Real Estate Booms and Banking Busts:

An International Perspective*

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1. Introduction

One striking feature of the current Asian financial crisis is that the most seriously affected countries *first* experienced a collapse property prices and a consequent weakening of their banking systems *before* experiencing an exchange rate crisis. While this sequence does not necessarily imply a causal link, the collapse in property prices is of central importance to the current problems. If banking systems in these countries had not been damaged by the collapse in property prices, the foreign exchange crisis would have been less devastating and the prospects for an early recovery would be much brighter than they now appear.

Real estate cycles may occur without banking crises. And banking crises may occur without real estate cycles. But the two phenomena are correlated in a remarkable number of instances ranging over a wide variety of institutional arrangements, in both advanced industrial nations and emerging economies. The consequences for the real economy depend on the role of banks in the country's financial system. In the US, where banks hold only about 22% of total assets, most borrowers can find substitutes for bank loans and the impact on the general level of economic activity is relatively slight. But in countries where banks play a more dominant role, such as the US before the Great Depression (where banks held 65% of total assets), or present day Japan (where banks hold 75% of total assets), or emerging markets (where banks hold well over 80% of total assets), the consequences for the real economy can be much more severe.

In this paper, we develop an explanation of how real estate cycles and banking crises may be related and why they occur. First we review the determinants of real estate prices and ask why the real estate market is so vulnerable to sustained positive deviations from long-run equilibrium prices. (See Figure 1.) We place special emphasis on the role played by the banking system. Increases in the price of real estate may increase the economic value of bank capital to the extent that banks own real estate. Such increases will also increase the value of loans collateralized by real estate and may lead to a decline in the perceived risk of real estate lending. For all of these reasons, an increase in the price of real estate may increase the supply of credit to the real estate industry, which in turn, is likely to lead to further increases in the price of real estate.

Bank behavior may also play an important role in exacerbating the collapse of real estate prices. A decline in the price of real estate will decrease bank capital directly by reducing the value of the bank's own real estate assets. It will also reduce the value of loans collateralized by real estate and may lead to defaults, which will further reduce capital. Moreover, a decline in the price of real estate is likely to increase the perceived risk in real estate lending. All of these factors are likely to reduce the supply of credit to the real estate industry. In addition, supervisors and regulators may react to the resulting weakening of bank capital positions by increasing capital requirements and instituting stricter rules for classifying and provisioning against real estate assets. These measures will further diminish the supply of credit to the real estate industry and place additional downward pressure on real estate prices.

This conceptual framework of interactions between the real estate market and bank behavior is used to interpret recent examples of real estate booms linked to banking

crises in Sweden, the United States, Australia, Japan and Thailand. We conclude with a discussion of the policy implications of our analysis emphasizing measures to limit the amplitude of real estate cycles and ways to insulate the banking system from real estate cycles.

2. Real Estate Cycles

2.1 The Role of Optimists

We begin with a model of land prices developed by Mark Carey (1990). This provides a straightforward explanation of how cycles may begin in a simple setting where it is plausible to assume that supply is fixed. This is directly relevant to commercial real estate booms, moreover, because the dynamics of land prices undoubtedly drive overall real estate prices in the cases we analyze in which real estate prices rise, far more than any plausible increase in construction costs. We will consider complications introduced by construction lags in the following section.

Carey's model[1] assumes that N potential investors are identical except with regard to their reservation prices for land, P. These differences of opinion may occur because investors make errors in computing the "fundamental value" of land[2] or because investors may have private information about future expected income from land or the appropriate

[1] The complete exposition of this model may be found in Carey (1990) Chapter 3, "A Model of the Farm Land Market."

[2] The fundamental value of land is the price that is equal to the discounted present value of the net income that can be generated from renting the land. In Section 2 below, the concept is broadened to include commercial real estate and the fundamental price is defined as the price at which the current stock of real estate structures is precisely equal to its replacement cost.

capitalization rate.[3] These reservation prices are distributed along a continuum around the "fundamental value"[4] of land according to a distribution function F(P)[5]. In most markets, one could argue that sustained deviations *below* the fundamental value are unlikely because sophisticated investors who know the fundamental value will profit by buying until the price rises to the fundamental value. This presumption seems plausible for the market for land. Conversely, it is tempting to assume that if the price is too *high*, sophisticated investors will profit by selling short until the price falls to the fundamental value. But this assumption is *not* plausible in the market for land because of difficulties in selling land short.[6] Moreover, increases in the supply of land cannot be expected to moderate the rise in price because the supply of land is fixed, at least in the short run.[7]

Optimists, those with reservation prices above the fundamental value, will strongly influence the price in this kind of market with no short sales and fixed supply.[8] Indeed,

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[3] As Carey (1990) notes, if investors are permitted to be risk averse, differences in reservation prices may also reflect differences in risk aversion and/or private information regarding the covariance of returns on land and other assets.

[4] The "fundamental value" is the value consistent with long run equilibrium.

[5] Carey (1990) shows that the assumption that F is continuously differentiable with a nonzero variance and a symmetric density will yield the key results regarding the impact on P of increases in heterogeneity, the mean and financial resources.

[6] As Carey (1990, p. 50) notes, such markets are not inconceivable. Indeed, it may be useful public policy to nurture an organized options market in land. Short of that, one could imagine short sales of the shares of publicly traded corporations that do nothing but rent land. Although publicly traded property companies are relatively common, they usually perform many other functions in addition to holding land and renting it and so they do not provide a very efficient means of selling land short.

[7] Of course, this is not precisely true. Zoning laws may change freeing up land for commercial use, but generally such measures take a significant amount of time. Carey (1990, p. 51-52) shows that the volume of US farmland has declined very slowly since the 1950s not withstanding a more than doubling of real land prices. While the conversion of farmland to commercial use is somewhat easier, the process still takes a substantial amount of time.

[8] Krugman (1998) develops a model based on moral hazard that yields similar results in which "Pangloss" values dominate markets for assets in fixed supply.

even if their optimism is unfounded, they are likely to remain in business so long as the upward trend in prices continues. As we shall see, even if they earn substandard returns, they are likely to be able to borrow against their capital gains so long as lenders value their land at market prices when determining its value as collateral.

The price of land in Carey's model is determined by the proportion of investors willing to pay the price, P, which is sufficient to clear the market for the entire supply of land, Z. The demand for land at any arbitrary P′ depends on the proportion of investors who have a reservation price, $P \geq P'$, which is (1-F(P′)), times the number of investors N times the resources, L, available to each investor[9]: N(1-F(P′))L. In equilibrium, the demand for land must equal the value of the total supply, PZ, and so:

$$P = [N(1-F(P))L]/Z. \quad (1)$$

For ease of exposition we will make the simplifying assumption that F(P) is a uniform distribution centered on the fundamental price, P*, with a range equal to P*± h, where h is the measure of the heterogeneity of reservation prices among investors.[10] (See Figure 2.) Since 1-F(P) = (P*+h-P)/2h we can rewrite (1) for the special case of a uniform distribution as:

$$P = [N(P^*+h)L]/[2hZ+NL]. \quad (2)$$

Partial differentiation of (2) indicates that P will increase with increases in the number of investors (N), the fundamental price (P*), and the resources available to investors (L). P will also increase in response to increases in the extent of heterogeneity (h), so long as

[9] At this stage L represents both the investor's equity and loans available to the investor. In section 3 we shall consider L to be loans. This simplification is useful because land and commercial real estate tend to be highly leveraged investments. Indeed, the extent of leverage gives rise to some difficult principal agent problems, which are discussed below.

[10] Carey shows that all the key results hold for the more general case as well.

the total resources available to half of the investors exceed the value of land at the fundamental price, P*.[11,12]

2.2 The Role of Non-Financial Variables

We can transform (2) from a static to a dynamic equation by introducing time subscripts for each of the variables. We will first consider P^*_t and broaden the discussion to include commercial real estate.

The demand for the stock of commercial real estate depends on the price and the discounted present value of the expected stream of future rents which, in turn, depends on demographic factors, the expected growth in income, anticipated real interest rates, taxes and the structure of the economy.[13] In each of the real estate cycles we examine, it is plausible that the initial increase in real estate prices was a response to an increase in demand. In some cases the growth of the economy accelerated, in others the structure of output shifted in favor of the office-intensive service sector, or anticipated real interest rates declined.

P_t equilibrates the demand and supply for ownership of the stock of real estate structures, while rents equilibrate the demand and supply of the flow of services from the stock of commercial real estate. While P_t tends to adjust quite rapidly, rent tends to

[11] The sign of $\partial P/\partial h$ will be positive so long as $NL/2>P^*Z$. If total resources available to half the investors fall short of the value of land at the fundamental price, P will fall below P*. The optimists will lack sufficient resources to raise the price above P*.
[12] Note also that if opinions are homogeneous (h=0) and centered on the fundamental price, the equilibrium price will not deviate from the fundamental price.
[13] Allen and Gale (1997) emphasize that expectations regarding the supply of credit may also play an important role in the dynamics of real estate and equity prices.

adjust more sluggishly so that vacancies often remain above the natural rate for substantial periods of time.[14]

When the price for the stock of existing commercial real estate structures rises above the replacement cost, developers have an incentive to initiate new construction that will increase Z_t (now redefined to represent the stock of commercial real estate structures). This will eventually restore long-run equilibrium in which the ratio of the price of the stock of existing commercial real estate to replacement cost equals one. The price at which the stock of existing commercial real estate is equal to the replacement cost is P^*_t, the fundamental price consistent with long-run equilibrium.

New construction, however, takes a substantial amount of time – perhaps two to six years – and so the adjustment process is likely to be slow. Moreover, developers have imperfect information about future demand and limited knowledge about forthcoming supply and so the amount of new construction is likely to differ from that which would take place with perfect foresight.[15] Consequently the ratio may rise far above one before the new construction is ready for occupancy and additional supply may continue to increase for several years after vacancy rates start to rise. Thus real estate cycles may

[14] In the empirical literature, rent adjustment equations are specified with rent change a lagged function of the deviation in the actual vacancy rate from the natural vacancy rate. That is, the expected rate of change in real office market rents is modeled as depending positively on the gap between the actual vacancy rate and the beginning-period vacancy rate. A natural vacancy rate is imbedded in the constant term, which is interpretable as the product of the adaptation coefficient and the natural vacancy rate (See Shilling, Sirmans, and Corgel (1987) and Wheaton and Torto (1988))

[15] Rosen (1984, p.261) in one of the few academic studies of commercial real estate observes that "Present methodology for analyzing future commercial real estate market conditions can at best be said to be inadequate. "

occur simply because of forecast errors and lags in the adjustment of the stock of commercial structures.

The degree of heterogeneity of reservation prices, h_t, may also be expected to vary over time. In general h_t is likely to increase when vacancies are low and new information regarding the determinants of demand causes prices to rise. Investors may believe that they have special insight into how the new information will affect demand and future price increases or they may make errors in interpreting the new information. On the other hand, h_t is likely to fall when vacancies are high and prices are falling, at least in part because the most optimistic investors are likely to suffer financial distress or failure and be obliged to leave the market.[16]

In general the number of potential investors in commercial real estate (N) will not be an important determinant of the dynamics of real estate prices because it does not vary much. But one exception may have been important during the 1980s when many countries began to liberalize financial regulation and open their markets to foreign investors. The liberalization of financial regulation may have increased N_t, by increasing the number of institutions that were permitted to invest in real estate directly (as in the US) or by permitting foreigners to invest in real estate (as in several emerging markets).

Finally, the supply of financial resources available to real estate investors, L_t, appears to have been an important factor that increased the boom in real estate prices and extended its duration in all of the cases we analyze. This raises the question, why, despite the evident dangers of heavy concentrations of real estate lending, did

[16] The distribution may become skewed to the left of P* at this point since those investors with h>0 may be obliged to leave the market, but those with h<0 will be in relatively strong financial condition.

banks permit their exposures to real estate become so large?

2.3. The Role of Banks

A bank's loan-concentration decision can be modeled as the outcome of an expected profit calculation subject to the constraint that the perceived risk of bankruptcy be no greater than some probability γ (Guttentag and Herring (1985, 1986)). We can express this constraint as:

$$\Pr(A \leq M) \leq \gamma \tag{3}$$

where A is the value of the bank's portfolio of assets at the end of the period and M the bank's minimum acceptable value of assets which is determined either by internal risk guidelines or the capital ratio required by regulators, whichever is binding. By making use of Tchebysheff's inequality we can rewrite this constraint as

$$\gamma\,(E(A) - M)^2 - \sigma_p^2 \geq 0 \tag{4}$$

where σ_p^2 is the variance of the expected return on the bank's portfolio of loans. Using this formulation of the constraint, we can form the Lagrangian expression:

$$G(L_j, V) = \sum_{j=1}^{n} L_j (r_j - i) + V(\gamma(E(A) - M)^2 - \sigma_p^2). \tag{5}$$

Where V is the shadow price of the risk constraint, r_j is the expected return on asset j and i is one plus the opportunity cost of funds. For ease of exposition we will focus on the two-asset case in which the risk constraint is binding (V>0). L_1 is the amount the bank will choose to lend to the real estate sector given L_2, the other assets in the bank's portfolio:

$$L_1 = \left[\frac{1 + 2V\gamma(E(A) - M)}{\sigma_1^2 2V}\right](r_1 - i) - \frac{L_2\sigma_{12}}{\sigma_1^2}. \tag{6}$$

The concentration of loans to the real estate sector – the amount lent relative to capital – will be greater the higher the expected return relative to the opportunity cost of funds and the lower the perceived covariance of returns with the rest of the portfolio. Differentiation of the first-order conditions (see Appendix A) shows that the desired concentration *increases* as the promised return *increases* ($\partial L_1/\partial R_1>0$); *declines* as the expected probability of a default *increases* ($\partial L_1/\partial \pi_1<0$); *declines* as the perceived correlation with the rest of the portfolio *increases* ($\partial L_1/\partial \rho_{12}<0$ for $\rho_{12}>0$); *declines* as the capital requirement *increases* ($\partial L_1/\partial M<0$); and *increases* as the expected value of assets *increases* ($\partial L_1/\partial E(A)>0$).

