WP/06/288

IMF Working Paper

Regulatory Lessons from the Crisis of the Costa Rica's Mutual Fund Industry

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INTERNATIONAL MONETARY FUND

 WP/06/288

IMF Working Paper

Monetary and Financial Systems Department

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Authorized for distribution by Arne Petersen

December 2006

Abstract

In 2004, the mutual fund industry of Costa Rica experienced a massive run by investors that reduced the industry to half its size in a month. This paper explores how weaknesses in the regulatory framework played a role in the crisis and draws lessons for developing countries. The analysis of events demonstrates the need for developing countries to design a multi-pillar framework for securities regulation as well as to strengthen financial literacy and capacity building. At the micro level it shows the importance of market conduct rules and the challenges that the implementation of mark-to-market poses for developing markets.

JEL Classification Numbers: K22, G18, G24, G28

Keywords: collective investment schemes, mutual funds, securities markets

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I. INTRODUCTION

By the beginning of 2004 the mutual fund industry had reached the average Costa Rican household and was competing directly with savings accounts and other traditional banking products. From the development of its regulatory framework in 1998 through 2003, the industry experienced considerable growth. The population of investors grew from 9,573 in 1998 to 67,327 in December 2003 and assets under management increased from 1.35 percent GDP to 16.2 percent GDP, equivalent to roughly 60 percent of bank deposits.

However, an adjustment in the prices of emerging market bonds at the end of the first trimester of 2004 triggered a crisis in the industry that could have had systemic consequences. Mutual funds showed negative returns for the first time in their history and the losses incurred by investors provoked a massive run that could have had more severe consequences if redemptions had not been honored in a prompt and orderly manner. By June 2004, total assets held in mutual funds had declined to 8 percent GDP.

This paper will explore whether weaknesses in the regulatory framework for the securities market played a role in the crisis and, to the extent possible, will draw lessons that might help other developing countries in the design of their regulatory framework.[1] The adjustment in prices that led to the crisis was the result of a combination of factors that exceeded the responsibilities of the securities regulator. It is not, however, the intention of this paper to discuss other issues that played a part in the crisis, although an overview of the local and international context will be provided.

An analysis of the events relating to the crisis shows the need for developing countries to design a multi-pillar framework for securities regulation as well as to increase their efforts in financial literacy and capacity building. At the micro level it shows the importance of market conduct rules for the healthy development of the securities market and the challenges that the implementation of mark-to-market poses for developing markets.

II. THE MUTUAL FUND INDUSTRY

Prior to the Securities Act of 1997, collective investment was carried out through trusts and “carteras mancomunadas.” The latter were pools of assets managed by brokerage houses as an “off-balance” product but that in practice represented a claim against the brokerage house since there was a promise of a fixed return regardless of the performance of the asset portfolio. Given the risks and the opacity of the product, the Securities Act required that it be phased out by no later than 2002. This problem was not present in the case of trusts, where investors’ returns were totally dependent upon the performance of the asset portfolio; however, the product was not regulated. Thus the Securities Act required trusts to be subject

[1] All data included in this paper were taken from official documents of the *Superintendencia General de Valores de Costa Rica*. In addition, the analysis of the international and local conditions relies on reports prepared by the *Superintendencia.*

to the same regulatory requirements as mutual funds, which in turn eliminated any incentive to use trusts for collective investment.

A. The Regulatory Framework

The Securities Market Act of 1997 chose mutual funds as the vehicle for collective investment. The Act, effective 1998, completely updated the regulatory framework for the Costa Rican securities market, including collective investment schemes (CIS). The Act chose mutual funds as the preferred vehicle for collective investment[2] and defined the general guidelines for their regulation by the *Superintendencia General de Valores* (SUGEVAL).[3]

The SUGEVAL gave priority to the development of a regulatory framework for the mutual fund industry. Both because of the role that mutual funds had played in other countries as the vehicle for retail investors' participation in the securities markets, as well as the interest of market participants in this product—given the phasing out of the "carteras mancomunadas"— the immediate development of a set of regulations for the industry was essential. Thus, international consultants were hired to assist the SUGEVAL, and by 1999 a basic framework for the authorization of mutual funds and mutual fund managers had been completed.

The framework clearly defined the nature and characteristics of the product vis-à-vis banking products. The framework created "mutual funds" as a new legal category, different from trusts and corporations, administered by a fund manager. Mutual funds were defined as pools of assets belonging to a collectivity of investors, whereby investors' returns depend on the performance of the portfolio of assets. Thus, the risks involved in the investments are borne by investors and not by the fund manager. The regulations further strengthened the off-balance nature of the product as well as investors rights, by establishing that mutual fund assets should be registered under the ownership of the mutual fund and not its manager. This specific feature made the "mutual fund" a more robust vehicle for collective investment than "trusts," since in the case of trusts assets are registered under the "fiduciary ownership" of the trustee.

The regulation of mutual funds and fund managers

The framework developed by the SUGEVAL sought to ensure the proper regulation of both mutual funds and the fund manager by making them both subject to an authorization regime. In the case of mutual funds, the authorization was based on the submission of a prospectus that was complemented by a system of periodic disclosure. Taking a conservative approach, the regulations also included a prudential framework for mutual funds with diversification

[2] The only exceptions were trusts administered by commercial banks and pension funds administered by pension fund managers. However, as stated above, the Securities Act required trusts to be regulated and supervised according to the rules developed for mutual funds, which reduced the incentive to manage CIS through this vehicle.

[3] An explanation of the structure of financial regulation in Costa Rica is provided in Appendix I.

rules, although not for Costa Rican sovereign paper.[4] Fund managers, on the other hand, were subject to capital requirements.

Box 1. The Regulatory Framework for Mutual Funds and Fund Managers

The authorization of mutual funds was based on proper disclosure to investors. The system included an authorization regime based on the submission of a prospectus complemented by a periodic disclosure regime, which together ensured that investors received adequate information at the moment of placement as well as during the time of investment. Disclosure requirements were developed based on the IOSCO Principles as well as existing requirements in developed countries. The SUGEVAL defined a minimum content for the prospectus and developed a template to be used by market participants. Disclosure obligations included:

a) Provision of a summary of the prospectus—and if requested, the complete prospectus—at the moment of placement.
b) Information on the share price, net assets and commissions, to be provided daily to the regulator and available to the market and investors.
c) Portfolio composition, to be provided biweekly to the regulator and available to the market and investors.
d) Personal statement accounts, to be provided to each investor on a monthly basis.
e) Financial statements for both the mutual fund and the mutual fund manager, to be provided quarterly as well as annually. Annual statements had to be audited and supplemented with an additional report on compliance with securities regulations and internal controls.

