Japanese Banks’ Bad Loans:
What Happened?

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In this paper we trace the increase in Japanese banks’ loan spreads and ex ante riskiness of their loan portfolios in the late 1980s and early 1990s. We show that within the three sets of city, trust, and long-term banks, the banks with the highest late-1980s capital deficiencies vis-a-vis the then-impending BIS capital standards had the highest growth rates in risky lending. They also had the highest short-term growth rates in retained earnings which count as Tier I capital. We describe how banks were led to enhance their BIS capital ratios in this way because of the inflexible loan loss provisioning and write-off procedures they faced in Japan. Taken together, the events illustrate the perils of partial regulatory change, whether in the process of deregulation or “new-regulation” as the BIS standards were, when the affected regulations are part of an inter-related system of regulations, incentives, and economic agents’ decision rules.

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1. Introduction

The extent of the 1990s bad loan problems of Japanese banks has received extensive press coverage. By the end of 1995, it was reasonably well-agreed that these problem loans amounted to some 100 trillion yen, or roughly 15% of outstanding loans. However, there is still little systematic analysis of the causes of the loan problem. That is the task of this paper. We present evidence that, in the late 1980s and early 1990s, the approaching 1992 BIS capital standards\(^1\), based as they are on accounting measures, had the perverse effect of giving banks an incentive to increase the risk of their loan portfolios; that the loan loss and bad debt write-off procedures helped banks pursue that incentive; that the incentive was compounded by the decline in profitability of banks’ traditional business; and that the incentives could be acted upon, given the degree of deregulation in bank lending, i.e. relaxation of “window guidance,” in the early 1980s.

Some of these factors also contributed to the recent banking problems in other countries, e.g. Australia and New Zealand, Norway, Sweden, Korea, and the U.S.. This we should expect. Japan’s banking industry has faced the same world-wide trend toward declining demand for banks’ traditional services as have the banks in these other countries. Profit margins, which had been declining for Japanese banks since the early 1970s, were temporarily boosted in the late 1980s by the shift toward higher margin/higher ex ante risk loans. Our evidence is consistent with the hypothesis that the new BIS capital standards played an important part in this shift. For example, we find that on average the banks with the highest capital deficiencies vis-a-vis the then-impending 1992 BIS capital standard had the highest growth in risky loans and retained earnings.

The BIS capital standards require that Tier I plus Tier II capital be at least 8% of risk-adjusted asset exposure. The determination of Tier I capital, which is shareholders equity including retained earnings but excluding goodwill, and of Tier II capital, which includes items like loan reserves, is heavily

\(^{1}\) The standards were actually established by the Basle Committee on Banking Supervision which was established at the end of 1974 by the central bank governors of the Group of Ten industrialized countries. The Committee holds its meetings at the BIS headquarters in Basle, Switzerland, which perhaps is why the capital standards are conventionally referred to as “BIS capital standards.” This said, we follow the conventional terminology in this paper.
dependent on accounting procedures. Moreover, the measurement of risk adjusted asset exposure involves
the classification of assets into “buckets” which are each assigned a risk weight to multiply the book value
of all the on-balance sheet assets in the respective buckets. This measure of risk-adjusted exposure is thus
also heavily dependent upon accounting valuations, as well as the fiction that all assets falling within each
of the broad asset classes have the same default risk.

In sum, both the numerator and denominator of the BIS capital-to-risk-weighted assets ratio are
accounting based. Thus, faced with declining margins and the approaching BIS capital requirements, it is
not surprising that banks would tend to make riskier loans with higher promised returns and thereby
improve their capital positions so long as the higher expected defaults on riskier loans were not charged
“up-front” against the loans. In fact, tax-deductible general reserves in Japan were a fixed 0.3% of
domestic and OECD loan capital. As the structure of loan risk changed, the fixed rate was not adjusted, or
reserves accumulated, to compensate for the change in the pattern of likely defaults on the riskier, longer-
term loans. This in spite of the fact that the increased risk seems to have been recognizable at the time,
e.g. banks’ credit ratings were successively downgraded from 1989 onwards. Even more ironically, if
banks had had more freedom to choose the level of general reserves for loan losses, they would probably
have had an incentive to over-provision, not under-provision, because general reserves were both tax
deductible and still counted as Tier II equity in satisfying the BIS requirements.

General provisions are not the only charges made “up front” by banks against loans that are
booked. Banks also make specific provisions, and in addition they eventually have to write off loans that
go bad. General provisions are the most preferred of the three, since they are tax deductible and count
toward Tier II capital. Write-offs, which are fully tax deductible but don’t count toward capital, are next
desirable, while specific provisions, which are only 50% tax deductible and don’t count toward capital, are
the least desirable. Taking the tax rules as exogenous, banks would nevertheless have to make specific
provisions and write-offs if the net book value of loans had to approximate their mark-to-market value,
while from a BIS standpoint, they’d prefer to simply delay the write-offs or specific provisioning (and thus
unavoidably the tax deduction). In fact, the legal and administrative rules that Japanese banks had to
satisfy for write-offs and specific provisions to be tax deductible were stringent, especially in the case of the fully deductible write-offs. The rules were "benevolent regulation" in the sense that they made it rational for the banks to delay recognition of probable or known losses, just as they needed to do from the standpoint of satisfying the BIS requirements.

Following German and Japanese input to the BIS negotiations, Japanese banks were allowed to continue to make general loan loss reserves as a fixed fraction of loans based on historical default rates and at the same time count "hidden reserves" as Tier II capital. The result was a mixture of unrealistic net book and a marked-to-market valuation of other assets (i.e. the hidden reserves) that ended up being even less reflective of economic reality than straight GAAP accounting valuation. However, even if the hidden reserves serendipitously counterbalanced the mis-statement in net book value of loans at a point in time, the pro-cyclical value of the hidden reserves would, and did, decrease just when it was needed! Perhaps more importantly, the mere existence of the reserves would per se have imposed little constraint on banks' incentives to make riskier loans.

While the effects of the BIS capital standards were accentuated for Japanese banks, other factors which also probably added to the bad loan problems did parallel those in the U.S. and other countries. For example, as in other countries, an implied Japanese Government guarantee for bank deposits would have caused banks to rationally treat gains and losses from risky activities asymmetrically---"heads the banks win, tails the Government loses." Perhaps in Japan bank managers worry more about "losing face" than elsewhere, and perhaps the loss of a failed bank's franchise might have been greater in Japan where bank entry was tightly regulated. But whatever the absolute level of these potential restraints on bank risk-taking relative to other countries, they had almost certainly decreased over time. Reduced rents in the Japanese banking industry due to the shifts in demand for banking services would have lowered the value of any lost franchise. Further, bank managers arguably could have perceived that they had "more face to lose" if they didn't do something as demand for their services shifted. Potential managerial entrenchment aside, the MOF "convoy system" could also have further strengthened an individual bank's incentive to
make risky loans—if a bank was conservative, it risked cross-subsidizing any losses of others which made higher premium - higher risk loans.\(^2\)

In this paper, we have not modelled the interplay of all these potential contributory factors. We implicitly assume that the cost of not meeting the BIS guidelines, i.e. exclusion from the international banking business, dwarfs all other costs. But it is interesting that, in a model with deposit insurance subsidies, capital controls, and endogenous asset choice, Gennotte and Pyle (1991) find that banks still optimally choose higher risk asset portfolios in the face of tightening capital constraints, even if all the assets are marked-to-market. The increased risk can substantially reduce or even completely overturn the desired risk-reduction effects of the capital constraints, the degree depending upon costs of making loans, the net present value of the riskier assets, etc. The accounting-dependent nature of BIS guidelines just compound the incentive.\(^3\)

In the following section, we examine the time series evidence on Japanese bank spreads and loan portfolio composition during the 1980s and early 1990s. In Section 3, we analyze the cross-sectional relationship between city, trust, and long-term banks' anticipated BIS capital deficiencies in the late 1980s and their subsequent loan and capital raising activities. In Section 4, we provide a detailed description of loan loss reserve and write-off rules for Japanese banks, and argue that it is the interplay between the inflexibility of these rules and the impending BIS capital requirements which, in the late 1980s, gave banks the incentive to tilt their loan portfolios toward riskier assets. Section 5 contains a discussion of the results and alternative potential explanations.

\(^2\) Hoshi (1994b) outlines several cases in which "[t]he Ministry of Finance successfully encouraged healthy financial institutions to absorb troubled financial institutions to avoid bank failures." There is some well-informed debate over the degree to which the convoy system had weakened by the late 1980s.

