



# The Excess Capital Hypothesis and

# *Cyclical Changes* in Loan Underwriting



When loan growth outstrips GDP growth, it usually means credit quality is compromised and loan losses are on the way. In the run-up to the crisis, banks either didn't see or ignored the warning signs.

**BY BRUCE G. STEVENSON**

CYCLICAL CHANGES in lending and underwriting standards by commercial banks are well known. In economic expansions, banks lend to meet demand by creditworthy borrowers. However, once the demand of those borrowers is met, banks continue to lend—to weaker borrowers through relaxed credit standards—in order to maintain income. The result is a cyclical pattern of lending, over-lending, defaults, and loss explained by the *excess capital hypothesis* (ECH).

This article demonstrates that loan officers' perceptions regarding the strengthening and weakening of underwriting standards on commercial loans are a leading indicator of loan delinquencies and losses. This correlation is the result of causal relationships predicted by the ECH.

When banks loosen underwriting standards, credit markets expand and credit flows to most borrowers, even those with weak quality. Then, when loan officers perceive risk emerging in the credit markets, they tighten underwriting



standards. This withdrawal of credit precipitates the default and losses that occur when marginal borrowers lose their access to bank debt. The cyclical changes predicted by the ECH result from these dynamics.

Rates of loan loss lag the cyclical waxing and waning of bank-supplied credit by about two years. Periods of excessive credit expansion and borrowing lead to increased leverage (for example, LBO bubbles), compromised underwriting standards, loans made to inherently unqualified borrowers, and, eventually, defaults and losses.

In extreme cases, credit markets can collapse, as they did in 2008 and 2009. The excess capital hypothesis explains that the effort by banks to maintain income levels after the demand of creditworthy borrowers is met produces excess capital in the economy at the same time it provides credit to weaker borrowers through relaxed standards.<sup>1</sup> Further, returns on loans fall as banks reduce the price of loans to induce demand, and the shift

from creditworthy borrowers to less-than-creditworthy ones produces the well-documented exponential increase in the risk of default.

One of the key tenets of the ECH is the cyclical waxing and waning of underwriting standards in which standards are loosened in periods of credit expansion and are tightened during periods of credit contraction when loan losses emerge. The ECH predicts correlations between changes in underwriting standards and loan delinquencies, defaults, and losses.

Previously, this author addressed these predictions by assessing anecdotal and largely qualitative evidence from past credit crises. This article examines these predictions thoroughly and quantitatively, providing clear evidence that changes in lending standards do occur and are correlated to both excessive lending and loan delinquencies and losses.

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### Previous Studies on Changes in Loan Underwriting Standards

Previous studies demonstrate that lax standards are more likely in periods of expansion and that banks tighten standards during contractions.<sup>2</sup> However, most of these studies do not include the critically important experience of the 2008-10 credit crisis, which, in many ways, resulted in the most extreme changes in loan standards and loan losses in many decades. This article addresses this most recent experience as well as the mid-2000s period leading up to it.

There are several explanations proposed for the dynamic nature of standards. Broadly, these explanations fall into two categories:

#### 1. *There are cyclical changes in competition between banks.*

As economic and lending conditions change, banks face changing competition for borrowers. In expansions, lending standards fall as interbank competition increases. Unrealistic optimism can create lending booms that lead to future losses and credit crises. During contractions, banks become more conservative as they focus on capital shortfalls and regulatory pressure.

#### 2. *Deposit insurance creates distortions in the credit markets.*

The transfer of risk from bank shareholders and depositors to the FDIC and taxpayers through deposit insurance creates moral hazard and incentives for bank managers to take on more risk. While this argument may be true absolutely, it is an unlikely explanation for waxing and waning of credit standards because the level of deposit insurance does not vary over the credit cycle and changes only rarely.

Researchers have demonstrated since the 1990s that loan underwriting varies with economic conditions. Most recently, Zhipeng Zhang of Boston College conducted an extensive study of defaulted bank loans and discovered a cyclical effect in loan underwriting.

