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**Article**

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CESifo Forum

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*Suggested Citation:* Eichengreen, Barry (2008) : Origins and Responses to the Current Crisis, CESifo Forum, ISSN 2190-717X, ifo Institut für Wirtschaftsforschung an der Universität München, München, Vol. 09, Iss. 4, pp. 6-11

This Version is available at:
https://hdl.handle.net/10419/166334

# Origins and Responses to the Current Crisis

Barry Eichengreen*

Nearly two years after the outbreak of the credit crisis (which can be dated to March 2007, when major losses were announced by the US subprime-based investors Accredited Home Lenders Holding and New Century Financial), key issues remain to be resolved. At the most basic level the questions are two. What caused the crisis? And in light of one's answer to this first question, what should be done to minimize the risk of repetition if not of identical events then of something similar?

To say that these questions remain to be answered is not the same as saying that there has been a shortage of attempts. Standard operating procedure starts by rounding up the usual suspects: unethical mortgage brokers, greedy bankers, naïve homeowners, and ill-informed investors. Lists focusing less on individuals than mechanisms emphasize agency problems between brokers and banks, the originate-and-distribute model, excessive leverage and short-term funding, the perverse incentives created by executive compensation practices, conflicts of interest within the rating agencies, permissive monetary policies and even high Chinese savings rates. These long lists of causes lead to correspondingly long lists of reforms: regulate mortgage brokers, rating agencies, and executive compensation; force banks to keep a participation in any securities they originate; require banks to hold more capital; revisit whether monetary policy should respond to credit booms and asset bubbles; and revalue the *renminbi*. This of course is only a very incomplete summary of a vast and rapidly-growing literature.

The limitations of this standard operating procedure will be apparent. However successful it is at pinpointing the immediate causes of the crisis, it fails to identify the deeper conditions that allowed those immediate causes to arise. While there is no question that investment banks and other financial institutions relied excessively on leverage and short-term funding, for example, the deeper question is how they came to do so and why such practices were so freely allowed. Similarly, while there is no disputing that relying on self-regulation in the form of banks' internal models of value at risk and commercial credit ratings meant inadequate regulation, the deeper question is how this belief in the efficacy of self-regulation was allowed to develop. Failing to inquire into deeper forces may lead to regulatory reforms that address symptoms rather than fundamental causes, allowing those causes to again manifest themselves in the future in different but equally destructive ways.

A more parsimonious way of putting the point is: if the causes of the crisis are so obvious in retrospect, then why did so many smart people fail to appreciate their gravity prior to the event?

## Major causes

At the most fundamental level, the causes of the current crisis go back to the Great Depression of the 1930s.[1] A factor contributing to financial problems in that period, in conventional analysis, was conflicts of interest between the commercial- and investment-banking arms of large financial conglomerates. It was the tendency for the investment-banking division run by individuals with high risk tolerance to gamble the funds of small retail depositors, in this view, that led to the bank runs and failures that converted a garden variety recession into the Great Depression.[2] Whether or not this diagnosis is accurate is disputed.[3] But, matters of historical accuracy notwithstanding, for present purposes this dispute is beside the point. The point is that the diagnosis led

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[1] For some authors, including present company, this would seem to be the *locus classicus* of all things economic.
[2] The Pecora Commission established by the US Senate Committee on Banking, Housing and Urban Affairs alleged a number of specific conflicts of interest, such as the tendency for banks to underwrite questionable securities in order to pay off their own bad loans. The obvious irony implicit in this analysis is that the roots of the current crisis lie not merely in today's incentive problems but in incentive problems that arose in the 1920s.
[3] See White (1986) and Kroszner and Rajan (1994, 1997).

to the Glass-Steagall Act separating investment and commercial banking and to tight regulation of the financial services industry. Without access to retail deposits and with money market instruments tightly regulated, investment banks funded themselves using their partners' capital and could therefore be placed outside the financial safety net.

Tight regulation and populist posturing were understandable reactions to the financial disaster that was the Great Depression. But as memories of that episode dimmed, the advantages of financial markets and financial innovation acquired more weight in policy discussions. In the United States the two critical events marking this trend were the deregulation of commissions for stock trading in the 1970s, the removal of Regulation Q placing a ceiling on interest rates on retail deposits in the 1980s, and the elimination of the Glass-Steagall restrictions on mixing commercial and investment banking in the 1990s. In the days of fixed commissions, investment banks could make a cushy living booking stock trades for their customers. Deregulation meant more competition, entry by low-cost brokers like Charles Schwab, and thinner margins. The elimination of Glass-Steagall then allowed commercial banks to encroach on the investment banks' other traditional preserves.[4] Forcing commercial banks to compete for deposits on price in turn left them no choice but to pursue these new lines of business.