Mutual funds were also subject to prudential regulations. Regulations included diversification limits, leverage limits and a liquidity coefficient. Diversification limits applied to all investments except those rated triple A by one of the international credit rating agencies and Costa Rican sovereign paper. The limits were complemented by a "prudent man rule," which meant the obligation for mutual fund managers to be diligent in the selection of investments. There were two stages in the liquidity coefficient regulations, which aimed to ensure that mutual funds maintained enough liquidity to face redemptions. In the first stage, the coefficient was defined as a percentage of assets under management (15 percent for money market funds and 10 percent for all other open-end funds). In the second stage, the liquidity coefficient depended on the average permanence of investors in the fund.

Mutual fund managers were subject to capital requirements. The Securities Act created a specialized category of financial intermediaries, the sociedades administradoras de fondos de inversion (mutual fund managers), as the only financial intermediaries authorized to manage mutual funds. They had to be structured as corporations and could be part of financial groups. Mutual fund managers were subject to an authorization regime primarily based on minimum capital requirements that had to be adjusted by the volume of assets under management. There were also fit and proper requirements for the investment committees.

However, the framework did not contain detailed rules on governance issues or market conduct obligations applicable to fund managers. The regulations issued by the SUGEVAL contained general provisions regarding the need for fund managers to have an appropriate organizational structure, and adequate human and technical resources. There was also a minimum set of "fit and proper" requirements for the members of their investment

[4] Over time the prudential framework has been transformed into a classification tool with consequences only for the purpose of disclosure. Thus, fund managers are authorized to structure non diversified funds, but are subject to more stringent disclosure requirements.

committees: in addition to a minimum number of years of experience in the financial sector, the regulations required the appointment of at least one independent member. As for market conduct obligations, the Securities Act provided a general framework applicable to all financial intermediaries, including fund managers. Thus, since the Securities Act or the regulations issued by the SUGEVAL contained general obligations in these areas, the SUGEVAL did not consider as a priority the development of more detailed rules to be applicable to fund managers. Rather it began to work on the development of a general framework that would apply to all financial intermediaries, including fund managers. By March 2004, when the crisis began, the SUGEVAL had already released for consultation a regulatory framework for financial intermediaries that included more detailed rules on corporate governance and market conduct.[5]

Mark-to-market valuation

Following international best practices, mutual funds were required to adopt mark-to-market valuation in August 2002. In fact, regulations issued by the *Superintendencia General de Entidades Financieras* (SUGEF), the SUGEVAL and the *Superintendencia de Pensiones* (SUPEN) required all CIS, including pension funds, to be valued at mark to market, except for money market funds, which were allowed to continue under a cost-based system.

The introduction of mark-to-market valuation represented a major change in the regulation of mutual funds with very practical implications for investors. Subscription (buying) and redemption (selling) prices in a mutual fund are calculated based on the net value of the asset portfolio. In a cost based system, subscription and redemption prices are not affected by the "actual" value of the assets in the portfolio, since assets are valued at the price of acquisition except if actually sold, whereas under mark to market both subscription and redemption prices are affected daily by the changes in asset prices, showing either gains or losses.

The move to mark-to-market also represented a real challenge for the Costa Rican market, since as is the case for many developing countries, the secondary market lacks depth and liquidity. Secondary market trading is still modest and concentrated in repos, which due to their financing objectives cannot be taken into account for price formation. As shown in Table 1, during 2003 and 2004 outright buys and sales represent only around 24 percent of total trading volume. Given the limited level of trading, the implementation of mark-to-market required the development of a methodology that could reasonably lead to fair value.

[5] That framework has not yet been approved. However, new regulations for the mutual funds industry were enacted in 2006, which do address the issues stated above.

Table 1. Secondary Market

	Trading percentage		Number of trades		Average volume 1/	
	2003	2004	2003	2004	2003	2004
Repos	74.79	74.80	95,642	103,631	77.2	80.4
Outright sales—Debt	24.26	24.9	38,955	37,664	62.0	80.4
Forward trades 2/	0.53	0.10	261	55	199	73.6
Outright sales—equity	0.14	0.18	2,136	2,539	6.5	195.0
Lending	0.09	0.03	30	36	283.3	7.7
Total	100	100	137,024	143,925		
Total volume 1/	9,867,997	11,140,158.8				
Daily average volume 1/	39,630.5	44,383.1				

1/ In millions of colones.
2/ Operaciones a plazo.
Source: SUGEVAL.

The development of a methodology for mark to market—and the regulations that supported it—was the result of a very complicated process, since many issues were controversial. There was ample debate regarding the role that the regulator should have in the design of the methodology; whether the market should have one methodology or multiple methodologies should be allowed; whether price vendors should be authorized and finally over the level of discretion that operators should retain to deviate from the prices resulting from the use of the methodology (see Box 2). The final regulations allowed participants to develop their own methodologies based on guidelines developed by the superintendencias. In practice, the superintendencias fostered the development of one methodology for the whole sector, through the *Bolsa Nacional de Valores* (BNV), which became the first de facto price vendor. The BNV developed a pricing vector based on the yield curve for sovereign issuances,[6] which has been used by most market participants. A particular feature of the methodology, that proved to be a key factor in the volatility observed during the crisis, was that the prices from trades of specific sovereign issuances were used to estimate prices of other sovereign issuances that were not being traded, thus linking the prices of different issuances.[7]

[6] The main methodological elements of the pricing vector are explained under Appendix II.

[7] This feature known as the "drag along" method to calculate prices meant that if the price of a particular security dropped by 20 points, then the price of all other securities linked to it would drop by 20 points too, regardless of whether there were trades for those particular securities or not.

Implementation of mark to market took place very smoothly, in particular because of the time selected for its implementation. Implementation was carried out in a period when interest rates were decreasing and therefore the prices of securities were increasing; thus it was expected that very few, if any, CIS would reflect losses as a result of the change in the accounting methodology. However, given its long-term impact, the Superintendencias devised a communication strategy: CIS managers were required to send a letter to each individual investor explaining the impact of mark to market, and this was reinforced through announcements placed by the Superintendencias in the major newspapers, as well as brochures prepared for that purpose.