In economic expansions, banks make more loans and relax their lending standards. As economic conditions improve, banks may change their views on marginal borrowers such that businesses and households whose characteristics make them look risky may become acceptable borrowers.

As unemployment falls in cyclical expansions, risk premia decline and collateralization is reduced. Relaxation of lending standards can lead to expanded credit, lower profits on lending, and higher probabilities of default among borrowers. Banks may even fund economically unprofitable projects during expansions.<sup>3</sup>

When credit contracts, the banks not only reduce the amounts of loans but tighten loan standards. Specifically, when macroeconomic conditions worsen, banks are more likely to strengthen covenants in loan agreements and require greater collateralization. Banks may overreact in contractions by not funding economically profitable projects.<sup>4</sup>

### Survey of Loan Officer Opinions on Lending Standards

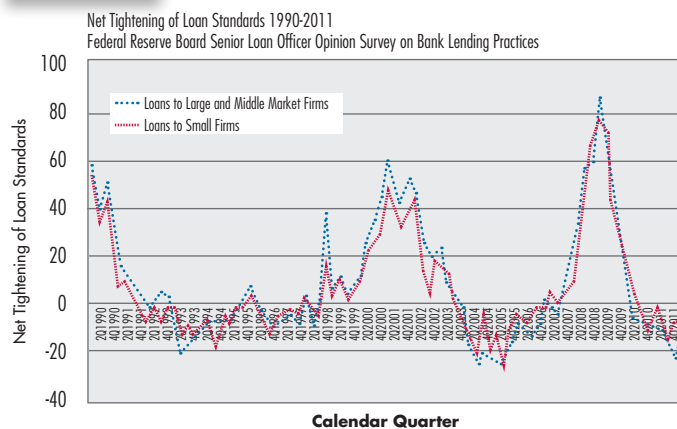
This article draws its data from several sources. Figures on GDP are taken from the U.S. Bureau of Economic Analysis. Loans outstanding issued by commercial banks and statistics on loan delinquencies and charge-offs are drawn from the Federal Reserve. Data on loan-underwriting standards are taken from the Federal Reserve Board's Senior Loan Officer Opinion Survey on Bank Lending Practices.<sup>5</sup>

Each quarter, the Federal Reserve Board surveys senior loan officers about their lending practices, including whether they have tightened or eased their credit stan-

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Figure 1

## U.S. Commercial Banking Industry



These data reflect self-reported behaviors by loan officers who may have incentives to report tightening more readily than loosening.

dards. The Fed constructs a measure of net tightening from the answers. The measure equals the percentage of banks reporting tightening of standards minus the percentage of banks reporting easing. Net tightening is reported for a range of loan types, including loans to commercial firms of various sizes and commercial real estate borrowers. Results of the survey have been used in a number of previous studies.

Figure 1 shows the results of the loan officer survey. On average, loan officers reported net tightening over the period 1990 to 2011 and there were distinct periods when they reported very high levels of tightening (for example, 2007 to 2009). Conversely, in the periods of reported net loosening, the magnitude was smaller.

There were pronounced periods of tightening in the early 1990s, the early 2000s, and in 2008-09 (Figure 1). These periods roughly correspond to the credit crises that occurred at the beginning of the 1990s and from 2008 to 2010. Interestingly, and importantly for this article, there were distinct periods of easing between these periods, notably 1992-95 and 2003-07. Easing also occurred in 2010-11.

The amplitude of loosening, tightening, and loosening in 2003-11 was greater than in earlier periods, suggesting that loan officers perceived a greater variation in the conditions for underwriting loans to commercial and industrial borrowers. This period is also important since it was the only one in which there was both reported loosening of loan standards and empirical evidence of it.

One final comment on the underwriting standards data is warranted. Figure 1 clearly shows a wider range, and greater maxima, for tightening of loan underwriting standards than for loosening. These data reflect self-reported behaviors by loan officers who may have incentives to report tightening more readily than loosening, given that the organization that solicits and reports the results—the Federal Reserve—also monitors and regulates the banks.