Although we do not have data that enable us to estimate the parameters of this model of bank behavior, it is nonetheless useful for making inferences about what may have motivated decisions to take on increasing concentrations of loans to the real estate sector. First, lending to the real estate sector was attractive because it appeared to be profitable. Promised returns (where R_1 is interpreted to include not just the contractual interest rate but also fees stated in interest-equivalent form) were often higher than rates available on prime corporate loans. Indeed, in several of the cases which we analyze, the initial burst of lending occurred when banks received expanded powers which were, in part, intended to increase bank profits and help them to compete more effectively with less heavily regulated financial firms.

Rising real estate prices may also have directly encouraged greater lending to the real estate sector in two ways. First, to the extent that the bank's own holdings of real estate rose in value, E(A) and the economic value of the bank's capital increased and so

would the bank's willingness to hold more real estate loans. Second, to the extent that the market value of collateral on outstanding real estate loans increased, the risk of loss on the existing portfolio of loans declined and it was possible to lend more without increasing the probability of bankruptcy, γ. Increasing real estate prices may also have had a more subtle impact on the subjective probability of a default which banks applied to new real estate lending, a possibility we discuss in the next section.

Despite these factors which increased the attractiveness of real estate lending, it is clear (at least with the benefit of hindsight) that banks failed to assess risks appropriately. Why did banks underestimate the risks of heavy concentrations of real estate lending? Three hypotheses are plausible: (1) banks underestimated risks because they were subject to disaster myopia; (2) banks underestimated the risks because of poor data and weak analysis; or (3) banks estimated the risks properly, but ignored them because of perverse incentives.

2.3.1. Disaster Myopia

In most of the cases we analyzed at least one generation had passed since the last crash in real estate prices. Indeed, in most instances real estate prices had climbed steadily upward for a significant period. Consequently, the repayment record on real estate loans was relatively good in comparison to other types of lending. Guttentag and Herring (1984, 1986) have argued that the underestimation of such low-frequency shocks may be a plausible consequence of the way in which decisions are made under uncertainty.

The ability to estimate the probability of a shock – like a collapse in real estate prices – depends on two key factors. First is the frequency with which the shock occurs

relative to the frequency of changes in the underlying causal structure. If the structure changes every time a shock occurs, then events do not generate useful evidence regarding probabilities.

On the other hand, if the shock occurs many times while the structure is stable, probabilities may be estimated with considerable confidence. High-frequency shocks affect many kinds of activities conducted by banks. For example, default rates on credit card receivables and car loans or routine deposit withdrawals can be estimated with considerable confidence. Consequently, high frequency shocks are not a significant source of insolvency exposure for banks. Banks have both the knowledge and the incentive to price high-frequency shocks properly and to make adequate provisions to serve as a buffer against loss. If they do not, they will quickly incur ruinous losses that will lead to insolvency.

In contrast, the causal structure underlying low-frequency economic shocks such as speculative bubbles, shifts in policy regimes, or abrupt changes in relative prices may not remain stable for long enough to permit estimation of shock probabilities with much confidence. Nonetheless, if we have sufficient knowledge of the mechanism determining outcomes – like the toss of a fair coin – we may be able to predict the probability of an event with considerable confidence even if we lack a sufficient amount of empirical evidence. In contrast to the transparent mechanism which generates outcomes in the toss of a coin, our understanding of the economic processes generating shocks like the collapse of real estate prices is much less comprehensive and, therefore, more likely to be subject to uncertainty. How do banks make decisions with regard to low-frequency shocks with uncertain probabilities?

Specialists in cognitive psychology have found that decision-makers, even trained statisticians, tend to formulate subjective probabilities on the basis of the "availability heuristic," the ease with which the decision-maker can imagine that the event will occur (Tversky and Kahnenman (1982)). Since the ease with which an event can be imagined is highly correlated with the frequency that the event occurs, this rule of thumb provides a reasonably accurate estimate of high-frequency events. But ease of recall is also affected by other factors such as the time elapsed since the last occurrence. Under such circumstances the availability heuristic can give rise to an "availability bias." This is depicted in Figure 3 where the subjective probability of a collapse in real estate prices, π, is shown as a declining function of the time elapsed since the last shock at t=0.

At some point, this tendency to underestimate shock probabilities is exacerbated by the threshold heuristic (Simon(1978)). This is the rule of thumb by which busy decision-makers allocate their scarcest resource, managerial attention. When the subjective probability falls below some threshold amount, (π^* in Figure 3) it is disregarded and treated as if it were zero.

Once this threshold has been reached, behavior seldom changes even in the face of evidence that the actual shock probability has increased as, for example, in the cases discussed in succeeding sections where commercial real estate lending continues despite evidence of rising vacancy rates. But the tension between observations and beliefs may give rise to cognitive dissonance. When confronted by evidence that challenges the competence of their decisions, bankers, like other decisionmakers, first tend to ignore it, then reject it and finally accommodate it by changing other beliefs in order to protect their self-esteem as prudent lenders.

The availability and threshold heuristics together cause "disaster myopia," the tendency over time to underestimate the probability of low-frequency shocks.[17] To the extent that subjective probabilities (π_t) decline even though actual probabilities remain constant or increase, banks take on greater exposures relative to their capital positions and the banking system becomes more vulnerable to a disaster. This is an insidious process. Disaster myopia can lead banks to become more vulnerable to a disaster without anyone having taken a conscious decision to increase insolvency exposure.

Disaster myopia is likely to be shared by a large number of banks because uncertainty may also be conducive to "herding" in which banks take on largely similar exposures. Being part of a group provides an apparent vindication of the individual banker's judgment, and some defense against *ex post* recriminations if the shock occurs. Keynes (1931) perceived this clearly:

> A "sound" banker, alas, is not one who foresees danger and avoids it, but one who, when he is ruined, is ruined in a conventional way along with his fellows so that no one can really blame him.

Disaster myopia may also afflict the supervisors who should constrain the increasing vulnerability of banks. Supervisors, after all, are likely to be subject to the same perceptual biases as bankers. The conditions that caused disaster myopia among bankers may also have influenced regulators. For example, one seasoned regulator speculated about why supervision had been so ineffectual in preventing the banking problems during the 1980s, which included (among other problems) multiple bank failures in the wake of regional collapses in real estate prices. Ettin (1991, p. 15)

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[17] Although this exposition relies heavily on cognitive psychology to explain disaster myopia, Guttentag and Herring (1984) show that the hypothesis is consistent with the Bayesian approach to optimization for low frequency events.

conjectured that part of the answer might be "the comfort of years of real and financial macrostability with unusually low failure rates in both the banking and thrift industries…." This must have been equally true of bank supervisors in Japan and Sweden who had experienced an even greater degree of stability over the past three decades.

Susceptibility to disaster myopia is often reinforced by several institutional factors. For example, managerial accounting systems may inadvertently favor activities subject to low-frequency shocks. Although standard accounting practices are helpful in monitoring, pricing and provisioning for high-frequency shocks, they are not useful in controlling exposure to a low-frequency hazard because the shock occurs so infrequently that it will not be captured in the usual reporting period. Indeed, the absence of bad outcomes in the accounting data may intensify pressures to reduce default premiums and reserves. Moreover, in the absence of appropriate provisions for potential losses, an activity subject to low-probability shocks will appear misleadingly profitable. This problem is often compounded by the practice of recognizing fees (which may be considerable in some lines of real estate finance) up front, when the loan is booked, rather than amortizing them over the life of the loan.

The illusion of high profitability creates additional problems. To the extent that salaries and bonuses are based on reported short-term profits without adjustment for reserves against shocks, the line officers who are in the best position to assess such dangers will be rewarded for disregarding them. In the US this incentive to take a short-term view is often strengthened by the prospect of job mobility. Managers may expect that they will be elsewhere – in another job, perhaps in another institution – by the time

problems emerge. The *appearance* of high profitability may also impede the effectiveness of the supervisory authorities, who find it very difficult to discipline banks that appear to be highly profitable.

In addition, competition may interact with disaster myopia in two related ways to increase vulnerability. First, competitive markets make it impossible for banks that are not disaster myopic to price transactions as if there were a finite probability of a major shock when banks and other competitors who *are* disaster myopic price them as if that probability were zero. Second, if banks are apparently earning returns above the competitive level (disregarding the need for reserves against future shocks), equally myopic banks will be encouraged to enter the market, thus eroding those returns. In response, banks can protect target rates of return on equity for a time by increasing their leverage and rationalizing such actions in terms of the need to maintain target returns in the face of shrinking margins, and in terms of similar actions by other banks. Thus competition, interacting with disaster myopia, may accelerate the process through which banks become increasingly vulnerable to a major shock like a collapse in real estate prices.

Once a shock occurs, disaster myopia may turn into disaster magnification. The availability heuristic may exacerbate financial conditions because, just after a shock has occurred (such as t + n′ in Figure 3), it is all too easy to imagine another sharp decline in real estate prices and the subjective shock probability will rise well above the true shock probability. As Guttentag and Herring (1984) show, this will result in sharply increased tiering of interest rates in financial markets as lenders try to reduce exposures and increase risk premiums in response to sharply higher shock probabilities. The extent of

credit rationing is likely to expand for borrowers who cannot offer a credible contractual rate that will compensate for the increase in the perceived risk of default.

The abrupt drop in the flow of credit to the real estate market will put further downward pressure on real estate prices. This is also likely to diminish lending to other sectors of the economy as banks try to rebuild their reserves and capital to cope with the increased risk of default. To the extent that supervisors and regulators were susceptible to disaster myopia, they may also suffer from disaster magnification. In response to the greatly increased subjective probability of a disaster they may seek to protect the banking system by insisting on higher capital ratios and more aggressive provisioning against potential losses. Several analysts charged that US banking regulators exacerbated the regional economic crisis in New England by raising capital standards and requiring reserves against real estate loans even before they were classified as non-performing (Litan (1992).[18]

2.3.2. The Role of Inadequate Data and Weak Analysis

Banks may also have underestimated the risk of heavy concentrations of loan exposure to the real estate sector because of inadequate information and weak analysis. Under the best of circumstances, it is difficult to estimate the present value of a real estate project. It will depend, among other factors, on projected rents and discount rates adjusted for anticipated inflation and loss in value due to physical or functional depreciation and vacancies due to the development of competing properties. The estimate

[18] This interpretation is hotly contested, however, since at the same time that regulation tightened, the demand for borrowing also declined because of the regional recession. Moreover, other nonbank lenders, which were not subject to more intensive supervision or official capital requirements, also decreased their lending in New England. For further discussion see Berger, Herring and Szegö (1995)

is likely to be very sensitive to even minor changes in the assumed discount rate, or net revenues. Unfortunately, in some markets data regarding building permits, new construction contracts, rents, market prices and vacancy rates are difficult to obtain and verify. Nonetheless, prudent lenders should at least attempt to make present value calculations as a benchmark for comparison with other valuation approaches such as replacement costs and appraisals based on comparable properties.

Appraisals based on comparable properties are generally easy to obtain, but are of limited usefulness to lenders. Appraisals show only what past market values have been, not what they are likely to be over the term in which the loan must be serviced and repaid. Moreover, any distortions of market values similarly affect appraisals. Kane and Hendershott (1995) present econometric evidence of appraisal bias. Using data for US commercial office markets, they show, based on demand growth and assuming only buildings already started would add to stock, asset values as measured by appraisals were 30 percent too high. In fact, supply did continue to increase, and in the end, appraised values were 50 percent too high.

While computation of replacement costs is a useful discipline, it finesses the question of land values, which are the driving force behind most sustained deviations from long-run equilibrium values. Ultimately, the price of land must be consistent with the stream of net income that can be produced from its use, but in the short run it will also reflect the capitalized value of anticipated future increases in price. When investors uncritically extrapolate past price increases into the future, the price may rise to unsustainable levels.

To the extent that market values depart from sustainable long run equilibrium, it may be seriously misleading to mark collateral to market. Lenders may feel safer than they should when prices are rising and overreact when prices decline.

Uncritical reliance on current market values can also lead to errors in underwriting. What is relevant for the underwriting decision is the expected value of the property when the loan is to be repaid, not the current value. This is obviously a problem when it appears that a speculative bubble is in an expansion phase. But it is also an important point even when there is no suspicion of a speculative bubble. Because it often takes a number of years for the supply of new construction in response to an increase in demand to be ready for occupancy, the current price of commercial properties may rise far above what the price will be when the new construction is completed. Given lags in production, market values can be expected to decline after an initial positive demand shock; when they do so, they will put high loan to value lending at risk. As a result of these predictable price decreases, the mortgage put option is "in the money." What is required is realistic discounted cash flow models, in which rents are modeled to return to equilibrium values after the appropriate construction lag. Valuation of land is far more difficult. Land is essentially an option and is heavily impacted by shifts in expected rates of growth in demand. Thus underwriting of land is inherently riskier and loan-to-value ratios should be adjusted accordingly.