\(^3\) In Gennotte and Pyle (1991), the capital controls are imposed by Governments in order to try to reduce the value of the deposit insurance subsidies. However, it is unclear that there was any explicit consideration given in the BIS guidelines to whether they optimally reduced the cost of deposit insurance, which is borne by home country Governments. Indeed, it was sometimes suggested in the press that the BIS guidelines were "unfair" to Japan given a higher assumed Japanese Government guarantee for the banking sector. Contrary to these press suggestions, though, if the BIS capital guidelines could have been effective, perhaps they would have actually moved the financial system closer to an optimum by offsetting such a big alleged implicit subsidy (the amount of the subsidy depends upon how closely the insurance costs charged to the insured institutions reflected their risk).
2. **Overall Banking Trends in Japan**

As can be seen from Fig. 1, Japanese banks’ profit margins fell in the early 1980s and at the same time became more erratic. Not only does the general trend of declining profit margins resemble that in other countries, but even the year to year variations in Japanese and U.S. banks’ rate of return on loans\(^4\) resembled each other up through the late 1980s, as can be seen from Fig. 2. However, a substantial disparity between bank rates of return in the U.S. and Japan began to occur at the end of the 1980s, as can also be seen from Fig. 2. The average rate of return for Japanese banks increased from about 5.32% in 1989 to about 6.58% in 1990. End-of-year assets of large commercial banks in Japan declined from 508 trillion yen in 1989 to about 491 trillion yen in 1990, while interest income climbed from 27 trillion yen to 32 trillion yen\(^5\). The leveling off in Japanese banks' asset growth might in part be attributable to the Bank of Japan - Ministry of Finance - initiated directive called “soryo-kisei,” apparently promulgated in 1990, requiring that a bank’s loans not exceed the prior year’s level.\(^6\)

Underlying the 1990 increase in return, and in spite of or because of the directive, was a substantial shift in the promised interest rates on the banks’ loans. Bank of Japan statistics\(^7\) show that in 1989 loans and discounts outstanding for all banks with a promised interest rate of 7.25% and below were 27 times the value of loans and discounts with interest rates of 7.5% and above. By 1990, loans with interest rates of 7.5% and above were 3 times the value of those with a rate of 7.25% and below. On average there was a twelve-fold increase in loans with interest rates greater than 7.5%. Of the 1990 loans

\(^4\) Write-offs and allowances for loan losses have not been subtracted from the interest income in computing the rate of return.

\(^5\) If we measure the return as interest income divided by previous year-end assets, the big increase “shows up” in 1989—an increase of about 20%, nearly double that for U.S. banks.

\(^6\) We are indebted to Yasuhiko Tanigawa for drawing our attention to this regulation. The stated purpose of the regulation seems to have been a slowdown of funds available for real-estate lending. If so, its promulgation could indicate that the regulators themselves were becoming more concerned about the risk profile of banks’ loan portfolios.

\(^7\) Bank of Japan, 1992, Research and Statistics Department, Economic Statistics Annual, Table 71.
with interest rates of 7.5% and above, 94% of them had interest rates between 7.5% and 9.0%; and for this major subset, there was a twenty-six fold increase in loans in 1990 compared to 1989.

Unless there were substantial resets of coupon rates on "old" loans, the loans with interest rates of 7.5% and above were presumably new loans. The increase in promised interest rates on loans might simply have reflected a general increase in yields on Government securities. Short, medium, and long-term yields in Japan rose from roughly the beginning of 1989 until the closing months of 1990. Moreover, banks' interest expense as a fraction of non-equity liabilities increased sharply from 4.83% in 1989 to 6.13% in 1990 (using end-of-year liability numbers). However, if we look at the spread between loan yields and the interest rate on deposits and debentures for "Ordinary Banks," plotted in Fig. 3a, we can see that after decreasing from around 3% in the mid-1970s to around 1.7% by 1987, it had increased again to about 2.2% by 1990. Fig. 3b also shows that, according to the OECD, Japanese banks' interest margins increased steeply in calendar year 1990 and 1991 as compared with U.S. banks. The higher spread was maintained through 1991, even though the steepness of the yield curve declined in the 1989-1990 period; indeed, the yield curve was inverted for much of 1990.

A natural question to ask is: on what types of loans were these higher spreads being earned? One directly measurable characteristic of loans is their maturity or duration. Two sources of evidence indicate that the maturity of Japanese bank loans increased in the late 1980s. First, the Bank of Japan breaks out the Outstanding Loans and Discounts of all Banks and City Banks into those with a maturity of less than 3 months, 3 months to 1 year, and more than 1 year. The "More than 1 year" category increased steadily from about 40% in the early 1980s to about 56% in 1991. Second, loan maturity on the borrower side increased --- as Japanese non-financial firms built up accumulated earnings in the 1980s, they were

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Reported interest expense for large commercial banks increased from 23,847,400 million yen in 1989 to 29,334,600 million yen in 1990 while Nonbank Deposits, Bonds, and Other Liabilities decreased, and Central Bank borrowing remained approximately constant. (Source: "Table 34, Income and Expenses of Ordinary Banks," Economic Statistics Annual, Research and Statistics Department, Bank of Japan, March, 1992; Referenced Source: The Federation of Bankers Associations of Japan).
increasingly able to meet short-term funding needs internally and through equity cross-holdings and trade payables rather than bank loans.\textsuperscript{11}

If the term structure risk and/or default risk is higher for the longer maturity loans, higher premiums for bearing that risk could explain higher steady-state spreads on loans. Moreover, if loan values are not marked-to-market and instead spreads are calculated using accounting income after loss provisions, an increase in loan risk will generate a transitory increase in spreads if accounting loss provisions underestimate expected "economic" losses. Turning to the term structure risk, if the maturity of the loans is increasing relative to deposits and debentures, then part of the spread may reflect a bigger gap between the average maturity of bank loans and their funding.\textsuperscript{12} In fact, Bank of Japan statistics show that there was a steep increase in 1990-1991 in the proportion of deposit funds coming from "Time Deposits with Liberalized Interest Rates," "Money Market Certificates," and "Small denomination Money Market Certificates." We don't have enough data to determine whether the increased duration of these funding sources exactly matched the increased duration on the loans, nor do we know to what degree the loans were variable rate and/or banks were hedging their interest rate risk, so we will never be able to rule out the possibility that a bigger maturity gap may explain part of the higher spreads.

Another possibility is that, for a given borrower type, the ex ante default risk (per period) is higher on the longer maturity loans, so that the lengthening maturity of loans alone should have commanded higher loss provisions. We can see from Fig. 3a that the yield on lending and the spread between loan rates and funding costs move quite closely together. Indeed, banks' yield on lending and 10-year Government bond yields both increased about 43\% between fiscal year 1988 and 1990. Term structure risk aside, such co-movement between the default premium component of loan spreads and the level and volatility of interest rates is to be expected if default risk moves up and down with the level and

\textsuperscript{11}The same trend toward increasing loan maturities has occurred in the U.S., except that there the replacement for short-term bank loans was the commercial paper market (the domestic corporate debt market in Japan has been held back by onerous restrictions).

\textsuperscript{12}Conceptually even a perfect match between average loan maturity and bond maturity would not be sufficient --- the individual loans should be matched one-by-one on maturity with the Government bonds, and then the average of the spreads calculated, i.e. here, the average of the spreads is not the same as the spread of the average.
volatility of interest rates. Such co-movement in default risk and interest rates is typically what we see empirically in other countries in the pricing of corporate debt (Gennotte and Marsh (1994) and the references therein).

The 50 basis point increase in loan spreads, i.e. from around 1.7% by 1987 to about 2.2% in 1990, is an increase in the average spread across all loans in banks’ portfolios, both old and new. What magnitude of increase in the risk of the average portfolio would it take to generate an increase of 50 basis points in average loan spreads? We know that, with some assumptions, the Black-Scholes option-pricing formula can be used for pricing default risk (see Merton (1974)). Let’s assume that bank loans have a maturity of 5 years, that the loan-to-value ratio is 80%, and that the interest rate is 6.0%. Then, if the volatility of percentage changes in the value of the collateral is constant over time and the value doesn’t typically jump up or down sharply, a volatility of about 27% per annum in the value of that collateral would be consistent with a 1.7% default premium on a real estate loan. With these same parameters, it takes only about an increase to 30% in the volatility of the collateral’s value for the default premium to increase to 2.2%. That is, the volatility of the collateral’s value would only have to increase by about 3 percentage points to account for the 50 basis point increase in spreads.

