

METHODOLOGY

ICEI - BUSINESS CONFIDENCE INDEX



National Confederation of Industry
Brazil
CNI. THE STRENGTH OF THE BRAZILIAN INDUSTRY

Version 3.3

Brasília-DF
January/2015

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1 Introduction

The Business Confidence Index (ICEI) is a leading indicator designed to identify shifts in industrial production trends. The ICEI helps to predict industrial production and thus Brazil's GDP growth, as confident entrepreneurs tend to step up investment and production in order to meet the expected increase in demand.

The information required for building the ICEI is collected through two questionnaires:

- (i) Questionnaire of the Industrial Survey¹; and
- (ii) Questionnaire of the Construction Survey².

The two surveys cover Brazil as a whole. The Industrial Survey is conducted in partnership with industry federations in 24 states (AC, AL, AM, BA, CE, ES, GO, MA, MG, MS, MT, PA, PB, PE, PR, RJ, RN, RO, RR, RS, SC, SE, SP e TO) and in the Federal District.

Meanwhile, the Construction Survey is carried out in partnership with industry associations and construction unions in 22 states (AL, AM, BA, CE, ES, GO, MA, MG, MT, PA, PB, PE, PR, RJ, RN, RO, RR, RS, SC, SE, SP e TO) and in the Federal District. It also relies on the collaboration of construction industry unions (Sinduscon) in 14 states (AL, BA, CE, ES, GO, MA, MG, PE, RJ, RO, SC, SE, SP-SINICESP and TO) and in the Federal district.

State, regional and national indicators are prepared for companies of different sizes and national sector indicators are also produced.

<http://www.portaldaindustria.com.br/cni/en/>

¹ For more information on the Industrial Survey, please see the Industrial Survey Methodology.

² For more information on the Construction Survey, please see the Construction Survey Methodology.

2 Background

The Business Confidence Index (ICEI) started with the Industrial Survey in 1998. The Industrial Survey was initially designed to gauge the opinion of entrepreneurs in 19 Brazilian states and cover companies with 25 or more employees. The survey sample was designed to produce national and state results covering two company sizes (small and medium; large) and activities were classified according to the Brazil Federal Revenue's list of Economic Activity Codes - CAE. The ICEI began to be released in 1999.

The weighting was based on company size according to the number of employed persons registered in the Register of Employer Establishments of the Ministry of Labor and Employment (CEE/MTE, 2010).

In 2002, the sample was reviewed to allow for the generation of indicators for the five geographic regions. The sample incorporated companies from all federation units and the ICEI began to be prepared for the five geographic regions of Brazil.

In 2006, the economic activities became based on version 1.0 of the National Classification of Economic Activities (CNAE 1.0) and start to cover Mining and Quarrying.

In 2007, an improvement was made to the ICEI. The number of questions used for building the indicator was reduced from six to four. The two questions on the activity sector (prospects for the next six months and current conditions with respect to the last six months) were excluded.

That same year, the sample was redesigned based on three company sizes (small; medium; large) and the cut-off point for inclusion in the target population was reduced from 25 to 20 employees. The weights assigned to each company size were updated based on the 2004 CEE/MTE. Furthermore, the ICEI report began to incorporate the indices by activity sector.

In 2009, the weights assigned to each company size started to be calculated based on the 2007 CEE/MTE.

In January 2009, the set of questions of the Industrial Survey questionnaire regarding the ICEI included two new questions on the federation unit where the company is located (prospects for the next six months and current conditions as compared to the last six months).

In January 2010, the ICEI incorporated the construction industry and the calculation of states' and federal district's results were changed to include two more variables. The ICEI also started to be released on a monthly basis.

In June 2010, the index began to include results for construction industry sectors.

In January 2012, six methodological improvements were made to the ICEI: new definition of company sizes; a new base year was defined for weights; new classification of activities; the mining and quarrying sample was expanded; the scope of the target population was expanded; and the sample was reviewed to include companies with 10 or more employees.