Bank supervisors should monitor underwriting standards carefully. They should be especially cautious when real estate lending is growing rapidly. Not only are marginal projects likely to be of lesser quality, but perhaps of equal importance, new lending

officers hired to grow the business are likely to be less skillful in screening and monitoring projects than are seasoned professionals.

The increasing concentration of real estate loans in bank portfolios that occurred in each of the episodes analyzed below should have raised warning flags about reduced diversification, but apparently neither bank managers nor supervisors perceived the risk. Although real estate prices may not be highly correlated with returns in other sectors of the economy when real estate prices are rising rapidly, the same events which cause real estate prices to collapse often dampen returns in the rest of the economy as well.[19] The consequence is that the diversification benefits of real estate disappear when banks need them most.

Of course, in order to control concentrations of exposure to real estate risk, it is necessary to measure them properly. In several of the cases below it seems plausible that neither the banks nor their supervisors perceived the full magnitude of exposure to real estate prices. In many countries[20], national reporting systems track development, construction and mortgage lending which constitute direct exposure to the real estate sector. But an institution's exposures are seldom consolidated across all its affiliates to develop an overall view, nor are these experiences disclosed to the public.

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[19] Using empirical data from the US real estate market, Appendix B examines the question of whether real estate has different portfolio hedging characteristics in up markets vs. down markets. An up market is defined as a period in which the percentage change in median stock returns is above the median and a down market as a period in which the percentage change is below the median, for the period 1970 to the present. Using monthly REIT returns and monthly S&P 500 returns from January 1972 to the third quarter 1997, we find that up beta's are much lower than are down beta's: .53 vs. .75.

[20] Sweden was a notable exception in the episodes we surveyed.

It is equally important to monitor indirect exposure, which may turn out to be as debilitating as direct exposure. For example, if a bank has lent heavily to non-bank financial intermediaries such as finance companies that engage in real estate lending, it may be taking on substantial additional exposure to the real estate. This is a painful lesson which Japan, Sweden, and Thailand learned when finance companies that had large concentrations of real estate exposure borrowed heavily from banks to bolster their liquidity position and then failed, causing losses to their bank lenders.

Another important source of indirect exposure derives from the practice of using real estate to collateralize other kinds of lending. In an environment where real estate prices are rising rapidly, real estate appears to be a remarkably safe form of collateral which permits banks to make loans to projects for which they would not otherwise be willing to advance credit. Banks may believe that if they are well-collateralized – especially if they are over-collateralized with real estate worth more than the amount advanced – they need not worry about the details of the project being financed. This is particularly true in countries where accounting and disclosure standards are weak and the techniques of credit analysis and cash flow lending are not well established. The problem, of course, is that in the event of a collapse in real estate prices, such as occurred in the examples below, the value of collateral can quickly fall below the amount of the outstanding loan, creating an incentive for the borrower to default. Although the bank may have believed that it was making a loan to the manufacturing industry, for example, its exposure was in fact to the real estate sector.

More fundamentally, banks and their regulators should be aware that a loan collateralized by real estate is fundamentally riskier than a loan collateralized by

marketable securities such as loans brokers make to their customers. As Macey (1994) notes, securities held in a margin account are traded in active secondary markets and can be marked to market minute to minute if necessary. Margin calls can be made to restore the value of collateral when security prices fall[21] and if the borrower cannot make the margin call, securities can be sold without incurring high transactions costs. Property is not traded in a broad, deep resilient secondary market and so its value is much more difficult to monitor. Moreover, it is much more costly to sell the collateral if a margin call cannot be met. Indeed, there may be significant legal obstacles in selling real estate seized from a borrower who cannot repay a loan. Until it can be sold property, it is subject to both physical and technological depreciation and is often costly to maintian.

2.3.3 The Role of Perverse Incentives

Commercial real estate is often highly leveraged. Real estate developers usually operate with a minimum of capital in order to shift as much risk as possible to the lender. Banks generally try to protect themselves by requiring low loan-to-value ratios, guarantees, takeout commitments for longer-term financing, and strict loan covenants that will protect them against risky behavior by the developer after the loan is made. But when real estate markets become overheated, underwriting standards often deteriorate

When disaster myopia sets in, lenders believe that they can accept higher loan-to-value ratios, weaker commitments or guarantees and looser loan covenants without increasing their risk of loss. Moreover, intensified competition from other disaster myopic lenders may force prudent lenders to accept weaker underwriting standards or

[21] Macey also observes that a broker with margin accounts is usually safer than a bank with loans collateralized by real estate because the securities which the broker holds as collateral are much less likely to be highly correlated than real estate prices.

withdraw from the market. In this environment real estate developers have increased opportunities for exploiting their creditors by increasing the riskiness of their projects, which are often difficult to monitor.[22] Moreover, when a project is near default, developers may lack incentives to contribute new capital to rescue the project, since most of the benefits would accrue to their creditors (Myers, 1977). Thus high leverage combined with asymmetric information between bank lenders and real estate investors can give rise to perverse incentives for real estate investors to increase the riskiness of real estate investments. But banks may also be subject to perverse incentives.

Some banks may have *ignored* the risk of a disaster because they believed they would be protected if a disaster were to occur. Virtually every country has erected a safety net for depository institutions to guard against a banking disaster that might ignite a financial crisis by disrupting the payments system and interrupting the flow of credit to bank-dependent firms, thereby causing a decline in economic activity.

Banks are structurally vulnerable to a liquidity shock because they finance holdings of opaque, imperfectly marketable assets (like real estate loans) with short-term liabilities, which they promise to redeem at par. Depositors are aware of their informational disadvantage vis-à-vis banks, and they understand that banks are highly leveraged. Thus when a shock, such as a collapse in real estate values occurs they know that even a relatively small percentage decline in asset values, will result in a much larger percentage change in net worth, perhaps rendering the bank insolvent. Depositors may abruptly reduce their estimate of the bank's net worth and run to redeem their deposits,

[22] Allen and Gale (1997) emphasize this asset substitution problem in their model of bubbles and financial crises.

forcing the bank to incur firesale losses to liquidate assets or to borrow at an interest rate sharply higher than its customary rate.

Once begun, runs tend to be self-reinforcing. News that a bank is selling assets at bargain prices or is borrowing at very high rates will further undermine the confidence of current and potential depositors. Even depositors who believe that, with sufficient time, the bank would be able to redeem all its liabilities, have reason to join the run if they fear that the illiquidity costs resulting from the run might render the bank insolvent. Sophisticated depositors (including other banks which have made interbank placements with the bank) know that illiquidity losses tend to get larger as the run continues because the most marketable assets are sold first. They also know that the bank will suffer especially large losses if it is obliged to sell distressed real estate assets in a depressed market.

This vulnerability to runs is a public policy concern (rather than the strictly private concern of an individual bank and its customers) because of the fear that a loss of confidence in the solvency of one bank may lead to a contagious loss of confidence in other banks. This is especially worrisome in countries with weak disclosure and accounting standards because the lack of transparency makes it very difficult to distinguish sound banks from weak banks.

The safety net erected to guard against a contagious collapse, which often includes deposit insurance or other government guarantees and access to an official lender of last resort, tends to insulate banks from potential market discipline. This is especially evident in the case of state-owned banks. All creditors in state-owned banks are likely to believe that they are protected by a state guarantee and thus have virtually no incentive to

monitor the riskiness of their bank's lending decisions. Even when the state explicitly disavows any liability, as did France (before providing billions of francs to keep state-owned Crédit Lyonnais afloat), the disclaimer lacks credibility.

Deposit insurance plays a similar role in privately-owned banks, undermining the incentives for insured depositors to monitor and discipline bank-lending decisions. Moreover, uninsured creditors of large banks may believe that they are protected by implicit deposit insurance because of the way in which lender-of-last resort assistance is usually provided and administrative discretion to terminate a bank is usually exercised. Lenders of last resort routinely lend to banks long after they become insolvent. This permits creditors who are not covered by explicit deposit insurance the opportunity to withdraw their deposits before a bank is terminated. Even then, the authorities usually avoid liquidating the bank and imposing loss on uninsured depositors and creditors, but instead provide assistance while keeping the bank open, or arrange a purchase and assumption transaction in which all liabilities are honored by the acquiring bank.

The protection that the safety net affords gives rise to the classic moral hazard problem in which the existence of insurance may undermine the incentive for depositors to be concerned to prevent the insured risk from occurring. As a consequence bank managers find that if depositors do not demand greater compensation when greater risks are taken, they can increase expected returns to their shareholders by substituting riskier assets, such as commercial real estate loans, for safer assets.

Shareholders will constrain risk exposures to some extent so long as their equity stake is high relative to the potential loss. But as the equity stake falls relative to the potential loss on existing exposures – as in the aftermath of a collapse in property prices, for

example – the bank will be tempted to take increasingly greater risks. The reason is that shareholders value a distribution of returns that is truncated at the termination point. They reap all the positive returns above this point, but shift all returns below this point, including negative returns, to the creditors, the deposit insurer or taxpayers.

Workout loans become especially problematic when potential losses exceed the bank's capacity to bear loss (Herring 1989). Under these circumstances a bank may be willing to extend a workout loan to a troubled borrower, for example, a real estate developer who cannot pay interest, even when the expected return on the loan is not sufficient to compensate for the opportunity cost of the new funds. Keynes (1979, p.258) clearly saw this danger when he observed, "Owe your banker £1,000 and you are at his mercy; owe him £1 million and the position is reversed."

Extending a workout loan becomes an especially attractive option for the bank, if it enables the borrower to keep current on interest so that the bank can delay (perhaps indefinitely) the costs of writing down the book value of its outstanding exposure.[23] More generally, the bank has incentives to manipulate its accounts to mask the deterioration in its condition by understating loan losses or by 'gains trading' in which assets with market values above book values are sold and those with market values below book are kept at book value (Carey 1993). These perverse incentives provide another explanation, in addition to cognitive dissonance, of why in many of the cases below we observe increased commercial real estate lending at a time when vacancies are high and rising.

Perverse incentives may also explain the behavior of supervisory and regulatory authorities in the aftermath of a collapse in real estate prices. Because the safety net

tends to shield depository institutions from market discipline, the closure of banks has been converted from a market-driven to an administrative process, with lots of scope for the exercise of administrative discretion. Without the market pressure of a bank run, supervisory authorities are free to engage in forbearance, which opens the possibility of agency problems between supervisory agents and their taxpayer principals.

In the aftermath of a major shock, such as a collapse in commercial real estate values, a long delay usually occurs before insolvencies are recognized and resolved. The supervisory authorities may be simply overwhelmed by the magnitude of the crisis and lack sufficient resources to pay-off insured depositors or to make good on implicit guarantees. Because a collapse in real estate prices is often coincident with a decline in aggregate income, the government may be especially reluctant to increase the fiscal deficit to hire more supervisory personnel or make good on explicit and implicit government guarantees for bank depositors or other creditors.

In addition, the supervisory authorities are usually hesitant to admit the scale of the crisis. On the one hand, supervisors, who are as likely to be subject to cognitive dissonance as bankers, realize that such an admission would raise question about the quality of oversight they had provided. On the other, they may be apprehensive that public acknowledgment of the extent of insolvencies might undermine confidence and increase the risk of igniting a financial crisis.

Finally, the prospect -- however remote -- that real estate prices might return to levels attained before the collapse provides a rationale for delay in the hope that the passage of time would eliminate the problem. In effect, the supervisory authorities often decide to

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[23] In the United States, this practice is known as “evergreening.” Bank examiners seek to

forbear and gamble that the decline in real estate prices will be reversed. During the mid-1980s, when the supervisory authorities of the US thrift industry were faced with a similar problem, they introduced generous new regulatory accounting conventions with new kinds of regulatory capital to disguise the problem and attempted to increase the franchise value of the thrift charter through liberalizing powers granted to thrift institutions. The result was a surge in bad loans (many of which financed commercial real estate development) that increased losses to taxpayers by $120 billion.

The reluctance of the authorities to take strong disciplinary action when the banking system is in jeopardy provides another, more cynical motive for herding. A bank knows that if it takes on an idiosyncratic risk exposure and loses, it may face harsh regulatory discipline, including termination. But if it is careful to keep its risk exposures in line with those of other banks, even if a disaster occurs, the regulatory consequences will be much lighter. The supervisory authorities cannot terminate all banks or even discipline them harshly. Indeed, the authorities may be obliged to soften the impact of the shock on individual banks in order to protect the banking system.

In summary, perverse incentives resulting from the combination of high leverage and asymmetric information may lead to riskier real estate projects than if they were financed largely through equity claims. Highly leveraged real estate developers will initiate riskier projects when they can shift most of the downside risk to banks. Like real estate developers, banks are also highly leveraged with opaque assets. Although this would usually impel depositors and other creditors to monitor and discipline bank risk taking, the official safety net undermines their incentive and so banks will be more willing to

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prevent it.

undertake risky real estate lending than they would in the absence of the safety net. The supervisory authorities could prevent this by substituting regulatory discipline for market discipline as if they were faithful agents for the taxpayers who underwrite the safety net. But, in practice, they often respond by protecting banks from market discipline, rather than the taxpayer principals.

