

IMA

ANDIMA
MARKET
INDEX

Methodology

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Foreword

Two important and profoundly related events marked the Brazilian financial market's activities during the latter half of the 90's: on the one hand, the significant growth of domestic federal public debt; on the other, the growth of fixed interest funds, with portfolios of an ever more relevant share in government paper issued by the National Treasury Secretariat and the Central Bank.

Faced by this scenario, in December 2000 ANDIMA in conjunction with BM&F (Brazilian Mercantile & Futures Exchange) launched IRF-M - Índice de Renda Fixa de Mercado (Fixed Income Market Index), with a portfolio composed of all the LTN's and NTN-F's traded in the market. This new index was intended to become a benchmark for asset managers and would open the doors for the development of a number of other indices based on other papers issued by the National Treasury Secretariat.

However, the recent years of instability in the portfolio that composes the index, the lack of experience in assuming longer-term risks, as well as the debt's profile, limited the use of the

IRF-M as a general benchmark. In addition, the 2002 crisis caused prefixed debt to disappear almost entirely and went so far as to endanger the very existence of the Index.

Furthermore, the adoption of marking-to-market rules led to portfolios with high levels of fluctuation as a result of appreciation or depreciation, showing more clearly the lack of a more effective reference for each portfolio's terms and objectives.

By the same reasoning, the lack of more appropriate parameters in order to assess performance, for example, caused many pension funds with long-term actuarial liabilities - in general based on price indices - to compare their profitability with very short-term indicators such as money market rates.

Adoption of a more appropriate parameter such as an index based on performance of a portfolio composed of papers based on price indices would more effectively serve as a benchmark for the profitability of these assets.

In a similar manner for fixed income funds with LFT - "Letras Financeiras do Tesouro" - in their portfolios, an index based on the price

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of these papers would not only be more efficient in tracking profitability, but would also reduce occasional questionings by quota holders with regard to the ability of management in monitoring this benchmark.

In the light of this absence of a reference in assessing portfolio performance and considering the Association's overall experience in calculating market prices for federal papers, the National Treasury Secretariat formally proposed that ANDIMA should also disclose benchmark indices for portfolios based on NTN-B's, NTN-C's, and LFT's. Treasury officials estimate that disclosure of these Indices in combination with a number of other measures taken over the last two years may serve to increase the dynamics of the primary and secondary markets for federal papers.

Hence, with a view to carrying out its role of stimulating the primary and secondary markets for fixed income bonds, the Association began to disclose the IMA - ANDIMA Market Index as of April 1, 2005, which embraces almost entirely the outstanding public debt bonds held by the market and is sub-divided into four indices with specific features that reflect the

various existing indicators covering these papers, such as IGP-M and IPCA, for terms below and above five years.

Devising ANDIMA's Market Index was only possible after entering into an operating agreement by the Association with the National Treasury Secretariat on December 22, 2004, setting out the conditions for both bodies to disclose the new Indices. In summary, the agreement provides for the Treasury to convey all the necessary information for calculating the indicators, and the Association will be in charge of preparing the methodology and developing the calculating system.

Fore this purpose, the Association created the ANDIMA Market Index Commission, composed of members from the National Treasury Secretariat, from BM&F, as well as from different types of financial institutions and asset managers, which initially was mainly concerned in defining every detail of the methodology that follows. After launching the Indices, the Commission will adopt the role of monitoring published information and providing a source of ideas intended to improve the Indices.

In conclusion, it should be mentioned that

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creating the ANDIMA Market Index family represents an additional initiative intended to reinforce the Association's self-regulation process and its mission of "acting towards strengthening the financial market, with a focus on fixed income securities, setting out ethical and operating standards for participants as well as ensuring the production and disclosure of technical information with a view to its consolidation".

Alfredo Neves Penteadó Moraes
President of ANDIMA

Features of each Index

Following a number of meetings of the Commission, it was agreed that the ANDIMA Market Index family should include sub-divisions in order to satisfy the requirements of the several kinds of investors and their respective portfolios. The table below shows the structure as approved during those meetings.