Of course, the loan portfolio wouldn’t have turned over in this short period. Let’s suppose that 30% of the loans were new and, for further illustration, that rates were fixed on the “old loans,” and that the default risk on these new loans were orthogonal to that on the current loans. Then the default premium would have had to be 3.36% on the new loans in order for the average spread to be 2.2%. The volatility of the assets would then have had to be in the 35% range, i.e. the volatility of the value of collateral on the new loans would have had to be eight percentage points higher on the new loans. In practice, the new loan risk was undoubtedly not orthogonal to the old. In fact, the increased concentration in commercial real estate-backed loans in major urban areas in Japan presumably made bank loan portfolios even less diversified, even if all else were equal. If so, the own-asset volatility of these new loans

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13 For simplicity of illustration, the loan is taken to be a discount loan. Note that the important point in the illustration concerns the relative change in the volatility — the absolute level of the volatility could be recalibrated by changing the assumptions about the characteristics of the debt.
could have been even less than eight percentage points higher than the old and at the same time have been commensurate with the increase in loan spreads.

We now turn to the changes in banks' loan portfolios in order to determine if their \textit{ex ante} risk did increase commensurately with loan spreads. Not surprisingly, the much-discussed shift toward real estate-related lending shows up strongly in the data. For example, Fig. 4 gives a bank-by-bank breakdown of real-estate-related lending over the 1980-1992 period. There are roughly two "waves" in the fraction of the banks' real estate related-lending; one in the 1983-1986 period, and the second in the 1988-1990 period. The 1980s shift to real estate lending and away from traditional loans can also be seen in the aggregate statistics on Japanese bank lending by industry.\footnote{Source: "Table 31: Outstanding Lendings of Commercial Banks by Industry," \textit{Comparative Economic and Financial Statistics: Japan and other Major Countries 1993}, International Division, Bank of Japan.}

If we interpret "kensetsu fudosan gyou" to be commercial real estate loans, which in Japan as elsewhere are considered more risky than residential, then commercial real estate increased substantially, from 11.0\% of loans in 1980 to 17\% in 1991. Housing Funds (juutaku shikin), i.e. \textit{explicit} loans for residential real estate, also increased slightly, from 9.0\% to 10.5\%, over the same period.\footnote{By way of comparison, in the U.S., roughly 30\% of FDIC-insured commercial bank and trust loans, or about 12\% of total loans and leases, were secured by non-farm, nonresidential properties at the end of 1991. Whilst it is hard to rely on cross-sectional comparisons of real-estate related lending because many loans classified as "non-real-estate" are often secured by land. For example, it has been estimated that 50\% - 70\% of U.K. bank loans in the late 1980s were related in one way or another to property.} Loans to Manufacturing and to Wholesale and Retail Trade decreased from 32\% and 25.5\% respectively, in 1980, to 15.1\% and 18\% in 1990.\footnote{In spite of the evidence for this shift in lending, there was virtually no change in the composition of collateral backing loans, or the ratio of secured to unsecured loans, according to Bank of Japan figures. We don't currently have a good explanation for this apparent disparity.} The small increase in aggregate bank Housing Fund loans during the 1980s also conceals a substantial "reshuffling" of All-Bank new Housing Fund loans among the three main bank lenders: the city banks, regional banks, and shinkin banks. The proportion of new Housing Fund loans made by the city banks increased dramatically during the 1980s—from about 27\% in 1983 to about 57\% in 1989, before falling back to about 42\% in 1991. At the same time, the proportion of Housing Fund
loans made by the regional and shinkin banks dropped by a factor of 2 between 1983 and 1989, as did their share of the consumer credit loan business.

Some of the banks' shift away from traditional business loans toward real estate\(^\text{17}\) can be explained by the steep increase in Japanese real estate prices in the 1980s. For example, the value of City Banks' new loans to Housing Funds (residential real estate) increased by about 580% from 1983 to 1990. But still, over the same period, the number of new loans increased by 171%.

So far, it has been implicitly assumed that real-estate-backed loans as a class have a higher \textit{ex ante} risk than banks' "traditional" industrial loans (of course, \textit{ex post} the loans were risky!). It is difficult to estimate \textit{ex ante} real-estate-related loan risk in any country, including Japan and the U.S., because transactions are infrequent and appraisal values tend to be smoothed. In the U.S., Ross and Zisler (1991) estimated the annual volatility of unlevered real estate returns to be in the 9\% - 13\% range based on the prices of REITs with primarily non-residential holdings. The estimated volatility of Japanese land prices in the 1970s through 1990s, where land prices are those assessed by Japan's Ministry of Land, are shown in Table 1. As can be seen, the volatility of national (unlevered) land prices is about 9.4\% over the 1971-1996 period. For the period 1971-1986 which excludes the 1990s decline, it is 8.6\%. Interestingly, these volatilities are reasonably similar to the Ross and Zisler estimates for the U.S. Moreover, the volatility of real estate prices has more or less mirrored the volatility of stock prices (or vice versa!), i.e. unlevered real estate prices --- particularly in Tokyo and Osaka, have tended to have a beta of about one \textit{vis-a-vis} equity returns. For example, from 1978 to 1996, commercial land prices in Tokyo had a volatility of about 19.61\%, while the volatility of the Nikkei over the same period was 18.87\%.\(^\text{18}\) Remembering that equity

\(^{17}\)While the shift to residential real estate doesn't show up strongly in the Bank of Japan numbers, it presumably would if we could consolidate in the seven housing loan companies (Nippon Housing Loan Co., Japan Housing Loan Inc., Jyuso Inc., Daiichi Housing Loan Co., Housing Loan Service Co., Sogo Jukin Co., and Chgin Seihou Housing Corp.), which are all joint ventures between banks, insurance companies, and securities firms.

\(^{18}\)Moreover, it is not that these 1970s-1990s statistics pertain to an "unusual" period. Asakura (1993) documents that prices of rice paddy land went from 100 yen (per acre) in 1877, to 250 yen in 1880, and back to 45yen in 1885. If they were random points rather than after-the-fact extremal points, these figures imply a land price volatility back then of 41\% - 75\% per annum.
price changes partly reflect corporate leverage, these estimates suggest that land-related loans carried considerable *ex ante* risk.

In using the volatility of the prices of land to measure default risk on land-backed loans (via an options-pricing model), we assume that banks don’t have any information that land was under-priced and hence was a positive “alpha” investment. Models for national level mispricing of real estate involve macroeconomic variables like inflation and growth, and it seems unlikely that banks in aggregate would have inside information about such variables. But if they did, they should be in the real estate business, not the banking business! (perhaps, with 100% loan-to-value ratios, they were).\(^\text{19}\)

As noted in the introduction, one of the problems with BIS capital guidelines is that they define credit risk only in terms of broad classes of loans, just as we’ve done so far in the discussion, whereas risks can (and can be made to!) differ substantially among loans in the classes. Upon examination, many of these loan-specific factors seem to have accentuated, not reduced, the *ex ante* risk of Japanese banks’ loans, particularly the real estate-related ones. For example, the real estate market in Japan can be reasonably considered even more illiquid than other countries like the U.S., adding a substantial “appraisal uncertainty” to the risk of real estate loans. Also, while we can’t observe the degree of recourse or recovery on the loans, or detailed covenants governing banks’ abilities to intercede in borrowers’ operations under adverse conditions (borrowers have an incentive to take on more risk under adversity), Japanese banks’ reported at least considerable *ex post* difficulty in recovering real estate collateral on defaulted loans.

Further, the ratio of the loan-to-collateralized real estate value for the typical Japanese commercial borrower reportedly averaged around 80%. Loans in excess of 100% of stated collateral value were not unknown.\(^\text{20}\) In fact, irrespective of the formal loan agreement, *first* main bank lenders are often

\(^{19}\) Werner (1994) shows that quarterly changes in Japanese land-related loans were closely related to quarterly changes in Japan’s net capital flows over the 1979-1991 period. It seems plausible that this correlation makes the real-estate loans more risky, e.g. it would certainly reduce the diversification in the banks’ loan portfolios. We are still studying this result and its implications.