Box 2. The Development of Mark-to-Market Regulations

From the start, the development of mark-to-market regulations proved to be a very complicated process. Market participants believed that the market was not prepared for it and thus openly and vigorously opposed its implementation. For their part, the superintendencias believed that the market could no longer rely on a cost based system, since it could lead to inequalities in the treatment of investors, given the fact that the real price of assets was not reflected in the prices used for the subscription (buying) and redemption (selling) of units. Therefore it worked on draft regulations for the implementation of mark to market, but many issues were subject to debate:

The role of the regulator: There was ample debate regarding the role that the regulator should have in the design of the methodology. In fact at least one of the superintendents pushed for the methodology to be developed by the superintendencias. Probably because of the reputational—if not legal—risk that could arise from this "price giver" function, the view that prevailed was that valuation of portfolios should be the direct responsibility of CIS managers and therefore the regulations did not prescribe a specific methodology. However, the regulations issued by the superintendencias did include guidelines that impacted the design of the methodologies, since they required the use of observations from the market to calculate the price of securities traded as well as to estimate the prices of securities for which no observations were available.

One or multiple methodologies: There was also debate regarding whether the market should have only one methodology. The view that prevailed was that the key issue for proper valuation was not the standardization of the methodologies but the consistent use of the methodology chosen by the CIS manager. Therefore, the regulations allowed participants to develop their own methodologies, provided, however, that each financial group used the same methodology across different products. In practice, the superintendencias fostered the development of one methodology for the whole sector.

Price vendors: There was ample debate regarding whether third parties different from the CIS managers should be allowed to develop methodologies and if so, whether they should be subject to an authorization regimen, with fit and proper requirements. In the end the regulations allowed for third parties to provide methodologies, but did not create "price vending" as an authorized activity. As a result of that decision, any disagreement in price calculations between the managers and their price vendors had to be solved internally, and as far as the superintendencias were concerned the responsibility for proper valuation of portfolios lay exclusively with the CIS managers. In practice the *Bolsa Nacional de Valores* (BNV) became the first "de facto" vendor providing a pricing vector to most of the market participants.

Discretion to deviate from the methodology: There was disagreement regarding whether operators should retain discretion to deviate from the price resulting from the methodology if they considered that that the price did not reflect fair value. The final regulations significantly limited the possibilities for operators to deviate from their methodologies.

B. Characteristics of the Industry

Since the development of its regulatory framework, the mutual fund industry of Costa Rica experienced considerable growth. From 1998 until 2003 assets managed through mutual funds grew from 49,119 million colones to 1,203,940 million colones, which represented around 17 percent GDP and 60 percent of total claims on banks.

In addition, there was an increase in the number of investors. The number of investors grew during the same period from 9,573 to 67,327. Although the SUGEVAL does not have data available on the type of investors, based on conversations with market participants, it can be concluded that the majority of those investors were middle-class Costa Ricans. In addition, corporations and banks managed their own funds (their treasury) through mutual funds.

There was also an increase in the number, type and sophistication of products available, with financial funds predominant. The number of funds available for public offer grew from 59 to 144, and included money market, short-term, income, growth, share, real estate and mortgage funds. Nevertheless the majority of assets under management in mutual funds were held in financial funds.

Table 2. Mutual Fund Industry
as *of December 2003*

Type of Fund	Assets 1/	Investors	Funds
Money market	85,631	7,750	26
Short-term	88,960	4,555	16
Income	278,086	12,326	30
Growth	651,085	40,299	58
Share	1,839	198	3
Real Estate	94,546	2,134	10
Mortgage securitization	3,793	65	1
	1,203,940	**67,327**	**144**
Dollars	901,307		
Colones	302,633		

1/ In millions of colones.
Source: SUGEVAL.

Most financial funds' portfolios were highly concentrated in Costa Rican sovereign issuances. As is the case for many other Latin American countries, the Costa Rican securities market is characterized by the preponderance of government issuances and the lack of other alternative investments, both in equity and corporate debt.[8] Mutual funds are authorized to invest their resources in foreign issuers, quoted in the local market or in regulated markets abroad. However, probably because of the market's (both fund managers and investors) lack of sophistication, fund managers structured the portfolios as local portfolios, and thus, concentrated in Costa Rican sovereign issuances. As of December 2003, roughly 95 percent of financial funds invested in issuances in colones were invested in Costa Rican sovereign debt, 3 percent in repos, and 3 percent in other debt issuances.[9] In the case of financial funds that invested in issuances in dollars, 77 percent was invested in Costa Rican sovereign debt, 12 percent in repos, and 11 percent in other debt issuances.

[8] Both the Ministry of Finance and the central bank are issuers of securities. If registered with the *Superintendencia General de Valores*, their issuances are authorized for public offering and therefore could be held by both retail and institutional investors. By law institutional investors can only invest in issuances authorized for public offering.
[9] Figures add up to 101 percent (taken from the SUGEVAL).

III. THE CRISIS

During 2002–2003 a combination of internal and external factors created a bubble[10] in the price of Costa Rican sovereign paper, which resulted in very attractive returns for mutual funds and thus to significant growth in the industry. The adjustment in prices that took place in 2004 led to a massive run by investors that reduced the industry by half its size in less than a month. A set of measures was devised to ensure that redemptions took place in an orderly and timely manner, thus avoiding more severe consequences.

A. Evolution of the International and Local Markets Prior to the Crisis

During 2003 and the first months of 2004 the prices of Costa Rican sovereign paper appreciated considerably. This in turn led to a tightening of the spreads[11] over the U.S. Treasury bonds to very low levels not only compared to their historical levels but also to other countries with similar credit ratings. As shown in Table 3, in September 2003 Costa Rican bonds showed a lower spread than Panama bonds, in spite of the similar credit rating. Moreover, before the crisis, certain short-term instruments issued by the Central Bank were traded at such prices that the spread over the U.S. treasury bills was negative.[12]

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[10] A bubble refers to a situation where the prices of an asset increase significantly without a change in the fundamentals, which in the long run should determine its “fair price” See Arce, Jose Luis, *Ajuste en los precios de los instrumentos de deuda emitidos por el Gobierno de Costa Rica en moneda extranjera y la turbulencia de la industria de inversión colectiva*, 2005.

[11] The spread is the premium that an issuer would have to pay over the yield generated by a similar type of asset that is considered risk-free. Typically U.S. treasury bonds are used as the benchmark.

[12] See Arce, op.cit., p. 3.

