What does the global financial crisis tell us about Anglo-Saxon financial capitalism?

Iain Hardie
Politics and International Relations
University of Edinburgh
15A George Square
Edinburgh
EH8 9LD
Iain.Hardie@ed.ac.uk
Corresponding Author

Sylvia Maxfield
Simmons School of Management
Simmons College
300 The Fenway
Boston, MA 02215
Sylvia.maxfield@simmons.edu

Abstract: By the traditional categories that dominate the varieties of capitalism literature, the UK became more bank-based while the US continued to illustrate, better than any other case, the traditional market-based model. These differences, alone, question the idea of a single Anglo-Saxon model of finance. Both the US and UK are clear examples of market-based banking, but with significant differences. We first highlight these differences. Then, drawing from the financial economics literature we consider, within these systems, the nature of exchange, risk concentration, and liquidity risk, to explore the two countries’ experience of the financial crisis and highlight vulnerabilities of the market-based banking model. Market-based banking is probably here to stay and, at its worst, poses significant collateral risk to non-financial sector stakeholders. At its best, it is hardly the patient capital of bank-based capitalism but, well regulated, could enhance credit and liquidity. Nonetheless, recent regulatory developments do not augur well.
Introduction

Leaving a G-20 Summit in the wake of the 2008 global financial meltdown, French President Nicolas Sarkozy reported that the world “had turned the page on the Anglo-Saxon model”. But what is the Anglo-Saxon model? Political economy scholarship largely takes it for granted. High stock market capitalization, dispersed shareholding, and a high proportion, relative to bank loans, of equity and bonds in corporate financing are all evidence of arms-length interactions and impatient capital in a ‘market-based’ political economy. However, as John Zysman recognized (1983: 287), political economy literature ‘under-analyzes’ financial markets and any change within the market-based system. A detailed analysis of the US and British financial systems, supposedly quintessential Anglo-Saxon cases, suggests significant gaps between the varieties of financial capitalism literature, scholarship in financial economics, and the political economy of finance.

Recent work on the political economy of European finance illustrates the weakness of the traditional view of the UK as a market-based system (Hardie and Howarth 2010; Howell 2007). We extend that work by comparing and contrasting financial market characteristics in the UK and the US in the period leading up to the financial meltdown of 2007-2008. The introductory articles in this volume critique the base-line characterization of national financial systems in the varieties of capitalism literature, and use a more nuanced analysis of banking to conclude that both the UK and US are market-based systems, but with very significant differences both from each other and from the standard conception of market-based systems. We argue that in the nature of exchange, risk concentration and liquidity risk, the US and UK had few of the strengths generally associated with market-based systems, while taking on many of the weaknesses existing literature associates with bank-based systems. The consequences of a system centered on market-enabled credit provision offer an explanation of the crisis.

Variations in Market-Based Banking

Looking in particular at change since the 1990s, we show that the US can be seen in the traditional analysis as market-based, although with qualification. Bank assets to GDP in the US are the lowest of the countries studied in this special edition, and bank loans represent a lower proportion of company financing than in Europe or Japan. However, while closer than any other case to the ideal of capital market based finance, the evolution of the US financial system has moved it away from that ideal and toward market-based banking. The UK, in contrast, moved more towards a bank-based model as generally perceived. Most obviously, bank lending to UK
non-financial companies experienced dramatic growth, while equity financing has been negative (i.e., companies are repurchasing equity) and private bond markets remain small. For the UK banks since 2001, customer lending grew faster than their holdings of securities (Bank of England 2008a: 9), and since 1980, UK bank assets have increased approximately five times relative to the size of the UK economy, even excluding the banks’ large foreign currency assets (Miles 2009: 6). The British case in fact provides a clear example of market-based banking, as a result of the most market-based commercial banks among the countries explored in this volume.