IMA - ANDIMA Market Index	
Name	Composition
IMA General	The sum of IRF-M, IMA-S, IMA-C, and IMA-B
IRF-M	All outstanding LTN's and NTN-F's
IMA-S	All outstanding LFT's*
IMA-C	All outstanding NTN-Cs
IMA-C 5	All outstanding NTN-C's with maturities below or equal to 5 years
IMA-C 5+	All outstanding NTN-C's with maturities above 5 years
IMA-B	All outstanding NTN-B's
IMA-B 5	All outstanding NTN-B's with maturities below or equal to 5 years
IMA-B 5+	All outstanding NTN-B's with maturities above 5 years

*Does not include LFT-A's and LFT-B's **Note:** Only papers definitely sold and traded in the secondary market is included in the indices.

Each ANDIMA Market Index has its specific features as follow:

IMA - General

Obtained by compounding on a daily basis the profitability of the Indices listed below. Hence, it is calculated based on the weighted sum of the IRF-M, IMA-S, IMA-C, and IMA-B portfolios. It represented roughly 90% of outstanding federal bonds in March 2005. The Index does not cover foreign exchange clause papers and non-negotiable bonds.

IRF-M

Composed of prefixed federal bonds held by the public, serving as a benchmark for prefixed investments. Its methodology was developed jointly by ANDIMA and BM&F. Both institutions undertake its calculations and disclosure simultaneously and on a daily basis.

IMA-S

Composed of post-fixed federal bonds (tied to the SELIC Rate) - LFT - held by the public. The respective portfolio does not include LFT-A's and LFT-B's.

IMA-C; IMA-C 5 e IMA-C 5+

Composed of federal bonds tied to the IGP-M index and held by the public. In addition to this "com-

plete" Index embracing all definitely traded maturities, two partial Indices are also calculated. A short-term index composed of maturities below or equal to five years (IMA-C 5), and a longer-term index composed of paper with maturities above five years (IMA-C 5+).

IMA-B; IMA-B 5 e IMA-B 5+

Composed of federal bonds tied to the IPCA index and held by the public. In addition to this "complete" Index embracing all definitely traded maturities, two partial Indices are also calculated. A short-term index composed of maturities below or equal to five years (IMA-B 5), and a longer-term index composed of paper with maturities above five years (IMA-B 5+).

*The Meaning of
these Indices and the
General Expression*

In general, ANDIMA Market Indices gauge the value at market prices of their portfolios with an initial value of R\$1,000.00, whereby the sums invested in each maturity bear the same proportions as the outstanding debt held by the public.

In order to maintain these features, the portfolios are changed whenever there are changes in the proportions of outstanding amounts, whether arising from new paper issues, from government re-purchases, or payments of principal and interest. Hence, the proportions at any time between the sums invested in two portfolio maturities will always be identical to the proportions between the outstanding amounts of these bonds in the market.

Constructing the Indices

The ANDIMA Market Index family was devised in such a manner as to expurgate the variations in portfolio profitability arising from changes in the amounts of bonds available in the marketplace, or in the case of sub-divided Indices, arising when a specific maturity changes its features.

General Index formula:

$$I_t = I_{t-1} \times \frac{\sum_{i=1}^n q_{i,t-1} \times p_{i,t}}{\sum_{i=1}^n q_{i,t-1} \times p_{i,t-1}}$$

whereby:

t = time;

n = number of bonds that compose the Index portfolio;

It = index number;

$It-1$ = preceding business day's index number;

$qit-1$ = amount of each bond in Index portfolio on the preceding business day;

pit = bond price;

$pit-1$ = bond price on the preceding business day.

As can be concluded from the formula shown above, the amounts used when calculating daily portfolio profitability will always be those of the preceding business day, in order to expurgate the effect that the variation in the volume of paper outstanding in the market for a specific maturity may cause on the portfolio market price.

Sources of Information

Amounts

Following the agreement between ANDIMA and the National Treasury Secretariat, it was understood that the latter would send the Association every day the outstanding market amounts of all the maturities that comprise the diversified portfolios.

Should it not be possible to send the files regarding the amounts in time, through the means agreed on by the parties, ANDIMA will calculate the Indices based on the amounts for the most recent day available until the information flow between the two bodies is back to normal.

The Indices are composed solely of federal bonds held by the public and traded in the secondary market. Their amounts outstanding may be changed in accordance with a number of events such as sale and purchase public auctions, direct placements for specific purposes, the direct sale to individuals, through the "Tesouro Direto" program, exchanges, etc.

