

# **Basel II Adoption and Adaptation in Latin America: Colombia as a Case Study for Other Emerging Markets\***

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November, 2008

## **Summary**

This study attempts to assess the likely impact the implementation of Basel II would have on the Colombian financial sector, examining the effects both qualitatively and quantitatively. This paper summarizes this assessment, garnered through 1) a detailed questionnaire, 2) lengthy interviews sent to key market participants as well as government officials, and 3) a quantification of the capital requirements for the entire financial system, using individual loan information.

Despite the fact that the financial supervisory body of Colombia has not issued an official statement regarding the implementation of the regulatory framework encompassed by the Basel II Accord, both the public and private components of the financial sector have made significant strides in that direction, particularly with regard to credit risk. Although some work needs to be done on the implementation, the country is ready to move forward, making adaptations that take into account the Colombian system. An initial assessment of capital needs suggests that the current over-capitalization of the system, well above the mandatory levels, provides ample cushion for the additional capital required under Basel II.

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## **Introduction & Acknowledgements**

This study represents an in-depth analysis of the potential implementation of the New Capital Accord, (Basel II) in Colombia, as one of the country case studies commissioned by the Inter-American Development Bank (IDB) Research Department as part of a larger study encompassing Latin American progress toward Basel II adoption.

In accordance with the basic guidelines determined by the IDB, this study contains six sections: 1) a brief overview of the present structure of the Colombian financial sector and the recent history leading to its current configuration, 2) a detailed explanation of the methodology utilized to fulfill the requirements of the IDB and provide enlightening information about Basel II implementation in Colombia from all possible angles, 3) a brief history of legislation and mandates of the financial regulator related to topics addressed in the Basel II Accord and an outline of the current regulatory structure, 4) an assessment of the preparedness of the financial sector, including both public and private components, for the possible implementation of a Basel II framework, 5) a comprehensive description of the quantitative exercise undertaken and the conclusions that can be drawn from it, and 6) a brief summation of the results of the study and a list of recommendations.

The completion of this study was aided by a significant number of people within the Colombian financial sector. Notably, a debt of gratitude is owed to the Superintendencia Financiera de Colombia (SFC), in particular the Superintendente Financiero, César Prado Villegas, and the Director of Research & Development, Camilo Zea. Dairo Estrada, from the Banco de la República (Central Bank), and Roberto Borrás of the Ministerio de Hacienda y Crédito Público were especially useful from the public sector perspective. In the private sector, many thanks are expressly owed to Vice President of Risk at BCSC, Patrick Tissot, and the Manager of Risk at BCSC, Jorge Hernán Borrero. Additionally, the following people deserve mention and thanks for their very kind collaboration in this study: Germán Michelsen and Mauricio Cepeda of Banco de Bogotá, Olga Lucía Matamoros and Jaime González of Bancoldex, Oscar Forero Quintero of Banco de Crédito, Juan Carlos Mora of Bancolombia, Felix Pérez and Daniel Gómez of BBVA, Javier Suárez of Davivienda, and Francisco Javier Becerra and Aníbal Rojas of HSBC. Many others from these organizations undoubtedly helped in compiling information, coordinating interviews, and generally facilitating our job, and though their names are not listed explicitly here, many thanks go out to them as well. We would like to thank the IDB Research Department, especially Andrew Powell and Luis Giorgio, and Silvina Vattnick from the Centro de Estabilidad Financiera in Buenos Aires, for their trust and support throughout this study, and the valuable comments. Finally, we would like to thank the all the participants in the kick-off seminar in Buenos Aires, graciously hosted by Silvina and her team, most especially, the comments from Martín Naranjo, who provided useful suggestions that improved our initial proposal. All the responsibility for the content, however, is entirely ours.

## Overview of the Colombian Financial Sector

After enduring a period of volatility that spanned over a decade and witnessed waves of M&A activity as well a debilitating crisis at the turn of the century, the Colombian financial system has entered a period of relative calm coinciding with recovery in the larger economy.

The Superintendencia Financiera de Colombia (Financial Superintendency of Colombia, hereafter “SFC”) is responsible for supervising the entire financial system. Its current structure is the result of the 2005 merger of the entities previously responsible for banking and capital markets supervision. On the banking side, its predecessor, the Superintendencia Bancaria, dates from 1923, when it was created upon the recommendation of the mission headed by Edwin Kemmerer, a Princeton University professor of Economics. The SFC is under the aegis of the ministry of finance (Ministerio de Hacienda y Crédito Público - Minhacienda), that is accountable for all economic regulation in the country, including financial regulation. Finally, depositors are insured by a publicly-owned deposit insurance entity: Fogafin.

The overarching regulatory law that governs the financial system is called the Estatuto Orgánico del Sistema Financiero (EOSF), which was originally enacted by the Colombian Congress in 1995, but, since then, has been subject to substantial changes. Minhacienda is responsible for the decrees which deal with the details, as specified by law, and the SFC uses “circulares” to clarify the decrees or when required by law.

The financial system has three types of institutions: credit establishments, financial services providers, and miscellaneous enterprises. Credit establishments include banks, commercial finance companies, and vaguely named “financial corporations.” Financial services providers count among their ranks trust companies, investment management firms, stock brokerages, and pension fund administrators. Finally, the “miscellaneous” category encompasses insurance companies, capitalization companies, and currency exchange houses; these entities tend to be of much less import to the financial system as a whole.

Although the designations for the various types of credit establishments seem only nebulously different, the main activities in which each is engaged are relatively well-differentiated. Banks, by far the most common type of credit establishment, offer interest-bearing deposits of any term-length, ordinary loans, mortgages, operations in the currency market, and factoring. Commercial finance companies provide leasing services and consumer credit. Lastly, financial corporations provide medium-term credit to industry and deal with risk capital activities.

While the sub-categories of financial services providers seem better differentiated than the sub-categories of credit establishments, the underlying services rendered, in contrast, tend to overlap. Trust companies supply investors with a variety of services, including portfolio management, mutual funds (and other pooled investments), and voluntary pension funds (essentially long-term investment funds). Investment management firms tend to focus solely on the administration of pooled investment funds. Stock brokerages center their businesses on the buying and selling of stocks for investors but also take

part in the administration of pooled investment funds. Pension fund administrators manage long-term compulsory pension funds, as well as the same “voluntary pension funds” offered by trust companies.

The Colombian financial system thus appears to have remained a complex, multifaceted creature throughout the volatile years 1990-2005. However, a single component –the banking system– towers over all other components in terms of size and importance. Of the US\$91,813 million in assets supervised by the SFC at the end of December 2007, US\$79,111 million (86%) came from the balance sheets of the 16 banks operating in Colombia. The proportion of credit outstanding loaned by banks is even more pronounced: over 90% of the US\$54,024 million that comprise the Colombian financial system’s loan portfolio comes from banks.

This dominance is in large measure a result of the post-crisis environment characterized by consolidation and outright downsizing. Although, as noted, many different legal forms of financial institutions continue to exist, a shift toward financial services under one umbrella (universal banking) occurred with force during the early part of this decade. Despite the merger of banking and securities industry supervision in 2005, the number of entities currently supervised by the SFC remains less than the number of entities supervised by just the Superintendencia Bancaria in 1995 due to the drastic downsizing obligated by the crisis period.

Even the banking sector shows a level of attrition, though consolidation instead of outright failure proved the norm. Approximately twice the number of banks existed at the end of 1995 as presently exist. State banking virtually disappeared and entities specializing in mortgage loans (including both “corporations for savings and mortgages” and “banks specializing in mortgage credit”) were absorbed almost in their entirety by commercial banks.

As a consequence of this shake-up, financial depth fell and the composition of the banking system’s loan portfolio suffered a considerable change; only recent recovery has reversed these trends. Prior to the onset of the crisis, the total loan portfolio of credit establishments measured almost 40% of GDP; at the depth of crisis, this figure had fallen nearly in half, to 22%. Resurgence has come slowly, as year end 2007 data showed a depth level of 31.4%. In parallel, during the 1990s, mortgage credit gained increasing importance largely at the expense of consumer credit, reaching 30% of the total loan portfolio in 1999. As the crisis unwound, it collapsed to its present weight of less than 10%. Consequently, consumer credit has retaken its position as a solid second to perpetually dominant commercial credit. At the end of 2007, total banking system loans were 59.6% commercial, 30.8% consumer, 7.8% mortgage, and 1.8% microcredit.

Perhaps the only element that remained constant throughout the crisis and continues to the present-day is the dominance of local banks. In contrast to various other Latin American economies, where large international banks predominate, local interests control the majority of banking operations in Colombia. Domestic banks account for 10 of the 16 banks in operation and two domestic banking conglomerates control approximately 50% of both the entire system’s assets and the stock of credit outstanding. Subsidiaries of large international players possess only 22% of the system’s total assets and credit outstanding.

In sum, as the Colombian financial sector has emerged from its turn-of-the-century crisis, it has modernized and consolidated itself. Despite possessing vestiges of the complicated pre-crisis system, the financial industry has become increasingly characterized by universal banking that, through economies of scale achieved by consolidation, has led to financial depth returning to near pre-crisis levels. And importantly, all of this progress has been impelled internally, as domestic banks far outweigh their international counterparts in terms of both assets and prestige.

## Methodology

To understand fully the impact Basel II implementation would have on the Colombian financial sector, we sought to examine likely effects both qualitatively and quantitatively. In accordance with this goal, we carried out a three-part investigation aimed at gathering both human perceptions and hard data. First, we constructed two surveys involving specific fact-based questions as well as more open-ended questions. The first survey was directed toward executives in charge of risk management at the important banking institutions in the country; the second was directed toward executives working at the financial supervisor for the country, the SFC. In addition, we conducted in-person interviews with many of these same executives and other members of their risk management teams, clarifying survey questions, and, more importantly, collecting insights on themes we felt were unsuitable for the short-answer format of the survey. Finally, utilizing data provided publicly by the SFC and confidentially by several banking executives, we created a purely quantitative model to determine the effect Basel II implementation would likely have on the capital requirements of the Colombian banking system in its entirety.

While the two distinct surveys shared basic components to facilitate comparisons of the respective views of the public and private sectors, the questionnaire for the regulatory bodies possessed a broader focus, reflecting the need to understand the entire implementation process from the governmental side and solely the material impact of this implementation from the banking side. The regulator survey included 56 typically multiple choice questions separated into six sections: current status of capital requirement regulation, strategic decisions related to Basel II (credit & operational risk being subsumed by this category), banking supervision under Basel II (Pillar II), transparency and market discipline (Pillar III), and assessment of the potential impact of Basel II adoption. On the other hand, the bank survey was comprised of 66 questions – also typically multiple choice – and was divided into just three sections, all dealing primarily with Pillar I: credit risk, operational risk, and market risk. Copies of these questionnaires are found in the Appendix of this study.