3. The Case of Farmland Prices in the United States

Carey (1990) provides a striking example of a sustained deviation from long-term equilibrium in the pricing of farmland in which both disaster myopia and perverse incentives are heavily implicated. (See Figure 4 which shows the average, inflation-adjusted[24] US Farmland price from 1960 through 1988.) From the end of World War II farmland prices rose steadily until 1970. Then, after a slight pause, farmland prices rose sharply from 1972 reaching a peak in 1981 more than 2.5 times higher than the 1960 value. From 1981 to 1988 prices collapsed to the level attained in the late 1960s leaving many farmers with land worth less than their outstanding mortgage obligations. The result was a wave of defaults and the failure of more than sixty agricultural banks (Carey (1990, p.1)).

What happened in the early 1970s? Carey (1990, Ch. 4) scanned the literature read by farm investors and their lenders and identified a "Malthusian Optimism" hypothesis in contemporary accounts.[25] In the early 1970s agricultural exports rose sharply because of

[24] Carey (1990) deflated farmland prices by the Personal Consumption Expenditures deflator from the National Income Accounts.

[25] Carey (1990, p.127) formulates nine hypotheses based on contemporary accounts. One of the most interesting is the hypothesis that farmers expected inflation to exceed the rate implicit in the nominal interest rates and so they could make real gains on fixed rate mortgages. This would have required very high forecasts of the rate of inflation and

crop failures in other parts of the world and because some less developed countries gained better access to world capital markets and were able to finance increased imports of food. This was interpreted as validating the views of the neo-Malthusians[26] who predicted that the demand for food would grow exponentially, but the supply of food would not. They forecast that grain-importing countries would never become self-sufficient and that they would become increasingly dependent on grain produced in North America. Thus, productive farmland in North America would become increasingly valuable as the rest of the world became increasingly dependent on its output.

Carey (1990) interprets this as increasing the heterogeneity of views on future farmland prices. It may also have contributed to the development of disaster myopia. Farmland prices had risen during the whole postwar era and this neo-Malthusian view of future farm prices provided a rationale for ignoring earlier collapses of farmland prices that occurred during the 1930s. In fact, the sharp increase in agricultural prices turned out to be temporary because supply in the rest of the world did increase and many countries became self-sufficient. Farmland prices increased nonetheless, despite the fact that neither net farm income nor the return on farm assets changed much from 1960 to 1988 (apart from the brief exception of a sharp upward blip in 1973). Indeed, the sharpest rise in the late 1970s occurred at the same time the return on farm assets was falling (Carey (1990, p.44)). The neo-Malthusian view provided a rationale for dismissing this evidence as a transient departure from a long-run trend and as justification

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different loan contracts since the main lender at the peak of the boom was issuing only variable rate mortgages.

[26] A popular expression of this kind of thinking at the time is to be found in *The Limits to Growth*, published by the Club of Rome.

for maintaining confidence that farmland prices would continue to rise. The subjective probability of a collapse in farmland prices was treated virtually as if it were zero.

Lenders must have also shared this optimism about farmland prices and the disaster myopia of investors. The most aggressive lenders, the Federal Land Banks (which are part of the Farm Credit System), increased their lending sharply as farmland prices began their ascent and continued to increase their lending three years *after* the peak. Carey (1990, Ch. 5) shows that they did not attempt to protect their interests by charging higher risk premiums[27] nor by demanding lower loan to value ratios. They behaved as if the risk of a disaster were minimal.

Why were the Federal Land Banks willing to take such enormous risks even after the rise in farmland values had ended? The Farm Land Banks are cooperatively owned by their borrowers and were supervised and regulated by the Farm Credit Administration, an independent agency of the federal government. The banks were governed by their borrowers who, from the perspective of Carey's model, had revealed themselves to be optimists because they have borrowed to purchase land. The banks had no conventional owner's equity[28] at risk and so risk-taking was not constrained by shareholders. Indeed, the absence of an equity stake in the Farm Land Banks undoubtedly increased their willingness to take greater risks.

The Farm Credit Administration was an ineffectual supervisor. It had little power to enforce its regulations and no real accountability to the taxpayers for whom it acts as

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[27] As we show in Appendix A equation A.9, lenders will normally increase risk premia charged to borrowers when they perceive an increase in the risk of default.

[28] Although each bank had "member-borrower capital," it was recovered when the borrower's loan was repaid. Moreover, it was the policy of the bank to refund the stock

agent. Moreover, it shared the optimism of its borrowers, forecasting in 1983, two years after farmland prices had peaked, that "The value of total assets should continue to expand with … real estate leading the way."[29]

The creditors also failed to discipline the risk-taking of the banks. The Farm Land Banks were funded largely through issues of bonds by the Farm Credit System which placed a volume of bonds in the early 1980s second only to the US Treasury (Carey (1990, p. 158). As a federal agency, the Farm Credit System enjoys an implicit guarantee from the US Treasury and so holders of the bonds had little reason to monitor or price the risks taken by the Farm Land Banks.

Thus the Farm Land Banks were subject to amazingly perverse incentives. They had directors who were optimistic about the future value of farmland, no equity at risk, no real oversight from their supervisor and no discipline from their creditors. It is not surprising that they financed the boom in farmland prices. Nor is it surprising that the Farm Credit System sustained massive losses when farmland prices collapsed. Optimism, disaster myopia and moral hazard were a lethal combination.

4. The Case of Property Prices in Sweden

Throughout the postwar era, until the 1980s, Sweden had experienced relatively stable, but rising real estate prices with the last cycle having occurred in the Great Depression. Not only was that experience beyond the memory of decisionmakers in the private and public sector, it was also arguably irrelevant to the modern, post-industrial Swedish economy.

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contributions of all members at par and the Farm Credit System bailed out several Farm Land Banks to enable them to do so (Carey, 1990, p160).

Commercial real estate prices began to rise during the 1980s in response to an acceleration in the growth of real income and the perception that the structure of the Swedish economy was shifting in favor of the service sector, which was expected to require substantially more office space. Inflation-adjusted property prices rose much more sharply from 1985 to 1989 reaching a level 450 percent higher than at the beginning of the decade. But from 1989 to 1993, inflation-adjusted property prices collapsed to a level just below that achieved in 1982. (See Figure 5 which shows inflation-adjusted property prices in Sweden.) The banking system fueled the boom in property prices and suffered serious damage when property prices collapsed.

During the preceding decades the Swedish financial system had been heavily regulated with controls on interest rates and foreign exchange flows. The government sought to maintain low and stable interest rates and frequently used moral suasion and quantitative controls to influence the volume and composition of bank lending.

Like many other industrial countries in the late 1970s and 1980s[30], Sweden began to experience pressures to liberalize financial regulation. Partly this was a response to the growth of less-regulated, nonbank financial institutions and the emergence of new capital markets, which competed aggressively with banks. Partly it was a response to the demands of customers who wanted access to higher quality, more cost effective financial services in order to compete effectively in international markets. The government contributed to the strains on the financial system by seeking to fund increasingly large fiscal deficits, which made interest rate controls increasingly unworkable. Bank profits

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[29] Farm Credit Administration, *Agricultural and Credit Outlook*, 1984, p. 23 as quoted by Carey (1990, p.154).

were low as a result of disintermediation. Liberalization of regulations was seen as a way of restoring the competitive position of Swedish banks.

The liberalization process proceeded in stages, culminating in 1985 with the lifting of official lending guidelines by the Swedish Central Bank (Goldstein et al, 1993). Banks took the opportunity to grow their balance sheets and to shift from government bonds to loans, in the expectation of raising profits. The ratio of bank lending to nominal GDP increased from 43 percent in 1986 to 68 percent in 1990. Swedish bank statistics do not identify real estate loans as a separate lending category, and so it is not possible to quantify the proportion of this increased flow of credit that went to the real estate sector. Nonetheless, Jaffee (1994, 92) concludes that it was significant because "a substantial part of the loan losses taken by Swedish banks can be attributed to real estate."

After the lifting of controls on bank lending banks began to compete effectively with finance companies which were already heavily involved in real estate lending and property prices began to rise much more rapidly. Swedish banks were attracted to the booming real estate market because it was easy to find willing borrowers and, in the context of Sweden's postwar experience, it appeared to be a relatively safe form of lending. Jaffee (1994, p.98) observes that the commercial real estate cycle in Sweden had two primary causes: "(1) a group of optimistic investors and developers who expected to profit from purchasing and producing commercial real estate, principally office buildings; (2) a group of equally optimistic bankers who were willing to lend them

[30] Similar trends could be observed in Germany, Japan, the United States and several other industrial countries.

money for this purpose. … [The] optimistic expectations of both groups were based on a plausible view of rising demand for office space."[31]

It seems quite plausible that Swedish banks were subject to disaster myopia. Based on more than three decades of favorable experience with real estate lending they were prepared to regard the probability of a collapse in real estate prices as if it were zero. Macey (1994, p. 44) concludes that "While there is certainly no evidence that Swedish bankers consciously decided to increase risk to imprudent levels, it does seem clear that the bankers ignored the increased risks associated with their rapid expansion. Indeed, it appears that the bankers considered themselves very safe until the crisis was upon them." Further evidence of the inattention of the banks to the increasing riskiness of their real estate lending can be inferred from the fact that net interest margins and operating profits in Sweden remained relatively stable during the rapid expansion of credit (Goldstein et al, p. 9).[32]

Some observers, moreover, have perceived evidence of herding. Macey (1994, p. 45) notes that Swedish banks exhibited a sort of "herd behavior…in expanding their exposure to the real estate sector, the bankers were encouraged by the fact that they simply were doing what other bankers were doing."[33]

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[31] As Jaffee (1994) notes this was a pervasive phenomenon. Although the property price movements were more extreme in Sweden that any other European country but Spain, almost no leading industrial country was untouched. The other Nordic countries also experienced a real estate boom and Norway and Finland suffered from a serious banking crisis when property prices collapsed.

[32] As we show in Appendix A, interest margins should be expected to rise when lenders perceive a higher risk of default.

[33] Macey also charges that regulation may have contributed to herding behavior through informal administrative guidance and moral suasion.

Why didn't Swedish bank regulators constrain the increasing risk exposure of Swedish banks? Jaffee (1994, p. 94) observes that the bank supervisors shared the expectations of the bankers and saw deregulation as an opportunity for banks to raise profits through expanded lending. Moreover, the Swedish authorities had always placed heavy emphasis on collateralization, believing the collateralized loans were safer than uncollateralized loans.[34] As a result, the real estate exposure of banks was much broader than their direct loans to the real estate sector. Macey (1994, p.48) observes that "many loans are collateralized by real estate even when the expected source of repayment is from earnings generated from the manufacturing or sales activities of the borrowing firms." Indeed it is likely that borrowers with property to offer as collateral received much less rigorous credit analysis. In retrospect it is clear that Swedish lenders took undue comfort in real estate collateral.

Bank creditors were also ineffectual in constraining the banks' exposure to real estate risk. Even if they had not shared the banks' disaster myopia, they had little reason to monitor the risk exposures of their banks because they are likely to have expected to benefit from an implicit safety net. Although Sweden did not have explicit deposit insurance, as soon as banks got into serious trouble the Swedish Parliament guaranteed the entire liability side of banks' balance sheets. One indication of the role of moral hazard may be that Nordbanken, which might be expected to have the surest claim on the

[34] Macy (1994, p.54) concludes "The traditional regulatory climate favoring collateralized real estate lending – along with the traditional strength of the domestic real estate market in Sweden, where there had not been a downturn in real estate prices since World War II – provide the only available explanations for the fact that excessive risk-taking of Swedish banks was disproportionately centered in real estate."

public purse by virtue of the fact that it was 71% state owned, experienced the largest loan losses.

The Swedish real estate boom ended abruptly in 1990 with the beginning of the worldwide economic slowdown and the rise in Swedish interest rates. Swedish tax reform may have also contributed to the downward pressure on real estate prices by reducing the top marginal tax rate applied to interest deductions from 50% to 30% with an overall limit for interest deductions (Goldstein et al (1993, p.8), as did rising vacancies.

The real estate problem started to become an obvious banking problem when the finance companies, which had been heavily involved in real estate development and lending and did not benefit from an implicit government guarantee, lost access to the commercial paper market. They borrowed heavily from banks to stay afloat. The banking crisis began when one finance company (Nyckeln) suspended payments following major losses on its real estate loans and shares in real estate holding companies (Jaffee, p. 96). In 1992, the Swedish Parliament formalized an earlier emergency decree by "enacting Government bill 1992/93:135, which guarantees that banks and certain other credit institutions can meet their commitments on a timely basis by providing support for continued operations" (Macey (1994, p. 30).

An unusual feature of the Swedish banking crisis is that all major banks applied for government assistance voluntarily, in some cases before it was even clear that assistance would be required (Macey (1994, p. 66). This is in striking contrast to Japan and the United States where undercapitalized banks have operated for extended periods in the hope that they would be able to restore their profitability without seeking direct official

assistance (while, nonetheless, exploiting implicit guarantees). Macey (1994, p.67) suggests that the difference may be due to a Swedish law which requires that banks must be liquidated whenever the equity is less than 90 percent of registered share capital. Failure to comply causes personal liability for all losses to directors personally and to anyone else acting on behalf of the bank who is aware of the failure to liquidate. The happy result is that it curbed costly go-for-broke behavior and speeded up the restructuring of the Swedish banking system so that most Swedish banks had regained profitability and access to international capital markets by 1993.