Table 3. Spread of Costa Rican and Panamanian Bonds
(Basis points)

Costa Rica	September 2003	June 2004
bde08	259	419
Bde09	272	427
Bde11	315	436
Bde12	314	428
Bde 13	300	420
Bde14		407
Bde20	323	422
Panama	**September 03**	**June 2004**
22/04/2008	330	241
08/02/2011	373	335
23/07/2012	361	328
15/03/2015	390	399
15/05/2020	372	388
16/01/2023	359	378
30/09/2027	237	304
01/04/2029		383
Source: SUGEVAL		

As was the case for other emerging markets, the low U.S. interest rates were one of the factors that pushed the prices of the Costa Rican eurobonds up. For its *Global Financial Stability Report* (GFSR) of April 2004, the IMF conducted a study on the determinants for the 2003 rally in emerging market debt. The findings of the study suggested that following September 2001 global liquidity stemming from the low U.S. interest rates had become a more important determinant of emerging market spreads than country specific fundamentals.[13]

At the local level, the government's policy on issuance contributed to the increase in prices. The minister of finance had made changes to its issuance policy, which consisted of incrementing external indebtedness and prolonging the maturity of its issuances in order to reduce short-term refinancing needs. There were also changes in placement policies, since during this period the government preferred to place its issuances through private placements rather than public auctions. Due to this strategy, the stock of short-term notes in colones and bonds in dollars issued in the domestic market diminished considerably, leaving mutual fund managers with fewer investment options.[14] Beginning in March 2003 net subscriptions of mutual and pension funds exceeded net government placements. At their peak, in September 2003 net subscriptions in mutual and pension funds amounted to roughly 340 million colones while net government placements amounted to roughly 40 million colones, thus leading to an increase in the prices of Costa Rica eurobonds. For example, the

[13] See GFSR, April 2004, pp. 60-70.
[14] See Arce, op. cit.

price of the Costa Rica eurobond with maturity date 2020 (bd20), increased 569 points (from 119.18 to 124.87) from January to mid-April 2004.

Table 4. Ministry of Finance Placements by Maturity
(In millions of colones)

	Dec 02		Dec 03		Dec 04	
Maturity	Amount	Percentage	Amount	Percentage	Amount	Percentage
0-90	28,597.1	1.7	9,774.2	0.5	352,349.1	15.7
91-180	115,499.8	6.7	77,789.4	4.1	165,354.5	7.4
181-360	316,552.7	18.3	261,572.4	13.9	135,047.5	6.0
361-720	33,099.3	1.9	122,704.2	6.5	416,756.7	18.6
+ 720	1,239,222.1	71.5	1,408.277.9	74.9	1,170.966.6	52.3

Source: SUGEVAL.

The increase in the prices of Costa Rican bonds led to very attractive returns, which in turn accelerated the growth of the industry. Given the fact that assets have to be valued at mark to market, the capital gains that resulted from the increase in the prices of Costa Rican sovereign bonds generated returns for financial funds concentrated in this paper that were significantly higher than those of more traditional products. As Table 5 shows, at their peak in June 2003 returns on income[15] and growth funds[16] invested in issuances in dollars were approximately 10 percent, while the return on a 30-day certificate of deposit of a state-owned bank was around 2.5 percent. These attractive returns, which were heavily advertised by financial groups, provoked accelerated growth in the industry. During 2003, the industry showed a 65 percent growth compared with 2002, reaching US$4,000 million (63 percent of total claims on banks).

[15] Income funds are funds where interest from assets is distributed to investors on a periodic basis.
[16] Growth funds are funds where interest from assets is capitalized.

Table 5. Returns by Type of Mutual Fund
(Last 30 days)

	Dec-02	March	Jun	Sept	Dec-03	March
	Funds in colones					
Type						
Money market	12.29	14.72	15.57	11.56	11.57	10.99
Short-term	14.35	14.5	14.28	12.05	11.44	10.12
Income	9.28	14.13	17.36	12.51	10.99	12.13
Growth	12.22	15.13	17.06	12.40	12.11	11.95
Equity	11.67	6.92	42.39	18.51	(19.86)	(27.29)
	Funds in dollars					
Type						
Money Market	3.04	2.95	1.5	1.24	1.66	1.75
Short-term	4.46	4.40	3.61	2.24	2.84	2.36
Income	6.01	6.46	12.24	6.45	3.95	4.49
Growth	5.84	7.32	9.66	5.70	3.4	(1.55)
Equity	(52.77)	6.29	30.45	(13.13)	32.49	(6.52)
Real state	10.3	8.29	8.79	7.71	8.88	8.92
Securitization	8.77	8.61	9.77	8.52	8.02	9.14
Source: SUGEVAL.						

Most of this growth was concentrated in income and growth funds in dollars, which by definition were instruments for long-term investment. However, in their design mutual fund managers did not include incentives for investors to hold their investments for longer periods of time, such as early exit commissions. Thus, in practice these funds were used as if they were money market funds, but benefited from the better returns resulting from the holding of longer term paper.

B. The Adjustment

The indication that interest rates in the U.S. could increase led to an adjustment in the price of emerging market bonds. The revised language in the January and March policy statements of the Federal Open Market Committee, when it dropped its commitment to keep rates low for "a considerable period," combined with strong economic data and signs of stronger employment growth sparked a shift in interest rate expectations. The yield curve for U.S. treasury bonds began an upward movement, in particular in the long part, while emerging market bonds showed a downward movement, which meant a widening of the spreads. Market operators began to unwind long-term positions in order to realize capital gains accumulated during the period of low interest rates and to keep more liquid, short-term positions.[17]

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[17] See GFSR, September 2004, pp. 8 ss.

In Costa Rica the adjustment extended to all sovereign paper. The adjustment began in the short part of the curve, especially with the certificates of deposit issued by the central bank. The first important adjustment took place on March 17, with the cd$c5 issuance,[18] which fell 273 basis points[19]. Since at that moment that paper was showing a negative spread, the adjustment was more severe. Later on, the correction extended to longer-term paper, that is, the eurobonds issued by the ministry of finance. By May it had also extended to the paper issued in colones.