The survey and the interview components entailed the participation of virtually the same list of entities – a list that represents the majority of the banking system by assets and all major governmental institutions related to the financial sector. On the private sector side, eight banks and one government-owned development bank received the questionnaire. Only one of these, Citibank, did not respond. This is not viewed as a significant detriment to the validity of the study in that Citibank is a relatively minute presence in the Colombian banking sector; moreover, the perspective of banks headquartered outside of Colombia was provided by other institutions. The banks that did respond (in alphabetical order) were: Banco de Bogotá, Banco de Comercio Exterior de Colombia (Bancoldex), Banco de Crédito, Bancolombia, BBVA, BCSC, Davivienda, and HSBC. On the public sector side, the questionnaire was completed only by the SFC but interviews were conducted with the SFC, the Banco de la República, and the Ministerio de Hacienda y Crédito Público. A summary of entities queried and primary persons interviewed follows, though it should be observed that many of the interviews involved junior personnel (unlisted here) who in many cases proved as helpful as their superiors.

**Table 1**

<b>Interviews Conducted</b>					
	<b>Entity</b>	<b>Primary Interviewee</b>	<b>Title</b>	<b>Secondary Interviewee</b>	<b>Title</b>
<b>Banks</b>	<b>Banco de Bogotá</b>	German Michelsen	Credit VP	Mauricio Cepeca	Head of Risk
	<b>Bancoldex</b>	Olga Lucia Matamoros	Head of Risk	Jaime Gonzalez	Risk Officer
	<b>Banco de Crédito</b>	Oscar Forero Quintero	Risk VP		
	<b>Bancolombia</b>	Juan Carlos Mora*	Risk VP		
	<b>BBVA</b>	Felix Perez	Risk VP	Daniel Gomez	Retail Credit Head
	<b>BCSC</b>	Patrick Tissot	Risk VP	Jorge Hernán Borero	Risk Manager
	<b>Davivienda</b>	Javier José Suárez Esparragoza	Risk VP		
	<b>HSBC</b>	Francisco Javier Becerra	Risk VP	Anibal Rojas	Risk Manager
<b>Government</b>	<b>Superintendencia Financiera</b>	César Prado Villegas	Financial Superintendent	Camilo Zea	R&D Director
	<b>Banco de la República</b>	Dairo Estrada	Head of Financial Stability Unit		
	<b>Ministerio de Hacienda y Crédito Público</b>	Roberto Borrás	Head of Financial Regulation		

\*conducted over the phone

While many of these are entities well-known throughout Colombia, in broader Latin America, and some even on a global scale, it is necessary to note the specific importance of each within the Colombian banking system.

Banco de Bogotá is the oldest domestic bank in Colombia and one of the largest: founded in 1870, the bank has become the second-largest bank by assets in the country and heads the Grupo Aval conglomerate, the biggest financial services conglomerate in Colombia. At year's end 2007, it held 14% of banking system assets.

Bancoldex is a development bank; founded in 1992 after essentially taking over the business of the government-run Proexpo (trade promoter), Bancoldex spent the next ten years as a bank exclusively catering to import/export businesses. In 2002, the bank began a restructuring that has allowed it to broaden scope, resulting in the provision of banking services not only to import/export businesses but to small businesses for development purposes as well. The major

stakeholder in Bancoldex is the Ministry of Trade, Industry and Tourism (“Ministerio de Comercio, Industria y Turismo”).

Banco de Crédito, a relatively small domestic bank, is part of a conglomerate, Helm Financial Services, that focuses primarily on business in Colombia, Venezuela and Panama (though it has offices in Miami as well). Banco de Crédito accounted for approximately 3% of Colombian banking system assets at the end of 2007.

Bancolombia is the largest bank operating in the country by assets, controlling approximately 21% of the system’s total assets. Founded in 1875, Bancolombia attained its present shape and size through both organic growth and acquisitions, including the 2005 integration of two savings & finance corporations known as Corfinsura and Conavi into its operations.

BBVA is one of the two foreign-based banks examined in this study and by far the most important foreign-based player in the Colombian banking industry. Headquartered in Spain, the Colombian operation possessed around US\$ 8.5 billion in assets at the end of 2007 (11% of the sector’s assets), making it the fourth-largest bank in Colombia by assets.

BCSC was founded more than ninety years ago as a savings institution for workers and has maintained this emphasis on personal and small business banking services to the present day. In 2005, another Colombian banking institution, Colmena, was integrated into the BCSC network, creating the present structure of the bank, which reported assets of US\$ 3.1 billion (4%) in December 2007.

Davivienda, part of the financial services conglomerate Grupo Bolívar, constitutes the third-largest bank in Colombia, with approximately 12% of the system’s assets. Created in 1972 as a savings & mortgage institution, Davivienda became a highly significant player in the financial sector with acquisitions of Bansuperior and Granbanco in 2005 and 2006, respectively.

HSBC, the other foreign-based bank analyzed, only recently entered the Colombian financial sector with the purchase of the Central American bank Banitsmo in 2006 and its satellite operations in Colombia. Accordingly, HSBC has a mere foothold in the country: though a major international player headquartered in London, HSBC controls little more than 1% of Colombian banking assets.

These institutions were chosen for their relevance for the system as a whole: the four largest institutions, comprising close to 60% of the total financial system assets, the largest and most internationally-active government-owned bank, as well as two of the most important foreign-owned bank, as well as a small bank with international operations, provide a broad view of the concerns bankers have and their assessment of the implication of a Basel II implementation. The quantitative exercise, however, differed from the survey & interview components, as it included the entire banking sector, and as such, was not limited to the entities listed above. This exercise will be detailed in Chapter 5.

## Evolution of Recent Financial Regulation in Colombia

While the SFC has not published an official opinion on the Basel II Accord and does not have an official road-map for adoption, the internal plan is to “Colombianize” the Accord and implement it in the near future. The evolution of financial regulation in Colombia since the last financial crisis hints at this plan, as significant progress in risk management without explicit endorsement of Basel II has characterized the Colombian regulatory environment from 2002 on. Since that year, a concerted, if at times halting effort, has been made to improve risk practices, particularly with regard to supervision and credit risk provisions.

On the heels of the 1998-2002 financial crisis, the Superintendencia Bancaria of Colombia (hereafter referred to as the “SBC”, the banking system regulator before banking & securities regulation were merged into the unified SFC) initiated an ambitious program of credit risk management well before the Basel II Accord had been published. By means of *Circular Externa 011 of March 2002*, the SBC called on all supervised entities to produce their own *Sistemas Administrativos de Riesgo Crediticio* (“Credit Risk Administration Systems”; hereafter SARC) in accordance with a series of guidelines published in the same *Circular* by the SBC. Notably, these guidelines defined all credit as conforming to one of four categories: consumer credit, housing loans, commercial credit, or microcredit.<sup>1</sup> In addition, all loans were to be rated from A-E in line with the definitions of riskiness delineated, credit type-specific definitions for delinquency & default were explained, and calculations for the provisions to cover expected losses were defined.<sup>2</sup> Furthermore, the expectations for the supervisory process by both the company’s upper management/board of directors and the SBC were detailed.

In essence, the document foreshadowed the credit risk and supervisory components of Basel II. Although it did not address directly the cornerstone of capital requirements, *Circular 011* placed the onus on individual institutions, defined calculations for provisions, and highlighted the (Pillar II & III) responsibilities of both the regulator and the management team with respect to credit risk.

This momentum, however, stalled due to a number of factors, one of which became especially relevant: the realization of the true costs and obstacles involved in the process. As Banking Superintendent Jorge Pinzón Sánchez observed early in 2004, the SBC was already suffering from a lack of resources, both monetary and human. This deficiency was more than matched by the deficiencies of the supervised entities: lack of data, lack of data integration, and the absence of true commitment all plagued the private sector. Moreover, the system was in the recovery process after the financial crisis at the close of the century.

The SBC, acknowledging the problems, decided upon a permanent reference model to determine expected losses and therefore necessary provisions. In late 2004 and early

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<sup>1</sup> This is highly relevant for Basel II impact studies as will be explained in the section explaining the quantitative exercise methodology.

<sup>2</sup> In Colombian risk ratings, A denotes the highest quality (signifying low probability of default) and E denotes the lowest quality (signifying high probability of default).

2005, more changes were formalized in *Circulares Externas 052* of 2004 and 001 & 002 (among others) of 2005.

By July 1, 2007, a reference model for commercial loan provisions had come into effect; a year later, the reference model for consumer loan provisions was implemented officially. The reference models for mortgage credit and microcredit are projected to be in place in the medium term (1-5 years).

The current iteration of SARC regulation has evolved from this foundation but remains grounded in it. The responsibilities of an institution's board of directors are more clearly spelled out; the necessary depth and breadth of the data sets to be used in internal models for provisions are elucidated more clearly, as is the process for internal model approval; and each stage of the credit process (awarding of loan, monitoring, etc.) is defined in terms of expected bank behavior. Thus, by means of SARC, the SFC has advanced considerably in Pillar II regulation and in the construction of a provisions framework for credit risk – without necessarily adopting Basel II.

The progress with regard to operational, market and liquidity risk, especially in the past two years, tends to mirror the early stages of SARC legislation. While not formally part of any effort to implement Basel II recommendations, each of these risk areas has recently seen an official promulgation on the part of the SFC delineating SAR (Risk Administration System) guidelines.

Published in *Circular Externa 041 of 2007* (in June), the framework for operational risk management known as SARO defines particular operational risks, outlines each stage in the identification and control of operational risks, and details specific responsibilities of management and the board of directors. The first series of SARO rules went into effect on July 1, 2008, with the main goals being better transparency for customers, safer & more reliable Internet applications for banking transactions, and more secure credit and debit card transactions. In 2009, goals for improved operational risk will include better tracking of the real cost of each transaction and extension of services offered by ATMs to diminish the emphasis on banking hours; in 2010, regulation will effect better identity-theft measures.

One of the risk elements not included (at least explicitly) in Basel II, is the one related to money laundering. This one can be considered a subtler component of operational risk, or, alternatively, of reputation risk. This element is nevertheless particularly relevant for the Colombian experience. Therefore, this risk was singled out into the Colombian risk regulation, and also went into effect in July 2008: the Risk Administration System for Money Laundering and Financing of Terrorism (SARLAFT). SARLAFT, initially introduced by *Circular Externa 022 of 2007* (April), consists of two phases: the first involves the prevention of the entrance of funds from dubious sources into the financial system, and the second entails the detection of activities aimed at legitimizing funds related to laundering or financing of terrorism.

Publication of the SFC's expectations regarding management of market risk followed SARO and SARLAFT, in October of 2007. *Circular Externa 051 of 2007* outlined SARM (market risk), based on the SAR infrastructure pioneered in the SARC legislation. At the risk of being repetitive, the SARM document describes responsibilities of management and the board of directors, the process for internal model approval, mandatory

documentation and data, and the required public divulgations of asset holdings. Furthermore, the reference model is explained in an annex to the Circular.