5. The Case of Commercial Real Estate Lending in Japan

During the late 1970s into the mid-1980s, Japanese banks were rapidly increasing the concentration of their portfolios in real estate-related loans and investments while at the same time reducing their capital ratios. In every year from 1975 to 1990, the rate of increase in real estate-related loans and investment in affiliated non-bank subsidiaries was greater than the increase in total loans, often by a substantial margin. Indeed trust and long-term banks continued to increase the share of real estate loans in their portfolios, several years after real estate loans began to fall[35]. The impact of real estate problems on the banking system extended well beyond banks' direct loans to the real estate sector. Ueda (1996, p.7) reports that the share of collateral in the form of land helps explain a substantial proportion of the bad loans ratio to total assets. Some banks apparently tended to rely on the rising value of land rather than rigorous credit analysis in underwriting loans. In addition, banks had very substantial indirect exposure to real

[35]This may be a manifestation of cognitive dissonance or, more likely, workout lending motivated in part by the hope of keeping outstanding loans from being classified as nonperforming loans.

estate risk through their loans to the jusen (mortgage finance companies) which became deeply insolvent as real estate prices fell.

Were Japanese banks consciously increasing their insolvency exposures? Or were they subject to disaster myopia? With the benefit of hindsight it is easy to see the signs of increasing vulnerability, but *ex ante*, before the collapse of asset prices, it was by no means clear.

Profits in real-estate-related loans and investment were relatively high with very few losses. Real estate prices had risen steadily throughout the postwar era, with the exception of a brief period around 1975. (See Figure 6 which shows the rise and fall of commercial real estate prices in Tokyo during the 1980s and early 1990s.) From 1980 to 1990, prices rose almost 350 percent despite a very modest rate of inflation in consumer prices. Although the relatively high price of real estate in Japan was the subject of considerable comment, it was rationalized as the consequence of rapidly increasing wealth in a country with relatively little space that could be economically developed. Some observers (with dubious insight) rationalized high and rising real estate prices by noting that real estate is a non-traded good, and thus is not subject to forces of international competition that constrain the relative prices of traded goods.

A real estate bubble[36] is a good example of a low-frequency shock that is subject to uncertainty. We do not have robust economic models that would have enabled us to

[36] If, indeed, the rise and fall of real estate prices was a bubble. Ueda (1996, p. 10) concludes that the rise in land prices was not a bubble, unlike the rise in stock prices. He believes that the increase in the price of land can be explained largely in terms of declining interest rates. (The Bank of Japan reduced the discount rate five consecutive times from 1986 to 1989.) Nonetheless, Ueda (1996, p.5) concludes, "there is some truth to the argument that large land price declines in the 1990s have been a totally unexpected shock."

predict an asset-price bubble with a high degree of confidence in an economy with extremely modest inflation in the prices of goods and services. Moreover, the empirical evidence regarding such episodes is so sparse that it did not provide a useful basis for setting aside reserves or charging appropriate risk premiums.

The eight jusen, which are an important part of the ensuing financial problems, were formed in the 1970s to conduct real estate lending that was regarded as too risky for banks. But, the relatively high profitability and low losses of the jusen, encouraged banks that had invested in jusen to enter the market during the 1980s in competition with their own affiliates (Yoshitomi (1996)). In the absence of compelling current evidence about the riskiness of such loans and investment, it may have been tempting to extrapolate recent favorable experience and increase exposures relative to capital without consciously accepting greater insolvency exposure.

Management information systems did not correct disaster myopia. Japanese accounting practices do not require that real estate be marked to market; but, given the opacity of real estate markets, this would have been difficult to accomplish in any event. To the extent that bonuses were based on profits without adjustment for reserves against defaults in real estate lending,[37] line managers may have been encouraged to ignore signs of impending disaster. Although life-time employment practices should lead Japanese managers to take a longer view than their US counterparts, the practice of rotating managers to new positions every two to three years may have undercut this benefit to some extent.

[37] Japanese tax laws, like those in the US, provide little scope for discretionary loss provisions.

If Japanese managers were troubled by doubt about the prudence of increasing concentrations of exposure to the real estate sector, they were undoubtedly encouraged that their peers were taking similar positions. Herding has been a prominent feature of the Japanese banking system and was officially encouraged to some extent by the convoy approach to bank regulation and supervision.

If managers of banks were subject to disaster myopia, it is plausible that the supervisory authorities were subject to the same perceptual biases. Indeed, senior bank managers are sometimes former regulators. If they believed there was little chance of a disastrous shock, supervisors may have been content to simply monitor the growing concentrations of exposure to the real estate sector without constraining it.

Japanese banks, like their counterparts in the US and Sweden, suffered from declining franchise values before the shock. During the 1970s and 1980s the development of the domestic securities market led to disintermediation from banks on the liability side. Government bond repurchase agreements provided a higher return to corporate and institutional clients than wholesale time deposits and medium-term government bond funds provided an attractive alternative to retail deposits. This led to pressure to liberalize deposit rates during the 1980s so that by 1990 nearly 70 percent of the deposits at city banks bore a market-determined interest rate.

On the asset-side of their balance sheets, banks saw traditional, large corporate customers turn increasingly to other sources of funds. With the lifting of capital controls, borrowers turned to the less-regulated Euroyen market, issued securities directly, and relied on internally generated funds. During this era also, a growing number of sophisticated foreign financial institutions opened offices in Tokyo and competed for

large corporate customers (and prime commercial real estate in Tokyo). And the blurring of regulatory distinctions among financial institutions in Japan also increased competition.

Banks attempted to compensate for the decline in net interest margins by lending to smaller firms and the real estate sector. Ueda (1996, p.8) presents econometric evidence that financial deregulation "forced some banks to expand real estate loans," as they faced a higher cost of funds and lost traditional clients to the securities market. Unfortunately Japanese banks appear to have been no more successful than banks in Sweden or the United States in charging risk premiums that were sufficient to compensate for higher risks in the new lines of business.

The loss of franchise value could be seen in the erosion of profits from traditional banking activities that had been sheltered from competition. Declining franchise values meant that shareholders had diminished incentives to constrain the risk taking of banks.

The importance of this factor may be open to question in the Japanese context. Close observers of Japanese corporate behavior often argue that the interests of shareholders seldom rank first in corporate decisions. The interests of other corporate stakeholders such as managers, employees, and customers may receive a higher priority, which may lead to a preference for growth even at the expense of profitability. From a corporate finance perspective this can be characterized as a principle-agent problem in which the shareholder principles find it difficult to induce agent managers to act in their interests. Thus, in the Japanese context, the key issue may be how the moral hazard effect of the safety net influences managerial behavior. If creditors and shareholders do not constrain managerial behavior, then the burden falls on the supervisory authorities.

The Japanese supervisory authorities, like their counterparts elsewhere, have found this heavier burden difficult to bear.

Japan, like the US has imposed tight regulatory restrictions on different kinds of financial institutions. Nonetheless, despite these restrictions, many different categories of institutions managed to build up heavy exposures to the real estate sector. Indeed, some institutions were permitted to engage in real estate lending to compensate for declining profits in their traditional lines of business.[38,39] This undoubtedly increased the supply of credit to the real estate sector adding to the upward pressure on real estate prices.

The Japanese safety net for financial institutions has provided remarkably complete protection for depositors and other creditors of banks. From World War II until very recently, the Japanese authorities have followed a policy of avoiding *all* bank failures. As the real estate problem intensified, the 21 major banks (city banks, trust banks, and long-term credit banks) were officially designated as too big to be permitted to cause loss to creditors.[40] Although Japan, like the United States has flat rate deposit insurance, it has played a relatively minor role in Japan. The main mechanism for protecting bank creditors has been the purchase and assumption operations in which a

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[38] The role of the Agricultural Cooperatives in the jusen debacle indicates some of the perils of regulatory attempts to compensate for the declining value of a traditional franchise by broadening powers into what appears to be a highly profitable new sector. The real estate sector proved to be subject to risks that neither managers nor regulators had experience evaluating.

[39] Ueda (1996, p. 9) concludes from his econometric analysis of the period that "banks that lost traditional customers and faced higher costs of funds increased real estate loans."

[40]The merger between Bank of Tokyo and Mitsubishi reduced the twenty-one to twenty. The closure of Hokkaido Takushoku Bank on Novermber 17, 1997 further reduced the total to nineteen. Although the closure of the tenth largest city bank qualified the notion that the largest banks were "too big to fail," it affirmed the view that the largest banks are too big to be permitted to cause loss to creditors.

large institution purchases the assets and assumes the liabilities of a faltering, smaller institution. This process was often guided administratively by the Ministry of Finance, but financial infusions by the Deposit Insurance Corporation have occurred only recently and infrequently. The result was to remove any reason for creditors to monitor the insolvency exposure of their banks.

This put much greater pressure on supervisors to monitor and discipline the insolvency exposure of banks. Japanese bank supervisors had difficulties meeting this challenge. Indeed, there have been reports (Ogawa 1995) of a "...woefully inadequate supply of trained bank examiners."

After the shock the Japanese authorities pursued a policy of forbearance. Banks were permitted to carry on with their impaired capital positions in the expectation that they would be able to earn their way out of trouble, or that in time, rising asset prices would reverse unrecognized losses. This is precisely the policy pursued by the US regulatory authorities during the 1980s. In the United States this policy proved to be very costly, especially in dealing with the S&L crisis. It gave many institutions an opportunity to play go for broke with the deposit insurer's funds and led to losses that were much higher than those attributable to the initial shock itself. It also led to fraud and bribery that damaged the political system. To what extent will Japan be able to constrain these costs?

There has been some evidence of go-for-broke behavior in the Japanese experience to date. The most striking example is the case of two credit cooperatives in Tokyo, the Tokyo Kyowa and Anzen Credit Unions. A special examination in 1993 alerted the authorities to significant nonperforming loans that would render the

cooperatives insolvent. But the authorities did not close the cooperatives, opting instead for a policy of forbearance. The two credit cooperatives took advantage of this policy by rapidly expanding their balance sheets -- bidding for deposits at above-market interest rates and lending to high-risk projects. Most of the new bets turned out badly with the consequence that the institutions became even more deeply insolvent.

There has also been evidence of fraud. One notable example was a restaurateur in Osaka who became, for a brief time, the largest individual shareholder in the Industrial Bank of Japan on the basis of forged Certificates of Deposit from a decapitalized financial institution. These kinds of events have undermined public confidence in banks and the regulatory system. Moreover, taxpayer outrage at paying $6.3 billion to liquidate seven jusen has constrained the ability of the authorities to mobilize public funds to resolve insolvent financial institutions.

Although the real estate boom in Japan was undoubtedly set off by a fundamental increase in demand, it was surely fed by an increasing supply of credit from Japanese financial institutions. Disaster myopia may have contributed to the increasing vulnerability of banks to a collapse in real estate prices. And perverse incentives apparently deterred creditors and regulators from doing anything to restrain the growing vulnerability to a real estate shock. Now, eight years after the real estate market peaked, the Japanese financial system is still encumbered by massive losses on real-estate-related loans. Whatever the ultimate budgetary cost of the necessary restructuring, undoubtedly the most serious cost has been the sluggish performance of the Japanese economy this decade. Banks weakened by real-estate-related losses are still trying to rebuild their capital and have been unable to finance a recovery from the recession.

6. The Case of Commercial Real Estate Lending in Boston

With the ongoing shift to a service economy and the recovery from the 1981-1982 recession, most U.S metropolitan markets experienced sharp office sector employment gains and subsequent boom-bust cycles in commercial real estate. Boston is exemplary in this regard. During the period from 1977 to 1990, the Boston economy experienced strong economic growth; in particular, office employment (in finance, insurance and real estate [FIRE]) grew at a rapid average annual rate of 3.9 percent, as measured by the Bureau of Labor Statistics. Demand for office space, as measured by REIS Reports,[41] increased at an average rate of 7.2% annually (see Figure 7). The growth in demand led to an increase in rents, asset prices and, with a lag, supply. Beginning from a base of 100 in 1977, inflation adjusted commercial real estate asset prices increased sharply, reaching a high of 177 in 1990, as measured by the NCREIF capital market index for Boston (see Figure 8).[42] Rents adjusted for inflation also increased in this period although not as dramatically as asset prices (see Figure 9).

The asset price spike was not the result of inadequate supply. As measured by completions, supply increased at a rate of 8.3% per year (or 4,493,636 square feet on average per year) outpacing the 7.2% rate of increase in demand. The pace of

[41] The REIS Reports, Inc., based in New York, gathers data by phone survey at the individual building level on office markets in major metropolitan areas (MSAs) in the U.S. Key data items collected include gross and net size of building, available space, average asking rents, and vacancy rates. Demand is measured as net absorption and supply is measured as completions, both in square feet for the Boston MSA.

