Denton method is running with the Ecotrim program

- **Seasonally adjusted series**

The level of the indicator, the inter-annual rate of change and the average rate of change are available for each series.

Base year

The IMAE has as reference year 2012. The time series is available since 1991.

Methodology of calculation

Chained volume index

If the monthly changes are linked together to form a time series, short-term volatility in relative price it may cause the chain-linked monthly measures to show substantial drift compared to corresponding direct measures. There is a positive correlation between the intensity and stability of the seasonal component of the series and the drift problem.

The annual overlap technique ensures the monthly data aggregate exactly to the corresponding direct index.

Seasonal adjustment

The IMAE is highly seasonal. Hence, the series is adjusted by TRAMO-SEATS or X12-ARIMA and broken it down into trend cycle, seasonality, and irregular component.

The Central Bank of Costa Rica estimates the seasonally adjusted series using the direct method³. In this way, the selection method based on direct and indirect will be one that has a smaller measure of degree of softness (R1) or less irregular.

³ See Kikut; Pages 1 and 2, application of the method of direct and indirect deseasonalisation to the flow of foreign exchange, June 1997. Ana Cecilia Kikut Valverde.
http://www.bccr.fi.cr/investigacioneseconomicas/politicacambiariaysectorexterno/Aplicacion_metodo_des_estacionalizacion_directo_indirecto_flujo_divisas.pdf

Methodology by industry

A - Agriculture, forestry and fishing

The basic data are split into four categories: exportable products, farm products, livestock products and rest. Monthly data regarding to quantity of products harvested, sold in the local market or exported which comes from different sources, most of them public institutions

Basic data sources: The Costa Rican Coffee Institute (ICAFE), the National Banana Corporation (CORBANA), the Sugarcane Industry Association (LAICA), the Rice Corporation of Costa Rica (CONARROZ), the National Council of Production (CNP), the Comprehensive agricultural marketing program (PIMA), the General Directorate of Customs, poultry production surveys from The Economics Surveys Area unit.

B - Mining and quarrying

Basic Data Sources: Administrative data and production surveys from The Economics Surveys Area unit.

C – Manufacturing

The production of the manufacture distinguishes between two types of regime: the definitive and special regimes.

Definitive regime

The primary information used to calculate the monthly index is a combination of administrative data and production surveys carried out by the Economics Surveys Area unit.

This regime were grouped into five: i) miscellaneous food products (including beverages and tobacco); ii) textiles, clothing and leather industry; iii) paper and paper products, printing and publishing; chemicals and petroleum chemicals; iv) manufacture of metal products, machinery and equipment and v) other manufacturing (vehicles, parts and accessories of vehicles, wooden furniture, medical and dental instruments, other manufacturing products).

Special regimes (include inward processing and free zones)

Production data regarding special regimes are based on exports, cover all the establishments classified under these regimes, and consider a change in ownership.

In order to keep consistency within the manufacturing industry, a similar aggregation to definitive regimen is used with one exception: regarding equipment and medical instruments products because of the dynamism they have shown in recent years.

Basic data sources: General Directorate of Customs, administrative data and production surveys from The Economics Surveys Area unit

D,E - Electricity, water supply, sewerage, waste management and remediation activities.

For the electricity and water activity, the source of information are the Costa Rican Institute of Electricity (ICE) which reports monthly information of the electric power sales, and the Costa Rican

Institute of Aqueducts and Sewage (ICCA or AyA), that provides data on water sales. The coverage of this indicator is up to 58,5% of gross value of production of the activity.

This index are constructed based on monthly reports of sales of electricity in MGW/hours as reported by the ICE, for all companies generating or distributing electricity, as well as on data on water sales reported by ICAA.

F – Construction

The activity of the construction is grouped according to the destiny of the production: private and public destination.

The monthly index with private destination is calculated using as an indicator the meters actually built by the different buildings or building prototypes (Housing Social Interest, middle and upper class, wine cellar, buildings, business premises, shopping plaza, urbanization and repairs and renovations of prototypes), and for which the BCCR in conjunction with the Association of Engineers and Architects (CFIA) conducted a quarterly survey of Advancement of Projects with Private destination (ETAPCP).