Sector results began to be released according to version 2.0 of the National Classification of Economic Activities - (CNAE 2.0). Results by company size began to be based on the definition adopted by Eurostat (the EU statistical office). According to the new definition, small enterprises are those with 10 to 49 employees; medium companies are those with 50 to 250 employees, and large ones have 250 or more employees.

In January 2015, the indicators aggregated by industrial sector (construction industry, mining and quarrying, and manufacturing) began to be weighted by company size. The series for the mining and quarrying and manufacturing industries were recalculated from 2007, while that for the construction industry was recalculated from 2010.

3 Methodology

3.1 Survey goals

The ICEI is a leading indicator intended to identify changes in industrial production trends, i.e. help predict industrial output and, therefore, Brazil's GDP.

3.2 Coverage

3.2.1 Geographic coverage

The ICEI covers the entire national territory.

3.2.2 Sector coverage

The ICEI consists of questions raised in the Industrial Survey, which covers manufacturing, mining and quarrying companies, and in the Construction Survey, which covers construction enterprises.

The economic activities used by the Industrial Survey are based on version 2.0 of the National Classification of Economic Activities (CNAE 2.0). The table in Annex A shows the correspondence between the sectors analyzed in the Industrial Survey and CNAE 2.0..

The economic activities included in the Construction Survey are based on version 2.0 the National Classification of Economic Activities (CNAE 2.0), as described in Annex B.

3.2.3 Company size coverage

Three company sizes, defined according to the number of employees in the enterprise, are considered:

- Small: 10-49 employees;
- Medium: 50-249 employees; and
- Large: 250-plus employees.

3.3 Survey unit

An enterprise is the survey unit. An "enterprise" is defined by the combination of all its local units engaged in the same economic activity in the same federation unit (state or Federal District).

A local unit is the physical space in which one or more economic activities are carried out. A local unit is the address in which an enterprise operates or a CNPJ (Brazilian Registration of Corporate Taxpayers) suffix. If there is more than one CNPJ suffix in the same address, the enterprise in question will be considered to have two or more local operating units. Therefore, the address in which an enterprise operates can be a single address (enterprise with a single local unit in the state or in the Federal District) or a multiple address (enterprise with more than one local unit in the state or in the Federal District).

3.4 Scope of the survey (target population)

The scope of the ICEI includes enterprises whose main economic activity falls under the category of manufacturing or mining and quarrying industry according to CNAE 2.0 or of construction industry according to CNAE 2.0, with at least 20 employees and registered with the Register of Employer Establishments of the Ministry of Labor and Employment (CEE/MTE).

3.5 Frequency

The ICEI is conducted monthly.

3.6 Data collection procedures

Information is collected in the first two weeks of the month immediately following the reference month by means of the Industrial Survey and Construction Survey questionnaires.

3.7 Sampling

The ICEI sample is the same as that used in the Industrial Survey⁴ and in the Construction Survey⁵. In both surveys, the methodology for generating samples is known as probability proportional sampling, which is widely used in qualitative research.

3.7.1 Samples of states and of the Federal District

To generate results for states and for the Federal District, the sample used is the same as defined for these in the Industrial Survey⁴ and Construction Industry Survey⁵.

⁴ For more information on the Industrial Survey methodology, please visit www.cni.org.br/e_sondindustrial

⁵ For more information on the Construction Survey methodology, please visit www.cni.org.br/e_sondconstr

3.8 Investigated variables

The index includes variables of the past trend and future trend types.

Table 1 - Investigated variables

Variable	Type	Reference period
CURRENT CONDITIONS		
Company	Past trend	Moment at which the questions were answered as compared to the previous six months
State*	Past trend	Moment at which the questions were answered as compared to the previous six months
Brazilian economy	Past trend	Moment at which the questions were answered as compared to the previous six months
EXPECTATION		
Company	Future trend	Next six months as compared to when the questions were answered
State*	Future trend	Next six months as compared to when the questions were answered
Brazilian economy	Future trend	Next six months as compared to when the questions were answered

* The questions on current conditions and general expectations for the state are only used for building the ICEI for states and for the Federal District.