[42] The NCREIF Property Index is constructed by the National Council of Real Estate Investment Fiduciaries. This Index is set at 100 for the fourth quarter of 1977. The universe of properties includes those held on behalf of tax exempt institutions and held in a fiduciary environment. Market value is determined by real estate appraisal. The NCREIF capital market index for Boston was constructed by NCREIF for this research,

completions peaked in 1984 but was almost as high in 1987, 1988 and 1990, as shown in Figure 10. Moreover, in every year from 1980 to 1990, except 1983 and 1986, supply increased more than demand, as shown in Figure 11. The supply-demand relationship is also reflected in rising vacancy rates which, after the early 1980s growth in demand, remained above 12% throughout the decade and reached a high of 17.5% in 1990, according CB Commercial (see Figure 12.[43])

The vacancy rate increase of 1990 occurred in part due to slowing employment growth and absorption. However, the high rate of vacancy was also due to supply decisions made three years earlier, in 1987, in a market that was oversupplied, as evidenced by high and rising vacancy rates. There was little reason to expect acceleration in demand growth to justify the high pace of starts in 1987. Rather, an increase in future vacancy rates could have been easily anticipated, ex ante, based on the existing pipeline of supply and realistic expectations of demand growth. If estimated future growth rates in demand[44] had been calculated based on the historical absorption pace from 1980 to 1987, future absorption would have been estimated at 4.5 million square feet per year. This estimate would have been less than the pipeline of future supply, which resulted in completions growing at a rate of 5.5 million square feet per year (from 1987 to 1989). Both historical absorption and the supply pipeline observable in 1987 indicated a growing vacancy rate. The difficult question that needs to be

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using the methodology described in *NCREIF Property Index Detailed Quarterly Performance Report*.

[43] Commercial real estate vacancy rate information is not standardized and varies across data sources, which are usually brokerage firms. However, all the major brokerage firms were reporting high and increasing vacancy rates in the mid to late 1980s.

[44] Indeed, the economic expansion was in its last stages, and demand growth was expected to slow.

addressed is why were commercial office buildings being developed at such a rapid pace, given high and rising vacancy rates.

Construction lags played a role in the excess supply of the late 1980s. Because of lags, prices and rents that increased in response to the exogenous demand shock of the early 1980s, decreased only after the increase in the pace of development resulted in new completions. Nevertheless by the mid 1980s, real rents were decreasing.[45,46] The information signaling provided by vacancies was similarly impaired by lags. Vacancies do adjust upwards to an increase in completions, not to starts. In Boston, however, high vacancy rates also signaled more than adequate supply in the mid to late 1980s but supply continued to accelerate.[47] Construction lags are likely to have exacerbated the cycle in

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[45] However, asset prices as measured by NCREIF continued to increase. This seeming inconsistency of a price rise accompanied by an increase in the vacancy rate may be explained in part by appraisal smoothing. NCREIF is an appraisal based index. (There is no transaction based price index for commercial properties in the U.S.) Considerable evidence exists for an appraisal bias due to lags in recognition of price shifts (see Hendershott and Kane, 1995).

[46] The increase in asset prices and rents is to be expected and not evidence of inefficient pricing in itself, even though rents and prices are expected to decline after the new supply is built. The increase in rents reflects today's scarcity value of space and the increase in asset prices reflects the discounting of increased cash flows expected in early years followed by declining cash flows in later years.

[47] Of course, with a decline in equilibrium rents, demand would increase, perhaps justifying the increase in supply. Thus whether supply is adequate relative to employment generated demand for space, depends on rent levels. A decrease in the cost of capital will be reflected in lower rents, which will increase the demand for occupied space. Capital costs for real estate development (relative to treasury securities) decreased in the mid-1980s. The relevant question is whether this decrease in capital costs and required rate of return was sustainable. Since there was no decrease in the risk of real estate in this period (or shift in tax treatment that would decrease the required rate of return), the explanation must be that capital cost declines were predicated on continuing rent and price increases, which, of course, were inconsistent with the expected increases in supply.

Boston, but they do not appear to have been the sole cause.[48] Rather the explanation must lie in part in institutional lenders' capital supply decisions, which do not appear to have been forward looking.

After 1990, the Boston commercial real estate market's oversupply rapidly worsened, with the onset of the 1991 recession in the U.S. economy.[49] The recession deepened the decline in the market, and the effects were devastating, even though the shock did not cause the overbuilding. Vacancy rates reached a peak of 19.3% in 1992.[50] Prices fell rapidly in 1991 and hit bottom in 1992. The large inventory of unoccupied space in 1990 coupled with the U.S economy entering a recession phase in 1991 led to the worst commercial real estate crash in Boston's history.

The commercial office market overbuilding of the 1980s was not unique to Boston, as seen in Figure 14. In 1990, vacancy rates were 14% or higher in 22 out of 23 U.S. markets for which we have data. In 1992, aggregate U.S. office building vacancies reached a peak at 20.5%. The commercial office market in the U.S. has not yet fully recovered, as vacancy rates still exceed 12%. Because values remain depressed, especially in the commercial sector, even with the incredible growth of securitization and commercial mortgage backed securities in the U.S. market, capital flows to real estate, when adjusted for inflation remain only 60 percent of their peak in 1987.

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[48] Vacancy rates signaled an oversupply that could have led to a reduction in starts but did not.

[49] The downturn in the U.S. economy began with a decline in GDP in the second half of 1990 which continued through the first quarter of 1991. Unemployment which was 6% in 1990 peaked at 8% in 1992 (U.S. Commerce Department, Bureau of Labor Statistics).

[50] Vacancy rates peaked earlier in oil- and gas-producing regions, for example Houston in 1995. See Goetzman and Wachter (1995) for evidence of geographic clustering of vacancy rates in U.S. 21 markets.

To analyze the role of financial institutions in the overbuilding episode, it is possible to track debt and equity flows into U.S. commercial real estate markets.[51] Between 1980 and 1990, the growth in real estate capital provided was vastly in excess of economic growth, as measured by GDP. Between 1982 and 1983 the nominal rate of growth of capital flows into real estate was 14.6% versus an 11.8% nominal growth rate for the GDP. During the period 1983-1988, the average annual growth rate of real estate lending was 15.1% per year compared to a 7.5% average nominal rate of growth for the economy. In other words, if growth in GDP is used as an approximate measure of growth in demand for capital, in each year from 1982 to 1988, U.S. commercial real estate received excess capital flows of approximately 8%.[52] The Wharton Real Estate Index, constructed to measure the extent of excess capital flows into U.S. commercial real estate and set equal to 100 in 1980, when supply and demand for commercial real estate were roughly in balance, peaks in 1990 at 150, indicating a 50% excess supply of capital.

The sources of capital flows to U.S. real estate market in this period are exhibited in Figure 15. As vacancies peaked in the latter half of the 1980s throughout the U.S., the

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[51] The Wharton Real Estate Index (WREI) measures the extent of excess capital flows, starting from a position of balance in 1980, in U.S. real estate markets (See Ambrose, Linneman and Wachter, 1997, for a full description). Estimates of the debt committed to commercial real estate are derived form the *Federal Reserve Bulletin Table 1.59*. Using growth in GDP to measure growth in demand for capital, nominal new capital flows to real estate under general circumstances, should approximately equal the nominal GDP growth rate, if the real estate market is to remain balanced. To illustrate, starting from a position of market balance (WREI = 100), if the justifiable capital demand rises 5% due to economic growth while the supply of capital also expands 5%, then the market remains in balance (WREI = 105/105 = 100). Alternatively, if the supply of capital increases 10% while economically justifiable demand only grows 5%, the market will have 4.7% excess capital, indicated by an index value of 104.7 (WREI = 110/105 = 104.7).

[52] Even if no equity was injected into the system during this period, excess capital flows were nearly 50% by 1989, after being in rough equilibrium only seven years earlier.

share of capital from REITs and syndicates declined, as did the share from pension funds. Foreign investment in U.S. real estate increased, but was insignificant in relation to overall capital flows until 1989. It was only in 1989 that real estate lending decreased and foreign investment decreased as well. Thus, foreign investment was not the key factor in the oversupply of capital to U.S. real estate markets.

As documented by Litan (1992), commercial banks in the U.S. increased their lending to real estate throughout the 1980s, as a share of their assets; but more importantly, commercial bank lending accelerated in the latter half of the decade, when other capital sources were withdrawing from the market. Moreover, underwriting practices were substantially liberalized over this period. At the beginning of the 1980s, the typical bank did not finance unimproved land. Nor did banks finance development, unless the developer had a commitment for permanent financing, and, in addition, developers were required to invest at least 30% of the development value. By 1990, land loans were common, construction loans were provided without takeout commitments and land-to-value ratios exceeded 90%, nearly 100% in some cases, according to Litan. Thus commercial bank lending was central to the increase in lending that resulted in the oversupply of commercial office buildings in the 1980s in the U.S.

Why were banks willing to assume such large exposures to commercial real estate lending? Commercial real estate lending appeared to be especially profitable with large spreads over the cost of funds and substantial fees. The practice of *not* amortizing fees over the life of the loan and *not* reserving against the possibility of loss served to exaggerate the profitability of this line of business. This misleading view of the profitability of commercial real estate lending may have contributed to disaster myopia.

Litan (1992) saw evidence of herd behavior as lenders joined the stampede, hoping that the boom would last forever.

Maisel (1992, p. 233) observed "the amazing aspect of banks' rapid loan expansion is that it took place after 1985, when the large losses suffered by savings and loan institutions were well recognized. Clearly many bankers thought they were being cautious and making only sound loans. They were aware of the dangers, but failed to forecast them accurately." Banks may well have thought that the experience of the thrift institutions was irrelevant to them because the thrift disasters could be explained by regional dislocations in the Southwest and the notoriously lax regulation and supervision of the industry. Moreover, most of the bankers who had lived through the fall in real estate prices in the early 1970s were no longer making real estate loans. The continuous rise in commercial real estate values since that time (see Figure 8) may have led their successors to believe that they were in a new era and contributed to disaster myopia.

Moral hazard undoubtedly also played a significant role. US banks, like their counterparts in Japan and Sweden, were facing intensified competition from nonbank financial intermediaries, foreign banks and the capital markets that eroded their franchise values. Moreover, their capital positions had been severely weakened by the recession of the early 1980s and the LDC debt crisis. With depleted capital positions and consequently increased effective leverage, shareholders were likely to have been more willing to assume greater concentrations of risk and commercial real estate lending may have seemed an especially profitable way to do so. Creditors, who believed they would

be protected by the safety net, lacked incentive to discipline greater risk taking by the banks.[53]

Why didn't supervisors prevent the build-up of exposures to commercial real estate? They too may have been misled by the way in which profits were measured and generally pleased to see banks enhance their profitability so that they could rebuild their capital positions. It is also plausible that they, like the bankers they supervised, were subject to disaster myopia. Indeed, those supervisors who were homeowners were benefiting from a concomitant rise in residential real estate values, which they undoubtedly hoped would continue.

Liberalization of regulation also contributed to the boom. Congress relaxed restrictions on loan-to-value ratios governing the real estate lending of national banks as part of the Garn-St. Germaine Act of 1982. In addition, thrifts were allowed into commercial real estate finance for the first time, at the beginning of the 1980s, with the passage of the Depository Institutions Deregulations and Monetary Control Act of 1980, thus increasing the number of institutions competing in the commercial real estate market.

These policies were reversed at the end of the 1980s after the disastrous experience of the thrift institutions with commercial real estate lending. Disaster myopia turned to disaster magnification. Under the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA), adopted in August, 1989, lending by thrifts was effectively

[53] Litan (1992) cautions that moral hazard is not the complete story. Although thrift institutions that were insolvent according to Generally Accepted Accounting Principles (GAAP) consistently had the highest concentrations of exposure to commercial real estate, the pattern among banks was less clear – perhaps because GAAP insolvent banks were not permitted to continue operation.

curtailed with regulations that limited loans to one borrower to no more than 15% of capital rather than the previous remarkably high 100% of capital. Litan also notes that in 1990, the Comptroller, the Federal Deposit Insurance Corporation, and the Federal Reserve adopted new guidelines that mandated additions to reserves where there was evidence of real estate value declines. Banks were required, according to the new regulations, to establish reserves against loans when value of the real estate collateral (as measured by recent prices for comparable properties or capitalization of cash flows) had declined so low as to eliminate any equity in the property (previous reserves were required only for nonperforming loans). This change in policy was applied first to the Bank of New England, which had invested almost 40% of its loan portfolio in real estate primarily in New England, which subsequently failed in January 1991.

The Basle Accord on capital adequacy may also have served to reduce the flow of bank lending to the real estate sector. Banks who were capital constrained under the new regulations attempted to reduce their risk-weighted assets by shifting more of their portfolios into government securities which were assigned a zero risk weight.

The collapse of New England real estate prices (of which the Boston commercial real estate market was an important part) caused several failures and forced mergers of banks and thrift institutions. The survivors, however, benefited from the steep fall in US interest rates and the recovery from the recession. By the mid 1990s they had restored their capital positions and were enjoying record profits.

7. The Case of Real Estate Lending in Thailand

Property markets in Thailand are now in a period of deep decline after a prolonged and unparalleled period of growth. With skyrocketing demand for commercial and residential space, real estate has been a robust growth sector in the strongly growing Thai economy. The long history of rapid economic growth and the institutions that encouraged highly leveraged lending may have contributed to the boom and bust property cycle.

Thailand's transformation in the post World War II period, from an agricultural to an early industrial and then to a service economy increased the demand for industrial and office space. Between 1980 and 1990, Thailand was one of the fastest growing economy in the world. The annual real rate per capita GDP growth averaged 8.4%. In addition, population growth proceeded at the robust annual rate of 2.6%.

The property boom resulting from this economic growth has been centered in Bangkok. Prior to the 1970s, Bangkok had only traditional business premises with residential, commercial, and residential space under one roof. With the extraordinary expansion of the industrial and service sectors, demand soared for industrial space as well as for high rise office buildings for the growing office employment sector. Modern office space had not existed and the supply of new space could not keep pace with the extraordinary increase in demand.

