

ADVERSE IMPLICATIONS OF BASEL 2

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ABSTRACT

Recent global financial system problems are forcing governments to consider strengthened regulation, supervision and capital adequacy rules. The Basel 2 Accords require banks to maintain levels of Tier I and Tier II capital that may be difficult to attain based on recent financial statements of international financial institutions. Using available public data, this paper analyzes the capital shortfall for 24 banks in seven countries, contrasts these results to that of major U.S. banks, and calculates the percentage of GDP represented by this additional financing. Various conclusions are developed regarding the potential adverse implications of implementation, including a decrease in lending, reduced economic activity, increased cost of bank capital, a questionable relationship between capital and lending, high costs of implementation, and competitive dislocations.

JEL codes: F33, G21, G28

I. INTRODUCTION

The current global economic crisis has resulted in efforts by various national governments, central banks and regulators to develop remedies to restore confidence and stability and to prevent future financial problems. This paper examines a set of international requirements – the Basel Accords – that have been in existence since the publication of Basel 1 in 1988 with enforcement by law in the Group of Ten (G-10) countries in 1992. After a brief explanation of the most recent version, Basel 2, this discussion focuses on the potential outcomes if these accords are fully implemented. There has not been adequate analysis of the implications of Basel 2 or whether this

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agreement can effectively prevent the failure of a poorly managed financial institution or of the economic system.

II. BASEL 2

Basel 2 contains international standards for banking regulators on the amount of capital banks must maintain to mitigate typical financial and operational risks. Proponents assume that such protocols can help prevent the global banking system from a systemic collapse should a major bank or a series of banks fail to meet its counterparty obligations such as occurred in the Bear Stearns and Lehman Bros. situations in 2008. The “international capital framework” (the phrasing in the official document issued by the Bank for International Settlements) attempts to accomplish this through the establishment of rigorous risk and capital management requirements that ensure that a bank holds capital reserves appropriate to its risk exposures created in normal lending and investment activities. The three pillars of Basel 2 are noted in Table 1.

Table 1: Basel 2 Pillars

The Basel 2 accords describe three pillars of required actions.

1. The first pillar discusses the amount of regulatory capital for each type of bank risk: credit risk, operational risk and market risk.

- Credit risk: any of three different procedures involving varying degrees of sophistication
 - Standardized approach, which establishes specific risk weights for each type of asset, including 0% for short term government bonds, 20% for exposures to OECD Banks, 50% for residential mortgages, 100% weighting on unsecured commercial loans, and 150% rating for borrowers with poor credit ratings. Banks using the standardized approach must use ratings developed by external credit agencies.
 - foundation internal rating-based approach
 - advanced internal rating-based approach
- Operational risk: any of three different approaches
 - basic indicator approach
 - standardized approach
 - the internal measurement approach (an advanced form of which is the advanced measurement approach)
- Market risk: the preferred approach is VaR (value at risk).

2. The second pillar deals with the approach of regulators to the first pillar, and

provides a framework for dealing with other risks a bank may face, including systemic risk, pension risk, concentration risk, strategic risk, reputation risk, liquidity risk and legal risk. Elements included in Pillar 2 are noted below.

- Governance and risk management
- Capture of the risk of off-balance sheet exposures and securitization activities
- Management of risk concentration
- Provision of incentives for banks to improve long-term risk management and returns
- Appropriate compensation practices

3. The third pillar addresses market discipline, sometimes referred to as transparency. The intention is to allow markets to have an accurate picture of the risk position of the bank and to allow the counterparties of the bank to price risk. Elements included in Pillar 3 are noted below.

- Securitization exposures in the trading book
- Off-balance sheet vehicles
- Resecuritization exposures

Note: For further information, see Bank for International Settlements, *Basel 2: The International Capital Framework*, at www.bis.org/publ/bcbsca.htm.