Loan officers may be more willing to report tightening than loosening based on the likely expectation that reported tightening is more desirable. If true, there may have been more loosening than reported.

### Relationship of Underwriting Standards to Loan Volume

Several researchers have suggested that changes in loan standards are correlated with loan growth and economic expansion: In periods of expansion, loan standards are loosened and, in periods of contraction, loan standards are tightened.

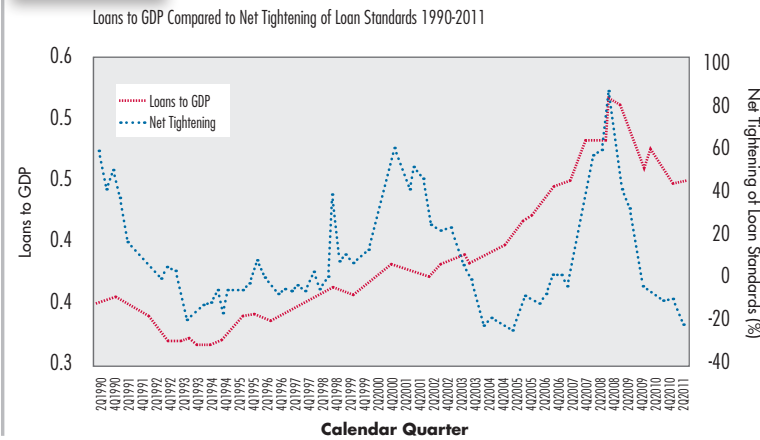
William Keeton of the Federal Reserve Bank of Kansas City<sup>6</sup> described a temporal sequence in which increases in loan growth should be preceded by an easing of credit standards and decreases in loan growth led by a tightening of standards. Relaxation of credit standards will be the first point of response when banks increase their willingness to lend. Loan growth will increase following this relaxation, as more borrowers meet the criteria for creditworthiness. Loan losses will occur last, as the impacts of lowered underwriting standards are felt.

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The ECH holds that loan growth is best understood when scaled to GDP: When the rate of loan growth exceeds economic growth, banks are lending to increasingly risky borrowers whose increasingly greater probabilities of default will eventually lead to loan losses. The ECH also holds that, in these periods of excessive lending, banks will weaken lending standards to attract borrowers and loan growth will outpace economic growth. In the ECH, loan growth is measured as total loans and leases of commercial banks published by the Federal Reserve divided

Figure 2

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by nominal GDP published by the Bureau of Economic Analysis.

The ECH also predicts a close correlation between loan growth, as measured above, and changes in underwriting standards. As loan growth and associated earnings fall below the rate of economic growth, lenders will loosen standards to attract borrowers. Eventually, when loan growth produces increases in risk, lenders will become more conservative and tighten underwriting standards. And when standards are tightened, loan growth slows.

Figure 2 shows the relationship between net loan tightening and the ratio of loans to GDP. Overall, there is a positive relationship—as predicted by the ECH—though the correlation is modest (correlation coefficient = 0.267). Close examination of Figure 2 reveals three distinct periods in which the relationships between these variables differ. In the first period, from 2Q:1990 to 2Q:2002, the relationship is strongly positive (correlation = 0.783),

and in the third period, from 3Q:2007 to 2Q:2011, the relationship also is strongly positive (0.867).

For both periods, banks tighten underwriting standards in response to loan growth that exceeds the rate of economic growth, and they loosen standards when loan growth lags the rate of economic growth. Keeton noted that, in the 1990s, there was a positive association of loan growth and easing of credit standards, with the fastest loan growth occurring when underwriting was relaxed and the slowest growth occurring when underwriting tightened.