In the mid-1980s, Thailand's economic growth accelerated. Figure 16 shows real GDP growth in Thailand was about 5% until 1986. Growth then increased sharply to 9.5% in 1987 and peaked at 13.3% in 1988. Economic growth dramatically increased the demand for modern commercial office space, which was not matched by supply. The

Urban Land Institute 1992 Market Profile for the Bangkok Metropolitan Area[54] reports that new supply of office space averaged 720,000 square meters per year from 1988 to 1990, while absorption averaged 880,000 square meters per year, with vacancy rates near zero. As a result, prime office market rents increased sharply. According to Richard Ellis data, office rents increased from $93 per square meter per year in late 1987 to $269 at mid-year 1991 (a rent level equal to NYC commercial rents at that time) and values increased threefold, while the vacancy rate remained near zero. Once the capacity to build high-rise office structures was in place, a sharp increase in supply did occur. As of 1990, a surge in the growth in new supply was predicted to result in substantial excess vacancies in the Bangkok market within five years.

Hillier-Parker[55] provides time series data of prime office market rents and prices for Bangkok from 1980 to 1990, shown in Figures 17 and 18. Inflation-adjusted commercial real estate prices in Thailand increased 103% in 1989 and 57% in 1990. The index, set equal to 100 in 1986, reached a level of 243 in 1990. Inflation adjusted rents shown in Figure 18, increased 19% in 1989 and 102% in 1990. (Nominal rents increased 25% in 1989 and 114% in 1990, while nominal commercial property values increased 114% in 1989 and 67% in 1990.) Both inflation-adjusted rent and value series appear to have peaked in 1990. Real rents dropped by 36% between 1990 and 1993, while real values dropped by 57% during the same period. However, they remained at high levels relative to 1986.

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[54] ULI profiles are based on data indices constructed by Richard Ellis.

[55] Hillier-Parker gathers data from first class, or class A office spaces in excess of 5,000 square feet in prime locations in Bangkok Metropolitan Area. See Goetzmann and Wachter (1996) for a description of the data source.

In fact, the weakening of the Thai commercial property market appears to have been foreseeable as of 1990. According to the ULI Market Profile of the 1990, forecasted new supply of office space in 1991 through 1995 was expected to average 5.5 million square feet per year (based on permits in place), which would have tripled the inventory of office space from 13.3 million square feet at the end of 1990 to 40.6 million square feet at the end of 1995 (about equal to the size of the Boston office market). The actual increase was even higher at 9 million square feet per year, and the vacancy rate increased to 21.3 %.

The decline in office rents and values from 1990 to 1993 was in part due to this surge in supply and in part due to an unanticipated slowdown in absorption. (GDP growth declined due to the tightening of fiscal policy, in response to an upwards shift in the inflation rate of 2.5 percent in 1983, to over 5 percent in 1988, shown in Figure 20.) Nonetheless, rental rates remained high enough to justify new supply.[56] The increase in supply of office space reversed the earlier spike in rents and the continuing additions to the stock approximately equaled demand, as reflected by stable (although high) office market vacancy rates for the Bangkok Metropolitan Area and stable rents and prices.

Increases in prices and rents, however, continued to outpace inflation in the land intensive industrial and residential sectors. Thus, although the supply of industrial space increased dramatically in these years, rents for industrial space increased as well. According to ULI data, manufacturing facility rents increased from $6.10 per square in 1990, to $7.90 per square foot in 1996. Warehouse rents increased even more from $4.10

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[56] This level of vacancy provided a two years supply of office space based on historical rates of absorption.

per square foot in 1990, to $5.90 per square foot in 1996. This may have reflected continued growth in land prices for this (which is relatively land intensive) sector. The multifamily sector also exhibited evidence of asset price inflation. Housing values increased dramatically, according to Richard Ellis data, as reported in the ULI Report of 1997: for example a 1,000 square foot, 2-story townhouse sold for $32,700 in 1990, $52,000 in 1994, and $70,000 in 1996. A detached single family sold for $177,600 in 1990 and $254,900 in 1996. This increase in prices was accompanied by an increase in the rate of construction. The pace of starts for condos increased from 20,327 per year in 1990 to 51,770 in 1994. The pace of construction for townhouses increased from 15,499,800 square feet per year in 1992 to 27,141,872 per year in 1994, resulting in an increase in the vacancy rate to 7%.

The growth in value in the multifamily sector was driven by the supply of capital along with an investment demand for housing. That is, the building boom in condos and townhouses was due to an increase in both the consumption and investment demand for housing. Evidence for this appears in the increasing stock of vacant housing units held by individual owners (rather than building developers). Investment demand is likely to have been fueled by expectations of high rates of future rent appreciation. While housing rents increased in the years 1990 to 1996, housing prices accelerated at an even faster rate. This is consistent with expectations for future rent growth that exceeded current rent growth rates. The ultimate source for the growth of rents was the continuing growth in output and income in Bangkok, and the resulting growth in prices of Bangkok land.

Commercial bank lending supported this rapid growth in the property sector. Bank financing of the property sector occurred through lending to finance companies and

to publicly traded developers. The growth in credit from banks to finance and securities companies is shown in Figure 22. This lending, which was typically highly leveraged, supported the growth in supply as well as appreciation in property prices.[57] The combination of high leverage and high appreciation made these loans particularly vulnerable to default due to the unraveling of expectations.

As a percentage of GDP, commercial bank loans to real estate quadrupled during the period 1987 to 1990, as shown in Figure 19. The exposure of the banking sector to real estate was even larger than these data on direct lending suggest. Banks invested in, and lent to finance companies, which had extensive investment in real estate. Moreover, the practice of using real estate as collateral was widespread in all lines of bank lending. It would not be surprising if credit analysis may have suffered when loan officers believed that they could rely on high and rising real estate values as a guarantee of repayment.

Why did banks become so heavily exposed? Disaster myopia may have played a role. Thailand had never experienced a commercial real estate cycle and so, understandably it was difficult to estimate the probability of a collapse in real estate prices. Moreover, it must have been tempting to extrapolate the remarkable rate of economic growth Thailand achieved in the 1980s. Rapid economic growth provided a rationale for dismissing rising vacancy rates as a transitory phenomenon with confidence that demand would quickly catch up with supply.

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[57] All asset prices that are based on expectations of future appreciation are sensitive to shifts in these expectations. For example, with a required yield (capitalization rate) of 10%, a decline in expected asset price appreciation from 10% to 0% will cause prices to fall by half.

Perverse incentives may also have contributed to the increasing vulnerability of the banking sector. Although Thailand does not have explicit deposit insurance, it does have a Financial Institutions Development Fund, which is managed by the Bank of Thailand and funded by yearly contributions equal to 0.1 percent of deposits from all institutions supervised by the Bank of Thailand. The Fund may "lend money, take equities in certain institutions, or bail out troubled institutions by purchasing their non-performing assets when it deems appropriate."[58]

The implicit government guarantees for the (formerly) sixteen Thai commercial banks were so strong that when the ninth largest bank, Siam City, lost 95 percent of its capital during the late 1980s, it was not subject to a run. Ungprakorn (1987, p.25) reports that, "The central bank's refusal to allow banks to collapse apparently preserved depositor's confidence. But the Bank of Thailand did ask the 15 other Thai commercial banks to prepare cash just in case Siam City depositors panicked. In the event there was no such panic at any of the 99 branches."

Regulatory arbitrage also appears to have contributed to the increasing vulnerability of the banking system to a real estate crisis. The Bank of Thailand has long constrained bank lending to the real estate sector in order to channel more financial resources to investment in export capacity and plant and equipment (and, perhaps to avoid the real estate problems banks have experienced in other countries). Although these regulations were not relaxed, they were, nonetheless, undermined by the growth of largely unregulated finance companies that became heavily involved in real estate lending and investment. Many of the finance companies were affiliated with banks and, from 1990 on, they were increasingly funded by banks. (See Figure 22.)

[58] Bank of Thailand website (http://www.bot.or.tb/supervis.html,p.3).

Thailand began the process of liberalizing its financial system starting with the lifting of capital controls in 1990. In 1993, the Bank of Thailand authorized the formation of Bangkok International Banking Facilities (BIBFs) that could deal in foreign currencies largely free of domestic taxation and regulation. The BIBFs were intended to establish Bangkok as a regional financial center. As interest rates rose in Thailand, banks increasingly funded themselves through the BIBFs. (See Figure 23.) Manufacturing corporations, finance companies and other real estate investors also borrowed heavily through the BIBFs, many of them on an uncovered basis. This is another way in which implicit guarantees contributed to a weakening in the financial sector. Many participants in financial markets believed that the government was firmly committed to maintaining a fixed exchange rate and expected to be able to profit from access to foreign currency at lower interest rates.

The investment boom of the early 1990s led to a growing current account deficit. The current account deficit, which had averaged –3.2 percent of GDP from 1983-89, rose to –8.3 percent in 1990 and fluctuated just below that level until 1997 (IMF (1997)). Real export growth fell sharply in the 1990s as shown in Figure 21.

The perception that Thai exports were less competitive led to concerns over the exchange value of the baht, which was pegged to a basket of currencies, of which the US dollar made up over 80 per cent. The baht and dollar inflation rates were roughly parallel until 1994, when the former jumped to 6% while the latter fell to 2%. As the US economy strengthened, the dollar appreciated relative to other major world currencies, including the mark, the franc, the pound and especially the yen, the currency of Thailand's second largest export market.

Since 1995, the Bank of Thailand has employed a tight monetary policy to curb inflation and support the baht. Higher interest rates depressed property prices. Real estate markets were further depressed in 1995 when the Bank of Thailand limited the use of collateral in extending new loans. The new regulation required that if a debtor were not able to make an interest payment, the bank could not advance additional amounts to the borrower on the basis of the same collateral. This led to a sharp increase in nonperforming loans, which obliged banks to set aside more reserve for non-performing loans. Banks attempted to rebuild their capital positions by reducing their loans. Banks were also under pressure to meet the Basle Accord standards of capital adequacy, which tightened credit conditions still further, leading to additional declines in property prices. Several finance companies, which were heavily exposed to the real estate sector, became insolvent.

The FIDIF borrowed extensively to bail out financial institutions such as the Bangkok Bank of Commerce and 16 other finance companies, which had massive non-performing loans. These 16 finance companies were suspended in June of 1997. In August, 42 more finance companies were shut down.

By July 1997 more than US$20 billion of foreign reserves had been used in the unsuccessful defense of the baht. On July 2, The Bank of Thailand, unable to defend the baht any longer, announced that the 13 year-old pegged exchange rate system would be replaced by a "managed float". With the depreciated baht the private sector, particularly the banking sector, found it even more difficult to repay their foreign debts. And because it has become almost impossible to obtain any more foreign funds, more and more firms were forced to shut down.

With virtually no foreign reserves and a weak private sector weighed down with foreign debts and nonperforming real-estate related loans, Thailand decided to seek foreign aid to help revive its economy. In mid-August, the International Monetary Fund organized a package of $17.2 billion in loans to Thailand. The prospects for recovery depend on a restructuring of the financial sector. As the IMF (1997, p. 11) concludes in the Interim World Economic Outlook, "the sharp devaluation and the deflation in the property sector, into which a significant portion of foreign borrowing was channeled and which has an important bearing on the balance sheets of commercial banks…will require much greater efforts to restructure the financial sector. If the recovery of the financial sector is delayed, the turnaround in the economy will be hindered considerably."

8. Policy Implications

Based on our diagnosis of the problems that may lead to real estate booms and banking crises, what public policy remedies are appropriate? The heart of the problem is the structure of the real estate market.

8.1 Measures to Counter the Bias towards Optimism

In Section 1 we argued that real estate markets tend to be ruled by optimists because of the difficulty pessimists face in selling short. Thus one straightforward remedy would be to nurture the development of an options market for commercial real estate. This is likely to present an insurmountable challenge, however, because commercial real estate tends to be a very lumpy commodity with a relatively small number of heterogeneous large projects. Moreover, the secondary market is so thin and subject to manipulation that potential market participants would be very unlikely to enter into contracts in which the payoff depends on future secondary market prices.

This suggests that it may be more practical to organize markets in the underlying equity claims on commercial real estate and permit short sales of the underlying claims themselves. Indeed, promoting greater reliance on equity in financing commercial real estate projects would have substantial additional benefits, REITS, discussed in the next section, may provide a partial solution to this need.

8.2 Measures to Discourage Excessive Leverage

The high degree of leverage taken on by many developers and real estate investors causes them to be very vulnerable to a variety of shocks that can lead to default. High leverage heightens the risk that the investor will incur the costs of financial distress, which include the costs of bankruptcy – i.e., the costs of transferring ownership of real estate to creditors -- and also the loss in value that may occur as a result of the perception that bankruptcy may be imminent, even if bankruptcy may ultimately be avoided.

These costs of financial distress should be distinguished from economic distress. The cost of financial distress may be measured as the additional loss from economic distress for a leveraged real estate investor versus an identical investor who is unleveraged. When real estate prices fall, both investors will experience economic distress, but the leveraged investor experiences a greater loss of value because of the increased risk of bankruptcy, greater uncertainty that the investor will honor its other financial commitments, and the increased costs of controlling conflicts of interests with creditors.

In addition to reducing the costs of financial distress, greater reliance on equity financing will reduce the incentives for real estate investors to shift risks to creditors by increasing the riskiness of their real estate investments. It will therefore also diminish the

restrictions which anxious creditors feel they must impose on real estate investors to limit the extent to which they can be expropriated by risk shifting.