In response, investment banks, in order to survive, were forced to branch into activities like originating and distributing collateralized bond obligations (investment-grade bonds backed by pools of junk bonds), whose market collapsed in the second half of the 1980s. Next they developed asset-backed securities and mortgage-backed securities, which gained a clientele in the 1990s. They utilized more leverage, funding themselves through the money market, to sustain their profitability. Commercial banks, now paying interest on deposits, were anxious to put their overnight money to work; this rendered them responsive to the investment banks' requests for short-term funding. Thereby arose the first set of causes of the crisis: the originate-and-distribute model of securitization and the extensive use of leverage.

It is important to note that these were unintended consequences of well-motivated policy decisions. It is hard to defend rules mandating price fixing in stock trading and placing ceiling on deposit rates. The deregulation of commissions allowed small investors to trade stocks more cheaply, which made them better off, other things equal. Similar arguments can be made about the removal of ceilings on interest on retail deposits. But other things were not equal. Investment banks, which were propelled into riskier activities by these policy changes and tightly connected to other financial institutions by the interbank market, remained outside the regulatory net. Allowing commercial banks to branch into new activities outstripped the capacity of regulators to keep pace, especially when budgetary imperatives and ideology left the regulatory agencies starved of resources. A fragmented regulatory regime suitable for a segmented financial-services industry became increasingly inadequate as the sharp lines between commercial banking, investment banking and other financial institutions were erased.

One can imagine how, with sufficient time, many of these problems would have been addressed. Well before the gravity of the crisis had become apparent, US Treasury Secretary Henry Paulson tabled a plan for reorganizing and consolidating supervision and regulation of the country's financial system. One can similarly imagine that, sooner or later, federal insurance would have been extended to money-market mutual funds, and investment banks would have been brought under the regulatory umbrella. But changes in regulatory practice take time. At the most basic level the subprime crisis resulted from the tendency for financial normalization and innovation to run ahead of financial regulation.

Similarly, eliminating Glass-Steagall's restrictions on mixing investment and commercial banking was a fundamentally sensible choice. Conglomeratization allows financial institutions to better diversify their business. Combining with commercial banking allows investment banks to fund their operations using a relatively stable base of deposits rather than relying on fickle money markets. This model has proven its viability in Germany and other European countries over a period of centuries. These advantages are evident in the United States even now, with Bank of America's purchase of Merrill Lynch and the decision of Goldman Sachs and Morgan Stanley to transform themselves into bank holding companies and access deposits on the wholesale market or by purchasing regional banks.

[4] It was not only commercial banks of course, but also insurance companies like AIG that did the encroaching.

Again, however, the problem was that other policies were not adapted to the new environment. Conglomeratization takes time. In the short run, investment banks were allowed to lever up their bets. They remained wholly outside the purview of the regulators. As self-standing entities funding themselves short-term, they were vulnerable to illiquidity and interruptions to their funding. A crisis sufficient to threaten the entire financial system ultimately precipitated the inevitable conglomeratization. Presumably there was a better way.

Another element in the crisis was the consumer spending boom in the United States and the resulting domestic and international imbalances. The Bush Administration cut taxes upon taking office, resulting in government dissaving. The Federal Reserve cut interest rates in response to the 2001 recession. All the while the financial innovations described above worked to make credit even cheaper and more widely available to households. This of course is just the story, in another guise, of the subprime, negative-amortization and NINJA mortgages pushed by subsidiaries of the like of Lehman Brothers. The result was increased US consumer spending and the decline of measured household savings into negative territory.

What should have been done about this continues to be disputed, even with the benefit of hindsight.[5] Some say that the Fed should have reversed its low interest rates more rapidly in order to damp down the lending boom and consumer-spending binge or that the Congress should have raised taxes to rein in the twin deficits. But either response would have slowed and in the worst case interrupted recovery from the 2001 recession. The appropriate response to ill-advised lending and unsustainable credit expansion was more vigorous regulation of the financial institutions extending the lending and providing the credit. Financial problems are best addressed using financial instruments, macroeconomic problems using macroeconomic instruments. But in this instance more vigorous regulation ran up against the obstacles enumerated above.