Finally, another risk element not included explicitly in Basel II, liquidity risk, was introduced by the SFC in 2008 in SARL. As the latest component of SAR legislation, SARL, encapsulated in *Circular Externa 016 of 2008* (May), follows its predecessors in form and content. However, because of its relative newness, it has not officially become part of the regulatory framework – banks cannot yet be sanctioned for non-compliance.

As should be clear from this laundry list of regulatory advancements, Colombia has taken very seriously the task of improving risk management, particularly within the last few years and, it may be inferred, during the tenure of the present Financial Superintendent, Cesar Prado, who entered office in July of 2007. After having started off anxiously in reaction to crisis in 2002 but having lost some of the impetus with the confluence of regime change, organizational restructuring, and resource shortages, the SFC has retaken lost ground and continued moving forward.

Yet it is just as clear from this laundry list that such progress does not necessarily signify direct adherence to Basel II guidelines. The SFC has made the conscious decision to implement reforms piecemeal and more significantly, has yet to address the crux of Basel II – capital requirements – or even the Accord itself. Thus, while strictly regulating provisions allows for indirect control of capital held, the key component to improved risk management is lacking. Pillars II & III, especially in terms of transparency improvement and increased responsibilities for executive-level management, have similarly been addressed, but not in Basel II terms.

Ultimately, then, a true assessment of where the SFC – and by extension, the Colombian banking industry – stands with regard to Basel II must wait until March 2009: the SFC plans to complete a study of capital requirement impact during the second semester of this year and intends to publish the official road-map toward Basel II implementation before the end of the first quarter of 2009. Only after the release of these documents will the SFC's position have been elucidated clearly and officially.

## Financial Sector Preparedness

The historical process described in the previous chapter demonstrates unequivocally the effort in recent years to improve risk management in the financial sector as a response to the crisis at the turn of the century. In both the previous chapter and historical experience, it has appeared that the SFC has been the driving force behind this movement despite the stops and starts occasioned by the change of regimes and the consolidation of supervisory tasks. Yet the information gleaned during the interviewing process and the results obtained by the questionnaires indicate that the banks themselves have caught up with the SFC or possibly even surpassed it in terms of readiness for Basel II implementation.

In real terms, the SFC is by no means a laggard with respect to peer countries in the developing world or within Latin America, but the manner in which it has approached legislative improvements in risk management may lead to this inference. As noted in the prior chapter, Colombia has adopted regulatory financial improvements piecemeal, often as part of the SAR (“Sistema de Administración de Riesgo” – Risk Administration System) framework. While many of these changes might be seen as building upon Colombia’s Basel I financial infrastructure, essentially creating a “Basel I+,” they do not imply the wholesale implementation or endorsement of Basel II and therefore lead to a perception that Colombia is not advancing in this direction: one foreign-based bank with operations in Colombia, in fact, expressed concern to personnel in the SFC regarding risk management progress in the country.

Undoubtedly, the absence of an official, published opinion or road-map with respect to implementation of the crux of Basel II, Pillar I capital requirements, obscures this progress, but it should not detract from the actual development that has taken place nor from the ongoing efforts of the SFC to determine the best possible method of applying the Basel II tenets. A highly regimented approach has been taken toward the consideration of Basel II implementation: an official working group for the in-depth study of the Accord has been created and upper-level executives have a formal agenda for the discussion of Basel II topics and its possible adoption in Colombia. Furthermore, the regulatory agency keeps very much up-to-date on its Basel II knowledge by sending delegations combining management and functionaries on an annual basis to meetings held by the Bank of International Settlements, the Association of Supervisors of Banks of the Americas, and the Federal Reserve; formal reports summarizing these events are required. Finally, the SFC has recently entered into agreements with regulatory agencies in other countries to help ensure compatible supervision for international banks and diminish the possibility of regulatory arbitrage.

Moreover, the SFC is certainly cognizant of both domestic and foreign opinion that credibility is strained without defined goals. Although much care will be taken with “Colombianizing” the Basel II Accord and thus not hastily adopting ill-fitting regulation, the SFC ultimately intends to adopt Basel II and has to publish in or around March 2009 its formal position with regard to Basel II.

Nevertheless, criticism on some level is deserved because substantial obstacles exist before the Colombianized Basel II framework could feasibly be implemented. The SFC

itself readily admits that full implementation would likely not occur until 2010 and that implementation is a process, not a single act: the entire process would likely extend for more than five years.

Chief among the problems highlighted by the SFC as responsible for this expansive timeline, particularly in the realm of credit risk, is its perception of the databases possessed internally and by banks themselves. Because of the crisis years at the turn of the century, data regarding probability of default, expected & unexpected losses, loss given default, etc. from this period are deemed anomalous and thus inadequate for periods of normal operation. Unfortunately, the financial system was not as highly advanced in the pre-crisis years, meaning the SFC counts even the most conscientious banks as holding 3-5 years of useful information. More robust data sets both in the banking system and within the SFC are necessary, along with a degree of trust in them that does not presently exist.

As importantly, more tangible resources are lacking. Because the SFC is charged with supervising an immense quantity of institutions not limited solely to banks, resources are stretched thin even without the structural change wholesale Basel adoption would necessitate. Superintendent Prado expressly notes this as a major, ongoing problem.

An unfortunate, more specifically troubling offshoot of this problem is the resultant perception both inside and outside the SFC that the regulator may not possess the technical savvy and sheer personnel numbers to implement Basel II recommendations adequately. The SFC has demonstrated significant progress in terms of technical capacity over the last few years according to both SFC personnel and banking executives, and has recorded expenses of approximately US\$ 1.25 million this year alone in order to continue this training effort. Yet the SFC teams responsible for the type of work demanded by Basel II continue to be relatively small, academic (instead of practical), and not as advanced as any key player in the financial system would like. The allure of private sector pay simply tends to overwhelm SFC resources and the relative inflexibility of governmental institutions complicates things further. These problems, symptomatic of the universal obstacles faced by financial regulators worldwide, imply that the SFC may forever remain one step behind private entities. Consequently, the banking system fears that the SFC will never be in a position to assess adequately the highly complex internal models that would inevitably be presented under the Basel II framework.

Already this problem seems to have reared its head in a subtle way. While a specific procedure is in place for the approval of internal credit risk provision models under SARC guidelines, the SFC has effectively eliminated the incentive for the banks to do so officially. The majority of banks interviewed named "approval process" as the primary deterrent to the development of internal models. Moreover, as the system functions currently, any calculations by the internal model must be compared with the reference model; if the internal model suggests fewer provisions be made than what is suggested by the reference model, the reference model must be utilized instead. Though this may not be precisely the letter of the law, it is the perception of banking executives and thereby is equally effective in forestalling attempts to produce internal models. Hence, despite the fact that the banks judge the reference model as overestimating the risk of good debtors and underestimating the risk of debtors with bad track records, there is little motivation to challenge it.

Perhaps influenced by the self-awareness of its own internal problems, the SFC possesses a somewhat pessimistic and not entirely realistic picture of the banking system's progress toward Basel II readiness, particularly in terms of the credit risk requirements. Ironically, the banks appear to have concealed the breadth of their real progress from the SFC, much as the SFC has obscured movement toward Basel II through the absence of a published plan of action. Although the SFC estimates that approximately 1-5 banks have plans to implement IRB models, of the small (number-wise) sample represented in the survey responses, five banks indicated that they would likely choose internal models for all loan portfolios and the remainder indicated internal models would be utilized at least in some portfolios. Moreover, while no bank has submitted an internal model for credit risk provisions to the SFC for official vetting, the banks surveyed overwhelmingly responded that they indeed possessed internal models for credit assessment, usually more than two and in some cases more than twenty. These models, constructed from internal data and examined yearly, likely do not comprise the rigorous models required by the SFC for approval; yet they nevertheless insinuate a predilection toward internal models not recognized by the SFC.

In addition, the major preoccupation of the SFC, the robustness of databases, seems of much less concern to the banking system. Most banks indicate they are using integrated, accessible databases with much consistency across business units and geographic areas. More specifically, these databases generally allow for portfolio segmentation by product, size, productive sector & length as well as analysis of recouped sums by capital and interest rate. Most strikingly, all but one bank defined their databases as possessing more than five years of historic information.

Given these results, it is no surprise that the banks themselves seem much more optimistic than the SFC: despite the fact that official Basel II implementation would likely not start according to the SFC until 2010 (approximately two years from the time the surveys were delivered), the banks surveyed revealed that they would be ready to implement their preferred IRB approach within 2-5 years, much earlier than the five years-plus from the starting point of 2010 estimated by the SFC. Obviously, the SFC response deals with broader implementation issues than simply credit risk, and when just the operational and market risk components are taken into account, the banking system appears far more divided and far less advanced. Similarly, because the banks surveyed are the major players in Colombia, it is conceivable to think that the smaller banks – and thus the financial system in its entirety – will take much longer to reach acceptable standards with regard to data and training. But in essence, the relative optimism of the banks surveyed suggests that the banking system mirrors the SFC in making internal progress that is not well-defined, even to the financial regulator.

This does not suggest, however, that these elite banks do not have their own problems to overcome. Among the obstacles elucidated by executives is the challenge of inculcating the culture of risk management into the broader organization. Though this process has been ongoing since the initial movement toward SARC by the SBC at the beginning of the decade, this remains a chief goal. Derived from this is the very similar goal that risk issues become a greater part of the dialogue at the highest levels of management. Because risk management on a highly sophisticated, numerical level is a relatively new concept in the banking world, many of the upper-level risk executives do not possess the years of experience of other senior managers and thus may not hold the same weight as nominal peers. It is feared, therefore, that risk management topics may

not receive sufficient attention. Unfortunately, without a top-down change in philosophy, the only recourse for this problem seems to be the passage of time.

In sum, then, both the SFC and the banking system have made considerable if stealthy progress in the direction of Basel II. Sizeable obstacles remain but ultimately, both the banking system and the SFC are prepared in the long run for Basel II implementation because each has clearly elucidated the belief that Basel II truly does represent an improvement in risk management. Given this perception, nothing will impede eventual implementation.

## Quantitative Impact of the Basel II Accord

### *Methodology*

As outlined in the methodology section above, we have attempted to approximate quantitatively the impact the implementation of the Basel II Accord would have on the Colombian financial system through a calculation of the change in capital requirements such an adoption would entail. A more thorough examination of the calculations is available from the authors.

