Mating Behavior of U.S. Financial Institutions in a Man-Made Habitat

Or . . .

Do Capital Requirements Disadvantage Low-Risk Institutions?

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Abstract

The first Basel Capital Accord (Basel I) was agreed to in 1988, and its phased implementation was completed in the member countries of the Bank for International Settlements (BIS) by 31 Dec1992 In the U.S., as in some other countries, the Basel I minimum risk-based capital requirements have been accompanied by a separate minimum unadjusted capital ratio (or, equivalently, a maximum leverage ratio). As a result, U.S. institutions are constrained by the largest of three regulatory ratios: (a) Basel total capital to risk-adjusted assets; (b) Basel Tier I capital to risk-adjusted assets; or (c) Tier I capital to total (unadjusted) assets. For a particular institution, at most one of these regulatory minima will be binding at a given time.

Since the introduction of Basel I, the number of banks and thrifts in the U.S. has declined dramatically. The total number of institutions peaked in 1985, at 18,050. By 1988, after the Basel agreement, the number had fallen to 16,598. In 1992, after Basel I implementation, the number had fallen to 14042. By 1999, it had dropped to 10,400. The vast majority of these vanishing charters were merged into other institutions, a process that was encouraged by the gradual reduction (through case law), and final elimination (under the Riegle-Neal Act) of interstate branching restrictions. However, we find that the current regulatory capital regime itself is also a significant determinant of merger activity over the period.

In equilibrium, capital should flow to financial institutions so that the appropriately risk-adjusted expected return on equity (ROE) equalizes across institutions. However, bank portfolios may be determined significantly by inherited long-term and illiquid deposit and loan contracts, by regulation (e.g., the qualified thrift lender (QTL) test), and by capital investment – both human and physical – in particular types of lending expertise. Similarly – especially for small

institutions and non-publicly-owned ones – capital may be slow to adjust due to the coordination problems and transaction costs associated with capital infusions. Furthermore, institutions may be bound by either one of the risk-adjusted Basel requirements or by the leverage ratio requirement. These regulatory capital restrictions further constrain banks' ability to adjust the ROE provided to shareholders.

For a given bank asset portfolio, either the leverage ratio or a Basel ratio will be operative. Institutions with low credit risk will be bound by the leverage requirement. We argue that such leverage-bound institutions should have great difficulty delivering equilibrium risk-adjusted ROE to their shareholders. In effect, they make inefficient use of costly capital funding. Mergers provide a vehicle to alleviate this inefficiency, if the merger mixes a low-risk portfolio with a high-risk portfolio.

We run probit regressions on all banks and thrifts over the period 1990-99 to find the significant determinants of bank and thrift merger activity. The dependent variable is 0 if the institution is not involved in a merger in a given year, and 1 if it is. An institution may enter the regression more than once in a given year if it is involved in more than one merger. The main explanatory variable, which we call regulatory capital slack (SLACK), is defined as the difference between the bank's excess capital over the leverage requirement and the excess over the Basel requirement. The null hypothesis is that institutions with very risky portfolios (large positive slack) and those with very un-risky portfolios (large negative slack) should both be likely merger candidates, since mixing un-risky portfolios with very risky ones achieves a more efficient use of costly capital.

We control for year, to filter out macroeconomic conditions and regulatory changes. We also control for primary regulator to filter out charter-type differences, and for whether

institutions are de novo or established. We use four different definitions of slack, using both the "well" and "adequate" Basel thresholds, and both the Tier I and total Basel definitions. We find that SLACK is consistently an economically and statistically significant determinant of merger activity. In the next stage we will test the hypothesis that given a bank is involved in an m & a transaction, its partner's SLACK variable will be of the opposite sign.

We conclude that the combination of risk-sensitive and risk-insensitive capital requirements has been a significant factor in the bank consolidation wave of the 1990s. And we further suggest that this pattern would only be amplified by the much heightened risk sensitivity and disparate application of the advance internal risk-based capital approach contained in the proposed Basel II accord.