The underlying concept of Basel 2 is that the greater the risk to which the bank is exposed, the more capital the bank needs to hold to maintain solvency. The capital adequacy described in the accords are Tier I core capital, including equity capital and disclosed reserves, and Tier II secondary capital, including undisclosed reserves, general loss reserves, and subordinated term debt. The Capital Adequacy Ratio is a percentage of a bank's risk weighted credit exposures, and is calculated as:

$$\text{Capital Adequacy Ratio} = \frac{\text{Tier I} + \text{Tier II Capital}}{\text{Risk Weighted Assets}}$$

As required in Basel 2, the total Capital Adequacy Ratio must be no lower than 8%, which is the threshold used in the analysis in this paper. Tier II capital is limited to 100% of Tier I capital.

III. REALITIES OF INTERNATIONAL AGREEMENTS

As with any international agreement, implementation of Basel 2 must accommodate diverse cultures and organizational structures as well as varying approaches to appropriate public policy. As an example of the latter situation, the U.S. was very late to the idea of national banking, which was prohibited by the McFadden Act of 1927 and not allowed until the Riegle-Neal Act of 1994 (with full implementation in 1997). Similarly, the Glass-Steagall Act of 1933 forced investment and commercial banking to be conducted as separate businesses, and this legislation was not repealed until the Gramm-Leach-Bliley Act of 1999. The result was the creation of multiple layers of regulation, some effective and some not, unlike the British and Japanese concepts of a

unified financial regulator. For a review of these issues, see Sagner (2008, Chapters 3, 4 and 8).

As recent history has shown, financial institutions may develop approaches to managing their activities that are unrelated to the capital on their balance sheets. This paper will demonstrate that U.S. financial institutions have far higher levels of capital than their international competitors, yet have been more aggressive in developing and managing risk. While regulators are expected to prevent overly risky behaviors, it is not easy for them to appreciate the potential for losses from sub-prime lending, securitized loan packages that contain too many underperforming assets, possible credit card losses and other problems. In the U.S., the situation is further complicated by regulatory oversight that may be through federal or state bodies; for example, insurance companies are subject to state but not federal regulation. The search for global solutions to these dilemmas led to the Basel Accords, although it remains to be determined if increasing capital will change banker behaviors.

IV. METHODOLOGICAL APPROACH

The decision to increase the minimum capital requirement for commercial banks *appears* logical given the desire of government regulators to reduce financial leverage and to prevent future credit crises as recently experienced. However, these well-intended objectives have not been subject to adequate analysis based on the impacts on banking institutions and the economies that they finance. Explanations for this deficiency would include the difficulty in assembling the necessary data, particularly from banks domiciled outside of North America, and the complexity in developing a methodological approach. In contrast, the U.S. Federal Reserve Board and the Bank of Canada, as well as the individual North American institutions, provide substantial data on operations and results.

The development of a rigorous analysis involved studying the impact of Basel 2 on 24 non-U.S. banks in seven countries, and for comparison, the group of U.S. large domestically chartered commercial banks as designated by the Federal Reserve (see Table 2). The selection of these banks was based on the availability of data through public documents. Sources used in this analysis include websites of the central banks of each country and the European Central Bank, Hoovers, Forbes, the specific banks, the U.S. Central Intelligence Agency, and other financial data from various published and internet sources.

For the U.S., the “all large U.S. banks” descriptor is defined by the Federal Reserve Board. As of November 2007, the total assets of all commercial banks in the U.S. were \$10,784.2 billion. German and Italian bank assets are from 2008. The data are primarily from year-end 2007 (with some 2008 data), the latest reporting for most non-U.S. banks and central banks. Furthermore, the use of this period avoids the most extreme fluctuations experienced during the recent crisis.