4 ICEI Calculation

4.1 Diffusion indicators

The ICEI is a diffusion index ranging from 0 to 100. Diffusion indicators with figures above 50 points indicating that entrepreneurs are confident. The ICEI is calculated based on four questions:

P_{α} - Current conditions of Brazilian economy

P_{β} - Current conditions of companies

P_{γ} - Expectations on Brazilian economy

P_{δ} - Expectations on the company

4.2 Current conditions and expectations indicators

Diffusion indicators for each of the four basic questions are initially calculated for each company size or activity sector. The indicators are calculated from the relative frequency of responses. Each question has five mutually exclusive options. From the most negative to the most positive, each option is assigned weights of 0.0; 0.25; 0.50; 0.75 and 1.0. The indicator for each question is the average of these scores weighted by the relative frequencies of responses, namely:

$$IP_i = \sum_{j=1}^5 (F_{ij} \times \varpi_j) \times 100 \quad (1)$$

Where:

IP_i : Indicator for question i , where $i = P_{\alpha}, P_{\beta}, P_{\gamma}$ and P_{δ} .

F_{ij} : Relative frequency of responses j , to questions i .

ϖ_j : Weights assigned to responses $j = 1, \dots, 5$ (see Table 2).

Table 2 - Weights assigned to response options

Type of response	Expectations	Current conditions	Weight (ϖ_j)
1	Very pessimistic	Worsened a lot	0.00
2	Pessimistic	Worsened	0.25
3	The situation will likely remain the same	Remained the same	0.50
4	Optimistic	Improved	0.75
5	Very optimistic	Improved a lot	1.00

Based on the indicators for each question, the two indicators below are calculated:

i) Current conditions indicator:

Weighted average of the indicators for questions P_α and P_β , with weights 1 and 2, respectively:

$$I_{\text{Current conditions}} = \frac{IP_\alpha + (IP_\beta \times 2)}{3} \quad (2)$$

ii) Expectations indicator:

Weighted average of the indicators for questions P_γ and P_δ , with weight 1 and 2, respectively.

$$I_{\text{Expectations}} = \frac{IP_\gamma + (IP_\delta \times 2)}{3} \quad (3)$$

4.3 Company size

The ICEI for each company size corresponds to the weighted average of the indicators of current conditions (weight 1) and expectations (weight 2) for the respective sizes.

$$ICEI^k = \frac{I^k}{3} + \frac{(I^k \times 2)}{3} \quad (4)$$

Where k indicates, the company size surveyed.

4.4 Indicators by Brazilian activity sector

The ICEI for each activity sector corresponds to the weighted average of the indicators of current conditions (weight 1) and expectations (weight 2) for the respective activity sectors.

$$ICEI^s = \frac{I^s}{3} + \frac{(I^s \times 2)}{3} \quad (5)$$

Where s indicates the activity sector surveyed.

4.5 Indicators for industry aggregates (construction, mining and quarrying, and/or manufacturing)

The aggregate indicators (construction, mining and quarrying, and/or manufacturing) are calculated from the weighted average of the indicators for each company size. Thus, the first step is to calculate the indicators for each of the three company sizes considered in the survey (small, medium and large) – or two for some states – according to equation (4).

$$ICEI^{IG} = \sum_{k=1}^3 (ICEI^k \times \beta^k) \times 100$$

Where:

$ICEI^{IG}$: ICEI for industry aggregate.

$ICEI^k$: ICEI for company size k , where $k = 1, 2, 3$ (see Table 3).

β^k : Weight assigned to company size k (see Table 3).

The weights assigned to each company size in each of the analyzed periods correspond to the share of enterprises in each size class in the total number of employed persons in the target population on December 31, according to the Register of Employer Establishments of the Ministry of Labor and Employment - CEE/MTE (see Table 3).