The other side of this story was financial internationalization. Much as with the separation of investment from commercial banking, the Great Depression led to the imposition of regulatory restrictions on international capital flows (not so much by the United States in this case as by other countries). The gradual relaxation of those restrictions, which was another logical reaction of policy makers as memories of the Great Depression faded, and which picked up speed in the 1990s, is a well-known tale. The point here is that by facilitating US dependence on foreign finance and feeding the country's credit boom, it helped to set the stage for what followed.

The other element helping to set the stage for the crisis was the rise of China and the decline of investment in Asia following the 1997–98 crisis. With China saving nearly 50 percent of its GNP, all that money had to go somewhere. Much of it went into US treasuries and the obligations of Fannie Mae and Freddie Mac. This propped up the dollar. It reduced the cost of borrowing for Americans, on some estimates, by as much as 100 basis points, encouraging them to live beyond their means.[6] It created a more buoyant market for Freddie and Fannie and for financial institutions creating close substitutes for their agency securities, feeding the originate-and-distribute machine.

Again, these were not exactly policy mistakes. Lifting a billion Chinese out of poverty is arguably the single most important event in our lifetimes, and it is widely argued that the policy strategy in which China exported manufactures in return for high-quality financial assets was a singularly successful growth recipe.[7] Similarly, the fact that the Fed responded quickly to the collapse of the high-tech bubble prevented the 2001 recession from becoming worse. But there were unintended consequences. Those unintended consequences were accentuated by the failure of US regulators to tighten capital and lending standards when abundant capital inflows combined with loose Fed policies to ignite a credit boom. They were aggravated by the failure of China to move more quickly to encourage higher domestic spending commensurate with its higher incomes.

Now we are paying the price. As financial problems surface, a bloated financial sector is being forced to retrench. Some cases, like the marriage of Bank of America with Merrill, are happier than others, like Lehman. But either way there will be downsizing

[5] This, of course, is simply the debate over the US contribution to the problem of global imbalances and what if anything should have been done about it.

[6] See Warnock and Warnock (2006).

[7] Assuming that the financial assets in question are indeed high quality – more on this below.

and consolidation of the financial-services industry. Foreign central banks are suffering capital losses on their US treasury and agency securities. As the People's Bank of China and other central banks absorb losses on their holdings of US treasury and agency securities, they will question whether the United States is properly regarded as a supplier of high-quality financial assets.[8] The Bretton Woods II model where China trades high-quality manufactures for high-quality US financial assets will lose its appeal.[9] Capital flows to the United States will diminish. The US current account deficit and Asian surplus will shrink. US households will have to begin saving again. A lower dollar will enable the United States to export more merchandise, in turn reconciling its balance of payments with the more limited availability of foreign financial capital. All this is of a piece. The shame is that it took a recession and full-blown credit crisis in the United States to bring about the inevitable adjustment.

At a fundamental level, then, the crisis was made possible by policies of liberalization, domestic and international, that – however well intentioned – allowed financial innovation in the form of new products (complex derivative securities) and vehicles (conduits and structured investment vehicles) to outpace supervision and regulation. But other innovations in the realm of risk management worked in the same direction. In particular, the development of mathematical methods designed to quantify and hedge risk encouraged commercial banks, investment banks and hedge funds to use more leverage. They encouraged their counterparties to provide it. They encouraged everyone to believe that the additional leverage was safe, since they now possessed rigorous techniques for managing it. These elaborate models, overseen by Ph.D.'s in finance, could not be maintained in-house by every financial institution, but they were extensively utilized by large ones, notably the leading investment banks. Not incidentally it was these institutions that utilized the most leverage and relied most heavily on sophisticated derivative instruments to manage their risk.

The problem was that these models were estimated on data from periods of low volatility and, typically, relatively short intervals, since the instruments whose returns were being modeled had existed for only a relatively brief period of time.[10] Rare events like a sharp drop in housing prices were outside the sample and not captured by the model. Institutional investors convinced themselves on this basis that their practices were safe. They convinced their counterparties. They convinced their regulators, who allowed them to use their own models when deciding how much capital to hold to provision against risk.[11]

All the while, as my colleague Robert Anderson puts it, institutional investors were incurring very large contingent liabilities that would come due in the event of that sharp fall in housing prices or another similarly rare occurrence not included in the sample period.[12] A proper model would have forced these firms to book their contingent liabilities. Vigorous regulation would have required them to provision against them. Forcing firms to book and provision against those liabilities would have provided incentives to avoid excessive leverage.