Table 6. Variation in the Prices of Costa Rican Eurobonds
(in percentage)

	Oct-Dec	Jan-June	Jul-Dec	Jan-Mar	Mar-Apr	Apr-May	May-Jun
	2002	2003	2003	2004	2004	2004	2004
BDE08	n.a.	6.4	0.5	1.1	-7.0	0.6	-0.2
BDE09	-0.6	8.7	1.1	0.9	-7.2	-1.5	-0.8
BDE11	-0.5	7.1	1.9	2.8	-6.9	-2.0	-2..0
BDE12	-0.9	7.4	0.5	3.8	-6.7	-2.6	-1.3
BDE13	n.a.	5.0	1.4	3.8	-7.1	-3.1	-1.3
BDE14	n.a.	n.a.	n.a.	0.5	-6.1	-3.8	-3.4
BDE20	-2.2	6.3	2.4	4.7	-6.4	-6.6	0.4
Source: Arce, Jose Luis.							

This adjustment induced a massive run of investors that reduced the size of the industry by a half in over a month. During March 2004 most financial funds experienced for the first time in their history negative returns. Negative returns during the period of March–April 2004 amounted to an average of 3 percent in dollars and 1 percent in colones; however, annualized losses for individual investors varied depending on the amount of time that each investor had remained in the fund. Thus, the longer the period of investment the lower the annualized loss. The losses prompted a massive run of around US$1,500 million in three weeks. By June 2004 total assets had declined by 52 percent for funds in dollars and 33 percent for funds in colones and the number of investors had declined from 67,327 (December 2003) to 39,573. Growth funds were the ones most severely affected by the run, followed by income funds.

C. Approach to the Crisis

The SUGEVAL had warned the market about the existence of a price bubble. For the SUGEVAL, the adjustment was an expected event, even though it did not know the specific moment when this would occur**.** In fact, in November 2003, the superintendent had gone to the press to warn investors about the existence of a price bubble and the need for an adjustment. This measure had given rise to severe criticism from mutual fund managers, who believed the announcement was introducing unnecessary concern about the industry and

[18] Government issuance in dollars with short-term maturity.
[19] See SUGEVAL, 2004, *Informe Anual del Mercado*, p. 21.

creating fear in investors. Nevertheless, in practice his call for caution did not have any noticeable effect either on fund managers or on investors' behavior.

Some regulatory options were explored and dismissed. The most important was the proposal of the superintendent to subject long-term funds (such as growth funds) to early exit commissions. The objective of this measure was to create incentives for a better match between fund assets and investors' permanence on the funds. However at that moment the *Consejo Nacional*, who had to approve the regulations, believed that the measure was very interventionist and asked the superintendent to consider other alternatives.

The crisis caught the SUGEVAL without an emergency plan. Although an adjustment was expected, the SUGEVAL did not foresee that it could lead to a massive run. Therefore no especial plan was devised. Nevertheless it should be emphasized that the off-site supervisory mechanisms in place allowed the SUGEVAL to have real-time information on secondary market trading as well as on the level of redemptions faced by mutual funds.

The volume of redemptions prompted the immediate involvement of the president of the central bank. The main concern was whether mutual funds would be able to get the liquidity necessary to honor redemptions in a timely and orderly manner to keep investors calm and thus avoid a loss of confidence that could spread to other products and lead to more severe, even systemic consequences. The president of the central bank assumed a key role in coordinating actions and responses taken by the superintendencias. In fact constant multilateral meetings took place at the central bank and the president of the central bank communicated daily with the three superintendencias.

A set of measures was taken to ensure the fair, timely and orderly redemption of investments. Measures taken during this period included a buy back by the central bank of issuances in colones (BEM) for C 25.000 million as well as the reduction in outstanding BEMs for more than 155,000 million colones, both measures aimed at providing liquidity to the market and more importantly, designed to generate public confidence. In addition, the SUGEVAL authorized mutual funds to increase their repo operations from 10 percent to 30 percent. At the beginning of the crisis the SUGEVAL refused to increase the limits, because it could have delayed the adjustment and caused unequal treatment of investors. When the prices of Eurobonds reached sustainable levels, the SUGEVAL authorized a temporary increase for the period between April 30 and May 31. This measure sought to avoid additional losses by mutual funds due to an over adjustment in prices.

The SUGEVAL also issued instructions for the winding down of mutual funds with significant redemptions. For some mutual funds the magnitude of redemptions in practice implied a winding down of the product, yet some continued to accept new investors and redeem participations in chronological order. In a period of declining prices, such behavior could have led to the unfair treatment of clients since it was possible that the last investors would bear the major losses. Therefore the SUGEVAL instructed managers of funds with significant redemptions to initiate winding-up processes, under which all customers would be redeemed at the same time, once all assets were liquidated.

There were also measures to reduce the severe volatility caused by special features of the pricing vector developed by the BNV. The SUGEVAL approved an amendment to the pricing vector in order to eliminate the "drag along" method to price securities, and this helped to smooth price volatility. The SUGEVAL also authorized the BNV to carry out block trades in a separate market.

Finally the SUGEVAL developed a communication strategy to address investors' concerns. The SUGEVAL deployed additional resources to the Information Center to deal with customers' questions. In addition, after the first week of redemptions, full page announcements appeared in the major newspapers giving investors general advice. The message was very cautious: it did not provide specific advice to investors on whether to redeem their units or not, rather it emphasized the need for investors to obtain information about the situation regarding their own portfolios and decide what was best for them. At the same time the SUGEVAL devised a special link on the web with daily information on all mutual funds, as well as a section on "Frequently Asked Questions." Finally the superintendent gave special attention to the press and requested it to be responsible in handling the news, which in fact it was.

After the crisis the SUGEVAL carried out a review of market compliance. The purpose of the review was to identify whether enforcement actions were needed, as well as changes in the regulatory framework.

D. End of the Crisis

Fund managers used outright sales to obtain the liquidity necessary to honor redemptions. This situation pushed the volumes of outright sales, as a percentage of the total volume of transactions, to the highest levels in many years. For the trimester March–June 2004, outright sales reached 32 percent of the total volume of transactions from an average of 24 percent in 2003. Conversely repo volumes diminished during the crisis due to the fact that fund managers needed to unwind repo positions in order to have securities available for sale. Thus, for the same trimester, repo operations represented 67 percent of the total volume of transactions, from an average of 75 percent in 2003.

Local banks were the buyers who provided mutual funds with the liquidity necessary to honor redemptions. Banks considered it necessary in order to avoid a loss of reputation for the financial group they belong to as well as prevent the risk of contagion. Although there are no data available for individual holdings, market participants indicated that most of the buying was carried out by the state-owned banks. Some market participants believed that it was easier for state-owned banks to "help" their funds because of their diffuse ownership.