Table 2: Banks Used in Analysis

(for the year ending December 2007, all amounts in billions of U.S. dollars)

<u>Names of Banks</u>	<u>Country</u>	<u>Assets</u>	<u>Names of Banks</u>	<u>Country</u>	<u>Assets</u>
Royal Bank of Canada	Canada	\$ 575.21	Mitsubishi UFJ Financial	Japan	\$ 1,931.17
Toronto-Dominion Bank	Canada	\$ 472.13	Sumitomo Mitsui Financial	Japan	\$ 1,114.89
Bank of Nova Scotia	Canada	\$ 411.20	Mizuho Financial	Japan	\$ 1,545.23
Bank of Montreal	Canada	\$ 357.44	Shinsei Bank	Japan	\$ 115.51
Canadian Imperial Bank	Canada	\$ 285.37	Chiba Kogyo Bank	Japan	\$21.16
BNP Paribas	France	\$ 2,888.73	Banco Santander	Spain	\$ 1,318.86
Société Générale Group	France	\$ 1,572.73	BBVA-Banco Bilbao Vizcaya	Spain	\$ 747.99
Deutsche Bank AG	Germany	\$2,946.88	Banco Popular Español	Spain	\$ 153.43
Allianz	Germany	\$1,329.96	HSBC Holdings	UK	\$2,520.45
Commerzbank AG	Germany	\$869.05	Barclays	UK	\$ 2,947.84
Unione di Banche Italiane	Italy	\$79.07	Lloyds Banking Group	UK	\$625.71
UniCredit Group	Italy	\$ 932.38	Royal Bank of Scotland	UK	\$ 3,490.80
			All Large Banks	US	\$ 6,107.70

Sources: Forbes Global 2000, 2008, at www.forbes.com/2009/04/08/worlds-largest-companies-business-global-09-global_land.html; Table 1.26, Federal Reserve Board, "Large Domestically Chartered Commercial Banks," *Statistical Supplement to the Federal Reserve Bulletin*, at www.federalreserve.gov/pubs/supplement; supplemented by data in individual bank websites.

V. BANK COSTS OF CAPITAL

A complex mathematical model was constructed to analyze the major sources of bank financing. For an explanation of the model components, see Table 3; for details of the calculations and results, see Sagner (2010). Bank costs of capital are provided in Table 4 based on public documents and on a study developed by Maccario, Sironi and Zazzara ("MSZ") (2009, Table 9). However, the intention of MSZ was to compare equity capital costs results with that of other developed economies, and so the analysis stopped before a comprehensive cost of capital calculation was achieved. The net result is that the total asset weighted average cost of capital is 5.82% for the period 1993 through 2001. This result determines the minimum threshold return that must be earned by banks on the various products and services provided to customers in order to prevent the destruction of shareholder value.

Table 3: Model of Bank Costs of Capital

The model developed for the analysis of the three components of bank cost of capital examines short-term liabilities, long-term liabilities and stockholders' equity. The important components of short-term liabilities include demand deposits and borrowing from other banking institutions ("federal funds"). Long-term liabilities include time deposits and bonds payable. It was necessary to make various assumptions in assigning liabilities to short- and long-term categories, as most non-U.S. banks report balance sheet information in somewhat different formats from U.S. reporting. The model is constructed in four sections labeled A through D.

- A: Financing, comprised of assets (commercial and industrial loans) and total assets; liabilities (demand deposits, time deposits, borrowings, short-term debt, long-term debt and total liabilities); and net worth.
- B: Costs of Debt and Equity, comprised of cost of short-term debt capital, the cost of long-term debt capital and the cost of equity capital.
- C: Proportion of Debt and Equity, comprised of short-term debt, long-term debt and net worth as a percent of total assets.
- D: Calculation of Weighted Average Cost of Capital, which calculates the weighted average cost of short-term debt, the weighted average cost of long-term debt, the weighted average cost of equity capital, and the total weighted average cost of capital.