A US innovation, Real Estate Investment Trusts (REITs), has broadened the investor base and thus increased the flow of equity financing for commercial real estate. REITs are passive, portfolio managers of real estate properties. They are mutual funds that hold property and pass on income and capital gains tax-free to individual investors.[59] Their shares are actively traded on stock exchanges (and, consequently provide an opportunity to sell real estate short). They differ from listed real estate companies, which are taxable, operating companies that conduct real estate construction and development activity.

A useful by product from the introduction of publicly-traded REITs is that the demand for information relevant for pricing real estate has increased. Security analysts on both the buy-side and the sell-side of the market compete in the provision of analysis relevant to the pricing of REITs. Although it is too soon to assert that REITs will be effective in reducing the amplitude of the next US real estate cycle, there is reason to be hopeful. While REITs have existed since the 1970's, the new REITs developed after the 1990 real estate recovery are different in several dimensions. Most important, the new REITs have less reliance on debt financing. The leverage ratio for old REITs was 50 percent in 1990. Today the leverage ratio is 35 percent. Moreover, old REITs utilize more short term debt while new REITs use more long-term debt. Finally, the new REITs are far larger and far better followed by Wall Street analysts.[60]

8.3 Measures to Counter Disaster Myopia

[59] See Jaffee (1994) for a description of the functioning of REITs. He proposes that REITs be introduced in Sweden.

The traditional bank-supervisory process is not well designed to deal with disaster myopia and exposure to major shocks of unknown probability such as a collapse of real estate prices. Instead, the primary thrust of supervision has been to been to assess the *current* condition of a bank. While the identification of weak banks is useful for managing crises, it is inadequate for the prevention of crises. To prevent crises the supervisory process must identify *vulnerable* banks before they become weak banks.

Supervisors experience great difficulty in constraining a bank currently in good condition that would be seriously damaged by a shock of unknown probability, since reasonable persons could easily disagree. Nonetheless, the central concern of prudential supervision should be to identify banks that are becoming heavily exposed to a major shock in order to prevent exposures from growing so large that they jeopardize the financial system.

Real estate-related loans have caused such serious problems in so many countries that the authorities should monitor such exposures carefully, measuring the vulnerability of individual banks and, consequently, the vulnerability of the banking system. Once exposure data are collected, the authorities have three basic options.[61]

First, the supervisors can return the information to the individual banks, perhaps accompanied by supervisory commentary, but permit each bank to determine whether its exposure is prudent. This is a measure-and-confront approach. To the extent that excessive exposure is inadvertent, the result of inattention or poor communications among operating officers, senior management and directors, this may be sufficient to

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[60] There is evidence that old and new REITs are converging, with old REITs becoming more like new REITs (Ambrose and Linneman (1998)).

prevent excessive vulnerability. But the bank may already be aware of its exposure to the risk of a collapse in real estate prices, having made a deliberate choice to accept a larger exposure in the belief that the risk of a collapse in real estate prices is low and in anticipation of higher expected profits. Indeed, the bank may take comfort in the knowledge that its peers were equally exposed and so the approach may prove wholly inadequate to prevent systemic vulnerability.

Second, the supervisory agency may release exposure data to the public in the hope that markets will discipline banks that are viewed as excessively exposed.[62] The disclosure of exposure data, however, may reveal proprietary information, abrogate confidential relationships and, if disclosure occurs only after the shock, undermine confidence. Moreover, it may not succeed in constraining exposures because creditors may also suffer from disaster myopia and not perceive the risk or they believe they can ignore the risk, because they believe they will be protected by the safety net in the event of trouble.

Third, the supervisor can specify stress tests that banks should be prepared to meet. This would constitute specifying the minimum decline in real estate prices that the bank should be able to sustain without recourse to official assistance.[63] Under the stress-test approach, if the bank's critical shock magnitude – the decline in real estate prices that

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[61] Guttentag and Herring (1989) discuss these approaches in much greater detail in the context of country lending.

[62] An example of this approach is the requirement established in the wake of the Mexican debt crisis by the US Securities and Exchange Commission and the bank regulatory agencies that the bank holding companies publicly disclose any concentration of country risk exposure that exceeded three-quarters of 1 percent of its total assets.

[63] The Basle Committee has outlined a similar approach in the supervised use of internal risk models to estimate capital requirements for market risk. Banks using this approach

would exhaust the bank's capacity to bear loss – were less that the minimum decline in real estate prices specified in the stress test, the bank would be required to reduce its exposure or increase its capacity to bear loss until it is able to sustain the officially specified, minimum decline in real estate prices without recourse to official assistance.

The basic problem with this approach is that judgments about whether exposure to real estate risk is excessive and what the minimum decline in real estate prices should be are inherently subjective. In the absence of knowledge about the probability of a shock, it is impossible to demonstrate objectively that a large real estate exposure gives rise to an excessive probability of failure.

In addition to stress tests, supervisors should insist that banks have a rigorous underwriting process for real estate loans. Banks should have explicit underwriting standards that are approved by the board and the implementation of these standards should be monitored by bank officers who are *not* compensated on the basis of revenue from new lending. While it is undesirable for the supervisors to actually set underwriting standards, they should be prepared to challenge any weakening of standards during a time in which real estate prices are rising rapidly. As we have seen, any given loan-to-value ratio is likely to be misleading when prices are rising rapidly because the current price will not reflect the lagged supply of new office space as construction is initiated and completed in response to higher prices. Thus supervisors should question seriously decisions to raise loan-to-value ratios when prices are rising rapidly.

From a regulatory perspective, perhaps the most important reform to counter disaster myopia is to reduce regulatory restrictions on diversification. Liberalization of powers

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must conduct regular stress tests to gauge their vulnerability to low probability events in

for solvent, *well-capitalized* banks should help reduce vulnerability to future shocks. The greater the degree of diversification across activities and geographic regions, the lower the vulnerability to any particular shock, even if disaster myopia cannot be corrected.

It is also important to deal with factors that encourage disaster myopia. Opaque accounting practices, which obscure the magnitude of the exposure of the consolidated institution or mask deterioration in the market value of exposures, are a fundamental source of vulnerability. They impede the ability of managers, owners, creditors, and supervisors to monitor insolvency exposure and they may also make a risky activity appear misleadingly profitable. This problem is compounded when these flawed measures of performance are used to set salaries and bonuses. The line officers who are in the best position to asses dangers of increasing vulnerability should have incentives that encourage them to take a long-term view of the institution's exposure. This generally means calibrating bonuses to long-term measures of profitability rather than short-term returns that make no adjustment for reserves against shocks.

8.4 Measures to Counter Inadequate Data and Weak Analysis

Both real estate investors in general and banks could benefit from the publication of better information relevant to the valuation of commercial real estate projects. These data should include regular reports of prices of real estate transactions, rents, indices of construction costs, vacancy rates, building permits, new construction contracts, as well as the macro data that are useful for predicting demand for commercial real estate. This information could be supplied by a private-sector research or ratings organization, but as

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all major types of risks.

a practical matter the government may need to take the lead in establishing the format, frequency, and credibility of reports.

Although an active market participant may be gathering much of this information from its own activities in the market, it may be reluctant to disclose the information to other participants because the information will lose its proprietary value. Moreover, a participant with large investments in the real estate market may be especially hesitant to release information that implies real estate prices should fall and may even be tempted to distort the information for its own strategic advantage. Since better information is likely to reduce the amplitude of real estate cycles and reduce the vulnerability of the financial system to a collapse in real estate prices, there are substantial potential positive externalities to be realized which may justify official intervention, perhaps funded by a tax on real estate activity.

8.5 Measures to Counter Perverse Incentives

In contrast to the measures for countering disaster myopia, the measures for countering perverse incentives for taking excessive risk are quite straightforward. The first principle is to refrain from providing full protection for all bank creditors – especially sophisticated creditors such as corporations, other banks, and institutional investors. This is largely a matter of privatizing or closely constraining the powers of state-owned banks and ending implicit deposit insurance for other banks. A policy of ‘too big to fail’ places the entire burden of monitoring risk taking on the supervisory authorities. One clear lesson from the preceding examples is that the authorities are seldom able to meet the challenge.

After a costly series of bank failures during the 1980s,[64] in substantial measure due to disastrous real estate loans, the US Congress passed new legislation designed to eliminate (or at least greatly reduce) moral hazard incentives for depository institutions to assume excessive risks. The Federal Deposit Insurance Corporation Improvement Act (FDICIA) attempted to achieve this end by constraining the scope for bank supervisory authorities to exercise forbearance at the expense of taxpayers.

FDICIA attempted to end implicit deposit insurance in two ways. First, it required that the deposit insurance agency use the least costly method of resolving failed banks under the assumption that only the deposit insurance agency is liable only for insured deposits. This approach to resolution would sharply limit purchase and assumption transactions that provided protection for all bank creditors whether insured or not.

Second, FDICIA attempted to end lender-of-last-resort assistance to insolvent banks. It attempts to deter the Fed from extending lender-of-last-resort assistance to insolvent banks by depriving the Fed of the protection of collateral when it makes advances to banks near insolvency. A major exception remains if the Fed and the Secretary of the Treasury agree that such advances are necessary to prevent "a severe adverse effect on … the national economy." Whether this will be a significant constraint on Fed behavior when a large bank is in jeopardy remains to be seen. But there is at least some reason to doubt that protection will be automatic. That alone should enhance market discipline.[65]

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[64] Between 1980 and 1991, 10 percent of all banks in the United States and 25 percent of all Savings and Loan Associations failed and many more depository institutions were in extremely fragile financial condition.

[65] Flannery and Sorescu (1994) present evidence that the pricing of subordinated debt has become more sensitive to bank risk as the authorities have stopped shielding holders of subordinated debt from loss.

In addition to removing the protection of the safety net for uninsured creditors, FDICIA has sought to counter moral hazard by preventing banks from operating without substantial amounts of shareholders' funds at risk. One clear lesson from the collapse of the US Savings and Loan industry is that losses surge as institutions become decapitalized and shareholders and managers are tempted to play go for broke. FDICIA attempt to reduce the scope for forbearance by replacing supervisory discretion with rules. These rules are designed to stimulate prompt corrective action as soon as a bank's capital position deteriorates. The sanctions are similar to the conditions that banks impose on their borrowers when their financial condition deteriorates. They become increasingly severe as a bank's capital position erodes from the well-capitalized zone down through three other zones to the critically undercapitalized zone in which the supervisor must appoint a receiver or conservator within 90 days. If the bank is viable, the threat of increasingly severe sanctions will induce shareholders to recapitalize the bank. But the aim is to ensure that prompt corrective action is taken – either by the shareholders or by supervisory authorities – before the bank's capital is depleted.

Although FDICIA calls for accounting reforms that would move regulatory measures of capital closer to market values, little progress has been made. This is a crucial omission. The rules for prompt corrective action will be effective only to the extent they capture the deterioration in the economic value of capital. If accounting conventions do not reflect changes in market values, then exposures will be more difficult to monitor before a shock. And, after a shock, the supervisory authorities will retain a significant amount of discretion to exercise forbearance. Under such conditions, corrective action is unlikely to be prompt. Indeed, it may not be forthcoming at all. Without more

transparent accounting practices, it will be difficult for supervisors to monitor the moral hazard incentives of banks and difficult for taxpayers to monitor the performance of their agents, the supervisors.

9. Concluding Comment

As we have illustrated in five very different institutional settings real estate booms often end in banking busts. Because real estate is in fixed supply (at least in the short term), and is difficult to sell short, real estate markets are vulnerable to waves of optimism.

The extent and duration of the resulting rise in prices can be greatly increased so long as banks augment the financial resources of the optimists. The willingness of banks to increase their exposure to real estate lending is likely to increase to the extent that they and their supervisors are subject to disaster myopia.

Moral hazard also plays a critical role, especially when bank shareholders have little to lose and bank depositors believe they will be protected by the safety net. These perverse incentives place a heavy burden on regulators and supervisors, which few have been able to shoulder. More often, they forbear, hoping for the best, and the vulnerability of the banking system to a collapse in real estate prices grows.

Poor information and inadequate analysis contribute to growing vulnerability. Inadequate accounting may hide mounting exposures from managers and their shareholders, creditors and supervisors. Inadequate appraisals, based on recent prices, tend to justify further lending in a boom market. Uncritical reliance on real estate collateral creates a false sense of security and may cause the real estate boom to weaken loan underwriting standards in other lines of business as well.

When the real estate boom begins to collapse, banks may also hasten the fall. Disaster myopia may turn to disaster magnification leading to a withdrawal of credit. Inadequate data become a source of concern and grounds for suspicion. The lack of transparency may cause depositors to question implicit guarantees. Supervisors may react to the consequent weakening of bank capital by requiring the banks write down nonperforming real estate assets and raise new capital. Or they may choose to forbear, continuing to hope that real estate prices will recover.

Forbearance may also have significant costs. If decapitalized institutions are permitted to operate they may be tempted to gamble for redemption, increasing losses still further. Moreover, even if they do not gamble for redemption, banks which are crippled by large holdings of nonperforming real estate loans will be unable to generate sufficient retained earnings to restore their capital in a timely manner. Instead, they will shed assets, scaling back new lending to all sectors of the economy and declining to roll over outstanding loans when they mature.

In economies where banks are the main source of financing, this can have a devastating impact on investment and economic growth. Moreover, as we have seen this past year, it undermines confidence in the economy, increasing its vulnerability to external shocks.

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