Introduction

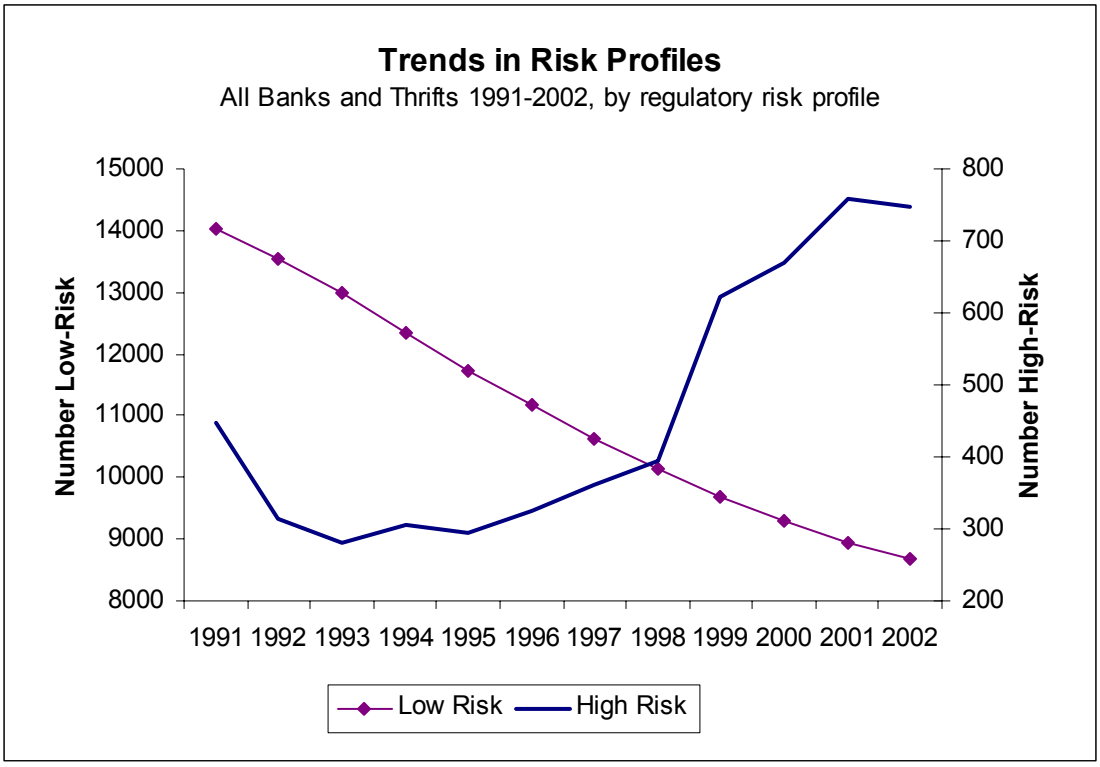
Since the Basel risk-based capital requirements went into effect in 1987, the U.S. banking system has been operating under a dual system of regulatory capital – one tied to the risk of portfolio assets, and the other a strict proportion of total assets. This system was codified into statute with the passage in December 1991 of the FDIC Improvement Act. Inevitably, this system meant that some firms (those with lower risk assets as defined under Basel) would be constrained, perhaps even significantly constrained, by the strict proportion, or leverage ratio, while other firms (those with higher risk assets as defined under Basel) would be constrained by the risk-based method of setting regulatory capital, or at least less constrained by the leverage ratio than the first group.

One way to relax the constraint that is imposed by the leverage ratio, or get out from under it entirely, is to acquire a riskier portfolio. A way to achieve this is to simply move into riskier lines of business. This can be a risky proposition, particularly if one lacks the business expertise in these new lines of business. Thrifts moving into commercial real estate in the early 1980s is a good example of what can happen in this regard. An alternative means of obtaining regulatory capital relief, if you are severely constrained by the leverage ratio, is to engage in a merger transaction. It is probably the case that the overwhelming preponderance of mergers are undertaken to broaden the extent of the market, and achieve a larger, stronger, and more efficient institution (as in Adam Smith's pin factory example). Other factors would include, scope economies and geographic diversification. In addition to these factors, we endeavor to show in this paper that some portion of bank merger activity is driven by another factor – the desire to achieve regulatory capital relief under the current leverage ratio/risk-based regime. If this is so,

then it is likely that this factor will play a much larger role if Basel II is introduced, as currently planned, with the leverage ratio intact.

Figure 1 below depicts the marked decrease in the total number of "low-risk" banks and thrifts, along with a marked increase in the number of "high-risk" banks and thrifts, since just prior to the inception of the prompt corrective action, PCA, capital standards under the Federal Deposit Insurance Corporation Improvement Act (which went into effect in January 1992). By low-risk banks and thrifts, we mean those banks and thrifts for which the leverage ratio requirement is most binding. By high-risk banks and thrifts, we mean those banks and thrifts for which the tier 1 risk-based requirement is most binding.