National financial systems can vary first, according to which financial system institutions engage in the various market-based banking activities and second, in the relative preponderance of the different types of market-based banking activities. Using the typology described in the introductory articles (see Table 1, [ ], this volume: [p.]), the UK’s financial system is a clear example of market-based banking dominated by large commercial banks. A notable change in the UK financial system in the decade before the financial collapse is that financial institutions that were primarily traditional-banking focused commercial banks became increasingly market-based. In contrast, the main change in the US financial system was the increasing dominance of parallel banks, including a range of US institutions that proved central to the financial crisis: the government mortgage finance agencies, Fannie Mae and Freddie Mac; investment banks, including Lehman and Bear Stearns; and certain money market mutual funds.¹ These parallel banks grew in the US much more than they did in the UK and they engaged heavily in market-based banking. While commercial banks in the US also saw growth in market-based banking, traditional deposit-based banking was not swallowed up in the wave of market-based commercial banking to the same extent as in the UK.

US “exceptionalism” is evident in lack of significant parallel banks in other countries considered in this volume, but is most notably evident also in the comparison between the two archetypal market-based systems, the US and the UK. The differences between the two systems, detailed in the next section, stem partly from regulatory history and national political culture. The centuries-old suspicion of national banking in the US protected smaller deposit-taking institutions, banks, savings and loans and thrift institutions. This accounts partly for the relatively

¹ We do not classify as parallel banks the insurance company AIG, or the monoline insurers. By providing credit insurance to market-based banking, AIG and the monolines were important facilitators (as, clearly, were the credit rating agencies), but not themselves engaged in banking. Not all money market mutual funds are parallel banks (for discussion of different types, see Pozsar et al. 2010: 51). Those mutual funds that engage in banking, but are legally affiliated with commercial banks are shadow, not parallel banks.
low concentration of the US banking sector compared to the UK. But in the decade before the crisis upon which we focus here, US commercial banks were continuing to depart from history through their national expansion of retail banking, and the shift into investment banking permitted by waves of deregulation in the 1980s and 1990s. Overall, US commercial banks were becoming more like universal banks, and more market-based, but to a lesser extent than their UK counterparts. UK banks relied more heavily than US banks on wholesale funding even though wholesale funding (in the US case partly disguised by off balance sheet activities) in both cases rose. In the US, it was the growth of parallel banking, exemplified here by the investment banks, and of the facilitators of market-based banking (see note 1) that was most noteworthy in this period. This parallel banking remained insignificant in the UK, and UK market-based banking relied on largely American facilitators. Despite these contrasts between the two financial systems, both are examples of highly market-based banking systems with similar vulnerabilities in the crisis.

How the US and UK Illustrate Market-Based Banking

Both the UK and the US fall clearly within the ‘market-based banking’ model suggested in this special edition, and demonstrate the nature and variety of market-based banking. Despite their differences, they exhibit similarities and depict the blurring of capital and banking markets that occurs as market-based banking grows. These similarities illustrate the dissociation of financial function and financial institution, with implications for how financial system typologies are invoked in comparative political economy. Twenty years ago it was reasonable for a study of the political economy to assume that different types of financial institutions carried out different financial functions. For example, commercial banks made most of their profits from the spread between deposit and loan interest rates while investment banks made most of their money from underwriting/syndicating stock and bond offerings. In market-based banking systems financial institution and financial activities are less and less aligned (on changes in the sources of bank profits, see Ertürk and Solari 2007).

In market-based banking, various forms of banking entities intermediate, and rely heavily on funding from other financial institutions, rather than on household depositors. Many of the instruments that trade as a result of this new bank intermediation activity are derivatives bought and sold in markets very different from the public equity exchanges envisioned in the stereotypical capital-market based Anglo-Saxon financial systems, and which involve not a one-
off sale but an ongoing credit exposure to the counterparty. The system is prone to opacity, illiquidity, risk concentration and the information asymmetry problems of moral hazard and adverse selection to which all financial systems are prone (Bebczuk 2003).

The crisis of 2007-2008 shows how, in both the US and the UK, risk was increasingly concentrated on the creditworthiness of a small number of large financial institutions, as occurs in the stereotypical bank-based system. In the UK, this concentration was on the commercial banks. In the US, despite the promises of risk dispersion in a market-based system, much of this centered on the investment banks that are uniquely important to the US system, and on AIG. Furthermore, although the nature of exchange in these markets could potentially have some of the claimed relationship advantages of a bank-based system, in reality these advantages are not manifest when the relationship is between financial institutions. At the same time, the ‘originate and distribute’ model of banking, enthusiastically followed in both countries, undermined the relationship aspect of exchange between financial institutions and non-financial companies, undermining a key perceived advantage of the traditional bank-based system. Lastly, the cases both illustrate the nature of liquidity risk in a system of market-based banking, and that this risk is high.