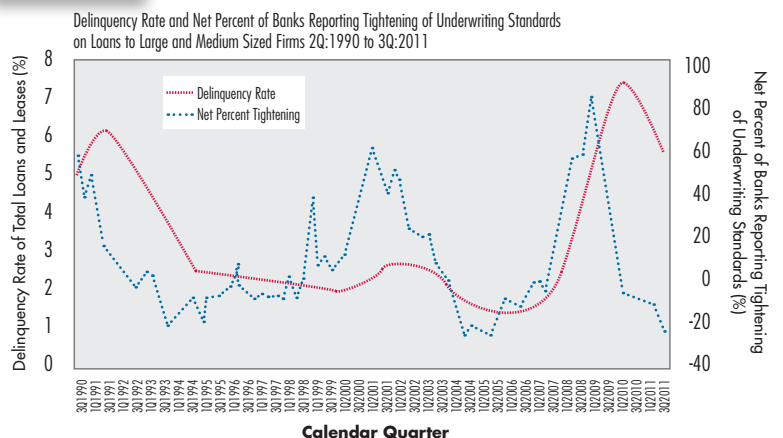
The relationship of loans to GDP and net tightening in the first and third periods is striking: It appears that loan officers tighten underwriting standards as loan growth exceeds that of the economy, as predicted by the ECH. The ECH holds that, when excess capital flows to riskier borrowers in riskier loans, senior loan officers respond by tightening underwriting standards.

It is important to note that the loans-to-GDP metric

Delinquencies rise quickly after loan underwriting standards are tightened and then tend to fall at a slower rate once loan standards are loosened.

Figure 3

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contains a lag, as the numerator is loans outstanding. Such loans have already been underwritten by banks and drawn by the borrowers. Instantaneous correlation of loans to GDP with changes in underwriting standards implies that net underwriting levels in one period are responses to loans underwritten and booked in earlier periods. Net tightening, then, is likely a response to perceived looseness in the loans made earlier and now on bank balance sheets, a dynamic predicted by the ECH.

The third period, from 3Q:2002 to 2Q:2007, has a decidedly different pattern. The relationship between loans to GDP and net loan tightening is negative. During this period, loan growth significantly outpaced the rate of economic growth, leading to unprecedented levels of leverage in the U.S. economy. Later, the 2007-09 financial crisis was associated with the greatest tightening of lending standards and contraction of liquidity in the capital markets in three decades, both of which led to dramatic increases in loan defaults and losses to banks. This anomaly

period in the middle of the 2000s will be examined later in this article.

### Relationship of Underwriting Standards to Loan Delinquencies and Loan Losses

Figure 3 plots the temporal patterns of delinquencies as reported by the Fed and the pattern of loan tightening. Delinquencies rise quickly after loan underwriting standards are tightened and then tend to fall at a slower rate once loan standards are loosened. Changes in the delinquency rate lag changes in underwriting standards by a half-year to two years.

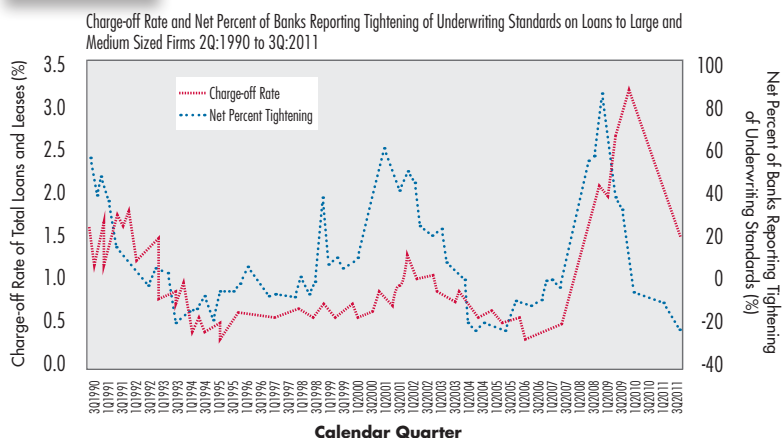
The temporal relationship of net loan tightening and charge-offs, as reported by the Federal Reserve, appears in Figure 4. As with delinquencies, charge-offs emerge shortly after there is tightening of underwriting standards, and a reduction in charge-offs occurs—with a longer lag—following easing of these standards.