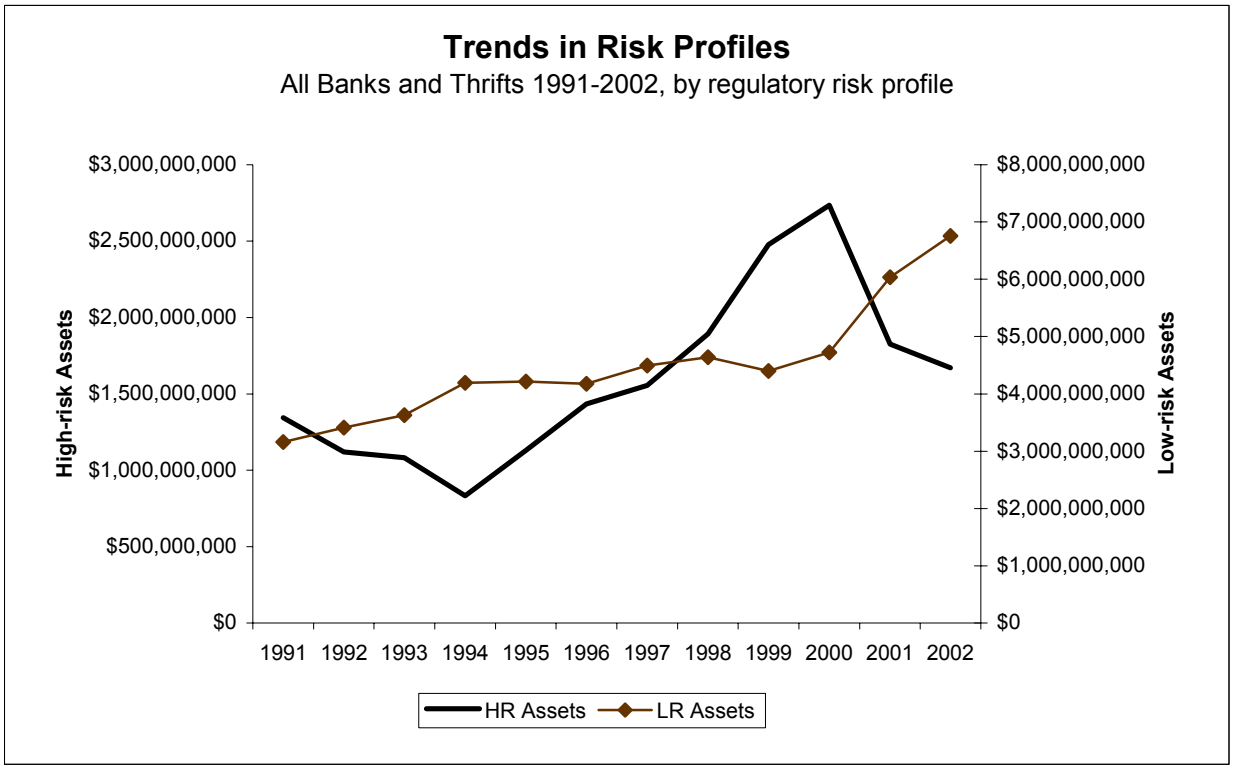
Figure 1



In Figure 2 below we look at this same issue in terms of total dollars of assets in leverage-ratio constrained versus risk-based ratio constrained institutions we find a very similar

picture persisting right up to the bursting of the tech bubble in 2000. What ensued was a somewhat unusual period in which we went into a recession and interest rates fell; yet there was little or no increase in defaults while home prices continued to rise. During this period, households shifted some of their asset holding from securities to real estate, and there was a contraction of commercial loan portfolios relative to mortgage portfolios. Some critics suggest that we may have shifted our irrational exuberance from a stock market bubble to a housing bubble. What this suggests is that the apparent reversal of the trend at the right hand side of the chart may be a somewhat temporary aberration due to portfolio performance and allocation largely driven by external market conditions rather than capital considerations.

Figure 2



Literature Review

While there are numerous articles on the causes and effects of bank and thrift mergers and acquisitions, and even a fair number on the role played by bank capital, there are scant few on the anticipated effects that Basel II capital requirements will have on excess regulatory capital, and, in turn, on merger and acquisition activity. One article, besides the present one, that does this is Hannan and Piloff (2003), a preliminary working paper by two economists at the Federal Reserve Board. Hannan and Piloff look only at the propensity to make acquisitions (as opposed to looking also at the likelihood of being acquired), and they look only at large bank holding companies (BHCs).

They restrict their samples to three distinct groups of bank holding companies: (1) the 9 largest BHCs who, based on their size today, would be required to adopt the advanced IRB approach when it is adopted; (2) those BHCs deemed most likely to adopt advance IRB in its initial Phase – that is, other than the nine largest, all bank holding companies over $50 billion; (3) BHCs between $15 billion and $50 billion, who are deemed likely to eventually adopt advance IRB. Their data are drawn mostly from SNL Financial Bank Mergers and Acquisitions database. For data prior to 1990, they supplement this with data from regulatory sources.

Hannan and Piloff have two different definitions of their dependent variable – the number of acquisitions made in a given year, and the dollar value of acquisitions made in a given year. They report statistically weak results in support of the theory that acquisitions are driven by excess regulatory capital for the firms they examined. And they go on to say that even if the results were statistically significant, they would not be economically significant – that is, the magnitudes of the effects are small.

Another article that, while not about Basel II, we found to be particularly relevant is O'Keefe (1996), which examines generally the financial attributes of banks involved in

transactions, and in particular how the Riegle-Neal Act affected both the pace of M&A activity and the nature of the structural changes brought about by that activity. In this very carefully done paper, there are a number of very interesting findings. The finding that Hannan and Piloff point to is that the amount of equity capital is negatively related to making acquisitions. However, the role of capital in making acquisitions was not a central theme in the O'Keefe paper. Further – and from the perspective of this paper – he was not looking at excess regulatory capital, nor was he looking at the fact that excess regulatory capital can come in different flavors for firms with different portfolio characteristics, which, in turn can cause opportunities and incentives for regulatory arbitrage.