The way the 2007-2008 financial crisis unfolded in the US and UK highlights a system where banks in particular, and the financial actors in general, intermediated between themselves – a system ‘feeding on itself’ (Trichet 2008) – in markets that were incomplete and therefore involved (negative) aspects of the relationship exchange traditionally associated with the bank-based, patient capital model, rather than the frictionless arms-length exchange of the impatient capital markets based system. Banks in the US and UK also became relatively disconnected from household savers and non-financial corporate borrowers, important players in the archetypal bank-based system. We conclude that, through their similarities and differences, the two cases illustrate a type that does not fit the classic capital and bank-based distinction and suggest a need to reframe the characteristics used to identify different types of national financial systems and their relevance for scholarship on varieties of capitalism. Furthermore, our analysis raises significant concerns regarding the likely development of market-based financial systems.

**Varieties of Market-Based Finance: Highlighting US-UK Differences**

Comparison of the US and UK financial systems highlights enough difference to question a common Anglo-Saxon model, in both the institutions involved in market-based banking and their

---

2 If credit risk is hedged (insured) via a Credit Default Swap, the buyer of the insurance pays a premium to the insurer, and in exchange the insurer commits to pay out in the event of a default.
Financial Institutions Engaged in Market-Based Banking

The history of regulation and accounting practice led to significant variation in the institutional composition of the two systems. The changing distribution of assets in the US financial system over the past several decades fits the prototype Anglo-Saxon model in the sense that the assets of savings and commercial banks and insurance companies have fallen. In the UK, in contrast, most noteworthy is the dramatic growth of commercial bank assets, absolutely and relative to other financial system assets. Most notably for a varieties of financial capitalism approach, since 2000, UK bank lending to non-financial companies has increased considerably, while equity has been repurchased and bond financing growth limited. The UK therefore apparently became, in the period most usually associated with out-of-control markets, more bank based within the traditional typology.

While in the UK bank financing of the economy increased dramatically, in the US a range of institutions usurped the commercial banks’ role: the rise of what we have termed here (following Adrian and Shin 2010) parallel banking. Of most relevance to this article, investment bank assets reached 30 per cent of those of commercial banks (Gorton and Metrick 2010: 11). Also, money market mutual fund assets were far larger relative to bank deposits than in other countries (IMF 2010a: 69). Despite the institutional differences, we see high levels of market-based banking. In the US, this involves market-based commercial banks (including shadow banks) and parallel banks; in the UK it involves commercial banks that are more market-based than their US counterparts (again including shadow banks), but parallel banks are small. We discuss next the activities carried out by market-based commercial banks in the two countries, and also by parallel banks in the US.

Market-Based Banking Activities

This special edition has argued that any complete picture of market-based banking must recognize the extent to which lending is the result of a number of different activities. Loans are sold to the market, either directly or via securitization. They are also sold to shadow banks, resulting in their being off balance sheet (in the US) or enjoying favourable capital treatment (in the UK) if, and only if, market financing is available via the ABCP market. Loans that are
retained on the balance sheet are financed in the wholesale markets, and the credit risk is hedged using CDS. The two countries vary in the extent of these activities.

**Selling of Loans.** In no country was the 'originate and distribute' model of banking - making loans with the intention of selling them - more enthusiastically practiced than in the US, be it in the US$500 billion loan trading market (no trading figures exist in the UK), or in a securitization market with outstandings (including through the parallel banks) equivalent to 70 per cent of GDP, far in excess the next highest country, the UK, at 25 per cent.\(^3\) Overall, securitization supported 28 per cent of outstanding credit in the US, twice the UK figure (IMF 2010b: 320; on link between securitization and credit supply, see Jiangli and Pisker 2008). The availability and pricing of these loans was determined by the market. In terms of a reliance on selling loans to facilitate further lending, it would appear that the US banks were more reliant on this form of market-based banking than their UK counterparts. However, much of this distribution was illusory, assets being retained on the balance sheet. Rather than originate and distribute, this was 'originate, rate and relocate' (Alexander, Eatwell, Persaud and Reoch 2007), as loans were securitized into highly rated bonds that were then retained by the banks. Furthermore, even though they are not really transferring risk, the banks acted as if they were and were therefore less inclined to monitor borrowers as was done in the traditional bank-based system.