Table 4: Major Bank Costs of Capital (in %) (For the years 1993 - 2001)

Country	Short-Term Debt	Long-Term Debt	Equity	Weighted Average Cost of Capital*
Canada	4.78	6.81	12.03	6.34
France	4.67	5.98	7.67	5.58
Germany	4.64	5.65	6.98	5.35
Italy	6.06	7.81	7.64	7.20
Japan	0.93	2.78	2.79	2.14
Spain	6.17	7.68	8.02	7.18
United Kingdom	5.73	6.62	8.88	6.41
United States	4.66	6.20	8.82	6.00

*Weighted by proportions of debt and equity on bank balance sheets. For the list of banks used in this analysis, see Table 2.

Sources: Derived from Aurelio Maccario, Andrea Sironi, and Cristiano Zazzara, "Is Banks' Cost of Equity Capital Different Across Countries? Evidence from the G10 Countries Major Banks" (May 2002), SDA Bocconi Research Division Working Paper No.02-77, Table 9; available at www.ssrn.com/abstract=335721, derived from IBES data containing historical and forecast earnings for publicly-listed companies in various countries. For a further explanation of the model used in calculating these data, see the forthcoming paper, James S. Sagner, "Bank Transparency: Cost of Capital and Credit Returns Issues," to be presented at the 2010 Midwest Finance Association meeting.

VI. ARE BANKS LESS RISKY THAN INDUSTRIAL COMPANIES?

While β may be the standard for the measurement of risk in the U.S., at least as perceived by investors, the American experience with regard to the financing of the banking industry is substantially at variance from other countries. As indicated in Table 5, the mean difference between the country and banking cost of equity capital is negligible for the sample of countries examined outside of the U.S., indicating that banking is perceived as equivalent to the risk and return from other investment opportunities.

Table 5: Country Financing Costs (1993 – 2001)

	% Difference between Country & Banking Costs of Equity Capital
Belgium	0.0258
Canada	0.1190
Switzerland	0.2311
Germany	-0.0035
France	0.0393
Great Britain	-0.0703
Italy	-0.1224
Japan	0.1480
Netherlands	-0.1085
U.S.	-0.1768
Mean	-0.0131

Note: For sources, see Table 4.

In the U.S., banks have traditionally been perceived as substantially less risky as other investments; in this sample, the difference between American country and banking industry equity costs were 17.7% lower during the period under study. The fallacious perception by investors that U.S. banking is not risky – as we now know from the events of the previous two years – has led to heroic efforts to prevent systemic failure, the loss of billions of dollars of market value in bank debt and equity, the disappearance of important financial institutions, and the ongoing consideration of new regulation and law.

VII. FINANCIAL AND ECONOMIC RESULTS

The results of the analysis in this paper are reported in Table 6 with the following significant findings.

- Banks outside of the U.S. operate with 3½ to nearly 5% of equity capital as compared to about 11½% in U.S. banks. Equity constitutes the most significant portion of Tier I capital.

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- There is a significant Tier I and Tier II capital position deficiency for major international banks as compared to the 8% minimum. In every situation examined, the required additional equity capital was substantial, ranging from \$34 billion (Italy) to \$227 billion (the UK). In contrast, the U.S. major banks have substantial excess capital.
- The proportion of Gross Domestic Product (GDP) for each country represented by the shortfall in the 8% requirement ranges from 1.9% in Italy to 10.4% in the UK.

Table 6: Bank Capital Requirements based on Basel 2 Accords (major banks only)

Country	Current % of Bank Equity Capital	Additional Amount Required to Attain 8% Equity Capital (millions of U.S.\$)	Gross Domestic Product (GDP) of Country (trillions of U.S.\$, estimates for 2008)	GDP % Absorbed by Banks for Basel 2 Requirements*
Canada	4.5%	\$51,908	\$1.3 T	4.0%
France	3.5%	\$143,508	\$2.1 T	6.8%
Germany	3.6%	\$151,409	\$2.8 T	5.4%
Italy	4.7%	\$33,929	\$1.8 T	1.9%
Japan	3.7%	\$103,409	\$4.4 T	2.4%
Spain	4.9%	\$49,439	\$1.4 T	3.5%
United Kingdom	4.1%	\$227,470	\$2.2 T	10.4%
United States	11.4%	(\$206,477)	\$14.3 T	(1.4%)

*Assumes 8% Tier I and Tier II Capital.