From the perspective of the present paper, a more interesting aspect of the O'Keefe (1996) paper is his finding that his "sample of acquirers and their targets differed systematically from each other and their peers prior to mergers." In particular, he found that acquiring banks had considerably lower concentrations of 1-4 family mortgage loans than did target banks. This finding is consistent with our theory of M&A transactions being driven by regulatory capital arbitrage, since mortgage specialists will tend to have *relatively* more excess risk-based capital than excess leverage ratio capital, and vice versa for those institutions specializing in C&I loans, for example.

Another paper of some relevance is Houston, James, and Ryngaert (2001). Notwithstanding the efficiency literature, which casts doubt on the wisdom of many bank mergers, they find systematic and persistent improvement in valuations stemming from these combinations, and then go on to examine the sources of these gains by looking at management's forecasts and analysts' assessments. One of the factors often mentioned by analysts was that the combination would benefit from freeing up excess capital.

Stiroh and Poole (2001) examine the trend toward concentration in the banking industry in the 1990s. They document a significant trend toward concentration as measured by the share of total banking assets held by the fifty largest bank holding companies and by the largest 10 banking companies. By comparing pro forma and unadjusted data, they are able to show that virtually all of this increased concentration is due to mergers and acquisition activity. Similarly, they show that, while there was almost no change in the number of charters held by the fifty largest bank holding companies over the period, there was a dramatic decrease after adjusting for mergers and acquisitions. In other words, as charters are acquired through merger and acquisition activity, they are eliminated through internal consolidation.

Theory

The conceptual framework motivating our empirical study rests on the structure of bank capital. More specifically it rests on the notion that there is an optimal amount of capital for a bank to hold, a regulatory required amount, and an actual amount. And, most importantly, there are two types of regulatory capital constraints – one that is related to the riskiness of the portfolio of assets, and one that is not – leading to the result that firms will be constrained by one or the other of these two types of capital requirements, depending upon the composition of their portfolios. It is this last point that leads to the possibility of regulatory capital arbitrage in mergers and acquisitions in the current capital regime, and which provides a basis for understanding how such opportunities might be enhanced by the even more disparate treatment of regulatory capital requirements if Basel II is implemented in it's current form.

Return on assets:

The theoretical motivation centers on the potential discrepancy between the optimal value of the bank capital ratio, and its actual value in the presence of strategic, and regulatory constraints. We begin with a standard definition:

$$R_{Ei} = \left(\frac{1}{k_i}\right) R_{Ai},$$

where R_{Ei} is the return on equity for bank i, R_{Ai} is its return on assets, and k_i is its capital ratio. The return on assets has the following structure. For simplicity, we assume that the bank's asset portfolio consists of a fraction, x_j, invested in each of J risky product types, with the remainder of the portfolio invested in a risk-free asset earning an ex-ante known return of R_f:

$$R_{Ai} = \left[\sum_{j=1}^{J} x_{ij} R_{ij} + \left(1 - \sum_{j=1}^{J} x_{ij}\right) R_f\right]$$

For simplicity, assume that returns on each of the risky product models is governed by a standard pricing process:

$$R_{ij} = E\left(R_j\right) + e_{ij},$$

where e_{ij} captures any residual factors. Substituting:

$$R_{Ai} = \left[\sum_{j=1}^{J} x_{ij}\left[E\left(R_j\right) + e_{ij}\right] + \left(1 - \sum_{j=1}^{J} x_{ij}\right) R_f\right],$$

and rearranging:

$$R_{Ai} = R_f + \sum_{j=1}^{J} x_{ij}\left[E\left(R_j\right) + e_{ij} - R_f\right].$$

If we assume that expertise is fixed in the short run, then the bank can control its return on assets only by adjusting its portfolio allocation decisions, x_{ij}.

Return on equity:

The return on equity, R_{Ei} , can now be written as:

$$R_{Ei} = \left(\frac{1}{k_i}\right)\left[R_f + \sum_{j=1}^{J} x_{ij}\left[E\left(R_j\right) + e_{ij} - R_f\right]\right].$$

The capital ratio is the second key strategic decision variable for the bank. It is assumed that bank managers attempt to maximize the risk-adjusted return on equity for shareholders. In the absence of capital regulation, the incentive to minimize k_i is balanced at some positive level by the exposure to the costs of potential insolvency, yielding the "unregulated optimum" value:

$$R_{Ei}^{*} = \left(\frac{1}{k_i^{*}}\right)\left[R_f + \sum_{j=1}^{J} x_{ij}\left[E\left(R_j\right) + e_{ij} - R_f\right]\right].$$

This optimum is typically not achieved, however, since regulators perceive externalities to bank insolvency, and therefore impose minimum capital constraints. In the U.S., the most important of these capital rules take two forms: (a) the Basel risk-adjusted minimums, k_{Bi}; and (b) the leverage ratio, k_ℓ. The regulation-constrained optimum thus becomes:

$$\overline{R}_{Ei}^{*} = \left(\frac{1}{\max\left(k_i^{*}, k_\ell, k_{Bi}\right)}\right)\left[R_f + \sum_{j=1}^{J} x_{ij}\left[E\left(R_j\right) + e_{ij} - R_f\right]\right].$$

Note that both the unconstrained optimum as well as the Basel constraint are functions of the bank's firm-specific portfolio choices.