Table 3 - Weights assigned to company sizes for building the ICEI Brazil

Segment	Company size	Weight* 1999 - 2003	Weight** 2004 - 2006	Weight** 2006 - 2009	Weight*** 2010 - 2011	Weight**** 2012 -
Manufacturing, mining and quarrying	small	0.281	0.244	0.244	0.233	0.246
Manufacturing, mining and quarrying	medium	0.301	0.271	0.271	0.263	0.259
Manufacturing, mining and quarrying	large	0.418	0.485	0.485	0.504	0.495
Mining and quarrying	small	-	-	0.263	0.286	0.215
Mining and quarrying	medium	-	-	0.233	0.232	0.225
Mining and quarrying	large	-	-	0.503	0.482	0.560
Manufacturing	small	-	-	0.299	0.286	0.247
Manufacturing	medium	-	-	0.303	0.289	0.259
Manufacturing	large	-	-	0.398	0.425	0.494

* Based on the number of employed individuals as recorded in the CEE/MTE, 2000.

** Based on the number of employed individuals as recorded in the CEE/MTE, 2004.

*** Based on the number of employed individuals as recorded in the CEE/MTE, 2007.

**** Based on the number of employed individuals as recorded in the CEE/MTE, 2009.

- The ICEI was not conducted by segment.

Annexes

Annex A - Correspondence between the classification of activities used in the Industrial Survey and CNAE 2.0

Industrial Survey	CNAE 2.0
Mining and quarrying	
Mining of coal and extraction of petroleum and natural gas	05 - Mining of coal and lignite
	06 - Extraction of crude petroleum and natural gas
Mining of metal ores	07 - Mining of metal ores
Mining of non-metal ores	08 - Other mining and quarrying
Mining support service activities	09 - Mining support service activities
Manufacturing	
Food products	10 - Manufacture of food products
Beverages	11 - Manufacture of beverages
Tobacco products	12 - Manufacture of tobacco products
Textiles products	13 - Manufacture of textiles
Wearing apparel	14 - Manufacture of wearing apparel
Leather and related products	15.1 - Tanning and dressing of leather
	15.2 - Manufacture of travel goods and miscellaneous leather articles
Footwear and parts	15.3 - Manufacture of footwear
	15.4 - Manufacture of parts and accessories of footwear, of any material
Wood products	16 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
Pulp and Paper	17 - Manufacture of paper pulp, paper and others
Printing and reproduction of recorded media	18 - Printing and reproduction of recorded media
Coke and refined petroleum products	19.1 - Manufacture of coke
	19.2 - Refined petroleum products
Biofuel	19.3 - Manufacture of biofuels
Chemicals (exc. Cleaning and perfumes)	20.1 - Manufacture of inorganic chemicals
	20.2 - Manufacture of organic chemicals
	20.3 - Manufacture of resins and elastomers
	20.4 - Manufacture of man-made fibers
	20.5 - Manufacture of pesticides and disinfectants
	20.7 - Manufacture of paints, varnishes, enamels, lacquers and related products
Cleaning and perfumes preparations	20.9 - Manufacture of other chemical products and preparations
	20.6 - Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
Pharmaceutical chemicals and pharmaceuticals	2.1 - Manufacture of pharmaceutical chemicals and pharmaceuticals
Rubber products	22.1 - Manufacture of rubber products
Plastics products	22.2 - Manufacture of plastics products

continua

Industrial Survey	CNAE 2.0
Non-metallic mineral products	23 - Manufacture of other non-metallic mineral products
Basic metals	24 - Manufacture of basic metals
Metal products (except machinery and equipment)	25 - Manufacture of fabricated metal products, except machinery and equipment
Computers, electronics and opticals products	26 - Manufacture of computer, electronic and optical products
Electrical equipment	27 - Manufacture of electrical equipment
Machinery and equipment	28 - Manufacture of machinery and equipment n.e.c.
Motor vehicles, trailers and semi-trailers	29 - Manufacture of motor vehicles, trailers and semi-trailers
Other transport equipment	30 - Manufacture of other transport equipment
Furniture	31 - Manufacture of furniture
Other manufacturing	32 - Other manufacturing
Repair and installation	33 - Repair and installation of machinery and equipment

Annex B - Correspondence between the classification of activities used in the Construction Survey and CNAE 2.0

Economic activity	CNAE 2.0 - Division
Construction of buildings	41 - Construction of buildings
Infrastructure construction	42 - Infrastructure construction
Specialized services for the construction	43 - Specialized services for the construction

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