**Shadow Banking.** Shadow banking in the US similarly appeared to involve removing assets from the balance sheet, but, as discussed above, it was temporary. In the UK, assets generally remained on balance sheet, but with favourable capital treatment (Basel Committee on Banking Supervision 2009). The primary motivation for this activity was the reduction of the capital needed to support lending (Acharya, Schnabl and Suarez 2010b) and increase profitability (Landman, Peasnell and Shakespeare 2006). If commercial paper market funding disappeared (as it did in August 2007), the banks experience 'involuntary balance sheet expansion'. The lending is therefore again market-based. The largest component of this shadow banking was Asset Backed Commercial Paper ('ABCP'). ABCP sponsorship by US entities (predominantly commercial banks) exceeded US$300 billion, more than twice the UK figure (all by commercial banks\(^4\)). However, UK banks were disproportionately active in the risky programmes (Arteta, Carey, Correa and Kotter 2008), and US bank activity relative to GDP (a key determinant of the fiscal

---

\(^3\) End 2007. Source: European Securitization Forum.

\(^4\) UK banks' liquidity support to ABCP programmes reached the equivalent of 35 per cent of their lending to domestic non-financial companies (Bank of England 2007: 33).
impact of any support for the banks) was lower. Shadow banking was important in both countries, both to financing before the crisis - US and UK assets were nearly half of the assets of ABCP programmes that totaled US$1.3 trillion (Acharya et al. 2010b) - and to problems after. However, relative to the size of the respective economies, US and UK bank sponsorship of ABCP was far behind that by Belgian and especially Dutch banks.

The ABCP market collapsed very early in the crisis. Liquidity guarantees provided by banks were triggered, and banks also felt the necessity to support ABCP vehicles for reputational reasons (Basel Committee on Banking Supervision 2009: 3). Despite the poor quality of the assets bought by some ABCP programmes, commercial paper investors made few losses: of ABCP outstanding in July 2007, only 2.5 per cent defaulted by December 2008. Banks meanwhile faced losses estimated at between US$68 and 204 billion (Acharya et al. 2010b).

**Wholesale Funding.** In terms of a reliance on selling assets, either permanently, temporarily or partially, therefore, US commercial bank lending would appear to be more market-based than the UK. However, the more dramatic difference between the two countries’ commercial banks lies in the nature of funding of banks’ balance sheets: the loans that were not sold. As the introductory articles emphasized, increased reliance on wholesale funding has been a characteristic of banking systems, and is central to our conception of market-based banking. On this score the US and UK have not followed the same path pre-crisis. UK bank dependence on wholesale funding has (with the exception of HSBC) increased significantly as loan to deposits ratios rose, facilitating significantly increased bank lending. In the US, in contrast, the loan to deposits ratios of the commercial banks have remained stable. In the UK, customer deposits have made up roughly 50 per cent of total commercial bank funding compared, with the US where customer deposits have accounted for over 75% of total commercial bank funding sources (IMF 2010a: 67). The decline in deposits relative to loans in the UK reflects a shift to other sources of bank funding such as debt and security sales (Basel Committee on Banking Supervision 2008: 31-32). In the US, increased reliance on wholesale funding by commercial banks and other financial intermediaries was partially hidden in off balance sheet activities, revealed for example when Citigroup brought US$ 25 billion of such assets back onto their balance sheet in 2008 (Dugan 2010). By the end of 2007, all off balance sheet liabilities of US banks represented 193 per cent of total liabilities, compared to a still significant but far smaller 54 per cent in the UK, itself more than twice the figure in any of the major European economies (IMF 2009a: 15). Nevertheless, in
the financing of banks’ loans on the balance sheet, the UK commercial banks are more market-based.