U.S. capital regulation:

Capital regulation in the U.S. assigns specific functional forms to the two regulatory components, k_ℓ and k_B. Under prompt corrective action (PCA), there are two "acceptable"

regulatory classes a bank can be in: "well" capitalized and "adequately" capitalized.[1] To be well (respectively, adequately) capitalized, a bank must have: (a) total (Basel tier 1 plus tier 2) capital in excess of 10% (or 8% for adequate) of Basel risk-weighted assets (RWA); (b) Basel tier 1 capital in excess of 6% (4%) of RWA; and (c) book capital in excess of 5% (4%) of book assets. For simplicity of exposition, we ignore here the distinction between tier 1 and total capital, assuming that the tier 1 constraint always binds first, so that the Basel total capital constraint is never operative. We then have the following two functional limits for well-capitalized banks:

$$k_{Bi} = k_B(x_i) = .06\sum_{j=1}^{J} w_{Bj} x_{ij}\text{, and}$$

$$k_\ell = .05,$$

and where the w_{Bj} are asset-specific weights established by the Basel accord:

Weight	Assets
0 %	Cash, and claims on OECD central banks and national governments
20 %	Claims on private-sector OECD banks, OECD sub-national governments and GSEs, and cash items in process of collection
50 %	First mortgages on 1-4 family real estate, and local government project finance in OECD countries
100 %	Commercial and consumer loans, and loans to non-OECD governments

In dollar terms, these constraints become:

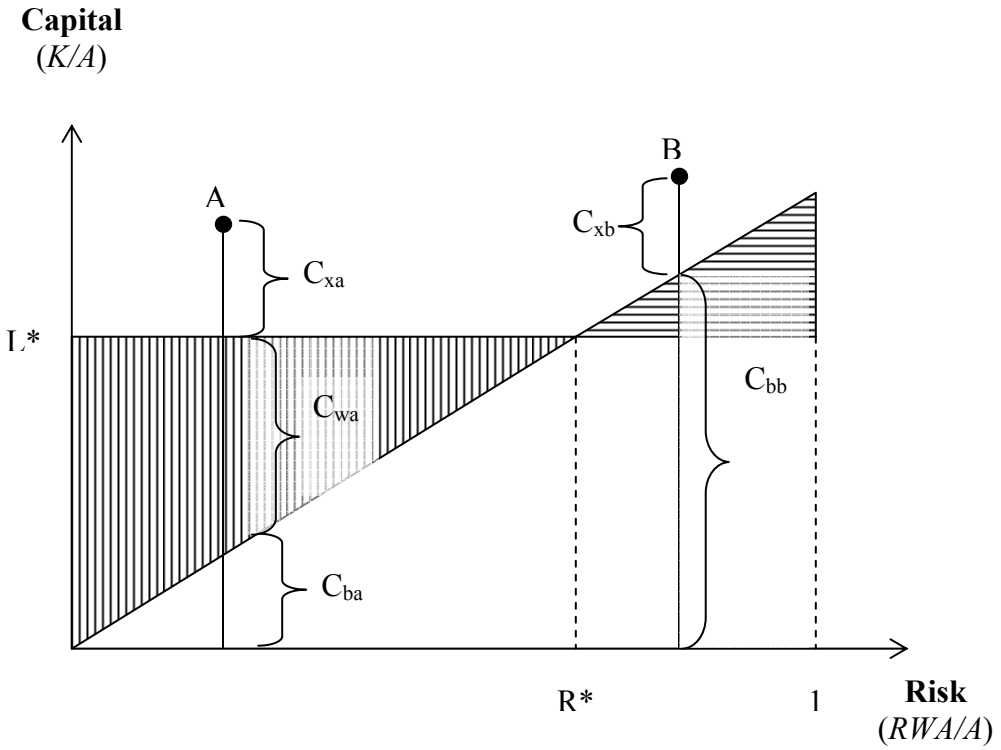
$$K_{Bi} = .06(RWA_i) = .06\sum_{j=1}^{J} w_{Bj} x_{ij} A_i$$

[1] Prompt corrective action (PCA) is mandated by the Federal Deposit Insurance Improvement Act of 1991 (FDICIA). It establishes categories of capital soundness, and mandates specific regulatory responses for institutions that fall below "adequately" capitalized. See Spong (1994, pp. 72-82) for further details.

$$K_{\ell i} = .05A_i,$$

where A_i is total assets for bank i.[2] These constraints are depicted graphically in Figure 3.