\(^{20}\) By way of comparison, in the U.S. the loan-to-value ratio on real estate was limited to about two-thirds until 1982; following decontrol, it surged to 80% for some institutions. (It has now dropped back to about 2/3 after FIRREA).
regarded as implicitly committing to add capital to keep group borrowers afloat if they get into financial difficulty, i.e. first main banks are effectively residual claimants with “100%” financing. It is also difficult to define the loan-to-asset values for banks’ (especially long-term banks’) holdings in jusen – on a “flow through” basis, the loan-to-value ratio for these holdings would mirror that of the jusen’s, but at least the ex post settling up banks’ responsibilities for their respective jusen-in-default is anything but clear.

In addition to their increase in real estate lending, Japanese banks also appeared to have shifted some of their remaining business lending to smaller enterprises. These enterprises have, on average, higher volatility of earnings before interest and taxes (EBIT) and, all else equal, higher default risk. For all banks, 41.6% of total outstanding loans and discounts went to “small enterprises” in 1982, but by 1989, that fraction had increased to 57.22%. Small enterprise “equipment financing” increased from about 8.44% in 1982 to 16% in 1989.

Of course, shifts in bank lending toward real estate also occurred in the U.S. and other countries in the 1980s. In the U.S., for example, total loans secured by real estate increased from about 29% of total FDIC-insured commercial bank and trust loans and leases to about 41% over the 1986-1991 period, while Commercial and Industrial Loans decreased from 34.2% to 27% over the same period.

To sum up, we believe that the statistics on aggregate bank lending in Japan in the late 1980s show a short-term increase in loan spreads which was both counter to past trends and rates of return in other countries. Commensurate with these increased spreads, a discernible shift in banks’ loan portfolio toward real estate took place. In the next section, we present evidence that is disaggregated by banks that

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22 This is not inconsistent with the trend toward real estate loan-related financing. Nearly two-thirds of the “equipment” financing is to real estate and services industry.

suggests that the promulgation of the BIS capital guidelines were an important catalyst behind these aggregate Japanese banking trends.

3. The Role played by the BIS Capital Requirements

The BIS capital standards began as a 1985 US-UK initiative, the stated objective of which was a reduction in the risk of international banking transactions and a “levelling of the playing field” for banks. A significant modification of the initial accord, due primarily to Germany and Japan, allowed them to continue making loan loss reserves based on historical default rates and at the same time count “hidden reserves” as Tier II capital. Thus, instead of applying U.S.-U.K. accounting rules in which loan risk must be provisioned against (so that, term structure risk aside, the net book value of a loan approximates its marked-to-market value), the German and Japanese treatment introduced a mixture of non-GAAP valuation of loans with marked-to-market valuation of other assets (i.e. the hidden reserves).

Negotiations concluded in December 1987 and the agreement was signed in 1988.24 Banks were required to have a 7.5% risk-weighted capital ratio by the end of 1990, of which 3.25% was to be in core capital (basic equity). At the end of the phase-in period on December 31, 1992, the risk-weighted capital standard was stepped up to 8%, with 4% in Tier I capital.25

The BIS capital standards, although often termed risk-based capital adequacy standards, can be more correctly understood as accounting risk-based standards. That is, neither risk nor capital is measured on a mark-to-market basis, but rather risk factors are assigned to categories of assets and historical cost accounting valuations are used in computing the capital ratios. Also, even though off-balance-sheet commitments are taken into account, they are converted to on-balance-sheet equivalents and then assigned to the various risk categories.

24 Paragraphs 18 and 21 of the BIS Accord were amended in 1991 to strengthen the distinction between general and specific provisions. The amendments effectively precluded supervisors from including any specific provisions in Tier II capital.

Beginning in 1986, many banks around the world found that they would probably be considered under-capitalized by the international capital standards that later became the BIS. In particular, there was substantial press coverage at the time speculating that the Japanese banks would have a difficult time meeting the BIS standards.\(^{26}\) To improve their BIS ratios, banks could do two things: either increase their reported capital and/or decrease their risk-weighted assets. One short-term way to increase reported accounting capital is to increase the riskiness of loans and thus loan margins, but not make commensurately higher loan loss provisions. While this procedure simply borrows tomorrow’s profit, the evidence is that, at least in the U.S., banks do indeed tend to alter their accounting treatment of loan loss provisions if minimum capital requirements are binding: Kim and Kross (1995) show that a 1989 change in minimum capital requirements, along with a change in the capital ratio computation, caused U.S. banks with low capital ratios to change their accruals so as to increase the capital ratios for their banks. Similarly, Stinson (1991) finds that federally-regulated U.S. Savings and Loans adjusted the size of loss provisions to meet net worth requirements when their net worth was close to the minimum required. Barth, Beaver, and Wolfson (1990) find that U.S. banks use securities gains and losses and/or loan loss provisions to smooth earnings.

When, in order to “enhance” an accounting-based capital ratio like the BIS one, a bank increases the riskiness of its loans but not its loan loss provisions, it can do even better if it simultaneously tilts the composition of its loan portfolio toward those assets whose official risk-weights are set too low relative to real expected loss rates. Such a tilt in loan composition would, all else equal, tend to concentrate loan risk, but the risk weights don’t take into account a bank’s ability to diversify its default risk across asset classes. So if the default risks of the industrial loans which were being replaced by real estate lending were more diversified, as casual evidence suggests, the increase in loan portfolio risk is even stronger than suggested by our analysis of shifts in the types of loans being made.

We showed in Section 2 that aggregate bank lending to (commercial) real estate increased substantially in the late 1980s. The fraction of loans going to small and medium-sized businesses also

\(^{26}\)For example, Euromoney estimated that on average Japanese banks Tier I capital was 2.76% in 1987 (Euromoney, July 1989, p. 63)
increased from 56% in 1986 to 70% in 1989. While this evidence is consistent with the hypothesis that banks increased the riskiness of their lending in response to the promulgation of the BIS capital ratios, it doesn’t constitute a test, since it involves only one pass of history. To do a cross-sectional analysis of the proposition that banks with higher prospective capital inadequacies did shift toward riskier loans, we assembled a database of cross-sectional data on Japanese banks covering the period 1981-1995. The banks were grouped into the 11 city banks, 3 long-term credit banks, and 6 trust banks.

We estimated the cross-sectional relationship between banks’ BIS ratios and risky lending in several ways and at two points in time. The first point in time that we consider is fiscal year 1985, which ends on March 31, 1986. Fiscal year 1985 was chosen as the first point in time to investigate because it could be argued that, given the time required to “ramp up” real estate lending, banks may have started to make some adjustments in their loan programs at this early point in the BIS deliberations.

Our first test on March 1986 is to see if there is a positive association between a bank’s anticipated difficulty in satisfying the then-anticipated BIS capital requirements and its growth rate in risky lending. We defined risky lending to consist of real-estate related lending, and computed the average growth rate of real-estate-related lending for each bank over the 1986-1988 time period. The rank correlation between banks’ capital shortfall versus the BIS capital ratio and the growth rate in real-estate related lending was used as a measure of association between them.

Unfortunately, BIS ratios were first published in March 1989. So we were forced to estimate BIS ratios in 1986, which we did by taking banks’ 1986 equity-to-risk-adjusted assets using their accounting statement data in 1986. We found:


28 Boyd and Gertler (1993) show that, among U.S. banks, bank size is an important variable in explaining shifts in asset composition etc. We did not stratify our sample by size —Japanese city, trust, and long-term banks are all large by almost any standard, and indeed their record does tend to resemble that reported by Boyd and Gertler for the large U.S. banks.

29 The major source of slippage in our approximation in the BIS ratio is the omission of changes in hidden reserves. To get a feel for our approximation, we calculated the equity-to-risk adjusted assets for banks in 1989 and compared it with the BIS ratios which were actually published in 1989. The rank correlation between the approximation and actual number across city banks is 0.80, and across trust
\[ \hat{\rho}^R (\hat{BIS}^{86}_i, \text{REGR}^{86-88}_i) = 0.27 \]  

(1)

where \( \hat{\rho}^R \) is the rank correlation coefficient, \( \hat{BIS}^{86}_i \) is our estimate of the BIS ratio for bank \( i \) in March 1986 (i.e. for fiscal year 1985), \( \text{REGR}^{86-88}_i \) is the real-estate-related loan growth rate over the fiscal years 1986-1988 where “real-estate-related” is defined as loans to financial institutions (non-banks), commercial real estate developers, and construction companies; and \( i = 1, \ldots, 11 \), the number of city banks in our sample. In (1), the order of ranking is that banks with the highest BIS ratio are assigned the lowest rank, i.e. 1, on that variable, and those with the smallest growth rate in real-estate-lending were assigned a 1. Thus, those banks with the worst estimated BIS ratios in 1989 on average increased their real-estate-related lending the greatest over the period 1986-88.