The same story can be told about liquidity risk. Insofar as investors modeled the risks of relying on short-term funding and incurring maturity mismatches at all, they did so using data from normal times, not from those rare occasions when liquidity dried up. As a result, institutions held inadequate liquidity to guard against disruptions to the supply of short-term funding. This problem first hit Northern Rock, a British building society, in the late summer of 2007, but it eventually infected the entire US investment banking industry.

The other point at which financial engineering came into play, also emphasized by Anderson, was in fostering the neglect of counterparty risk. The rocket scientists designed credit default swaps and other complicated insurance contracts that reduced the perceived need to provision by fostering the impres-

[8] This is the explanation for global imbalances modeled by Caballero, Fahri and Gourinchas (2008).
[9] See Dooley, Folkerts-Landau and Garber (2003).

[10] This created the temptation to use returns on other assets to model the behavior of new ones. For example, the rating agencies used their accumulated data and modeling experience in rating corporate bond defaults to predict defaults on complex derivative securities backed by mortgages. See Mason and Rosner (2007).
[11] Here we academics have something to answer for to the extent that we trained our students and encouraged our consultancy customers to take our models literally.
[12] The problem was not merely the truncated and unrepresented nature of the sample but also misspecification of the model itself (specifically, the tendency to attach unrealistically low probabilities to extreme outcomes, also known as "tail risk"). Why this was a problem is a topic for another day. One explanation would focus on the limitations of the underlying theory. Another would emphasize incentive problems within the banks constructing their models (specifically, the incentive for staff to understate tail risk in order to minimize the capital that had to be put aside by management – higher capital requirements squeezing profits and bonuses).

sion, reflected in models of value at risk, that investors could shed unwanted risks. But insurance is only as good as the insurer. It was eventually discovered that so-called monoline insurance companies like MBIA and Ambac, which had seemed adequately capitalized in good times, had inadequate resources with which to make good on their insurance contracts when the housing market turned down.[13] The models had not incorporated this counterparty risk. This gap encouraged institutional investors to neglect it when making their allocation decisions.

Moreover, the fact that the notional value of credit default swaps was a large multiple of the value of the underlying bonds created the danger of a domino effect if one large issuer of default swaps was to fail. These swaps were traded over the counter with limited liquidity and in the absence of a clearing mechanism. This created the danger that the default of one counterparty in this market might have a domino effect. This was why Treasury and the Federal Reserve were reluctant to allow Bear Stearns to fail in March 2008. It was part of what made Lehman Brothers' failure in September 2008 so disruptive. In this case, it would appear, the authorities underestimated the threat from the credit default swap market. It was what then forced the US government to step in and rescue American International Group (AIG).

**Prescriptions for reform**

The preceding is by no means a complete or comprehensive explanation for the crisis. Other authors would emphasize other factors, and they would have some justification.[14] The selective emphasis here has the advantage of highlighting the deeper factors that gave rise to the imprudent practices highlighted by other commentators. By focusing on factors that have changed in recent years, it helps us understand why the crisis erupted when it did and took its particular form. And by emphasizing more fundamental problems, it leads directly to prescriptions for reform.

A first prescription is to revisit the Basel II revision of capital adequacy standards for internationally active banks. Two central pillars of Basel II are banks' internal models of value at risk and commercial credit ratings for banks lacking internal models, both of which have been revealed as fundamentally flawed. Commercial credit ratings are unreliable under the best circumstances, and in any case existing circumstances are less than optimal: the rating agencies suffer from significant conflicts of interest.[15] Greater reliance on internal models was designed to capture the implications of the correlations between different assets for risks to the balance sheets of commercial banks. Basel I had placed different assets in different risk buckets and mechanically assigned capital requirements to each bucket, ignoring the correlations between them. It follows that going back to Basel I would throw the baby out with the bathwater.