Figure 3



Here, capital and RWA are both normalized by total assets to facilitate comparison between banks A and B.

The focus of our empirical analysis is the following equilibrium proposition:

In long-run equilibrium, capital will flow so as to banks to equalize the risk-adjusted expected return on equity paid to shareholders.

To see the testable implications of this proposition, assume that the Basel constraint, k_B, approximates (or dominates) the unconstrained optimum, k^*, so that Figure 3 is an adequate

[2] See Spong (1994, p. 75) for further details.

representation of capital choices facing banks A and B.[3] Bank A is constrained by the leverage requirement, and holds capital equal to ($L^* = C_{ba}+C_{wa}$) to satisfy its regulatory minimum, plus some buffer of "excess" (C_{xa}) capital to protect itself from unexpected adverse capital shocks that would provoke regulatory interference. C_{ba} represents bank A's (inoperative) Basel minimum capital requirement, while C_{wa} ($= L^*-C_{ba} > 0$) is a "wedge" to fill the gap between the risk-insensitive leverage requirement, L^* and the Basel requirement, C_{ba}. Because this wedge capital is insensitive to risk, it creates an artificial reduction of ROE for low-risk banks, which are bound by L^* rather than their Basel minimum. The less risky are bank A's assets, the more burdensome this reduction becomes for its shareholders.

Conversely, bank B holds higher-risk assets, and has sufficient RWA/A that it is constrained by its Basel minimum, C_{bb}, which dominates the leverage requirement, L^*. It too holds a buffer of excess capital, C_{xb}, to protect it from regulatory interference. Regulatory wedge capital ($C_{wb} = L^*-C_{bb} < 0$) might still be measured for bank B, but it does not represent a regulatory burden in the same sense that C_{wa} does for bank A, since bank B is bound instead by the risk-sensitive Basel minimum.

[3] This is not unrealistic. Flannery (1994), for example, reports that the typical commercial bank had a book equity capital ratio of 6.5% in 1990, while the typical thrift held 2.9%.

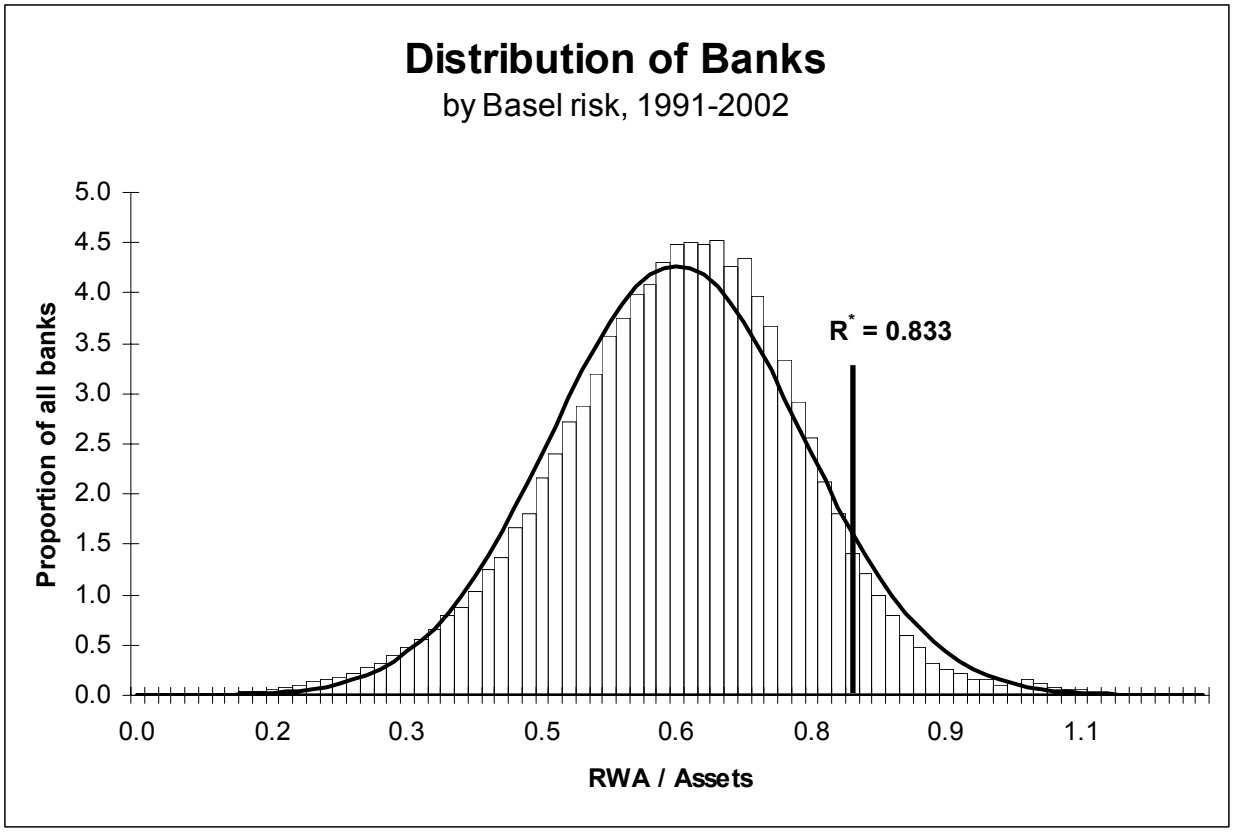
The Data:

Accounting data for every bank and thrift in the U.S. for the years 1991 through 2002 were taken from the Federal Deposit Insurance Corporation's (FDIC) Research Information System (RIS) data set. This data set matches line items from the official Consolidated Reports of Condition and Income (i.e., the bank call reports, forms 031-034) from the Federal Financial Institutions Examination Council (FFIEC) with the Thrift Financial Reports (TFRs) from the Office of Thrift Supervision (OTS). The sample thus covers essentially all depository institutions in the U.S. over a 12-year period.[4]

Figure 4 depicts the cross-sectional dispersion of RWA/A for pooled data (all institutions and all years). The transition point between high-risk and low-risk institutions (based on the Basel tier I ratio of 6%) is depicted with a vertical bar on the graph. Thus, the vast majority of banks and thrifts are low risk. This is an important empirical fact that surfaces in other results.

[4] Prior to 1991, the breakdown of real estate loans into three subcategories was unavailable; hence for 1984-90, total real estate loans are measured, giving us a four-category breakdown of the loan portfolio. Further details on the RIS variable definitions – including the specific year-by-year mapping of call report and TFR fields into the RIS variables – can be found at the online RIS dictionary: http://www2.fdic.gov/dict/.

Figure 4


Distribution of Banks
by Basel risk, 1991-2002
Proportion of all banks
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
R* = 0.833
0.0
0.2
0.3
0.5
0.6
0.8
0.9
1.1
RWA / Assets

Preliminary Results:

The present draft is essentially an extended abstract for the work we plan to complete. In the three tables below, we offer some exploratory regressions (tables 1 and 2) that reveal some key aspects of the data, plus a preliminary regression that gets to the heart of the issue we address.

Table 1 presents a regression of target firm's capital wedge on the respective acquirer's wedge (recall that wedge = L^*-C_b), along with a set of control variables. A naïve hypothesis predicts a negative coefficient here, presuming a world in which high-risk (i.e., R* < RWA/A, implying a negative wedge), capital-constrained firms acquire low-risk, leverage-constrained firms (positive wedge), to fully exploit the scarce, underutilized capital implied by the targets' positive wedge. However, this ignores the base-rate issue, that the vast majority of institutions are low risk, so that most mergers occur between two low-risk firms. The result is instead a positive coefficient in the naïve regression.

Table 2 presents the results of logit regression to identify how the capital wedge factors into a firm's merger decision. The key explanatory variables here are the wedge, L^*-C_b, and the capital buffer in excess of the regulatory minimum, K^*-C_b. This particular regression uses the subset of high-risk firms, so all wedges are negative, by definition. The significant negative coefficient, -2.139, on the wedge for the likelihood of no merge occurring therefore indicates that the riskier a high-risk institution becomes, the less likely it is to engage in mergers. One interpretation is that very high-risk firms have that status as the direct result of a strategic choice of risk profile, and that they therefore eschew mergers, which would naturally tend to reduce the overall risk profile.

Table 3 presents the most direct test of our hypothesis, that in equilibrium markets reward firms that make the most effective risk-adjusted use of capital. Here we consider the effect on the bidding firm's stock price of both the target firm's wedge and its relationship to the bidder's own wedge (i.e., the cross product of bidder and target wedges). If a positive wedge truly represents underutilized regulatory capital, then mergers in which low-risk institutions are acquired by high-risk partners should tend to alleviate that inefficiency, generating gains in the merger. Thus, one would predict a significant negative coefficient on the cross-product term. We indeed find a negative relationship. However, due to time constraints and data limitations, these preliminary results are based on a very small sample of 46 mergers.

The plan of research is to augment this sample with additional merger observations. There are hundreds of mergers involving firms with publicly traded stock over the sample period. When we have completed the mapping of our merger database to the RIS accounting data, we will have a much larger and more representative sample for the analysis of merger returns. In addition, we will examine more closely the impact of the merger on the market value of the combined entity (i.e., not simply the abnormal return to the acquirer). Stay tuned for these results... As the U.S. enters the implementation phase the new Basel requirements, the interaction of the Basel rules with the pre-existing leverage ratio may have important implications for market structure.