Much of the quantitative exercise is based on two measurements: risk weighted assets (RWA) and solvency margin. RWA is relatively self-explanatory: a measure of the assets of the banking system weighted by credit risk.<sup>3</sup> Solvency margin builds on this measurement, as the formula for its calculation includes RWA as a key component:

$$\text{Solvency Margin} = (\text{Capital} - \text{Deductions}) / (\text{RWA} + ((100/9) * \text{VAR}))$$

where VAR is Value-at-Risk. More intuitively, solvency margin is a measure of capital held by a bank as a percentage of risk-weighted assets; in essence, it shows the capital held as a hedge against financial downturns making normal business operations impossible. Knowing that any change in the assessment of risk at the asset level would ultimately manifest itself in these two relatively simple, intuitive measures, our primary exercise involved the examination of the effect of Basel II implementation on their values.

Unfortunately, while intuitively simple measurements, obtaining values for RWA (and by extension, solvency margin) requires complex groundwork. Both because the major Colombian banks and the SFC have signaled their preference for the Advanced IRB Approach and because the SFC presently possesses risk component measures for commercial credit only, our quantitative exercise utilized the Advanced IRB Approach. Under the Foundation IRB Approach, each entity in the financial system estimates its own probability of default while the values for other risk components (LGD, EAD, M) are determined by the regulatory body. Contrarily, in the Advanced IRB Approach, the financial entities themselves are responsible for all risk component estimates. Thus, all risk parameters had to be calculated; none was provided by the financial regulator.

The risks components LGD and PD (excluding commercial credit) were provided to us for the express purpose of carrying out these calculations by executives responsible for risk practices in Colombian banks. The commercial credit PDs were provided to us by the Superintendencia Financiera. The LGD values constant within credit type, are shown in Table 2.

In order to undertake the estimations, SFC provided a comprehensive database containing the information for all the outstanding credits in the banking systems. Using

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<sup>3</sup> It is imperative to note that RWA functions contrarily to various other methods of asset valuation: the higher the risk, the higher value ascribed to RWA.

individual client information for each loan, the IRB method was applied for each loan, depending on the type of loan, generating a RWA value for each loan. Adding those individual values generates aggregate RWA assets by loan type as well as for the system total.

**Table 2**

<b>Credit Type</b>	<b>LGD</b>
Commercial	55%
Consumer	80%
Mortgage	35%
Microcredit	90%

The information provided contained end-of-quarter information for 2007 (March, June, September and December) as well as for March and June of 2008. As expected, the consumer portfolio had the largest number of clients in the database, with an average of 8.5 million observations per quarter. The microcredit portfolio had, on average, 630,000 observations during that period, followed by 620,000 observations on average, in the commercial loan portfolio, and 500,000 observations on average for the mortgage portfolio.

Under the IRB Approaches, banks must classify their exposures into five general asset classes according to risk characteristics; each of these five categories, in turn, is subject to subdivision. The most complex of these classes encompasses all retail exposures. Such exposures involve large pools of loans to individuals by means of credit cards or personal loans, residential mortgage loans, and small business loans. These assets must fall into one of three subcategories: 1) exposures secured by residential properties, 2) qualifying revolving retail exposures, and 3) all other retail exposures. Exposures secured by residential properties are dominated by the aforementioned residential mortgages whereas qualifying revolving retail exposures are small loans to individuals – usually in the form of credit cards – whose balances may fluctuate according to the individual's decisions to borrow and repay.

By contrast, the other four classes are largely self-explanatory. Corporate exposures are comprised of debt obligations of corporations, partnerships or proprietorships. Sovereign exposures are defined as any obligations of sovereign nations and their central banks, though other minor, related entities may qualify. Bank exposures include exposures to banks and specific types of securities firms. Finally, equity exposures include direct and indirect ownership interests in the assets and income of commercial enterprises or financial institutions.

Colombian financial regulation categorizes loans in a slightly different, even simpler manner insinuated at various points previously. Four classifications of credit exist in Colombia – commercial, consumer, mortgage and microcredit – and each is entirely self-explanatory.

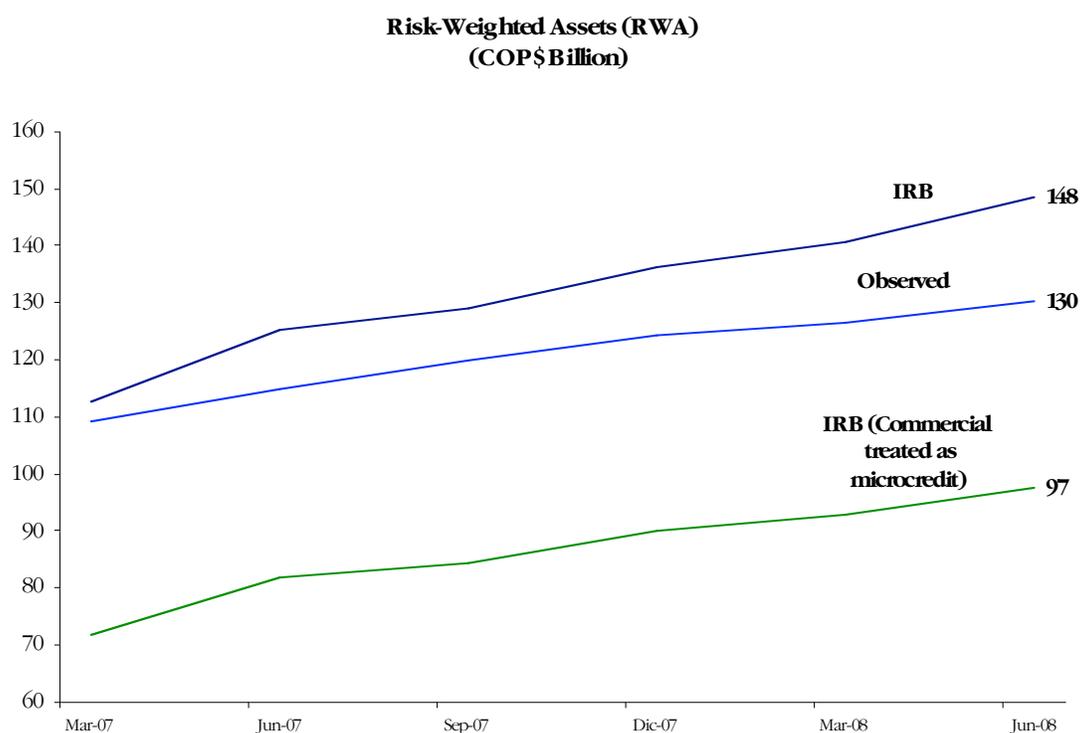
The information provided did not allow us to separate the loans along the lines of Basel II definitions for microcredit, that is, all loans originally valued under 1 MM, or, at current exchange rates, close to \$2,900,000,000. Based on expert judgment, close to 80% of commercial credit are under this amount. In order to set a range for RWA estimations, given the unknown percentage of commercial credit that can be classified as microcredit (under Basel II) definitions, we have estimated a boundary based on the assumption that *all* the loans are under that threshold.

After determining values for RWA and solvency margin under Basel II guidelines, all that remained for comprehension of the Basel II effect was the comparison of these values with the values currently calculated by the proprietary formulae of the SFC; this comparison follows.

## Results

Estimates for RWA from March 2007 until March 2008 are shown in Graph 1. The line marked “IRB” shows the estimates using IRB methodology, which would be higher than the own observed for that period, as currently measured by SFC. However, if we assume that the entire commercial portfolio can be classified under “microcredit” under Basel II definitions (i.e. loans under 1 MM), the RWA during the entire period are consistently under the currently observed ones. Therefore, RWA would be substantially reduced if commercial credit is classified as microcredit. As of June 2008, RWA would fall from the observed \$130 BN to \$ 97 BN.

**Graph 1**



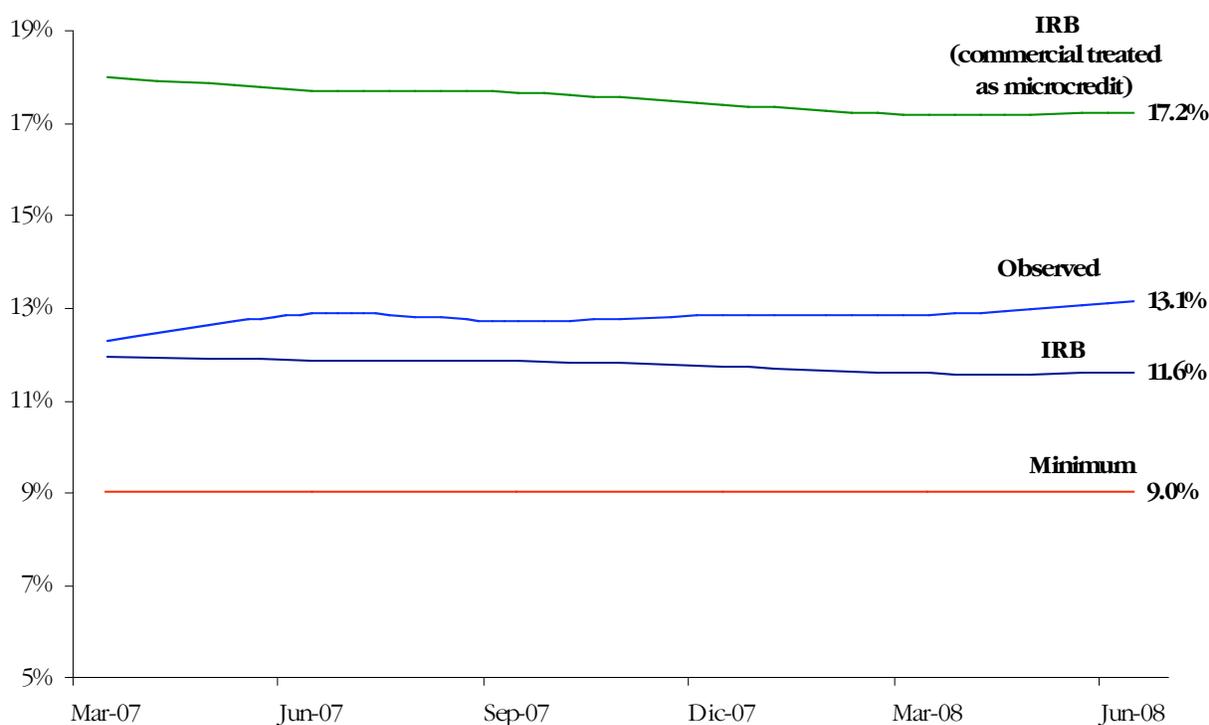
Once RWAs for each loan portfolio are estimated, the solvency margin can be calculated. As denoted in Graph 2, the reduction in RWAs implies a considerable increase in the solvency margin. As of June 2008, the observed solvency margin for banks, as currently estimated, stood at 13.1%. Under the new approach stemming from the New Capital Accord, it would increase to 17.2%. It's worth noting that there is a small proportion of the commercial loan portfolio whose initial amount was over \$2,900 MM. Therefore, the "true" solvency margin would be slightly under; however, the solvency margin would anyhow remain over levels estimated under current regulations.

Therefore, the results suggest that the adoption of Basel II in the Colombian banking sector, given the current portfolio would have freed capital in 2007 and the first half of 2008.