In March 1986, the U.S. and U.K. had not yet formalized any agreement on capital guidelines, and lobbying by non-U.S./U.K. parties to join the negotiations was still in progress. Thus, Japanese and other non-U.S./U.K. banks might have considered the likelihood and shape of the guidelines to be too preliminary to act in March 1986. Indeed, the BIS picture became a lot clearer later in 1986. Thus, we re-estimated the rank correlation between fiscal year 1986 (March, 1987) estimated BIS ratios and 1987-1988 growth rates in real estate related lending.

\[ \hat{\rho}^R (\hat{BIS}^{87}_i, \text{REGR}^{87-89}_i) = 0.51 \]  

(2)

The rank correlations between estimated BIS ratios and growth in real estate-related lending for the 6 trust banks are: \( \hat{\rho}^R (\hat{BIS}^{86}_i, \text{REGR}^{86-88}_i) = 0.11 \) and \( \hat{\rho}^R (\hat{BIS}^{87}_i, \text{REGR}^{87-89}_i) = 0.29 \).

Banks with BIS capital deficiencies which wanted to enhance retained earnings and thus Tier I plus Tier II capital had an incentive to make riskier, under-provisioned loans and “book higher current profits.” They might also have wanted to enhance the value of the Government insurance put-option, even if all assets were marked-to-market. Irrespective, we should be able to see the effect of the riskier loans on banks, 0.89. We felt that trying to extrapolate hidden reserves back from 1989, when they were first published, back to 1986, would just add noise to the approximation.

30 This breakdown was obtained from the Quick database.
retained earnings. To verify this, we computed the rank correlation across banks between the estimated BIS ratios in March 1987 and changes in retained earnings (standardized by assets) over the period April 1988 to March 1993. The correlation was 0.34 for city banks, 0.11 for trust banks, and 1.0 for long-term banks. These positive correlations are consistent with the hypothesis that the higher yields on riskier loans do indeed increase retained earnings and thus Tier II capital.

The cross-sectional correlations between estimated banks' BIS ratios and growth in real estate lending or retained earnings were computed beginning in 1986 or 1987 because the BIS guidelines were reasonably predictable by the latter date, and anticipated in some form at the former date. Moreover, it would likely have been too late in, say, 1990, for the banks to adjust their portfolios and realize returns quickly enough to make an impact by the December 1992 time of full BIS implementation. On the other hand, BIS rules allow hidden reserves of Japanese banks to be counted as Tier II capital. Thus, even if Japanese banks had been "on track" to meet the guidelines, the stock market crash around the end of 1989 would have caused an unforeseen decline in hidden reserves and hence called for renewed efforts. To investigate whether a "second wave" of loan portfolio adjustment occurred, we computed the correlation between banks' rankings on their published BIS ratios in March 1990 and their ranking in terms of growth in real-estate-related lending from 1990-1992. For city banks, \( \hat{\rho} (BIS_{1990}, REGR_{1990-92}) = 0.42 \). For the trust banks, the correlation is 0.36, and for long-term banks, 0.64.\(^{31}\)

So far, we have used banks' published or estimated BIS ratios as a measure of their potential capital shortfall in meeting the guidelines. However, because the guidelines didn't become fully binding until the end of fiscal year 1992 (i.e. March 1993 for Japanese banks), it could be argued that it was the projected shortfall in the ratio at that time which would have been the most important stimulus to bank behavior. We can estimate bank \( i \)'s March 1993 capital deficiency as projected in, say, March 1990, as follows:

\[
CD_{i}^{90} = [(\text{TotalAssets}_{i,3/93}\times 8\%) - (\text{TotalAssets}_{i,3/90}\times BIS_{3/90})] \div [\text{TotalAssets}_{3/93}\times 8\%]
\]

\(^{31}\) We didn't compute the rank correlation for long-term banks in 1986 above because we were missing data for I.B.J.
where $CD^0_i$ is the capital deficiency for bank $i$ at the end of fiscal year 1989 (March 1990) and where we assume that bank $i$ had perfect foresight with respect to its BIS asset growth from 1990 to 1993. \(^\text{32}\)

Since the published BIS ratio is used to calculate capital at the end of March 1990, hidden reserves are taken into account, because they are included in Tier II capital. Also, the March 1990 figure should reflect the end-of-1989 stock market crash.

The bank with the biggest capital deficiency by this measure, i.e. "at the bottom," in 1990 is given the highest rank. Using the convention that banks with the biggest growth in real-estate-related lending from fiscal year 1990 to fiscal year 1992 had the highest rank, the rank correlation between the estimate of capital deficiency and growth in real-estate-related-lending is:

$$\hat{\rho}^R(\hat{CD}^0_i, \text{REGR}^0-92_i) = 0.64$$

For trust banks and long term banks, the correlation estimate is 0.50.

Of course, these rank correlations are computed across a relatively small numbers of banks. If we regarded these banks as a sample from the population of all banks, the standard error would indeed be large --- approximately $1/\sqrt{n-3}$ where $n=11$ for city banks, 6 for trust banks, or 3 for long-term banks. But the correlations just reported are actually those for the bank populations for the respective classes of banks, not for samples. Any statistical error in the correlations stems from measurement errors in the true capital shortfall and growth-in-risky-lending variables. We have no precise way of assessing the likely magnitude of this error. However, we can see that the rank correlations are almost always in the 0.30 - 0.50 range, and seem remarkably robust to alternative measures of the variables, thus suggesting that the results are not so sensitive to errors-in-variables problems.

Implicit in the argument that banks used their lending practices to help meet their BIS capital standards is the requirement that profits be a potentially important source of increases in their capital.

\(^{32}\) The number for risk-weighted assets used in the denominator of the BIS capital ratio is computed by multiplying on-balance-sheet assets by an official risk-conversion factor, summing them, and adding the total to the total of off-balance sheet assets multiplied by both a balance-sheet conversion factor and a risk conversion factor. So for banks to perfectly forecast BIS asset growth, they would have had to be able to perfectly forecast the relative growth rates of assets in the various BIS asset categories.
Table 2 provides evidence on the relative importance of retained earnings versus new shares issues as sources of equity capital. In this table, the year-by-year ratio of proceeds from new share issues to total proceeds from new share issue plus the unappropriated retained earnings\(^{33}\) is given for each of the city banks. It can be seen from Table 2 that proceeds from new share issues made up a significant fraction of equity funding in the 1988 - 1990 fiscal years for many banks — often in the 50% to 60% range; conversely, retained earnings accounted for better than half of the increase in equity.

Of course, funds from both new share issues and retained earnings count toward Tier I capital. Banks with an anticipated capital deficiency vis-a-vis the BIS standards would have an incentive to raise funds from either source. Corporate finance theory doesn’t give a definitive prediction as to whether outside or inside equity is a cheaper source of funds. One important factor is the degree of asymmetry in information between that available to the stock market and that available to internal managers. For example, if managers issue shares when, based on their inside information, they think that the firm’s shares are overpriced, then we’d expect rational investors who realize that managers know more than they do to “mark down” the price they’re willing to pay. Myers (1984), Myers and Majluf (1984) suggests that this establishes a “pecking order” for funding sources in which internal funds will be used before resorting to external funding. The degree of asymmetry between insiders and outsiders was arguably substantial at the end of the 1980s after the stock market declined and much public discussion concerned the effects thereof on banks’ hidden reserves, and also the extent of their problem loans.\(^{34}\) Compounding any effects

\(^{33}\) The data for proceeds from new issues was taken from Toyo Keizai’s Japan Company Handbook. Using the information there, we calculated the number of shares and multiplied it by the issue price to get proceeds. We accounted for public issues at market price, so-called mid issues to shareholders at half the market price (in proportion to shares outstanding — like rights), and issues to specific buyers at a price set by the bank (private placements). We excluded convertible bond issues and stock splits. We aggregated the proceeds from the new share issues by fiscal year and expressed them as a ratio of unappropriated earnings plus the proceeds from new issues to get the numbers which are given in Table 2. The unappropriated retained earnings numbers include dividends on the basis that dividends are a control variable, and thus contribute to the banks’ ability to meet BIS guidelines. However, we re-computed the numbers in Table 2 where dividends are taken out of retained earnings and verified that their treatment is not important.