The basic information used for the statistical design of the study sample in the survey corresponds to the monthly records of professional responsibility of construction projects (which could have more than one project in progress) registered with the CFIA and the unit of measure them are the square meters.

The index of building with public destination, activity for which no statistical information available from sub-annual periodicity is made in monthly terms by the annual estimates.

G - Wholesale and retail trade; repair of motor vehicles and motorcycles

There are two main sources: i) A monthly survey to commercial companies requesting information on sales and ii) Administrative records from the Ministry of Finance.

The former data are split into six groups: i) food, beverages and snuff; ii) electrical and household appliances; iii) supplies construction; iv) chemicals and pharmaceuticals; v) vehicles and, vi) other commercial activities. The latter is used to replace missing data or validate atypical data from the survey sales.

H - Transportation and storage

This activity presents a combination of activities that have direct and indirect indicators. Among the activities included direct or indirect monthly indicator are those regarding to the external sector or foreign trade, whose main source of statistical information are of the Customs office. On the other hand, to deflate current values; the indexes of prices of these activities are considered and the source of information of the price levels is the Area of Indexes of the Central Bank of Costa Rica.

I - Accommodation and food service activities

The accommodation monthly index is generated from the Survey on the Monthly Behavior of Hotel while food and beverages index is calculated using the Denton Method without indicator.

J - Information and communication

The former data are split into three groups: i) production activities films, videos and television programs, sound recording, music editing, programming and transmission; ii) Communications; iii) Information services, programming and computer consulting, software development.

In items 1 and 3, the chained volume of the annual gross production value is used in a monthly allocation. The main sources of information are the Ministry of Finance.

On the other hand, the construction of the communications index is based on data provided by the ICE as well as data provided by the Telecommunications Superintendence (SUTEL), financial statements of private companies, and financial statements of public companies.

Among the main indicators are telephone minutes, internet consumption, mobile internet, fixed internet, mobile and fixed telephone, among others.

On the other hand, price indices related to these activities used to deflate income from services by economic activities to obtain a derived volume. The source of information of the price levels is the Area of Indexes of the Central Bank of Costa Rica as well as the National Institute of Statistics and Censuses (INEC).

K - Financial and insurance activities

The former data are split into four groups: i) monetary intermediation activity; ii) activities of holding companies, trusts, funds and similar financial entities, other financial service activities, except insurance and pension funding activities; iii) insurance, reinsurance and pension funding, except compulsory social security; and, iv) activities auxiliary to financial service activities, except insurance and pension funding.

The following sources of information are used to prepare the monthly index of the financial and insurance activity:

- Monthly financial statements provided by the General Superintendence of Financial Entities.
- Gross premiums information provided by the Insurance Superintendence.

Three monthly volume indicators linked to the Gross Value of Production were selected to construct the financial and insurance activity index:

- Financial Intermediation Services Indirectly Measured (FISIM): The monthly calculation of the FISIM produced by the state owned banks, private banks, unions, other financial intermediates and mutuals is carried out in current prices as well as previous year prices, so the volume measure obtained is used as an indicator.
- Explicit Fees: Explicit financial fees from state owned banks, private banks, unions, other financial intermediates and mutuals, obtain monthly income; these are deflated with the Consumer Price Index to obtain a measure of volume.
- Insurance Services: The volume index is calculated on a quarterly basis, and is transformed into monthly basis, using the monthly information of gross premiums from insurers

L - Real estate activities

Real estate activities do not have a short-term indicator. To be included in the monthly index, the annual estimate is used once it has been turned into a monthly indicator using the Denton method.

M,N - Professional, scientific, technical, administrative and support service activities

For the purpose of the industry, professional, scientific, technical, administrative and support group activities as a part of the IMAE have an indicator, either direct or indirect for the economic activities that comprise it; In cases for which no indicator is available, the raw value of chained production is carried out using the Denton method.