**Differences in the US and UK Experiences of the Crisis**

These differences between the two countries’ financial institutions and bank activities had a number of implications for the two countries' experience of crisis. Both had high exposure to problems in the ABCP and securitization markets in August 2007. At this point, the heavily market-based Northern Rock, which relied on securitizations for over half its mortgage lending (Bank of England 2009: 17), failed. While the proximate cause was a run on deposits, the initial problem was the high exposure to wholesale funding. At this early stage the ABCP and securitization markets - and writedowns on subprime lending - pressured commercial banks in both countries, but the main problems were amongst the parallel banking institutions in the US (see below), including the collapse of Bear Stearns. After the intensification of the crisis with the collapse of Lehman, it was largely the extent, rather than primarily the composition, of UK banks' wholesale funding that made them particularly exposed. Figures 1 and 2 show commercial bank funding in the two countries.

**Figures 1 & 2**

Pre-crisis, short term funding (less than a year) peaked at 62.6 per cent of US commercial banks wholesale market funding (in 2005), compared to their UK counterparts 51.7 per cent in 2006, suggesting that the wholesale funding of the US banks was more exposed to market pressures. However, all wholesale (market) borrowing was both a lower proportion of US banks' overall funding - 26 per cent at end 2007 - compared to 52 per cent for the UK, and - an even more dramatic contrast given the relative sizes of the two economies - the absolute volume of wholesale borrowing was higher in the UK (over $4 trillion at end 2007) than in the US ('only' $2 trillion) (authors' calculations from IMF 2010a: 67). Furthermore, in the context of the financial crisis, in one particular area, UK banks were particularly exposed to market pressures: the US$ interbank market (McGuire and von Peter 2009). Market borrowing of US dollars by non-US banks was a particular source of contagion during the crisis, and UK banks cross-border borrowing from other banks approached the equivalent of half of UK GDP at end-2007, compared to less than 10 per cent for US banks.\(^5\) Much of this was overnight borrowing and subject to 'home bias' during the crisis.

\(^5\) Source for cross-border interbank borrowing: [http://www.bis.org/publ/qtrpdf/r_qa0806.pdf](http://www.bis.org/publ/qtrpdf/r_qa0806.pdf), table 9C.
The picture of apparently more traditional US commercial banks is balanced in any assessment of the market-based nature of US banking not only by off-balance sheet activities, but crucially by the activities of the parallel banks. We focus here on the investment banks. Lehman shows that investment banks bought bad assets, but the key issue with the parallel banks was their high dependence on the market borrowing. Figure 3 shows largest US investment banks’ funding (Bear Stearns and Lehman excluded after 2007. 60 per cent of US investment bank assets are covered).

Figure 3

The contrast with the commercial banks, both UK and particularly US, is marked. At the end of 2007, US investment bank funding was almost entirely wholesale; of that market funding, over US$ 3 trillion, 83 per cent, was short term. Short term here means very short term: the investment banks had ‘to roll over a large part of their funding on a daily basis (Brunnermeier 2009: 80). As figure 3 demonstrates, investment banks were (are) heavily exposed to the repurchase (‘repo’) market: the proportion of assets financed by overnight repos doubled between 2000 and 2007 (Brunnermeier 2009: 5).6 The repurchase agreement was like a checking account for institutional investors, with excess cash deposited overnight or for a week or more with an investment bank like Bear Stearns, for interest. In addition to paying interest Bear Stearns pledges collateral to back the cash deposit. Ideally the arrangement rolls over when the contract expires. If a repo borrower, in this example, Bear Stearns, faces difficulties, lenders are faced with the classic dynamics of a bank run in their incentive to seize and sell collateral first, and in the way their self-interested actions, by pressuring financial market prices, have negative consequences for other actors. As prices fall and volatility increases, for repo financing terms (interest charge for depositing cash with the repo borrower) using any financial asset as collateral (including US government bonds) increases (Committee on the Global Financial System 2010: 2).