A better solution would be to compute capital requirements in two ways – an old-fashioned Basel I way where required capital was taken as a simple fraction of the value of assets (and thus not even distinguish different risk buckets), and the new-fangled Basel II way where required capital was a fraction of value at risk as computed on the basis of complex models – and to make banks hold the higher of the two. The Swiss National Bank has proposed requiring the banks under its jurisdiction to hold capital amounting to a fraction of assets, pure and simple. The present proposal is a generalization of their idea.

A second implication is that capital requirements should reflect the liquidity of funding and the potential illiquidity of assets and not just estimates of the volatility of asset returns. Even financial institutions with relatively conservative portfolios have experienced grave difficulties as a result of their inability to renew short-term funding. This has given rise to discussion of the desirability of liquidity requirements to supplement capital requirements. A more straightforward response would be to generalize the

[13] This was another case where regulatory decisions taken in the past, under different circumstances, helped to set the stage for the crisis. The monoline insurance industry arose in the 1980s when defaults on municipal bonds caused the regulators to conclude that regular ("multiline") companies writing mom-and-pop insurance policies should not be allowed to dabble in riskier activities like bond insurance. This decision led to the growth of monoline insurers to fill the gap. At the time no one had reason to anticipate the explosive growth of sub-investment-grade debt securities of all kinds, many of which had to be wrapped with bond insurance in order to be eligible for inclusion in the portfolios of pension funds and other institutional investors with restrictive covenants, or how the demand for such insurance would outstrip the capitalization of the monolines – which would in turn make use of mechanical models of value at risk in order to gauge their own capital needs.

[14] Some of my own writings do the same, see Eichengreen (2008).

[15] Changes in their fee structure, as demanded by Andrew Cuomo, the Attorney General of New York State, where the agencies do much of their business, can go some way toward alleviating these conflicts. Similarly, freer entry into the industry can ratchet up competitive pressure and encourage the adoption of better practices. My views of the rating-agency problem are in Eichengreen (2008).

Basel II capital adequacy ratios to incorporate a weight for liquidity risk.

Emphasizing counterparty risk as a factor in the crisis also suggests that minimum capital requirements should be set not on the basis of the riskiness of a bank's individual assets and liabilities but with the potential impact of its difficulties for the rest of the financial system in mind. Capital requirements should reflect implications for systemic stability, not just implications for the subject institution taken in isolation. This suggests that banks' own internal models, which understandably focus on the actual and prospective stability of the individual institution, are not the best basis for this calibration. The model that regulators develop and use may want to raise required capital ratios in periods when bank balance sheets are expanding rapidly, creating additional risks for systemic stability.[16]

This diagnosis emphasizing counterparty risk also points to the desirability of clearinghouse arrangements as an alternative to the over-the-counter market. Transactions over the counter are only as reliable as the counterparty. In contrast, an organized exchange or clearinghouse can net transactions immediately and multilaterally, reducing the danger of cascading defaults owing to the default of a particular market participant. Authors like Cecchetti (2007) have been arguing the case for exchange-based trading for some time. Recent events support their position.

The question is then why exchange-based trading of derivative securities has developed so slowly. One explanation is path dependence: the over-the-counter market developed first and therefore remains more liquid and attractive. A second explanation is that market participants prefer variety over liquidity: exchange-traded derivatives would be more liquid, but exchange-based trading would encourage uniformity (it would be hard to organize liquid exchange-traded markets in a wide variety of purpose-tailored instruments). A third explanation is that the big broker dealers have a proprietary interest in the over-the-counter market. All three explanations are consistent with the view that a policy intervention to encourage exchange-based trading (the application of tax incentives, for example) would not be inappropriate.

[16] A specific proposal for countercyclically required capital ratios to restrain credit booms is Goodhart and Persaud (2008).

Finally, this diagnosis of the crisis, emphasizing the removal of the Glass-Steagall Act, the tendency for commercial banks and insurance companies to encroach on the traditional preserves of investment banks and the tendency toward financial conglomeratization, points to the need for consolidated regulation. Having different agencies regulate different activities when those activities are undertaken by a single entity is an enticement for regulatory arbitrage. It may also prevent any single regulator from fully appreciating the risks to systemic stability (or even to the stability of the individual institution itself) of the entire range of activities in which the subject institution is engaged. Ironic as it may seem, this suggests that Henry Paulson, who tabled a proposal for consolidating regulation of the US financial services industry in the winter of 2007/8, may have been pointing in the right direction.

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