Sources: Forbes Global 2000, 2008, at www.forbes.com/2009/04/08/worlds-largest-companies-business-global-09-global_land.html, supplemented by data in individual bank websites; U.S. Central Intelligence Agency World Factbook, 2008 (estimated), at www.cia.gov.

VIII. CONCLUSIONS

It appears that the cost of meeting Basel 2 capital requirements would be devastating for the affected banks and countries, and by implication, this result is likely to be experienced by all Basel 2 participants. This conclusion results from various overt and covert implications, as discussed below.

- Decreased lending. Increased equity means decreased lending unless economies are improving. However, the latest data indicate that some economies are in decline while others are barely growing (see Table 7). With an unweighted average economic growth of only 0.4% for the countries examined in this paper, the unfortunate outcome of Basel 2 will be a reduction in lending activity.

Table 7: Country Economic Growth (annual rates)
(as of September 2009)

Canada	↑ 0.4%	Japan	↓ 0.7%
France	↑ 0.3%	Spain	↑ 1.2%
Germany	↑ 1.0%	UK	↑ 0.7%
Italy	↓ 1.0%	US	↑ 1.1%
Average Growth		↑ 0.4%	

Source: U.S. Central Intelligence Agency, "World Factbook," 2008 (estimated), at www.cia.gov.

- Reduced economic activity. Decreased loans mean further reductions in business activity. Lending activity constitutes a significant portion of financing for business, usually ranging from 30 to as much as 50% of all financing depending on the industry. Without access to bank loans, economic growth will inevitably be constrained throughout most developed countries.
- Increased cost of capital. Increasing Tier I and Tier II capital raises weighted average bank costs of capital as additional equity must be generated from the sale of stock and/or higher dividends. While this paper did not quantify the likely impact of Basel 2 on the cost of capital, even a 1% higher cost would inevitably force international banks to raise interest rates on loans, reduce lending to marginal borrowers, and defer investment in technology, human resources and other needed assets.
- Questionable relationship between capital and prudent lending. No evidence exists that increased capital improves the stability of the international banking system and reduces the possibility of systemic failure. The U.S. has the highest degree of equity capital of the countries studied, yet the practices of certain of its financial institutions precipitated the global financial crisis that began in late 2007. It is the quality of loans and investments that determines the likelihood for failure, not the proportion of Tier I and Tier II capital.
- Cost to implement. Like the requirements of the Sarbanes-Oxley Act of 2002, particularly section 404, the reporting and administration requirements of Basel 2 are extensive, highly technical and costly. Despite the burden placed on banks by

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these protocols, no evaluation of the cost and time commitment has been undertaken to provide justification for the effort required by the banks.

- Competitive dislocations. The banks that currently have adequate Tier I and Tier II capital are in the U.S. This will inevitably work to the advantage of those American banks with international operations, and to the disadvantage of banks that are presently below the required capital threshold (those in Europe, Japan and Canada based on the findings in this paper). Competition in global lending and investment banking is sufficiently difficult that it is inappropriate to impose further constraints on undercapitalized financial institutions.

Given the difficulty in developing specific data on banks that are not identified in this research as major banks, it remains for further research to pursue the Basel 2 implications for those institutions. However, it should be noted that U.S. experience is that smaller banks have 1 1/3% greater equity capital than large banks, a condition likely to exist or be exceeded in international banks; see Federal Reserve Board (2008). This is because this group of banks tends to lend primarily to consumers and local businesses, make fewer large loans, and retain more of their profits after taxes as equity. Thus, the requirement for additional equity capital for smaller banks may not be as pressing.

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