Problems in the US repo market were more severe than the UK or Europe (Hördahl and King 2008: 38). Commercial banks, in the US or UK, were not as heavy users of repos (Gorton and Metrick 2010), but UK banks’ foreign currency repos exceeded £500 billion by end-2007 (12.8 per cent of foreign currency liabilities),7 and banks in both countries turned increasingly to

---

6 Approximately 70 per cent of repo activity by US bond dealers is overnight (Duffie 2010: 6).
7 Source: Bank of England Monetary and Financial Statistics, December 2008, Table 1.2. Available at www.bankofengland.co.uk/statistics/ms/2008/dec/index.htm, accessed 22 November 2010. January 2010 figures suggest around 10 per cent of this is probably within individual bank groups.
this market as sources of unsecured borrowing dried up (Committee on the Global Financial System Markets Committee 2010: 5). Once repo financing became prohibitively expensive or unavailable for previously financeable assets, firms such as Bear Stearns and Lehman could not continue to operate, and central banks were forced to provide financing to others.

US investment banks are an extreme example of market-based banking, and were clearly central to the crisis. Whatever the implications of lowering the barriers between commercial and investment through the repeal of Glass Steagall, other aspects of the Financial Services Modernization Act are more directly linked to the financial crisis. More pertinent is Glass-Steagall’s initial passing, when combined with the 2005 SEC decision to remove fixed leverage ratios for the investment banks (Blundell-Wignall, Atkinson and Lee 2008: 3), which allowed US investment banks to become huge players in the parallel banking that eclipsed traditional US bank credit. Risk became concentrated on these investment banks before the crisis, and it was as much these risks as the US housing market collapse that explains why the US suffered in the early stages (August 2007) of the crisis and then again with Lehman’s bankruptcy and AIG’s rescue.

The liabilities of the shadow and parallel banks peaked in the summer of 2007 at close to US$20 trillion, at that point approaching twice the liabilities of traditional banks, before a $5 trillion contraction (Pozsar, Adrian, Ashcraft and Boesky 2010: 4) that ‘reduced the financial system’s lending capacity by several trillion dollars’ (Acharya, Gale and Yorulmeyer 2010a: 3). Most significant in volume terms are the money market mutual funds, ‘the lifeblood of the shadow banking system’ (Pozsar et al. 2010: 50), whose assets exceeded bank deposits on the eve of the crisis (ibid.: 52), and whose activities are central to any understanding of the financial crisis. The US money market mutual funds’ need for short term investment opportunities precipitated change in both the US and UK financial systems by offering a plentiful source of wholesale funding for commercial, their shadow, and parallel banks. Many of these money market mutual funds were themselves shadow (if their support came from commercial banks) or parallel banks (if they were supported by non-commercial bank financial institutions). Problems at a parallel bank, Reserve Primary Fund, triggered problems across money market funds after Lehman’s collapse.

Vulnerabilities of Market-based Banking
Despite differences in institutional structure, we characterize both the US and the UK as market-based systems. However, central to understanding the financial crisis in the two countries (themselves clearly central to the global crisis) is the fact that the market is not typical of the classic Anglo-Saxon variety. Rather, it was significantly different in the nature of exchange, the institutional locus of risk, and, third and connected, the extent of liquidity risk. The standard differentiation of bank- and market-based financial systems draws clear distinctions based on these three indicators. In bank-based systems exchange is relational, in market-based systems it is arm’s length. In bank-based systems risk is concentrated in the solvency of financial institutions, in market-based systems it is dispersed in the solvency of non-financial firms. Bank-based systems are more vulnerable to liquidity crunches than market-based systems because of this risk concentration on financial institutions, while market-based systems disperse risk among non-financial institutions and offer more liquidity. These distinctions, and the standard distinctions in the varieties of financial capitalism literature, are summarized in Table One.

Table One

We argue that the market-based systems of the US and UK share characteristics associated with bank-based systems, but without the advantages. Exchange involving financial institutions is frequently relational, but without the positive implications of such exchange between banks and non-financial firms in the classic depiction of the Continental credit-based system. This is evident in the ‘originate and distribute’ banking model of the US and UK. Risk is not disbursed as in the archetypal market-based system, but in the market-based banking system illustrated by the UK and to some extent the US is concentrated in a small number of large financial institutions. Furthermore in this system liquidity risk is high. This raises questions for the possible outcomes of increasingly market-based corporate financing across financial systems generally.