Product coverage: Activity volume indexes Legal activities, Accounting, book-keeping, tax consultancy and other accounting activities, employment activities and Security and research activities were built based on an employment index of the activity, whose base is (2012 = 100) from January 2004 to June 2013; Prepared by the area of indexes (ANI-BCCR). From January 1999 to December 2003 and from July 2013 to December 2020, it was combined with the monthly monetary value chain of the Gross Production Value (VBP) of the activity.

In regard to the volume index of activities consultancy activities in financial management, human resources, marketing, main and related offices, Architectural and engineering activities; (Including market, non-market and end use), Advertising and market research, Other professional, scientific and technical activities, Rental and leasing activities of tangible and intangible assets non-financial, general cleaning of buildings and landscaping and administrative and support activities for office and other support activities for enterprises; It is used as a volume indicator for the final regime the monthly monetary value chain of the Gross Value of Production of the activity; While for the special regime the volume derived from the Gross Production Value of the activity is used as indicator. This results from deflating the gross value of production in current terms (revenues reported by PROCOMER) by a proper index.

For veterinary activities, as volume indicator was used the monthly monetary value chain of the Gross Production Value (VBP) of this activity. While for activities of travel agencies, tour operators, reservation services and related activities as a volume index, the monthly index of travel agencies is calculated regularly in the area of services and construction (AESC-BCCR) as Input for general IMAE, whose indicator is the statistics of foreign trade.

O - Public administration; compulsory social security

Indicators are produced in order to obtain the two main components of the Expenditure for the Final Consumption on this activity, the value added and the intermediate consumption.

In regard the value added, the item "Workers' Compensation", budget line "0" of the Quarterly Budget Object Classifier, is used as an indicator of a sample of the main institutions that provide Public Administration Services as part of the Consumption of General Government. Once the total remuneration is quantified in current prices, the next step is to breakdown the monetary value in its two components: component of quantity and component of price (Monetary Value = Quantity * Price). The quantity component (volume) is obtained from the quarterly estimate of the employment of these institutions according to the budgets approved by the General Comptroller of the Republic. The transformation of this quarterly indicator into on a monthly basis is obtained using the "Denton" technique with indicator.

For intermediate consumption, the budget subheadings "1. Services" and "2. Materials and Supplies" of the Budget Classifier Object of Quarterly Expenditure for the same institutions of this economic activity. Once the total intermediate consumption in current prices is obtained, it is deflated with adequate price indices for each budgetary subheading and thus obtain its level of volume. The transformation of this quarterly indicator into a monthly basis is obtained using the "Denton" technique with indicator

P,Q - Education and human health and social work activities

Indicators are calculated in order to obtain the two main components of the Expenditure for the Final Consumption on this activity, the value added and the intermediate consumption.

In regard the value added, the item "Workers' Compensation", budget line "0" of the Quarterly Budget Object Classifier, is used as an indicator of a sample of the main institutions that provide Public Administration Services as part of the Consumption of General Government. Once the total remuneration is quantified in current prices, the next step is to breakdown the monetary value in its two components: component of quantity and component of price (Monetary Value = Quantity * Price). The quantity component (volume) is obtained from the quarterly estimate of the employment of these institutions according to the budgets approved by the General Comptroller of the Republic. The transformation of this quarterly indicator into on a monthly basis is obtained using the "Denton" technique with indicator.

For intermediate consumption, the budget subheadings "1. Services" and "2. Materials and Supplies" of the Budget Classifier Object of Quarterly Expenditure for the same institutions of this economic activity. Once the total intermediate consumption in current prices is obtained, it is deflated with adequate price indices for each budgetary subheading and thus obtain its level of volume. The transformation of this quarterly indicator into a monthly basis is obtained using the "Denton" technique with indicator.

For the private activities a monthly allocation of the annual gross value is necessary.

R,S,T,U - Other activities

The activities of the RSTU group, artistic, entertainment and recreational activities, households as employers, extraterritorial organizations and bodies and other service activities, currently do not provide a direct monthly indicator of activity, therefore, to determine production, it is based on the annual data of the chained index to the Gross Value of Production that was monthly using the Denton method.