Liquidity remained in the local market. Most investors who flew from mutual funds deposited their money in the banking sector. During the trimester of April–June 2004, deposits in state-owned banks increased by 389,680 million colones, a 77 percent increase from 2004, followed by an increase in deposits in privately owned banks of 81,327 million colones (16 percent) and in the *Banco Popular y de Desarrollo Comunal* of 35,146 million colones (6.9 percent).

The crisis has had a lasting effect on the mutual fund industry, which has not reached pre-crisis levels again. As shown in Table 7, income and growth funds were the most affected due to their larger concentrations in long-term Costa Rican issuances and greater sensitivity to variations in interest rates. In contrast, money market funds increased, mainly because they experienced less volatility due to the fact that their portfolios are valued at cost as well as the shorter "duration" of their portfolios.

Table 7. Mutual Fund Industry

Type of Fund	Assets under Management 1/			Number of Investors			Number of Funds		
	Dec 03	Dec 04	Dec05	Dec 03	Dec 04	Dec05	Dec 03	Dec04	Dec 05
Money market	85,631	172,338	186,427	7,750	9,413		26	28	
Short-term	88,960	104,828	74,049	4,555	4,082		16	16	
Income	278,086	102,018	112,387	12,326	5,219		30	28	
Growth	651,085	127,388	81,261	40,299	10,095		58	48	
Equity	1,839	1,262	0,796	198	147		3	3	
Real state	94,546	130,630	202,139	2,134	2,719		10	11	
Securitization	3,793	4,140	3,055	77	77		1	1	
Total	1,203,940	642,604	660,117	67,327	31,752	31,003	144	135	131

1/ In millions of colones.
Source: SUGEVAL.

The reputation of the SUGEVAL was also compromised. There was a public perception that the SUGEVAL should have done more to avoid the crisis. The superintendent was summoned twice to the Legislative Assembly to explain the role of the SUGEVAL in the crisis. Finally in September 2004, the superintendent announced that he would step down.

IV. Lessons from a Regulatory Perspective

The crisis might have been inevitable; however there are lessons to be learned. As stated above, the massive run was the result of an adjustment in the prices of Costa Rican sovereign paper, which had overappreciated due to a combination of external and internal factors. As such, the adjustment was inevitable. It could be argued that even in mature markets the adjustment would have prompted some investors to redeem their participation in the funds; however it is difficult to imagine that annualized losses of the level experienced in Costa Rica would have prompted a massive run in those markets. Thus, for some the run was a necessary lesson that an "inexperienced" market had to face so as to understand better the nature and characteristics of a product. Nevertheless certain weaknesses in the regulatory framework for financial intermediaries and portfolio valuation played a role in exacerbating the crisis and thus, it is important that those weaknesses be understood and addressed in order to build a resilient market able to cope with events such as those that occurred in 2004.

A. Micro Level

The relationship between disclosure and market conduct rules

Concentration limits for Costa Rican sovereign paper is not the answer. Some market participants believed that the crisis was a result of a weakness in the prudential framework for mutual funds, since it allowed them to be concentrated in Costa Rican sovereign paper. For them the solution lies in the inclusion of concentration limits for Costa Rican sovereign paper. The argument is appealing; however from a conceptual point of view it goes in the wrong direction, since decisions on the type of asset and investment limits should belong to investors who are bearing the risks of the investments. In addition, since there were no other investment alternatives available in the local market, in practice the imposition of those limits would have forced mutual funds to hold foreign paper and be subject to that risk exposure, a decision that should be left to investors.[20]

Therefore, disclosure remains a key component of the regulation of mutual funds. Acknowledging the importance of adequate disclosure, the regulations developed by the SUGEVAL in 1999 required that each mutual fund be accompanied by a prospectus that should include an explanation of its investment policies, the risks that could arise from those policies, and the mechanisms to manage those risks. In addition, the regulations required fund managers to provide investors with a copy of the prospectus prior to the investment. After the crisis the SUGEVAL conducted a review of the prospectus of all financial funds and concluded that all of them included such explanations. In addition, it concluded that the majority of fund managers had complied with their obligation to provide investors with the prospectus prior to the placement. Some participants have argued that disclosure requirements were not enough, since they did not force fund managers to include a warning on the cover of the prospectus stating that the funds were concentrated. Indeed, the addition of such a warning would have improved the quality of disclosure.[21] Nevertheless it should be emphasized that the basic disclosure was already there. Also, it is not clear that the warning alone would have resulted in a different outcome, given the lack of appropriate marketing and placement practices displayed by most fund managers.

But the crisis proved that market conduct rules, in particular appropriate marketing and placement policies, are also key to mutual fund regulation. From the review carried out by the SUGEVAL it can be concluded that investors did receive written information on the product they were investing in. Even so, the magnitude of the run vis-à-vis the magnitude of the annualized losses suggests that the run may have been caused by a lack of understanding of the nature of the product: many investors placed their resources in mutual funds under the false assumption that their principal would be returned to them untouched at redemption

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[20] As stated above, the regulatory framework did allow mutual funds to invest their portfolios in foreign securities.

[21] In fact the new framework for mutual funds recently approved does require the inclusion of those warnings. Some countries are following a similar approach. Spain, for example, requires the use of different colors for the prospectus, depending on the level of risk of the product.

time, as is the case for a certificate of deposit or a savings account. Thus, when they saw losses in the unit value, they realized that their principal was not protected and ran. This problem highlights the importance of market conduct regulation for the healthy development of a nascent industry. In this regard, proper regulation of mutual funds requires that mutual fund managers be subject to the financial intermediaries' regulation, including market conduct rules to regulate their conduct in their relationship with investors from the moment of subscription (placement) until the moment of redemption. In relation to placement, the most important obligations relate to the obligation to "know your customer" and the "suitability" requirement, which together require fund managers to understand the characteristics of their clients in order to provide them with advice and recommendations that are suitable for their individual situation.

The evidence showed that placement agents had failed to comply with their "know your customer" and "suitability" obligations. When the SUGEVAL authorized mutual funds for public offer it believed that it had a robust framework in place because it had enacted sound regulations for the product, which included the submission of a prospectus complemented by periodic disclosure to investors. What it had not realized was the impact that the lack of a more complete framework for financial intermediaries, that extended beyond capital requirements, would have in respect of the placement of the product and thus, of the healthy development of the mutual fund industry. The review carried out by the SUGEVAL proved that mutual funds had been marketed extensively by financial conglomerates, many of them using their banking platforms, without any prior review of clients' characteristics (risk aversion, investment objectives, etc.). This review should have been part of intermediaries' practices to address the "know your customer" and "suitability" obligations that are already included in the law. Moreover, numerous complaints were filed before the SUGEVAL for inadequate information and advice given at the moment of placement. In the case of funds managed by fund managers owned by state-owned banks, many investors contended that assurance was given to them that the product (mutual fund) carried the full faith and credit of the government, which is only the case for state-owned bank liabilities.