The sub-divided portfolio indices (IMA-B 5, IMA-B 5+, IMA-C 5, and IMA-C 5+) are also influenced by changes in the classification of a specific maturity - from long to short-term - regardless of new issues or redemptions.

Pricing

The prices employed in order to value papers in the theoretical portfolio are calculated by ANDIMA on a daily basis by means of data gathered through a representative sample composed of banks, asset managers, and financial intermediaries present in the government bond secondary market. This task

seeks to detect the papers' fair market price, i.e.: the price whereby an institution would trade these papers even when on that day they were not traded.

Several statistic criteria are applied with a view to eliminating spurious prices and likely outliers. On conclusion of these proceedings, an average indicative rate is calculated for each maturity. Should a situation arise whereby it is not possible to calculate rates for any one of the maturities that compose the Indices portfolio, the last available one will be employed in order to calculate a new unit price for the date. Consequently, a newly issued bond will only be included in the Index portfolio when an initial indicative rate is worked out by the Association.

Other Features Regarding the Indices

Inclusion criteria

Inclusion of bonds will take place on the day of their financial settlement, provided there are market prices available.

Exclusion criteria

Bonds will remain in their theoretical index portfolios until the day prior to maturity or the day before their removal from circulation for any reasons whatever.

Bond pricing

Bonds will be priced in accordance with their "market prices", calculated and disclosed on a daily basis by ANDIMA in the "*Mercado Secundário*" publication, following current methodology.

Duration

Duration of each maturity in the Indices portfolios is a function of weighing the maturities with regard to each payment by their current value. Hence:

$$D = \frac{\sum_{j=1}^n \frac{F_j}{(1+i_j)^{d_j}} \times d_j}{PV}$$

whereby:

- D = duration in business days;
- F_j = each portion of the payment flow;
- d_j = business days to go;
- i_j = effective interest rate;
- PV = bond's present value (unit price).

The portfolio's duration is the weighted average of the durations for each individual bond in the portfolio, using its market value.

In the case of the IMA-S index, it was decided to calculate the duration of each LFT maturity as a term in business days to go (since this bond does not have interim payments). The portfolio's duration is the term weighted by means of its market price (average term). However, in the market risk analysis, other interpretations may be brought up for this calculation.

In short, as duration measures bond price sensitivity to interest rate variations and considering that LFT's are tied to the SELIC Rate on a daily basis, some analysts suggest that LFT duration is of one business day, regardless of term. Nonetheless it should be pointed out that for the purposes of this methodology we have decided to consider LFT duration as a total term to go for the paper, in business days.

Rounding criteria

For calculating purposes, the index number and its respective daily percentage variation should be rounded to the 12th decimal point.

Amounts of Bonds

Information on amounts held by the public is supplied by the National Treasury Secretariat.

Events

These comprise new issues, maturities, repur-

chases, or any other events that may affect the total number of bonds held by the public.

Base

The IRF-M index was started on December 1, 2000 with a base value of 1,000. The remaining indices were launched on March 31, 2005 with a similar value base.

Errors and Omissions:

The entire series will be recalculated should there be errors owing to operating problems or human error.

Disclosure

The index numbers and their respective variations will be disclosed on their reference date in the ANDIMA site in the Internet and RTM by 8:00 PM.

Other data regarding Indices will be disclosed every day by 10:00 AM, with data referring to the preceding day. These are:

- Portfolio composition: amounts, pricing, mark-to-market portfolio value, and the relative share (%) of each bond (maturity) in the respective indices.

- Duration of the Indices portfolio.

Disclaimer

Disclosure of Indices is intended merely for information purposes and their use by financial agents is optional. ANDIMA and the Federal Government shall not be held accountable for occasional damages and losses suffered by users when employing these Indices for any purpose, and in this case users themselves shall bear full and sole responsibilities for their use.

Frequently Asked Questions

What is the main difference between the several Indices created by ANDIMA?

The basic difference is the papers that compose the theoretical portfolio for each Index. In all the instances the portfolios are composed of federal public bonds outstanding in the market and issued definitely. The IRF-M index is composed of prefixed papers (LTN's and NTN-F's); the IMA-C index, of papers tied to the IGP-M index (NTN-C's); the IMA-B index, of papers tied to the IPCA index (NTN-B's); and the IMA-S index, to papers referenced to the SELIC Rate (LFT's).