\(^{34}\) Barth, Beaver, and Landsman (1995) report that accounting items such as banks’ non-performing loans and fair values of securities and loans which are disclosed but not recognized in financial statements under SFAS 107 are significant in explaining cross-sectional equity prices. At least in the U.S., the implication is that investors derive information from these items in accounting reports; their absence in
of potential asymmetry on share issues was Ministry of Finance "guidance" which essentially ruled them out after 1990, and perhaps "non-share-price" factors such as a desire not to dilute cross-holdings.

We can't measure the effect of these factors on a bank's perceived relative cost of inside and outside funds. However, as long as there is a pecking order running from inside to outside funding, then we would expect to see a tendency for the banks only to raise outside funds when they are up against a tight constraint on inside funding. Thus, holding total equity funding constant, we would expect to see banks which made riskier-higher yield loans to generate short-run increases in retained earnings to have lower outside funding. To investigate these possibilities further, we computed the correlation for each city bank between its year-to-year outside funding and the year-to-year fraction of its loans tied to real estate over the period 1987 through 1992. These correlations are negative for all long-term, trust, and city banks except IBJ and Sumitomo Trust — they are 0.68, -0.75, -0.08, -0.55, -0.73, -0.24, -0.23, -0.78, -0.70, -0.10, -0.96, -0.86, -0.71, -0.34, -0.18, -0.13, 0.05, -0.18, -0.24, -0.64, -0.01 for IBJ, LTCB, NCB, DKB, HTB, BOT, SAKURA, MB, FUJI, SUM. BK, DAIWA BK, SANWA, TOKAI, ASAHI, MITSUI TR, MITSUBISHI TR, SUMITOMO TR, YASUDA TR, NIPPON TR, TOYO TR, and CHUO TR respectively. The average correlation (including the outlier for IBJ) is -0.37. These correlations are consistent with the hypothesis that banks which were making higher yielding and riskier loans to generate retained earnings because of capital deficiencies relative to the BIS standards faced less pressure to go to the external capital markets. Note that this negative correlation between real-estate related lending and external equity issues is the opposite of what we would have expected if real-estate lending and new share issues were all being driven by real estate prices. That is, most of the share issues occurred in a three year period of high share prices. We know from empirical work by Marsh (1982) and others that on average corporate stock issues increase when stock prices increase, and it can be argued that a major "fundamental" behind high stock prices in Japan was high real estate prices, i.e. one couldn't conclude that stocks were overvalued in Japan in the late 1980s unless one concluded that real estate was overvalued. So if real estate lending went up when real estate prices and stock prices were going up, we

Japanese reports presumably reduces investor information and increases asymmetry between the level of their information and management's.
would have expected to find a positive correlation between real-estate related lending and external equity
issues.

Whilst the evidence is consistent with banks on average resorting to outside equity issues only
when they were unable to generate accounting equity increases internally, we would also expect to see a
total capital demand effect. That is, banks with bigger capital deficiencies needed bigger increases in
capital from all sources. We’ve already shown that the bigger banks’ capital deficiencies, the more they
endeavored to generate retained earnings from riskier-higher margin loans. To complete our cross-
sectional analysis then, we looked at the rank correlation between banks’ estimated BIS capital ratios in
March 1987 and their new equity funding over the period April 1987 to March 1993. These correlations
are quite low for city banks, 0.08, and for trust banks, 0.14, but 0.50 for the long-term banks (of which
there are only three!). These numbers suggest that, at least for city banks and trust banks, asymmetric
information problems could have been important enough to make new equity issues an expensive source
of funds; moreover, the city banks, for whom the correlation between new issues and BIS capital
deficiencies are the lowest, had the highest correlation between risk-taking and the those deficiencies.

To summarize, there is strong evidence that, among Japanese city, trust, and long-term banks,
the ones with bigger late-1980s capital deficiencies vis-a-vis the impending BIS standards tilted their loan
portfolios toward higher margin/higher ex ante risk loans. Given the loan loss provision rules, these shifts
generated higher short-term retained earnings growth and thus short-term improvement in their BIS
ratios. We briefly noted U.S. research evidence that banks which are up against minimum capital
standards do, on average, adjust discretionary accounting items to help meet the standards. In the next
section, we discuss the Japanese rules for loan provisioning and write-off in detail. We argue that, in the
case of Japan, it was not the discretionary nature of the rules but rather their rigidity that was a problem,
i.e. given incentives, a situation in which asset choice is endogenous and loss rules are inflexible becomes
a lot like a situation where assets are fixed but rules can be manipulated.
4. The Bad Debt Reserve and Write-off System

Japanese banks' ability to use their risky lending activities to enhance their BIS capital ratios required that loan loss reserves weren't perfectly adjusted to reflect the higher expected default rates on the riskier loans. In fact, the determination of loss reserves was backward-looking and inflexible in the Japanese system.

Reserves against bad loans appear to have been introduced in Japan in 1964. Banks were then required to make a general bad debt reserve equal to 0.42% of outstanding loans, and the provisions against income which were credited to the bad debt reserve were tax deductible. The bad debt reserve requirement was then reduced 5 times to reach its current level, which is a tax deductible 0.3% for domestic loans and loans to OECD countries. We understand that the adjustments leading to the 0.3% percentage reflected historical loan default rates prior to 1985.

Making the tax-deductible allowance for loan losses a fixed percentage of loans does have the advantage that it makes it impossible for banks to manipulate the level of loan loss reserves. Since general provisions are tax deductible and count as Tier II capital, Japanese banks might have had an incentive to over-provision (just as U.S. banks did under similar tax rules in the 1980s). In the absence of a fixed loan loss rule, banks might also have had the opposite incentive to make reserves "too low" in order to disguise a deteriorating quality of its loan portfolio if they believed that it would "fool" investors or regulators. These pros of the fixed rule notwithstanding, however, a fixed loan loss allowance doesn't, ipso facto, respond to changes in the ex ante riskiness of loans. Most obviously the reserve allowance is invariant in the face of a shift in steady-state risk. But more subtly, it doesn't reflect changes in the timing at which uncertainty surrounding loan repayments is resolved: since the reserve is "reset" each year at 0.3% of the loan balance, any reserves which are "unused" for write-offs simply reduce the amount of provisions which are required to achieve the 0.3% reserve requirement in the following year.


36This treatment is in stark contrast to that in the U.S.: "Amounts of bad debt deductions for income tax purposes are includable in taxable income of later years only if the bad debt reserves are used subsequently for purposes other than to absorb bad debt losses."
are essentially identical to write-offs insofar as they are specific to loans and are not accumulated in a reserve account if not used in the financial year; the only point of difference seems to be that specific provisions are only 50% tax deductible, whereas write-offs are fully deductible. Thus even if the characteristics of loans or economic conditions change so that there is an increase in the number of loans which will likely default in a subsequent period, there is no requirement to build up reserves accordingly.

The loss reserve provisions in Japan can be compared to that in the U.S. and other countries. U.S. authorities don’t have fixed rules of regulatory accounting for allowances for loan losses (possibly because fixed rules can be “gamed”). However, the S.E.C., the Office of the Comptroller of the Currency, and the F.D.I.C. all recommend a “building block” approach to determining the adequacy of allowances. Components include: specific loans with potential losses; historical experience in default on various pools of loans, and their volume, maturity and composition; off-balance sheet credit risks; lending policies and procedures; and economic conditions. Ultimately, bank examiners judge the adequacy of the reserves. Tax deductibility seems to be “automatic” if the provisions are sanctioned by the examiners. Further, industry opinion seems to be that there is a substantial equivalence between GAAP (FASB Statement No. 5) and the regulatory accounting procedures. Using F.D.I.C. statistics for (federally) insured commercial banks and trust companies, the ratio of “Allowance for Loan & Lease Losses” as a fraction of “Total Loans & Leases” in the U.S. has been in the vicinity of 2.6% since 1987. Prior to that, it increased from about 1% at the beginning of the 1980s to about 1.6% in 1986.

A factor which might explain regulatory forebearance in Japan is that inadequacies in accounting for potential loan losses are, at least in part, offset by another accounting distortion—the “hidden reserves,” i.e. assets, especially equity holdings, which are stated at book value but have had a higher value if marked-to-market. Certainly it is reasonable to assume that bank managers, or their regulators, should be able to roughly associate bad debt allowances with these hidden reserves—risk controllers in large financial institutions typically try to mark-to-market and hedge the risk of liquid assets at least daily.