These relationships are consistent with several predic-

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Figure 4

### U.S. Commercial Banking Industry



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tions of the ECH. Specifically, in periods of easy credit when underwriting practices are relaxed, banks extend credit to risky borrowers who may lack the capacity to service debt. When the banks tighten their underwriting practices, borrowers experience delinquencies on debt payments (Figure 3) that ultimately give rise to loan defaults and charge-offs by banks (Figure 4).

In this respect, easy credit is self-supporting since new loans pay for old ones when a borrower's own cash flow is inadequate. Such aggressive borrowing and lending is possible only if banks have loose or weak underwriting criteria. When standards are tightened, the inability to service debt becomes apparent in the form of payment delinquencies and loan losses. Relaxation of underwriting standards allows banks to improve current earnings at the expense of future earnings when the consequences of higher delinquencies and losses become apparent.<sup>7</sup>

Temporal lags are an important component of the ECH generally and the ebb and flow of underwriting standards specifically. This author has observed one- to two-year lags between capital flows and loan defaults and losses, attributing this relationship to the flow of excess capital to ever more risky borrowers in ever more risky loans—some of which eventually default.

Changes in underwriting dynamics are an important component of the ECH and to the temporal lags inherent in this hypothesis. Specifically, one- to two-year lags are apparent in the correlations of net underwriting to loan delinquencies (Figure 3) and losses (Figure 4), while changes in underwriting appear to be an instantaneous response to loan growth, as expressed by loans outstanding relative to GDP (Figure 2). Thus, changes in underwriting occur as predicted by the ECH.

As noted above, the loans-outstanding-to-GDP measure does not capture loans as they are being structured or before they are funded, which is the point at which changes in underwriting standards can be enacted. Rather, this metric captures loans made earlier and now currently booked, and it includes the time difference between the

underwriting decision and actual loan funding.

Given this implicit lag, the apparently instantaneous response of changing underwriting standards in response to loan growth undoubtedly reflects officers' response to the characteristics of loans already approved and booked. As a result, poorly underwritten loans can build up on banks' balance sheets even if the loan officers' response times to loan growth appear to be instantaneous (Figure 2). When credit crises emerge and banks withdraw credit by tightening underwriting standards, the loans first to default and produce losses likely are those underwritten in earlier periods of looser credit criteria.

## The Anomalous Period of the mid-2000s

Why did loan officers not tighten underwriting standards in the 2000s when loan growth suggested that capital was flowing to ever more risky borrowers? Several pieces of anecdotal evidence suggest a collective change in behavior during this period, in which loan officers either did not see the warning signals implied by rising loan growth or chose to ignore them.

From the end of 2003 to mid-2007, loan officers reported net easing of underwriting standards on multiple classes of loans (Figure 1). While net easing was not unprecedented (consider the mid- and late 1990s, for example), the duration and magnitude of easing in the mid-2000s were unmatched. No other period had as much easing of underwriting standards for as long.

Fitch Ratings published several studies indicating that, from 2004 to 2006, there were declines in the number of leveraged commercial loans that had coverage covenants or leverage covenants, and there was a rise in the number of so-called covenant-lite<sup>8</sup> loans. According to Fitch, the very low level of corporate defaults in this period contributed to this decline in structural protections in leveraged loans, clearly a case of "disaster myopia." Since 2007 and the sharp reaction to elevated delinquencies, defaults, and losses, lenders have moved away from covenant-lite loans and to more traditional covenants.<sup>9</sup>



The 2004-07 period also was notorious for the dramatic relaxation of underwriting standards on loans to individuals, especially mortgages. The consequences are still being felt in nationwide foreclosures and loan losses.