It also showed weaknesses in the regulation of conflict of interest. Although there is no official data, many participants complained that banks who had invested in mutual funds were the first to ask for the redemption of their participations without communicating to the market or their own clients of their decision. Their early exit probably meant that they were less affected by the decrease in prices that individual investors.

The importance of adequate corporate governance of financial institutions

Failures in information and advice were compounded by the lack of qualifications of the sales personnel. The inspections carried out by the SUGEVAL showed that most fund managers did not have appropriate selection and training programs for their placement agents. Moreover, the evidence suggested that the sales personnel of many intermediaries did not have professional or technical qualifications—especially in cases where the banking platforms were used to sell investment products.

The crisis also showed the need for better risk management mechanisms. As stated before, the concentration of the portfolios in Costa Rican sovereign paper might have been unavoidable for mutual funds that did not want any exposure to foreign securities. However, the review carried out by the SUGEVAL showed that most fund managers had not developed policies to cope with the risks arising from a change in interest rates. Moreover in many cases the structure of the fund itself exacerbated the problems. That was the case, for example, for most income and growth funds, which did not incorporate in their design early exit commissions that in a crisis situation could have slowed down a run.

The challenge of mark-to-market

The development of a methodology that reasonably leads to fair value remains a key challenge for the SUGEVAL. As long as the secondary market lacks sufficient depth and liquidity, using observations from the market as the basis to estimate market prices would still pose challenges, since the prices of individual trades might not reflect market conditions; rather they could be the result of the specific conditions of the two intermediaries entering into a specific trade. The methodology has tried to solve this problem by establishing stricter parameters to determine the trades that could be used for the purposes of estimating the prices of securities included in the pricing vector.

At a regulatory level there is a need to clarify the roles and responsibilities of all participants, including the regulator. While acknowledging the impact of proper valuation for the market as a whole, the superintendencia had emphasized that asset valuation and the development of methodologies for that purpose are the responsibility of fund managers. Therefore from the start the superintendencia had decided not to be part of the “methodology committee” that the BNV instituted, although it kept active communication with it. While this approach seems correct, the superintendencia needs to develop proper mechanisms to effectively oversee asset valuation. A similar problem exists between the BNV in its role as price vendor and fund manager. In spite of the existence of the methodology committee, where objections to prices can be presented and more generally issues regarding the methodology can be discussed, many fund managers kept a passive attitude and delegated all responsibility for proper valuation to the BNV. Therefore, there is a need to clarify the roles and responsibilities of fund managers vis-à-vis the price vendor, which might require changes in the regulatory framework.

B. Macro Level

The regulatory approach

The regulatory approach used by the SUGEVAL might pose a more important threat to the health of the market. It is clear that the misselling of the product was a key factor in the run. However, the enactment of suitability requirements—and fit and proper requirements for the sales forces—would only solve the most obvious part of the problem. The more subtle and perhaps more important part is directly related to the approach to the regulatory framework, which could be characterized as “rules-based” and “single pillar.”

The approach relies exclusively on the SUGEVAL to ensure proper regulation and the compliance of market participants. During and after the crisis the SUGEVAL was blamed for (i) not having developed rules that would have made it mandatory for all mutual funds to prepare risk profiles of clients and provide advice on investment products on the basis of those profiles, and (ii) not having developed more stringent rules for sales forces and risk management. On the other hand, market participants received very limited blame for not having developed adequate practices in these areas, in spite of the fact that the Law and regulations already contained the principles that required them to do so. Thus, there is a perception that unless the SUGEVAL provides very specific guidance on how to comply with an obligation, that obligation is not enforceable even if it is in the law. This rule based system is compounded by a misperception that the regulator, and not the financial intermediaries, bears the main responsibility for ensuring compliance with laws and regulations. This approach is flawed and can introduce elements of moral hazard to the system by expecting that a financial regulator—with the limited resources that it will always have—would be able to prevent, deter and sanction all infringements of securities laws.

Like the banking approach toward regulation, the model for securities market regulation should shift toward a multi-pillar approach. This approach emphasizes the “self discipline” of financial institutions, through sound corporate governance, risk management practices and a component of “market discipline,” while the task of financial regulators has shifted to monitoring, evaluating, and when necessary strengthening the risk management processes that are undertaken by financial institutions. While it is common to find this model used in the context of banking regulation and supervision, the rationale applies also to the securities market.

Thus, the main challenge for the SUGEVAL lies in changing market participants’ culture toward compliance. Within this context it can be acknowledged that the SUGEVAL failed, but not because it did not issue very prescriptive rules but because it did not create a regulatory framework that placed responsibilities where they belong, namely with market participants. Such responsibilities include bearing primary responsibility for regulatory compliance and therefore the primary responsibility for the development of adequate policies, procedures, internal controls and risk management mechanisms to ensure that products are properly sold and in general to display appropriate and adequate behavior toward their investors and the market.

Financial literacy

More important than the failure in advice given to investors is the more general problem of the level of financial literacy of the country. From the findings of the inspections carried out by the SUGEVAL, it is clear that the industry failed to provide investors with necessary and sound advice at the time of the sale of the product. This failure was compounded by the fact that up until the moment of the crisis investors had not perceived the differences between mutual funds and banking accounts, since mutual funds had never experienced losses. However, the failure of the industry is merely indicative of a more important problem, which is the low level of financial literacy of the country and thus the need for a comprehensive investor education program.

The challenge for the SUGEVAL lies in finding the ways and means to implement broad financial literacy programs. As is the case for many countries, investor education programs have been carried out mainly through brochures, the development of a comprehensive website and of an information center located in the offices of the SUGEVAL. However these efforts are limited in their impact since they mostly reach the people who are already investing in the market, rather than the "average citizen." Since 2005 the SUGEVAL has changed the orientation of its educational efforts and has given more emphasis to activities that could attract the average citizen. In 2005 it conducted an Investor Fair, where different activities were carried out to educate investors on securities matters. The fair has been followed by periodic presentations to the public on basic issues related to the securities markets. Nevertheless many countries have found that mass media is the best tool to deliver their financial literacy programs.[22]

Capacity building

The final lesson to be learned is the importance of capacity building across all market participants, including the regulator. In developing countries it is very common to rely on international consultants—usually from more developed markets—for the drafting of critical sets of regulations. However, in the longer run a country has to bet on its own personnel, since the implementation of regulations will depend on the understanding that local participants—including the regulator—have of those regulations.