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Table 1

Regulatory Capital Relief in Mergers

OLS Regression
Dependent variable = Target bank's capital "wedge"

Variable	Estimate	Std. Error	t-Value
Acquirer's wedge	0.29982	0.01548	19.37
Target's buffer	-0.00262	0.00244	-1.07
Acquirer's buffer	-0.00644	0.00362	-1.78
Size difference	0.00001	0.00014	0.06
Portfolio difference	0.00007	0.00107	0.06
Geographic difference	-0.00247	0.00074	-3.34
SizeDiff x PortfolioDiff	-0.00158	0.00038	-4.15
SizeDiff x GeographicDiff	-0.00032	0.00017	-1.92
PortfolioDiff x GeographicDiff	0.00157	0.00177	0.89
Ln(asset)	-0.00719	0.00114	-6.33
$Ln(asset)^2$	0.00027	0.00005	5.79
ROA	0.00027	0.00006	4.70
Efficiency ratio	0.00001	0.00000	2.38
OTS	0.00525	0.00038	13.84
Fed	-0.00097	0.00042	-2.34
FDIC	-0.00105	0.00029	-3.63
Total offices	-0.00001	0.00000	-2.30
Top 100 size	-0.00629	0.00122	-5.17
1991	0.05492	0.00693	7.92
1992	0.05518	0.00696	7.93
1993	0.05568	0.00696	8.00
1994	0.05699	0.00699	8.15
1995	0.05625	0.00699	8.05
1996	0.05582	0.00699	7.99
1997	0.05463	0.00700	7.81
1998	0.05512	0.00700	7.88
1999	0.05520	0.00701	7.88
2000	0.05332	0.00700	7.61
2001	0.05346	0.00700	7.64
2002	0.05256	0.00703	7.48

N= 3975
R^2=75.10
Adj. R^2=74.91

Table 2

Who Merges?

Marginal Impact of ***High-Risk*** Firm Characteristics on the Merger Decision

Multinomial Logit Regression

Dependent variable = No merger vs. Target vs. Acquirer

Variable	No Merger		Target		Acquirer	
Wedge	-2.1389481	*	0.0891611		2.0497870	*
Buffer	0.0577780		-0.0448050		-0.0129730	
Ln(Asset)	-0.0446460		0.0189355		0.0257105	
$Ln(Asset)^2$	0.0009982		-0.0008953		-0.0001029	
ROA	0.0017496		0.0001268		-0.0018764	
1991	0.6937921	*	-0.2644661		-0.4293260	*
1992	0.7047047	*	-0.2504705		-0.4542342	*
1993	0.6555770	*	-0.2254308		-0.4301462	*
1994	0.7411561	*	-0.2778945	*	-0.4632617	*
1995	0.6686465	*	-0.2476965		-0.4209500	*
1996	0.7135956	*	-0.2481159		-0.4654797	*
1997	0.6380114	*	-0.2133905		-0.4246209	*
1998	0.6745511	*	-0.2337686		-0.4407824	*
1999	0.6888409	*	-0.2435742		-0.4452666	*
2000	0.6594507	*	-0.2269472		-0.4325035	*
2001	0.6965717	*	-0.2446268		-0.4519449	*
2002	0.7059486	*	-0.2386924		-0.4672562	*
Multibank HC	-0.1131352	*	0.0638110	*	0.0493241	*
No HC	0.0295281		-0.0234660		-0.0060621	
Total offices	-0.0000094		0.0000134		-0.0000041	
Top 100 size	0.0122078		-0.0116029		-0.0006049	
OTS	0.0122944		-0.0028215		-0.0094729	
Fed	-0.0052690		0.0115839		-0.0063149	
FDIC	0.0307480	*	-0.0053844		-0.0253636	*
Mutual	-0.0224515		0.0244261		-0.0019746	
Urban	-0.0364354	*	0.0217573	*	0.0146781	
Interstate dereg.	-0.0160454		-0.0125933		0.0286387	
Intrastate dereg.	-0.0242534		-0.0032409		0.0274943	

**: Significant at 1% level*

N: 6242

Log likelihood: -2680.201

Restricted log likelihood: -3561.744

Chi squared: 1763.085

Table 3

Explaining Bidder Returns

OLS Regression
Dependent variable = Bidder return, T-2:announcement

Variable	Estimate	Std. Error	t-Value
Target wedge	-229.4654	124.3725	-1.840
Target wedge X Acquiror wedge	-5201.5632	4286.1795	-1.210
Target ln(asset)	-2.3415	1.4802	-1.580
Acquiror ln(asset)	1.4531	0.6602	2.200
OTS	-0.0282	2.2484	-0.010
FED	1.5623	2.5450	0.610
FDIC	0.4359	1.2629	0.350
Total offices	0.1671	0.2498	0.670
1992	7.8188	13.2514	0.590
1993	17.1516	14.5835	1.180
1994	5.7905	14.2064	0.410
1995	10.8076	14.1304	0.760
1996	8.7529	13.7008	0.640
1997	12.3839	14.2169	0.870
1998	5.9370	13.9725	0.420
1999	13.2599	14.0556	0.940
2000	10.8507	14.0842	0.770
2001	8.0136	13.9040	0.580
2002	8.3136	14.9258	0.560

N=46
R^2=67.40
Adj. R^2=44.46