Why was a five-year term chosen to differentiate short and long-term Indices in the NTN-C and NTN-B portfolios?

This term was decided on by the ANDIMA Market Index Commission, the appropriate body in charge of developing the methodology and monitoring the Indices. Its members considered that the more liquid maturities would be covered by a five-year period, which explains this differentiation.

How are the Indices calculated?

All of the Indices are worked out according to the Laspeyres method. As a rule, calculation consists

of comparing values on a daily basis of each of the portfolios, using the day's bond market prices and those of the preceding day. Hence:

$$I_t = I_{t-1} \times \frac{\sum_{i=1}^n q_{i,t} \times p_{i,t}}{\sum_{i=1}^n q_{i,t-1} \times p_{i,t-1}}$$

whereby:

t = time;

n = number of bonds that compose the Index portfolio;

I_t = index number;

I_{t-1} = preceding business day's index number;

q_{it-1} = amount of each bond in Index portfolio on the preceding business day;

p_{it} = bond price;

p_{it-1} = bond price on the preceding business day.

How are the amounts and market prices used in the calculations obtained?

Amounts are informed to ANDIMA every day by the National Treasury Secretariat, pursuant to an agreement between the Association and the government body. Prices are calculated by ANDIMA based on a sampling collected among banks, asset

managers, and independent brokers, including Central Bank and National Treasury Secretariat open market dealers.

How do the Indices vary in the light of events that change the theoretical portfolio?

The Indices portfolio changes whenever new issues, redemptions, repurchases, or other events take place that affect the entire outstanding amount of public bonds in the market. Nevertheless, the Indices were worked out in such a manner as to expurgate variations in their values arising from these changes. Hence, they only reflect changes in their portfolio prices.

How are the bonds weighted in the Indices portfolio?

The weight for a certain maturity is reflected by the relation between its financial worth and the financial worth of the Indices portfolio.

How should investors choose an Index in order to monitor a certain investment?

Investors should monitor the Index closest to the features of their investments, with regard to term, indicator, and risk exposure. Hence, institutional investors wishing to tie their profitability to price indices such as the IGP-M index, should keep track of the accumulated performance of the IMA-C index, the portfolios of which are composed solely of public

bonds tied to this index, differentiated by papers with terms of up to five years and those of over five years.

Which Index is the closest to the DI rate as a benchmark?

The Index closest to the DI [interbank] rate is IMA-S, by virtue of its bond composition tied to the SELIC Rate. The IMA-S index, however, is subject to variations arising from discounts/premiums on LFT's, and may also show negative variations. Yet this movement is generally associated with periods of market uncertainties.

How is the general IMA index calculated?

The general IMA index is the product of a weighted calculation (by the portfolio's market value) of the variations of each Index in its composition.

What happens when an error is detected in the data disclosed?

When an error is detected on a certain date, ANDIMA recalculates the series from that point to the present date.

Questions or requests for explanations may be addressed to ANDIMA's Technical Division.

Telephone: 55 21 3814-3801
e-mail: getec@andima.com.br

Technical Division

Valéria Arêas Coelho

Technical Department

Luiz Macahyba

Department of Economic and Taxation Studies

Mary Carmen Mendez

Economics Analysts

Ana Lúcia Andrade dos Santos Roure, Antônio Lima Filgueira, Berenice Ribeiros Fontes, Dalton Boechat, Demetrius Durante, Enilce Leite Melo, Glória M^a Medeiros Baptista, Nuno Miguel Conde, Marcelo Cidade, Marcelo Kucuruza, Patrícia Fesch Menandro, Patrícia Herculano, Sandro Baroni Selaimen e Vinícius Gomes Araújo.

Communications Consultant

Cláudio Accioli

Graphic Production

José Mira

Editing

Marcelo Paiva and Mônica Chaves

Revision

Renato Mourão

Translation

Lersch Tradutores

Bibliograph References

Cláudia Kropf

RIO DE JANEIRO
Avenida República do Chile, 230, 13º andar
CEP: 20031-170 - Centro

SÃO PAULO
Rua Líbero Badaró 377, 4º andar
CEP: 01074-900 - Centro

Technical Division
Tel.: (+21) 3814-3801
getec@andima.com.br
www.andima.com.br