37In practice, few differences appear to exist between the total [allowance for loan and lease losses] for RAP [Regulatory Accounting Procedures] and GAAP, although differences often appear among components justifying the total allowance” (Baskin (1992, p. 95)).
However, the hidden reserves declined as equity values declined, just at the time that the big increase in defaults began to occur—in general, more than a dollar of hidden reserves are required per dollar of “required” bad debt reserves and write-offs because hidden reserve values are likely to vary inversely with loan losses.

Until 1994, it appears to have been very difficult for Japanese banks to write off loans. Even if a write-off was not deductible for tax purposes, it could not be taken under MOF guidelines unless the borrower was bankrupt or had been insolvent for two years. Since February 1994, banks have been permitted to establish Write-off Special Accounts. The Special Account can be established when: (1) the borrower’s business is unlikely to improve, or the borrower has suffered a substantial loss due to natural disaster or business decline; in this case, the establishment of the Special Account requires the approval of the Japanese tax authorities; (2) the borrower has been the subject of a suspension of trade at the Clearing House, petition for commencement of bankruptcy, reorganization and restructuring procedures, etc.; in this case, the bank may, at its discretion, write off 50% of the total amount of the loan (less the value of collateral) at the time of occurrence of the event. It appears that a tax deduction is allowed at the time the Special Account is established. When loan default appears certain, the loan can be written off against the Special Account. In addition to the amount which can be transferred to the Special Account pursuant to conditions (1) or (2), banks may also transfer additional money into the Special Account without it being tax deductible. In this case, the banks must file a report with the tax authorities.

Past regulatory tightness on write-offs may be in part endogenous to Japanese banks’ reluctance to foreclose on problem loans long beyond the point at which bankers in other countries would have. Hoshi, Kashyap, and Scharfstein (1990) have in fact presented evidence that such Japanese bank relationships with borrowers tend to help reduce bankruptcy costs. But there are also potential cons. Obviously, there will be some instances when problem loans are better handled by “workout specialists” and/or a change in the borrower’s management is warranted, which may or may not be expedited by a relationship bank. Economists have also long pointed to the “moral hazard” that managers of failing financial institutions have an incentive to increase the riskiness of their operations. Moreover, one

38 And the U.S. experience with failed financial institutions affirmed!
suspects that banks' monitoring skills may be better (or more apparent) on a relatively "isolated case" basis than in a situation like that in Japan of widespread problem loans due to causes largely beyond any bank's control.

The write-off rules could also have been consistent with banks' own interests (and thus those of their "regulators") if banks were concerned with their BIS capital standards, as we've argued the evidence suggests that they were. Assuming that general provisions are tax deductible and specific provisions are not, it is straightforward to show that, given the BIS treatment, the order of desirability of ways of handling defaults are:

\[
\text{general provision} > \text{not recognized} > \text{write-off} \geq \text{specific provision}
\]

That is, banks prefer not recognizing bad loans over writing them off, i.e. all else equal, the BIS effect of the former outweighs the tax advantage of the latter.

The effects of loan loss reserve and write-off rules has been apparent in Japanese banks' treatment of loans to "risky countries," defined to be countries which have defaulted in the past 5 years. Beginning in 1984, the administrative guideline for reserves against these loans has gradually increased to 35% (exceptions appear to be possible), out of which only 1% is tax deductible. When write-offs of defaults of these loans occur (usually by sale, since write-off of sovereign debt is extremely difficult), they are charged against the bad debt reserve, and only then does the amount in excess of the previously-allowed 1% become tax deductible. This treatment raises the cost of Japanese bank funding of these loans, both relative to banks in other countries, and relative to other forms of financing the loans. Realistically, if there is "money left on the table" as a result of the rules, we would expect to see banks use various off-shore devices to make the loans. It is also not surprising that each Brady Plan was used by Japanese banks as an opportunity for selling large amounts of loans now subject to the rules, the last instance being Bulgarian loans in 1995.
5. Discussion and Alternative Explanations

We’ve argued that Japanese banks shifted to *ex ante* riskier loans in the late 1980s. The thesis that we’ve advanced is that impending BIS capital guidelines provided an important incentive to banks to make these riskier loans in the late 1980s. The reliance of the BIS capital guidelines on “non-economic” procedures for accounting for loan risk seems to have played a critical role, as did the declining demand for traditional banking services at the time of introduction of the capital guidelines. Our estimates of the changes in *ex ante* loan risk are based on time series evidence of changes in loan composition and loan yields. Our evidence for the role of the BIS capital guidelines involves cross-sectional analysis of the risk-taking activities of banks relative to their BIS capital deficiencies.

Two supplementary sources of evidence corroborate the contention that there was indeed an increase in *ex ante*, not just *ex post*, risk. First, Standard & Poor’s lowered their debt ratings for considerable numbers of Japanese banks from 1990 onwards. As Fig. 5 shows, the debt of one bank was downgraded in 1989, while 16 debt issues were downgraded in 1990, 12 of them long-term debt. Since debt ratings will reflect both banks’ leverage as well as the riskiness of their underlying assets, and information about leverage increases could be inferred from the stock market---both from the changes in the price of equity as an option on bank assets, and from the estimated effect on hidden reserves, it would perhaps be incorrect to interpret banks’ entire ratings declines as evidence that loan risk increased. But we calculated that the magnitude of the change in unlevered mark-to-market value of bank assets required to substantiate changes in observed spreads and ratings was quite plausible.

Second, banks’ *ex ante* decision making processes also provide “visible hand” evidence of why the changes in loan portfolios occurred. At least some banks apparently changed the way that they organized loan originations in the 1980s in a direction that, if anything, would have led to the origination of higher *ex ante* risk loans. For example, pursuant to a well-known consulting firm’s recommendations, Sumitomo Bank is reported to have switched its loan risk evaluation responsibility from an independent

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39 The loans were also *ex post* risky of course!

40 We are indebted to Takeo Hoshi for telling us about this case.
credit investigation bureau to a monitoring bureau which reported to the sales division (after 1990, it reportedly switched back to the old organizational form).

To discuss these results further, suppose that we take the increase in *ex ante* loan risk as given (it could never be proved definitively— it is difficult enough to assess and price loan risk using all the data available *within* a bank, let alone with the external data that we have!), and focus on the incentives. It would be foolish to maintain that the guidelines had to be the only incentive behind the riskier loans. For example, it is now well-understood that implicit or explicit Government insurance of banks, in which the banks’ deposit premiums do not fully reflect the risk of their loan portfolios, itself provides an incentive to banks to make excessively risky loans. This incentive would also have been accentuated if there was any perceived likelihood of cross-subsidization among banks in the event that one of them failed --- if the regulatory authority penalizes *ex post* “strong” banks by in effect taxing them to help bail out banks which have taken large risks (it is difficult to tell *ex post* whether the failure was for risk-taking reasons which were controllable by the bank), banks have an incentive to follow each others’ actions. If any of the cross-subsidization is based on accounting statements, then the banks have a similar incentive to follow the norm in their treatment of loan loss provisions and write-offs.

Social pressures in Japan on bank executives might have constrained the level at which these incentives were acted upon in Japan relative to what they would have been in other countries, but it seems plausible that marginal increases in expected payoffs for risk-taking would have resulted in more of it. Further, if keeping face was motivated at all by the hope of bureaucratic benevolence in a regulated industry, declining industry demand, and thus declining monopoly rents, reduced the benevolence to be shared around. At least some bank managers must also have seen an equally compelling possibility of loss of face, if not outright loss of job, in the declining demand for bank services if they “did nothing.”

Agricultural cooperatives, which handle financial transactions, offer an example both of how declining demand can affect financial institutions’ behavior, and of how the BIS capital guidelines wouldn’t account for all the incentive to make riskier loans⁴¹. These non-bank domestic financial

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⁴¹ We thank Yukiko Ohara and Yasuhiro Tanigawa for drawing our attention to the agricultural cooperatives.
institutions are not covered by the BIS guidelines. Their business has steadily declined along with the shrinking agricultural sector, and it is well known that they made substantial non-agricultural loans, especially to housing loan companies, in the late 1980s. Perhaps these institutions were quite skilled at assessing the risk of such non-agricultural loans and charged appropriate loan rates to the borrowers, and thus that their substantial problem loans were just bad luck. Perhaps not. But even if not, we can’t necessarily infer a misalignment between the interests of cooperative managers and owner-depositors; if the latter had few alternative outlets for their deposits as a result of regulations, then it is the regulations, not the BIS guidelines, that were the source of the problem.