Because, as noted, solvency margin is derived in part from the value of RWA, the increase in RWA caused by the application of Advanced IRB credit risk calculations has a predictable effect on solvency margin (holding market risk constant and observing the same levels of Capital & Deductions): solvency margin decreases because the increased value of RWA in the above formula results in a larger denominator.

**Graph 2**

**Solvency Margin**



## Conclusions & Recommendations

Despite the fact that the financial supervisory body of Colombia has not issued an official statement regarding the implementation of the regulatory framework encompassed by the Basel II Accord, both the public and private components of the financial sector have made significant strides in that direction, particularly with regard to credit risk. Furthermore, no insuperable obstacles related to the unique structure of Colombia's financial sector appear to be impeding progress toward the improved risk management represented by the Basel II Accord; only universal difficulties pose a substantial threat to implementation.

The SFC, by means of its commitment to expanding its Risk Administration System (SAR) legislation, has obliged important advances in risk management practices in the banking system. Control of risk positions taken by these institutions are now much more rigorously controlled by upper-level executives including even the bank president and board of directors, and the model for calculating provisions to cover various types of risk has improved tremendously. In addition, it has created a regimented internal plan for the discussion and consideration of Basel II principles. Because of limitations on resources and the broad freedom allowed for idiosyncratic application within the Accord, the SFC has not taken an official position on Basel II or the all-important Pillar I capital requirements, but it can certainly be surmised.

For its part, the banking system has progressed mightily in its familiarity with Basel II standards and in the robustness of its internal databases. Pervasive internal (albeit unofficial) risk models, integrated company-wide databases, hands-on involvement of upper-level management, and substantial resources expended on both data enhancement and training all have come to define the internal operations of Colombian banks. While largely confined to the credit risk arena, these advancements reveal a concerted effort aimed at inculcating risk management as a defining component of bank culture, a more intangible goal of the Basel II Accord.

The obstacles that do remain, moreover, do not seem to be of a uniquely insuperable nature. Because of the strength of the domestic banking segment in the financial sector, it was theorized that Basel II could have an adverse effect on this substantial part of the economy if some form of regulatory arbitrage resulted from implementation. However, because of the SFC's efforts to reach out to other regulators, and in accordance with the views of major Colombian players, the possibility for substantial arbitrage appears minimal.

This rather idiosyncratic difficulty pales in comparison to the more universal problems faced by Colombia. The general criticism of Basel II that it rewards market leaders while penalizing the smaller entities by placing an emphasis on sophisticated internal models only leading banks are capable of producing could prove apt. Thus far, SFC regulation has functioned in nearly the opposite manner, as the removal of the incentive to construct official internal models places all entities on even footing. But as the capacity of the SFC for risk-based supervision improves and the already-prevalent internal models become formalized, Basel II adoption could certainly lead to further increase the lead of the current leaders. Contrarily, if this shift to internal models does not occur, the all-

reference model formula is rife with its own attendant problems, most notably procyclicality: if all institutions utilize the same model, a failure in this model would necessarily entail widespread problems.

While serious, this problem deals in terms of conjecture, whereas the struggle of the financial regulator is definite: obtaining adequate resources for training and technical upgrades will likely prove a perpetual problem, as will the brain-drain to the private sector and the generalized inflexibility of governmental institutions. A massive overhaul of the current supervisory teams needs to be undertaken, replacing the legal and accounting experts with more quantitatively-oriented professionals, including engineers, mathematicians and statisticians, combined with experts in finance and economics. This, however, is no easy task. Plans are underway to create a new cadre of young supervisory officers; however, their lack of experience *vis-à-vis* the teams in the supervised institutions might prove counterproductive. Therefore, this overhaul will take some time, at least until this new generation of quantitatively-oriented supervisors has had enough experience. For now, the composition of teams doing on-site supervision need to strike an appropriate balance between accounting, legal and broad experience, on one hand, and quantitative prowess on the other.

On the private side, continued improvement of data and training appear to be the major necessities, though the preoccupation level with respect to these obstacles is diminishing. More worrisome for the private sector is actually the behavior of the regulator: the banking sector appears confident of its ability, especially in credit risk areas, to move toward full-fledged Basel II regulation in the relatively near term. Hence, only generalized problems with Basel II or missteps of the SFC will likely derail implementation.

A more quantitative diagnosis corroborates the belief that the private sector is well-positioned for the potential implementation of Basel II in credit risk regulation. More so, results point out that, in terms of capital, there could even be capital savings. If the entire commercial loan portfolio is considered as microcredit, the observed solvency margin would be above the currently observed level, and therefore, with ample room to grow before reaching the currently required 9% level. The exercise carried out in this study suggests that risk is being slightly overestimated by the calculations of the SFC. This could, therefore, free part of the capital held by the banking system as a whole under the Advanced IRB framework of the Basel II Accord. Consequently, the banking system may not choose to alter either the composition of its loan portfolio or its capital levels with the adoption of a Basel II supervisory structure.

Estimations for capital adequacy done at the detailed loan-by-loan level, as well as at the aggregate level did not show substantial differences, suggesting that, for poor-data environments, the aggregate methodology is a good approximation to the final capital requirement results. Countries that might not have the data quality enjoyed by Colombian could use a simple, aggregate method to obtain a rough estimate of their capital requirements.

As with any data at the aggregate level, these results might hide disparities between institutions. As such, the SFC could spend some time reviewing current capital levels for individual institutions to assess which ones could require some additional capital.

In sum, then, the conditions appear relatively propitious for Basel II implementation. Yet the aforementioned advancements and seemingly inherent advantages must not breed complacency, as much work remains before Basel II implementation, in whatever form the SFC decides, is feasible. First and foremost, the SFC must publish a credible, realistic 3-5 year road-map, highlighting the position with respect to capital requirements. In this way, both the SFC and the banking system would have a clear idea of where the financial environment is headed and can thereby plan accordingly; at present, the banking system especially is working without a firm grasp on what the regulatory framework will look like in the medium-term. Furthermore, such a plan would likely improve the relative lack of communication that appears to exist between the regulator and the regulated entities.

Within this road-map, the foundation must be laid for true incentives aimed at generating internal models. Both the SFC and private banks have indicated that this is the preferred route, yet current regulation does little to advance the sector in this direction as the cost and approval process are so onerous as to be disincentives. Even with a reference model almost unanimously described as excessively strict, the incentive does not exist. Not only would a change in this policy put Colombia more in the spirit of Basel II legislation, in which self-policing allows for a previously unseen degree of freedom in the financial sector, but it would also mitigate the criticism of Basel II's procyclicality.

A corollary to this is likely the biggest challenge and the most needed change that faces the Colombian financial sector with Basel II looming on the horizon: the SFC must improve the technical team charged with evaluating and approving risk management practices of the supervised entities. More practical experience and increased technical & analytical savvy are mandatory, as an internal models approach will demand a level of sophistication that does not yet define the SFC due, ultimately, to a lack of resources for the job at hand. For both the regulator and the private sector to believe fully in Basel II implementation, this distrust in the capabilities of the SFC must be overcome.

A specific issue which the SFC should tackle as it moves toward the implementation of Basel II or a "Basel II-like" has to do with the current definitions used for its loan classification, to take into account Colombian business practices. Specifically, the ranges defined under the New Accord for microcredit are too high for Colombian standards. A review of this classification needs to be done to ensure that adequate risk-weights are assigned to loans fitting into these categories.

Resources also must be expended in improving databases. Though most banking institutions feel a degree of confidence in their databases, the fact that Colombia is not yet a decade removed from a financial crisis indicates expectations for these databases must be tempered. The process of data improvement must be ongoing.

By taking these recommendations into consideration, the financial sector and the SFC in particular can help smooth the process of advancement toward Basel II implementation. Fortunately, as is suggested as much by the banks themselves as the corroborating quantitative exercise, much of the foundation has been put in place. The historical impetus of the SFC has already reaped rewards, and under the leadership of the current officials installed at the SFC and with the wholehearted agreement of many banking executives, this process will no doubt continue.

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## APPENDIX 1: Alternative estimation methodology

The methodology used for this document was very data intensive, as explained before. This allowed the estimation of RWA for individual loans, which were then added to the portfolio level and the total loan book. However, this was only possible after a thorough data drilling exercise. If, as originally encountered, the detailed information was hard to get and the only available data was at the aggregate level, an alternative methodology can be used to estimate the required capital levels.

Assuming that realized losses can be equated to Expected Loss (EL) at the aggregate portfolio level, an aggregate PD level can be estimated for each type of loan portfolio, using the EL equation:

$$EL = PD * LGD * EAD * M$$

Taking estimates for LGD and M, and assuming EAD equal to outstandings, PD values can be estimated, and used to estimated values for RWA and solvency margins per portfolio.

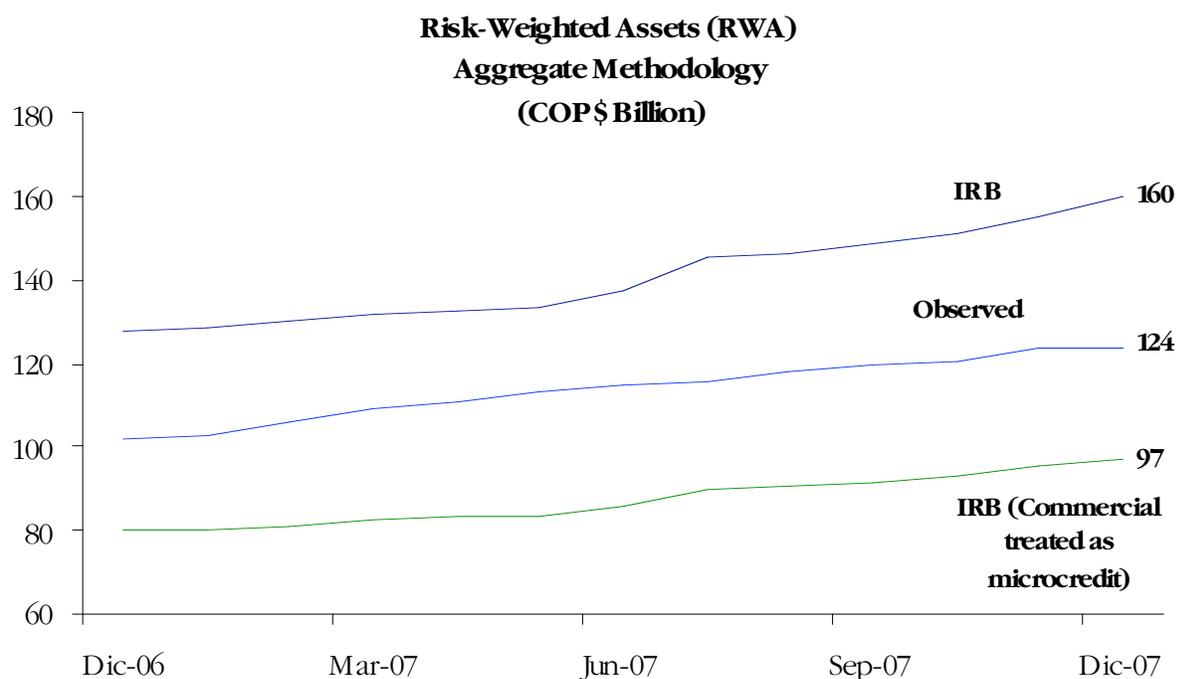
EL was calculated by summing write-offs and provisions for loans rated D or E within credit type; in other words, the value of loans of a particular type not expected to perform.<sup>4</sup> EAD, as the name suggests, is the balance of the loan portfolio at the moment of default. Consequently, in this case, EAD was taken as the outstanding credit – by loan type – reported to (and published by) the SFC. M was determined by evaluating credit life in Colombia. In SARC, the SFC counts consumer credit as averaging one year in length; this was assumed to be the case for the commercial credit and microcredit portfolios as well. For mortgage credit, the international standard of seven years was utilized; to ensure applicability, this was compared with confidential results from certain banking entities in Colombia which corroborated the value of seven years. Finally, the values utilized for LGD were provided to us for the express purpose of carrying out these calculations by executives responsible for risk practices in Colombian banks, as discussed in the paper