Thus, a critical component of any strategy to develop a market is the inclusion of staff and industry training to provide them with the basic knowledge that would allow them to make independent and informed decisions. Thus, even if at times it is still necessary to rely on external consultants for the drafting of regulations, a more coherent approach would include training within the terms of reference of the external consultant. This would ensure that the country has the capacity to deal with the challenges ahead.

[22] See, for example, the efforts by the Monetary Authority of Singapore.

APPENDIX I. THE STRUCTURE OF FINANCIAL REGULATION IN COSTA RICA

The regulation and supervision of the financial sector in Costa Rica is shared by three specialized regulators:

- the *Superintendencia General de Entidades Financieras*, in charge of the regulation and supervision of the banking sector;
- the *Superintendencia General de Valores* (SUGEVAL), in charge of the regulation and supervision of the securities sector; and
- the *Superintendencia de Pensiones* in charge of the regulation and supervision of the pension sector.

Although part of the central bank, the law affords the superintendencias operational (functional) independence; thus the central bank cannot give directions or orders to the Superintendencias in the areas under their competences.

The Superintendencias share a common board, the *Consejo Nacional de Supervision del Sistema Financiero,* which is in charge of providing general guidance and approving the regulations of the three superintendencias. Decisions regarding the suspension and liquidation of financial intermediaries are also a responsibility of the *Consejo Nacional*, based on a proposal of the superintendente in charge. The consejo also reviews in appeal, any decision taken by the superintendentes. The consejo is composed of seven members, five members from the private sector appointed by the board of the central bank for a five year period with the possibility of reelection and removable only with due cause, and two ex officio members: the minister of finance and the president of the central bank. Although the consejo holds separate meetings for each superintendencia, the superintendents are allowed to participate in all meetings. In addition, the agenda of each session begins with a point of "issues of interest for the three superintendencias," which further strengthens coordination.

Each superintendencia has a head, the superintendent who is appointed by the *Consejo Nacional* for a five year period, with the possibility of reelection and removable only with due cause. Except for the suspension and liquidation of market participants, all other decisions that pertain to the day-to-day operation of the superintendencia are taken by the superintendent. The superintendent is a full time civil servant and the head of the personnel of the superintendencia.

Twenty percent of the actual expenses of the superintendencias are funded by fees levied on market participants, while the remaining 80 percent is covered from the budget of the central bank. Every year the central bank defines the maximum amount to be given to the superintendencias altogether and within this limit, the *Consejo Nacional* approves the budgets of each superintendencia, based on a proposal submitted by each superintendent. The *Consejo Nacional* has instituted a budget committee to deal with budget issues in a unified way.

APPENDIX II THE PRICING VECTOR DEVELOPED BY THE *BOLSA NACIONAL DE VALORES*

The pricing vector is a system that generates a unified price report for a selected group of securities. Below are its main methodological elements.

1) It is based on the observations from trades carried out in the stock exchange. Thus, if observations exist for a particular issuance the system will be fed with the prices from those trades. In the absence of observations from the market, prices are estimated based in methodologies that have been developed for different categories of securities.

The current pricing vector comprises seven different categories of securities:

a) Issuances that comprise the sovereign yield curve (SYC)
b) Other public debt issuances
c) Private debt issuance
d) Foreign issuances
e) Equity issuances
f) Unit of close-end funds
g) Premium for other debt issuances of public entities

2) It only takes into account prices generated by outright sales that are settled in the same currency of the issuance.

3) Only prices from trades that fall within certain volume thresholds are taking into account. The stock exchange has developed different thresholds depending on the type of securities. As of today, those limits are:

For issuances that are part of the SYC

	Inferior	Superior
Colones	30,000,000	350,000,000
Dollars	100,000	2,000,000

For all other bonds

	Inferior	Superior
Colones	10,000,000	350,000,000
Dollars	35,000	1,000,000

For equity

	Inferior	Superior
Colones	5,000,000	350,000,000
Dollars	15,000	1,000,000

4) The stock exchange determines the "weighted average price" (WAP) or the "weighted average yield" (WAY) for each category of securities. The WAP or the WAY is obtained directly from the observations (trades) of each trading session. For issuances that are part of the SYC the system requires at least three trades (transactions) during a trading day to run the calculations; for all other issuances the system requires one trade.

$$PPP = \frac{\sum_{i,j,} P_{i,j} * FV_{i,j}}{\sum_{i,j} FV_{i,j}}$$

Where,

j:	Issuance
$P_{i,j,}$:	Price observed in trade i for the issuance j
$Y_{i,j}$, :	Yield observed in trade i for the issuance j
$FV_{i,j,}$:	Face value observed in the trade i for the issuance j
WAP_j:	Weighted Average Price for issuance j
WAY_j:	Weighted Average Yield for issuance j

And the WAY is calculated as follows:

$$WAY = \frac{\sum_{i,j,} Y_{i,j} * FV_{i,j}}{\sum_{i,j} FV_{i,j}}$$

5) The system works with:

a) Clean prices, that is, accrued interest is excluded.

b) The annual nominal yield

Issuances that Comprise the Sovereign Yield Curve (SYC)

The methodology builds first a SYC, which considers the relationship between the time until maturity and the yield for that maturity for the different issuances.

Only issuances by the minister of finance and the central bank are used to build this curve. The stock exchange decides the specific issuances that will be part of the SYC based on turnover and diffusion.

To derive points in the curve for issuances where there were less than three trades (transactions), the system calculates a “Mobile” WAP, which takes prices observed during the last five trading sessions –under certain circumstances. If there are no observations during the last five trading days, then the last observed price is taken to run the calculations.

Private Debt Issuances

In cases where there are no observations for an issuance, prices are calculated based in the SYC and the “individual premium” for the particular issuance. The individual premium is determined in relation to the SYC, comparing the yield of each issuance with the yield of the sovereign issuance with the same maturity. The premium is later on added to the points in the curve to determine the equivalent yield for each particular issuance.

The system recalculates the premium with the information taken from the secondary market. Thus if at some point the price is taken from observations from the market, then the system will recalculate the premium as a function of the new information.