It seems likely that changes in Japanese banks’ lending decisions in response to the BIS capital guidelines, along with the declining demand and margins on their traditional business, were in part due to the inflexible regulations constraining them from offering new financial products. Indeed, there is some evidence that Japanese banks did find some new overseas outlets for lending that did offer better spreads but perhaps without proportionately, or at least disproportionately, higher risk. Spreads on both OECD and Asian loans increased substantially from 1987 through 1989-1990, but there is no measurable evidence that credit risk increased substantially in these borrower countries. McCauley and Yeaple (1994) attribute the increased spreads to Japanese banks’ management decisions following decreases in the value of their equity holdings (which began in 1990).

In general, though, it seems likely that banks’ best prospect for revenue growth is in offering a broader range of financial services which can be created using modern financial engineering methods. At the same time, if banks are free to offer such newly-demanded services, it will be very difficult for the Government to micro-manage risk if deposits continue to be insured. For example, as Pyle (1986) showed, increasing expected bank audit frequency can substantially offset increases in asset risk, given a minimum capital requirement. But even if the authorities audit banks more frequently and require greater disclosure of the risk of positions, the disclosed positions can be outdated in minutes if banks change their positions by trading liquid assets and using derivatives. One solution would be for authorities to require that deposits be 100% collateralized by Government-guaranteed securities (in many countries outside Japan,
Government securities might no longer be considered risk-free!, thereby obviating the need for deposit insurance and attendant risk-control regulations.

In January 1996, the Basle Committee reissued a Supplement to the July 1988 Basle Capital Accord, extending the Capital Accord by adding capital charges for market risk to those for credit risk. "The capital standards for market risk, as set forth in [the] Amendment, will be implemented by the G-10 supervisory authorities by year-end 1997 at the latest" (Basle Committee (1996b)). It will allow a Tier 3 level of capital to be used in satisfying the capital requirement for market risk. The definitions of Tier 1 and Tier 2 capital will still be largely accounting-based, and interdependencies between credit risk and market risk will apparently not be taken into account.

Such considerations aside, the development of new capital standards for market risk have a "good news - bad news" challenge to them. On the good news side, to the extent that liquid assets are involved, risk measurement is easier (as the quite sophisticated and successful risk models used by securities clearinghouses like Options Clearing Corporation can attest). But on the "bad news" side: because the new standards apply to market risks and traded assets, if there are inconsistencies in the regulations and environment in which the regulations are applied, along the lines that we've discussed for the credit-risk standards and their effects on Japanese banks,42 then institutions up against a capital standard will be able to exploit them in almost a matter of moments, not the years it takes to alter loan portfolio composition; even with neutral incentives, if institutions can change their market risk dramatically in a matter of moments, then monthly or annual inspection and disclosure are not too useful (e.g. securities clearinghouses monitor positions intra-day for large positions and/or in volatile market situations),43 and serious securities firms hedge risk more-or-less in real time.

42 For example, the Amendment assigns weights for general market risk by maturity classes or duration classes. But these official weights almost certainly won't match market weights --- for a start, sophisticated fixed income models won't have fixed weights over different interest rate environments (see Marsh (1995) for references).

43 The Basle Committee themselves make note of this problem: "Supervisory authorities have at their disposal a number of effective measures to ensure that banks do not 'window dress' by showing significantly lower market risk positions on reporting dates. Banks will also, of course, be expected to maintain strict risk management systems to ensure that intra-day exposures are not excessive" (Basle Committee (1996a)).
The Basle Committee states: “It has been a long-standing objective of the Basle Committee to achieve more consistent regulatory treatment where different types of institutions engage in similar types of activities” (1996b, Emphasis in original). Whilst this may seem a worthy objective, especially in its emphasis on “type of activity” rather than institutional form, “consistent” regulatory treatment in the abstract can end up being inconsistent if it involves accounting treatment and the like that is case-specific in implementation. The result is really just another manifestation of the Lucas(1976) “critique” that decision rules can’t be expected to remain invariant to changes in the regulatory policy on which they depend; here, the “critique’s” point is simply reinforced when the regulatory treatment involves a perturbation to just part of the interdependent regulatory framework. So instead of getting us from a “second best” solution to a “first best,” the ostensibly “consistent regulatory treatment” ends up getting us to a “third best” one --- if not a “theory of second best,” then a “theory of unintended or unforeseen consequences”?

The Basle Committee’s April 1995 proposal for the Amendment responded to industry requests to allow banks to use proprietary in-house models for measuring market risks. If moral-hazard problems, of which the Committee seems well-aware, can be ruled out, this seems the obvious direction in which to go. It moves the debate to a different plain --- how to ensure the quality of bank’s in-house systems. For example, back-testing, discussed at length by the Committee, is not a very good test of models that were developed and fitted to all available data in the first place.
References


Figure 1
Time Series of Profit Margin on Total Funding for Japanese Ordinary Banks

Source: Bank of Japan, Economic Statistics Annual, 1994, Table 34.
Figure 2
Annualized Rate of Return on Assets, and Changes in Annual Rate of Return on Assets, of US and Japanese Banks

Change in Annual Interests Income on Year Average Assets

Calendar Year

Source: OECD, Bank Profitability, 1995
Figure 3a
Time Series of Yield on Lending, Interest Rate on Funding, and Spread for Ordinary Banks in Japan

Source: Bank of Japan, Economic Statistics Annual, 1994, Table 34
Figure 3b
Time Series of Interest Margins on Outstanding Loans of Japanese and US Banks

Change in Interest Income minus Interest Expenditure on Year
Average Assets

Calendar Year

Source: OECD, Bank Profitability, 1995
Figure 4
Time Series Cross-Section of Changes in the fraction of Loans made up by the sum of Real Estate, Construction and Financial Institutions (non Bank) Loans

Annual Change in Real Estate Lending in %

Fiscal Year

Source: Quick and Nikkei Telecom Database
Figure 5
Timing of Downgrades of Major 21 Japanese Banks by S&P
### Table 1

Volatility of Annual Change in Tokyo, Osaka, and National Land Prices for Selected Period from 1971-1996*

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* Total Increase in Equity = New Issues of Stock plus Unappropriated Retained Earnings
Appendix
RELATIVE ATTRACTIVENESS OF PROVISIONING AGAINST LOAN LOSSES, WRITE-OFF, AND NOT RECOGNIZING BAD LOANS FOR JAPANESE BANKS, GIVEN TAX AND BIS CAPITAL RULES

For simplicity, we assume:
- If a loan goes bad, a 100% loss occurs
- Write-offs and general provisions (up to 0.3%) are fully tax deductible
- Loans are the only bank assets
- Specific Provisions, General Provisions, and Write-offs have the same timing

Let:
\( \tau_{sp} = \) The portion of specific reserves allowed as a tax deduction
\( \tau = \) The Marginal Tax Rate;
\( L = \) Total Loans Outstanding
\( B = \) Bad Loan Amount (\( B/L = \) fraction of loans which are bad)
\( C = \) BIS-defined Capital
\( I = \) Income

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<td>I(1-( \tau )+( \tau B ))</td>
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\[ \Delta \text{BIS Capital due to BIS Accounting} \]

\[
\begin{array}{c|c|c|c|c}
\text{Total BIS Capital} & C+ I(1-\tau) & C+B+ I(1-\tau)+ \tau B & C+ I(1-\tau)+ \tau_{sp} B & C+B+ I(1-\tau)+ \tau B \\
\text{Total BIS Assets} & L & L-B & L-B & L-B \\
\text{New BIS Ratio} & \frac{C+ I (1-\tau)}{L} & \frac{C+B+ I (1-\tau)+ \tau B}{L-B} & \frac{C+ I (1-\tau)+ \tau_{sp} B}{L-B} & \frac{C+B+ I (1-\tau)+ \tau B}{L-B} \\
\end{array}
\]

We have:
- \[ \frac{C+B+ I (1-\tau)+ \tau B}{L-B} > \frac{C+ I (1-\tau)}{L} \] (General Provision > Not Recognizing)
- \[ \frac{C+ I (1-\tau)}{L} > \frac{C+ I (1-\tau)+ \tau B}{L-B} \] (Not Recognizing > Write-off, for \( B << L \))
- \[ \frac{C+ I (1-\tau)+ \tau B}{L-B} > \frac{C+ I (1-\tau)+ \tau_{sp} \tau B}{L-B} \] (Write-off > Specific Provisioning)