With these values determined, the extrapolation of PD became possible. Nevertheless, as the conditionality of all these values on credit type suggests, the value of PD varies among credit types. Similarly, the formulae given by Basel II for calculating RWA vary by credit type meaning accurate values of PD would mean nothing without first squaring Basel II definitions of credit types with the definitions inscribed in Colombian financial regulation.

The exercise was undertaken for the period December 2006-December 2007, given the data availability. The results, shown in Graph A1, do not differ greatly from the ones obtained using detailed loan-by-loan data. Under both methodologies, RWA are reduced; for December 2007, these are reduced from the currently calculated \$124 BN to \$97 BN under the IRB method. The results using aggregate estimates, therefore, are a good approximation to the capital impact for the Colombian banking sector.

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<sup>4</sup> D & E are the lowest rated loans on a scale going from A – E.

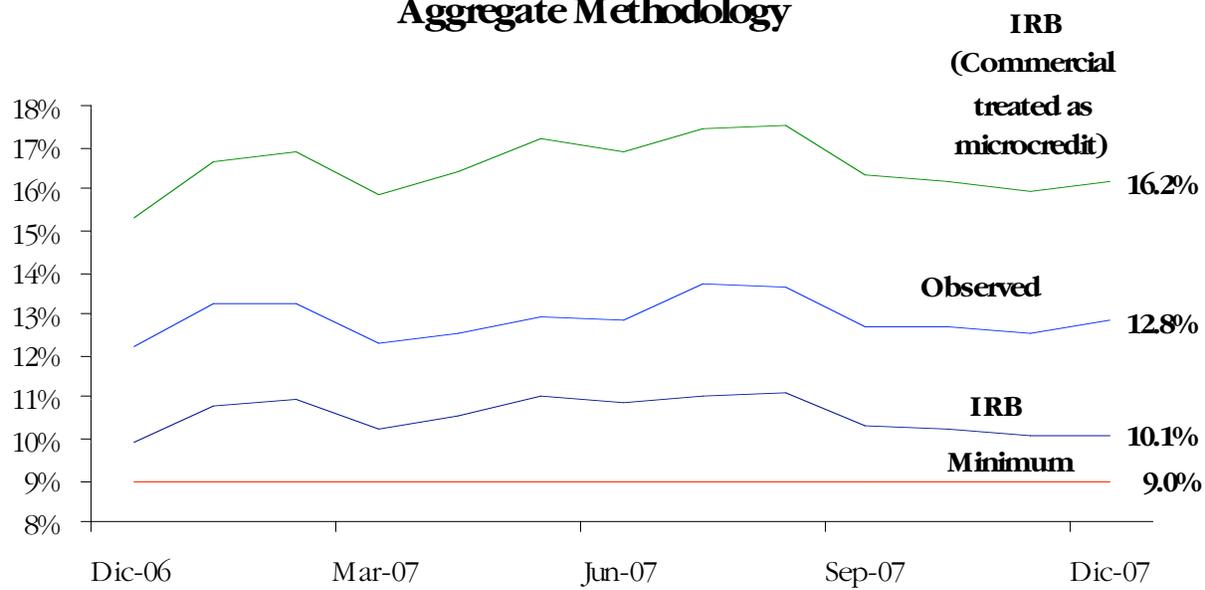
**Graph A1**

Graph A2 shows that the solvency margin in December 2007 would have increased from 12.8% under the current SFC methodology to 16.2% under Basel II IRB methodology. As with the detailed methodology finally chosen, it is worth to note that the real value for the solvency margin should be slightly under, but still above the observed level under the current method used to estimate RWA, which effectively frees capital for the entire system.

The similarity in results between the detailed, loan-by-loan estimate and the aggregate one provides useful lessons that can be used for countries with poor detailed data quality. One potential explanation is that these results are comparable given the fact that the banking sector concentrates its credits in the AA-range (second-best credit rating), which leads to similar PDs for most loans. This could be the result of the period under study, which is one of economic strength. Under different distributions of credit grading for the portfolio, results could potentially differ widely.

Graph A2

### Solvency Margin Aggregate Methodology



## APPENDIX 2: Questionnaires

### **Regulator**

#### **Parte I: Estatus actual de la regulación prudencial relacionada a requisitos de capital (temas vinculados con el cumplimiento general y otros seleccionados por su relevancia para BII)**

1. ¿Qué tipo de instituciones se encuentran cubiertas por los requerimientos de capital actuales? (seleccione todos que apliquen)
  - a. Banca comercial
  - b. Fondos de pensiones
  - c. Fiduciarias
  - d. Comisionistas de bolsa
  
2. ¿Cuáles son los tipos de riesgo que su cálculo de capital mínimo regulatorio toma en consideración actualmente? (seleccione todos que apliquen)
  - a. Riesgo de crédito
  - b. Riesgo de mercado
  - c. Riesgo operacional
  - d. Otro(s): \_\_\_\_\_
  
3. ¿Cómo funciona el proceso de aprobación de los modelos internos por parte de la Superintendencia Financiera?
  
4. ¿Cuántos bancos hacen uso de esos modelos para riesgo de crédito?
  - a. 0
  - b. 1-5
  - c. 6-10
  - d. 11-15
  - e. Más de 15
  
5. ¿Estas instituciones representan cuál porcentaje de los activos del sistema financiero?
  - a. 0%
  - b. 1-25%
  - c. 26-50%
  - d. 51-75%
  - e. 76-100%
  
6. ¿En el caso de la banca extranjera ¿existe algún tipo de cooperación entre el supervisor local y el supervisor de origen para la aprobación de los modelos?
  - a. Sí
  - b. No

**Parte II - Cuestiones generales sobre Basilea II vinculadas a decisiones estratégicas**

7. ¿Cuál es la posición oficial sobre la aplicación de Basilea II?
  - a. No aplicarlo
  - b. “Colombianizarlo”
  - c. Aplicarlo a partir de una fecha futura
  - d. Aplicar partes
  
8. ¿Se comunicó la posición formalmente a la industria?
  - a. Sí
  - b. No
  
9. En caso negativo, ¿hay planes para comunicarla formalmente?
  - a. Sí. ¿Cuándo? \_\_\_\_\_
  - b. No
  - c. NA
  
10. ¿Las autoridades tienen una agenda formal de discusión de estos procesos?
  - a. Sí
  - b. No
  
11. ¿La Superintendencia envía delegados a las reuniones del BIS, ASBA, otros? (seleccione todos que apliquen)
  - a. BIS
  - b. ASBA
  - c. Otro(s): \_\_\_\_\_
  - d. No enviamos delegados (Pase a la pregunta 15)
  
12. ¿Con qué frecuencia se envían?
  - a. Anualmente
  - b. Cada dos años
  - c. Cada tres o mas años
  - d. Esporádicamente
  - e. NA
  
13. ¿Cuántos delegados y de qué nivel jerárquico?
  - a. 1-3, de niveles bajos
  - b. 1-3, una mezcla de funcionarios y directivos
  - c. 1-3, directivos
  - d. Más de 3, de niveles bajos
  - e. Más de 3, una mezcla de funcionarios y directivos
  - f. Más de 3, directivos
  - g. NA
  
14. ¿Existen informes formales de esa participación?
  - a. Sí
  - b. No
  
15. ¿El país participó de los QIS realizados por el Comité de Basilea?
  - a. Sí

- b. No ¿por qué?
16. ¿Fueron desarrollados otros estudios cuantitativos?
- a. Sí. ¿Cuáles? \_\_\_\_\_
  - b. No
17. ¿Se realizó un diagnóstico sobre la capacidad de los bancos para la adopción de BII?
- a. Sí
  - b. No
18. ¿Cuáles son los obstáculos detectados para la aplicación de metodologías de medición de riesgos en términos de:
- a. Supervisor:
    - 1. Preparación profesional:
    - 2. Dotación de recursos:
    - 3. Facultades legales:
  - b. Bancos:
    - 1. Preparación profesional:
    - 2. Dotación de recursos:
    - 3. Facultades legales:
19. ¿Cuál es la fecha prevista para el inicio de la implementación del Nuevo Marco de Capital en Colombia?
- a. Este año
  - b. 2009
  - c. 2010
  - d. 2011
  - e. 2012 o más adelante
20. ¿Por cuánto tiempo ese proceso debe extenderse hasta su conclusión?
- a. Un año
  - b. 2-3 años
  - c. 4-5 años
  - d. Más de 5 años
21. ¿Cómo pretende administrar la cuestión de la cooperación con supervisores de otros países?
- a. No habrá cooperación
  - b. Habrá cooperación en algunos temas ¿cuáles?
22. ¿En este momento existen acuerdos de cooperación con supervisores de otros países?
- a. Sí
  - b. No (Pase a la pregunta 24)
23. ¿Cómo funcionan esos acuerdos?