Indeed, this was a period of “irrational exuberance,” when investors’ appetites for risky assets reached unprecedented levels and there was a belief that home prices couldn’t fall. The normal feedback process of loan officers responding to excessive loan growth by tightening underwriting standards did not occur. As John Weinberg of the Federal Reserve Bank of Richmond<sup>10</sup> noted: “Lenders can take on excessive risks in a lending euphoria that skews individuals’ evaluations of credit quality.”

Since the broader market believed that “this time it’s different” in the mid-2000s, it would have taken a very strong and independent loan officer to tighten underwriting criteria when peers would not. To do so would have rejected conventional thinking and reduced income on that officer’s lending portfolio. Apparently, as Figure 2 shows, there were few such officers, even though loan growth was signaling that contrarian—and prudent—behavior was warranted.

## Conclusion

Underwriting standards reported by senior loan officers at U.S. banks exhibit pronounced cycles, with easing of the standards generally occurring when the growth of loans outstanding exceeds the rate of economic growth and the tightening of the standards occurring with contractions in loans to GDP.

Consistent with the excess capital hypothesis, excess bank-supplied capital flows to risky borrowers whose self-generated cash flows often cannot service existing or new debt. Such lending can occur only if banks relax their lending standards and create very liquid markets. When lenders tighten underwriting criteria, markets become illiquid and borrowers cannot service their debt. Delinquencies on loan payments rise and some delinquencies result in loan defaults and losses to the banks.

This article provided new evidence on the close correlation of loan growth and changes in bank underwriting standards, including the period covering 2000 to today, as well as the correlations between changes in underwriting standards and both loan delinquencies and loan losses. These results are consistent with the arguments of the ECH.

Temporal lags in the process of approving loans and funding them mean that even if loan officers appear to

modify underwriting standards instantaneously with the industry-wide growth in loans—as they do under most historical circumstances—poorly underwritten loans can build up on bank balance sheets and manifest themselves as delinquencies and losses when banks withdraw capital in credit crises by tightening underwriting standards.

Notably, the mid-2000s was a period in which loan officers did not respond to the traditional signals of compromised lending standards with tightening of their own underwriting. The result was a rapid expansion of lending and of bank balance sheets even as the loans being made were of ever weaker underwriting (for example, covenant-lite) to borrowers whose repayment capacity was ever weaker. The result was a credit crisis from 2008 to 2010 for which the only precedent was the Great Depression. ❖



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## Notes

1. The excess capital hypothesis is outlined in a series of papers by the author. Please contact him for references and reprints.
2. Please contact the author for citations of these earlier studies.
3. Raghuram Rajan of the University of Chicago published an important paper on the reasons why credit policies at banks fluctuate over time even to the point of economically irrational decisions. See <http://faculty.chicagobooth.edu/raghuram.rajan/research/papers/fluct.pdf>.
4. See footnote 3 above.
5. See <http://www.federalreserve.gov/boarddocs/SnloanSurvey/201111/default.htm>.
6. Keeton, W. R. “Does Faster Loan Growth Lead to Higher Loan Losses?” Federal Reserve Bank of Kansas City *Economic Review* (Second Quarter 1999): 57-75.
7. See footnote 3 above.
8. Covenant-lite loans are those with fewer and less stringent limitations on collateral, payment terms, and income levels of the borrower. Such loans often remove the requirement to report and maintain ratios for loan to value, leverage, and earnings before interest, taxes, depreciation, and amortization.
9. Researchers at the Wharton School of the University of Pennsylvania have investigated the cyclical nature of loan covenants as well as the broader cyclical patterns of risk perception known as “disaster myopia” and “disaster magnification.” Charles Whitehead of the Cornell University Law School has published an important paper on the temporal cyclicity in loan covenants. Contact the author of this article for more information.
10. Weinberg, J. A., “Cycles in Lending Standards?” Federal Reserve Bank of Richmond *Economic Quarterly* 81, no. 3 (1995): 1-18.

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