**Riesgo de Crédito - Enfoque Internal Ratings Based (IRB)**

24. ¿Cuántos bancos tienen intención de implementar el enfoque IRB?
- 0
  - 1-5
  - Más de 5
25. ¿Considera que el sistema dentro de Colombia cuenta con información estadística suficiente para el diseño de modelos de este tipo?
- Sí
  - No
26. ¿Cree usted que los acuerdos de cooperación deberían ser utilizados para facilitar la adopción del nuevo Acuerdo, por ejemplo proveyendo bases de datos para los cálculos del IRB?
- Sí
  - No
27. ¿Existe la intención de crear algún tipo de data-pooling para construir bancos de datos y contribuir a estimar la Probabilidad de Incumplimiento (PI) y la Pérdida Dado Incumplimiento (PDI)?
- Sí
  - No
28. ¿Desde qué fecha los bancos han venido recolectando datos para estimar la probabilidad de incumplimiento de su cartera de créditos?
- Desde hace 6-10 años
  - Desde hace 3-5 años
  - Desde hace 1-3 años
  - Desde hace menos de un año
  - No han venido recolectando datos
29. ¿Se requerirán cuantos años de información histórica consistente para los modelos internos?
- Menos de un año
  - 1-2 años
  - 3-4 años
  - 5-6 años
  - Más de 6 años
30. ¿Con cuál frecuencia se harán back-tests en los modelos aprobados?
- Trimestral
  - Semestral
  - Anual
  - Cada dos años
  - Esporádicamente
  - Otro
31. ¿Está previsto algún tipo de ajuste a las fórmulas divulgadas?
- Sí

- b. No
32. ¿Cuáles son los principales desafíos para la implementación de la metodología de modelos internos con relación a las siguientes áreas:
- a. Estructura del sistema de ratings internos;
  - b. Criterios para clasificar las operaciones de crédito dentro del sistema de ratings;
  - c. Estimación de los valores de PI y PDI;
  - d. Sistemas de información y manejo del banco de datos
33. ¿En el caso de los bancos extranjeros que decidan adoptar modelos internos el supervisor como validará los modelos?
- a. En forma independiente
  - b. Se aceptará la validación realizada por el supervisor de origen
  - c. Otro: \_\_\_\_\_

### **Riesgo Operacional**

34. ¿Colombia pretende establecer requisito de capital para cubrir el riesgo operacional utilizando cuál(es) de los enfoques siguientes? (seleccione todos que apliquen)
- a. Modelo de referencia
  - b. Medidas avanzadas
  - c. No pretende establecer requisito de capital para cubrir el riesgo operacional
35. Si no tiene intención de establecer un requisito de capital para cubrir el riesgo operacional, ¿cuáles serían los controles establecidos sobre este tipo de riesgo?
36. ¿Cuáles son las mayores dificultades para la implementación de un requisito de capital por riesgo operacional?

### **Parte III: El Nuevo Marco de Capital y el Pilar II (Supervisión Bancaria)**

37. ¿Cuales son los requisitos para el presidente del banco en cuanto a riesgo crediticio?
38. ¿Cuales son los requisitos para la junta directiva en cuanto a riesgo crediticio?
39. ¿Es obligatorio que la junta directiva incluya miembros independientes con experiencia profesional en el tema de riesgo crediticio?
- a. Sí
  - b. No
40. ¿La Superintendencia Financiera tiene la capacidad para evaluar riesgos variados?
- a. Sí
  - b. No
41. ¿Con cual frecuencia se pueden examinar los riesgos?
- a. Diario

- b. Semanal
- c. Mensual
- d. Trimestral
- e. Semestral
- f. Anual
- g. Otro: \_\_\_\_\_

42. ¿Se espera que el monitoreo ocurra con cuál frecuencia?

- a. Trimestral
- b. Semestral
- c. Anual
- d. Cada dos años
- e. Otro: \_\_\_\_\_

43. ¿Qué tipo de informes regulares son requeridos de los bancos?

- a. Datos de incumplimiento
- b. Comportamiento de portafolios
- c. Variaciones en perfiles de riesgo
- d. Ninguno

44. ¿Estos informes se requieren con cuál frecuencia?

- a. Mensual
- b. Trimestral
- c. Semestral
- d. Anual
- e. NA
- f. Otro: \_\_\_\_\_

45. ¿Como se determinará la relevancia de auto-examinaciones de control?

46. ¿Es posible dentro de Colombia exigir niveles de capitalización, sobre una base general, superiores a los mínimos establecidos?

- a. Sí
- b. No

47. ¿Puede hacerse lo anterior sobre una base individual?

- a. Sí
- b. No

48. ¿Considerando el caso de subsidiarias o sucursales de bancos extranjeros, ¿cree usted que pudiera haber algún conflicto entre las autoridades del país de origen y las autoridades locales debido a la implementación del nuevo Acuerdo?

- a. Sí
- b. No

49. ¿En caso afirmativo, cuáles son los posibles conflictos que usted anticiparía?

- a. Modelos diferentes
- b. Consistencia de datos diferente
- c. Otra ¿cuál? \_\_\_\_\_
- d. NA

50. ¿En el caso de instituciones extranjeras operando en Colombia, quién debe ser el responsable por la aprobación y monitoreo de la metodología de modelos internos?
- El supervisor de origen
  - El supervisor local
  - Ambos
51. ¿Quién tendría responsabilidad bajo el Pilar II?
- El supervisor de origen
  - El supervisor local
  - Ambos
52. ¿La implementación del Nuevo Acuerdo implicaría modificaciones al marco legal vigente en qué aspectos?

#### **Parte IV: El Nuevo Marco de Capital y el Pilar III (Transparencia y Disciplina de Mercado)**

53. ¿Cuáles son las disposiciones dentro Colombia en materia de la información que deben proporcionar los bancos al mercado por lo que se refiere a:
- Composición de su capital
  - Evaluación de su exposición al riesgo
  - Procesos gerenciales internos
  - Adecuación del capital regulatorio
54. ¿Cuáles son los principales desafíos y cuestiones esperadas en relación a este aspecto?

#### **Parte VI: Evaluación del impacto de la implementación de Basilea II**

55. ¿Cómo se ve el impacto sobre el sistema bancario que tendría la adopción del nuevo Acuerdo de Capital?
- Se espera que el efecto sea básicamente de ajuste.
  - Se espera que los nuevos requerimientos sean importantes, pero sin requerir cambios sustanciales.
  - Se espera que los nuevos requerimientos tengan profundos impactos financieros en la estructura del capital, así como en la filosofía de supervisión.
  - No se ha analizado el impacto
  - Otro: \_\_\_\_\_
56. ¿Se han tomado algunas de las medidas siguientes que aumenten la preparación del sistema así como del supervisor para hacer frente a los requerimientos del Nuevo Acuerdo?
- Implementación de un grupo de trabajo al interior de la Superintendencia
  - Implementación de un grupo de trabajo en conjunto con las entidades financieras
  - Otra ¿cuál?
  - No se ha tomado ninguna medida

## **Banks**

### **PILAR I**

#### **RIESGO DE CRÉDITO**

1. ¿Cuál era la composición de su cartera a finales del año 2007? (Debe sumar a 100%)
  - a) % crédito comercial:
  - b) % crédito hipotecario (residencial):
  - c) % crédito hipotecario (comercial):
  - d) % crédito a otros bancos:
  - e) % crédito de consumo:
  - f) % microcrédito
  - g) % otro crédito:
  
2. ¿Cuáles son sus fuentes primarias de información sobre Basilea II? (Indique todos los que apliquen)
  - a) Comité Basilea de Supervisión Bancaria
  - b) Superintendencia Financiera
  - c) Fuentes del mercado (e.g., consultorías)
  - d) Otras: \_\_\_\_\_
  
3. ¿Qué tan involucrado está el presidente del banco en el tema de riesgo crediticio?
  - a) No está involucrado
  - b) Tiene conocimiento del nivel de la junta directiva
  - c) Participa en el comité de crédito del banco
  - d) NA
  
4. ¿Qué tan involucrada está la junta directiva del banco en el tema de riesgo crediticio?
  - a) No está involucrada
  - b) Limitada a una visión general
  - c) La junta tiene una sub-comité para examinar riesgo crediticio
  - d) La junta aprueba la política crediticia y cambios de procedimiento
  - e) NA
  
5. ¿Qué porcentaje de los miembros independientes de la junta directiva tienen experiencia profesional en riesgo crediticio superior a un año?
  - a) 0-10%
  - b) 10-30%
  - c) 30-50%
  - d) 50-70%
  - e) 70-90%
  - f) 90-100%

6. ¿Con cuál frecuencia se mandan a la junta directiva informes de riesgo crediticio?
- a) mensual
  - b) trimestral
  - c) semestral
  - d) anual
  - e) esporádicamente
  - f) Otra: \_\_\_\_\_
7. ¿Estos informes cuentan con qué nivel de detalle? (Indique todos los que apliquen)
- a) Exposición por portafolio
  - b) Análisis de cosechas
  - c) PI por portafolio
  - d) PDI por portafolio
  - e) Otra: \_\_\_\_\_
8. ¿Cómo se distribuye el capital de su banco en términos de Tier 1, Tier 2, y Tier 3? (deben sumar 100%)
- a) Tier 1:
  - b) Tier 2:
  - c) Tier 3:
9. ¿Cuáles de los siguientes elementos ha llevado a cabo su banco para mejorar la gestión de riesgo crediticio? (Indique todos los que apliquen)
- a) Análisis de la brecha (comparación de la política actual de gestión de riesgo con Basilea
  - b) Análisis costo-beneficio
  - c) Análisis del impacto sobre requisitos de capital
  - d) Hacer un grupo de estudio para Basilea II
  - e) Otro: \_\_\_\_\_
  - f) Ninguno
10. ¿Cuál es la percepción primaria de su banco respecto a Basilea II (seleccione solo una opción)
- a) Una oportunidad para mejorar la gestión de riesgo
  - b) Una oportunidad para mejorar el gobierno corporativo
  - c) Resultarán más problemas que soluciones
  - d) No tiene ningún valor
  - e) Otra: \_\_\_\_\_
  - f) No se sabe

**Pregunta 11 solamente para bancos extranjeros**

11. ¿Ha llevado a cabo su casa matriz (*head office*) algunos cambios para preparar la implementación de Basilea II en Colombia?
  - a) Sí (describa en detalle los cambios llevado a cabo)
  - b) No
  
12. Por favor, ¿Cuál modelo de riesgo crediticio seleccionará su banco para la implementación de Basilea II?
  - a) Modelo de referencia para todas carteras
  - b) Modelo de referencia para algunas carteras
  - c) Modelos internos para todas carteras
  
13. ¿Su banco ha estudiado el impacto que la adopción del Pilar I de Basilea II tendrá en requerimientos de capital?
  - a) Sí
  - b) No (Pase a la pregunta 16)
  
14. ¿Cómo calcularon el impacto sobre capital? ¿Por qué?
  
15. ¿Qué concluyeron?
  
16. ¿Cómo describiría el conocimiento de su banco de los enfoques IRB? (seleccione solo una opción)
  - a) Contamos con personal con gran conocimiento de los IRB enfoques
  - b) Hemos leído los documentos necesarios que tratan con los IRB enfoques y tenemos un conocimiento básico
  - c) Tenemos muy poco conocimiento de los IRB enfoques
  - d) No conocemos los enfoques IRB
  - e) Otro: \_\_\_\_\_
  
17. ¿Cómo evalúa el modelo de referencia para riesgo de crédito?
  - a) Apropiado
  - b) Estricto
  - c) Relajado
  - d) Sin comentarios
  - e) Otro
  
18. ¿Su banco ha considerado implementar uno de los enfoques IRB?
  - a) Sí
  - b) No (Pase a pregunta 20)
  
19. ¿Cuál enfoque ha pensado implementar?
  - a) Foundation IRB
  - b) Advanced IRB
  - c) No hemos decidido entre los dos
  
20. ¿El banco cuenta con modelos internos para la evaluación de riesgo crediticio?
  - a) Sí
  - b) No (Pase a pregunta 26)

21. ¿El sistema cuenta con cuántos modelos diferentes (incluyendo plantillas y tarjetas de puntuación) para determinar la solvencia crediticia del deudor?
- a) 1
  - b) 2-5
  - c) 5-10
  - d) 10-20
  - e) Más de 20
  - f) NA
22. ¿Cómo se desarrollaron estos modelos?
- a) Resumen histórico de la práctica de negocios
  - b) Las plantillas basadas en la opinión experta
  - c) Adquiridos de vendedores genéricos de software. ¿Cuáles? \_\_\_\_\_
  - d) Software adaptado a datos internos
  - e) Desarrollados con datos internos históricos
  - f) NA
23. ¿Se calibran estos modelos?
- a) No
  - b) Sí, a datos externos
  - c) Sí, a datos internos
  - d) NA
24. ¿Se examinan estos modelos periódicamente?
- a) No
  - b) Sí, cada dos años (o aun más infrecuentemente)
  - c) Sí, anualmente
  - d) Sí, se hace *back-* y *stress-testing* continuamente
  - e) NA
25. ¿Cuántos sistemas diferentes de riesgo de crédito usa su banco?
- a) Múltiples sistemas independientes por cada unidad de negocios
  - b) Múltiples sistemas conectados por cada unidad de negocios
  - c) Un sistema por cada unidad de negocios
  - d) Múltiples sistemas independientes por cada procedimiento, a través de unidades
  - e) Múltiples sistemas conectados por cada procedimiento, a través de unidades
  - f) NA
26. ¿Cómo es el sistema primario de almacenamiento de información para riesgo crediticio?
- a) Papel, principalmente
  - b) Microfilmación, principalmente
  - c) Archivos almacenados electrónicamente
  - d) Bases de datos diferentes por unidades de negocios diferentes
  - e) Bases de datos integradas
27. ¿Cómo describiría la consistencia de la base de datos?
- a) De una calidad baja y con información dispersa

- b) Alguna consistencia dentro de unidades específicas de negocios o regiones geográficas
  - c) Mucha consistencia a través de unidades de negocios y regiones geográficas
  - d) Consistencia perfecta, a través de unidades de negocios, regiones geográficas, clientes, y tiempo
  - e) NA
28. ¿Cómo es la accesibilidad de las bases de datos?
- a) Complejas
  - b) Parcialmente accesibles
  - c) Totalmente accesibles
  - d) NA
29. ¿Permite hacer seguimiento a las recuperaciones de crédito por cliente?
- a) Sí
  - b) No
30. ¿Permite separar los montos recuperados en capital, intereses, intereses de mora y castigos y otros cargos?
- a) Sí, por capital
  - b) Si, por capital e intereses
  - c) Si, por capital, intereses e intereses de mora
  - d) Si, por capital, intereses, intereses de mora y castigos
  - e) Si, por capital, intereses, intereses de mora, castigos y otros cargos
  - f) Ninguna de las anteriores
31. ¿Permite estimar el valor de mercado de las garantías por cliente?
- a) Sí
  - b) No
32. ¿Permite estimar el uso de las líneas de crédito y cupos de tarjetas de crédito de aquellos clientes que incumplen (*default*)?
- a) Sí
  - b) No
33. ¿Permite separar a deudores comerciales por tamaño de venta?
- a) Sí
  - b) No
34. ¿Clasifica a las grandes corporaciones en base a sistemas estadísticos-predictivos?
- a) Sí
  - b) No
35. ¿Permite segmentar adecuadamente la cartera por producto, tamaño, sector productivo, plazo, etc.?
- a) Sí, por producto
  - b) Si, por producto y tamaño
  - c) Si, por producto, tamaño y sector productivo
  - d) Si, por producto, tamaño, sector productivo y plazo
  - e) Otra ¿cuál?

f) Ninguna

36. ¿Cuántos años de información histórica tiene su banco?
- a) No se sabe
  - b) 1
  - c) 2-5
  - d) Más de cinco
37. ¿Cómo se han estimado la pérdida esperada (PE) y la pérdida no esperada (PNE) por cartera?
- a) Revisión histórica
  - b) Modelos estadísticos
  - c) Aproximaciones teóricas
  - d) Otra, cuál? \_\_\_\_\_
38. ¿Hay proyectos implementados de PE y PNE?
- a) Sí
  - b) No
39. ¿Existe documentación técnica interna?
- a) Sí
  - b) No
40. ¿Existe procedimiento de asignación de capital por crédito?
- a) Sí
  - b) No
41. ¿Funcionan los sistemas de rentabilidad ajustados por riesgo por cliente/cartera/producto?
- a) Sí por cliente
  - b) Sí, por cliente y cartera
  - c) Si por cliente, cartera y producto
  - e) No funcionan
42. ¿Su banco ya ha decidido qué modelo usará para estimar la probabilidad de incumplimiento (PI)?
- a) Sí
  - b) No
43. ¿Cuántos de sus empleados son capacitados para manejar este modelo?
- a) 1
  - b) 2
  - c) Un equipo de más de dos personas
44. ¿Cuáles son las ventajas más grandes del enfoque IRB sobre el modelo de referencia para su banco?
- a) Mayor flexibilidad
  - b) Acorde con el portafolio
  - c) Acorde con la política actual
  - d) Otra, cuál? \_\_\_\_\_

45. ¿Cuáles son las desventajas más grandes del enfoque IRB respecto al modelo de referencia para su banco?
- a) Costos
  - b) Trámite aprobación
  - c) Menor flexibilidad
  - d) Otra, cuál? \_\_\_\_\_
46. ¿Cuándo espera que su banco esté listo para implementar el enfoque IRB preferido?
- a) Dentro de un año
  - b) Entre 1-2 años
  - c) Entre 2-5 años
  - d) Más de 5 años
47. ¿Su banco tiene una hoja de ruta para esta implementación?
- a) Sí
  - b) No

**Si su banco es extranjero pase a la pregunta 50**

48. ¿Cómo afecta su posición en el mercado si los bancos internacionales con sucursales en Colombia implementan los enfoques IRB por mandato de su empresa matriz?
- a) Nos afectaría bastante ¿Por qué?
  - b) Sería ventajoso para nosotros ¿Por qué?
  - c) Nos sería indiferente ¿Por qué?
49. ¿Cómo afectaría la posición de competitividad de su banco en Latinoamérica si los enfoques IRB fueran implementados en otros países de la región?
- a) Nos afectaría bastante ¿Por qué?
  - b) Sería ventajoso para nosotros ¿Por qué?
  - c) Nos sería indiferente ¿Por qué?

**RIESGO OPERACIONAL**

50. ¿Cómo considera las actuales exigencias para medir y mitigar el riesgo operacional?
- a) Apropiado
  - b) Estricto
  - c) Relajado
  - d) Sin comentarios
51. ¿Su banco ha considerado implementar uno de los enfoques AMA para riesgo operacional?
- a) Sí
  - b) No
52. ¿Cuáles son las ventajas más grandes del enfoque AMA sobre el modelo de referencia para su banco?
- a) Mayor flexibilidad
  - b) Acorde con la situación del banco

- c) Acorde con la política actual
  - d) Otra, cuál? \_\_\_\_\_
53. ¿Cuáles son las desventajas más grandes del enfoque AMA respecto al modelo de referencia para su banco?
- a) Costos
  - b) Trámite aprobación
  - c) Menor flexibilidad
  - d) Otra, cuál? \_\_\_\_\_
54. ¿Cuándo espera que su banco estará listo para implementar el enfoque AMA preferido?
- a) Dentro de un año
  - b) Entre 1-2 años
  - c) Entre 2-5 años
  - d) Más de 5 años
55. ¿Su banco tiene una hoja de ruta para esta implementación?
- a) Sí
  - b) No
56. ¿Como describiría el conocimiento de su banco respecto a los enfoques AMA para riesgo operacional?
- a) Contamos con personal con gran conocimiento de los enfoques AMA
  - b) Hemos leído los documentos necesarios que tratan con los enfoques AMA y tenemos un conocimiento básico
  - c) Tenemos muy poco conocimiento de los enfoques AMA
  - d) No conocemos los enfoques AMA
  - a) Otro: \_\_\_\_\_
57. ¿Su banco ha estudiado el impacto que tendrá el riesgo operacional en sus requerimientos de capital?
- a) Sí
  - b) No

**Si su banco es internacional pase a la pregunta 60**

58. ¿Cómo afectaría su posición de competitividad si los bancos internacionales con Sucursales en Colombia implementaran el enfoque AMA?
- a) Nos afectaría bastante ¿Por qué?
  - b) Sería ventajoso para nosotros ¿Por qué?
  - c) Nos sería indiferente ¿Por qué?
59. ¿Cómo afectaría la posición de competitividad de su banco en Latinoamérica si el enfoque AMA fuera implementado en otros países de la región?
- a) Nos afectaría bastante ¿Por qué?
  - b) Sería ventajoso para nosotros ¿Por qué?
  - c) Nos sería indiferente ¿Por qué?

**Si su banco es local pase a la pregunta 62**

60. ¿Su casa matriz (*head office*) conoce el enfoque AMA?
- a) Sí
  - b) No
61. ¿Su banco ha recibido información referente a la implementación posible del enfoque AMA de su casa matriz (*head office*)?
- a) Sí
  - b) No

### **RIESGO DE MERCADO**

62. ¿Su banco ha pensado en implementar modelos internos para riesgo de mercado?
- a) Sí
  - b) No (Pase a la pregunta 65)
63. ¿Cuándo espera que su banco estará listo para implementar el enfoque IM?
- a) Dentro de un año
  - b) Entre 1-2 años
  - c) Entre 2-5 años
  - d) Más de 5 años
64. ¿Su banco tiene una hoja de ruta para esta implementación?
- a) Sí
  - b) No
65. ¿Cuáles son las ventajas más grandes de los modelos internos sobre el modelo de referencia para su banco?
- a) Mayor flexibilidad
  - b) Acorde con la situación del banco
  - c) Acorde con la política actual
  - d) Otra, cuál? \_\_\_\_\_
66. ¿Cuáles son las desventajas más grandes de los modelos internos sobre el modelo de referencia para su banco?
- a) Costos
  - b) Trámite aprobación
  - c) Menor flexibilidad
  - d) Otra, cuál? \_\_\_\_\_