At the heart of all three of these characteristics of financial systems are differences in information flows. Market-based systems require high transparency, and are embedded in legal and accounting standards environments that guide public and semi-public disclosure of information pertinent to the exchange. Such systems are expected to elicit and organize information for moderately decentralized consumption. In contrast, in bank-based systems, the financier and borrower can keep pertinent information relatively closely held, resulting in a tendency toward opacity.
Informational aspects of arms-length versus relational exchange are related to liquidity characteristics. In archetypal bank-based systems, bank leverage normally remains fairly low, constrained by government regulations and savers’ deposits. But liquidity is also relatively low, constrained by household deposits, in turn motivated by overall consumer wealth, interest rates and a variety of different kinds of government policies and social institutions. Liquidity is higher in the capital market based systems, constrained only by investor’s appetite for stocks and bonds. The informational efficiency of capital markets also helps support liquidity. ‘Informationally efficient’ capital markets easily illicit and centralize information. The liquidity and informational characteristics of such a financial system are mutually reinforcing, and liquid markets facilitate price discovery (Levine 1997).

Another important difference between the traditional system types concerns the locus of risk. In bank-based systems the first-order risk is bank solvency. Households trust their savings to banks in the form of deposits and banks are a primary source of financing for non-financial firms. Banks are the critical locus of risk. In market-based systems, in contrast, the primary locus of risk should be the nonfinancial firms in whom savers invest directly by purchasing bonds or stocks.

As the US and UK cases illustrate in the crisis, the nature of exchange, the locus of risk and liquidity characteristics of these market-based financial systems are not as the classic typology would predict. Exchange between financial market actors is relational, but without the advantages of relational exchange between a financial actor and non-financial company. In risk concentration and liquidity risk, the market-based systems of the UK and US appear closer to a bank-based than a market-based model.

The Nature of Exchange

In arms-length exchange, healthy markets need public trust in information accuracy. In such exchange transactions occur when price aligns willingness-to-sell and willingness-to-pay. Markets determine price, parties to the transaction know about one another only what is required by law and accounting practice, and markets bring them into a one-time exchange. In a bank-based system the parties to a transaction have previously exchanged information, and exchanges are repeated frequently. Previous interactions shape proclivities in any current transaction. Parties transact directly, without an intermediary.

In both countries, ‘originate and distribute’ undermined relational exchange between banks and non-financial firms. Meanwhile, the relational exchange typical of bank-based systems, but without the information content and longer-term time horizons expected of bank-based
systems, came to dominate exchange between financial institutions. The result is relational exchange without information or patience.

**Over-the-Counter (‘OTC’) Trading Markets.** Securities are traded on a variety of markets. Information is elicited, synthesized and distributed in different ways on public exchanges than on OTC markets (Duffie, Garleanu and Heje 2005). Disclosure of information pertinent to valuing securities is critical for public exchanges, the main focus of VoFC analysis. Public exchanges require transparency to value securities, but such exchanges contribute to this transparency, and mitigate counterparty risk. Information however flows differently in OTC markets, the main focus of the financial crisis.

OTC trading occurs through dealers who consummate deals through bilateral arrangements outside an organized exchange. Financial instruments involving securitization (mortgage-backed securities, collateralized mortgage obligations, credit default swaps, etc.), often little more than non-standard contracts, are traded on OTC markets, as are instruments that dominate the wholesale funding markets such as asset-backed commercial paper and repo agreements. Prices in these trades are negotiated. These markets are more opaque than public exchanges. Critical information in these exchanges includes counterparties’ financial stability, which is not directly observable (Acharya and Bisin 2010). Counterparties must rely partly on reputation and signals, but repeated interactions should build trust (Lagos, Rocheteau and Weill 2010). Babus (2010) found banks in OTC markets forming core-periphery relationships in which repeated transactions created relationships, contrasting with a classic understanding of bank- and market-based systems in which the idea of securities trading involving relational exchange appears almost oxymoronic.

**Information in Derivative Markets.** It is the information character of securities derivatives markets that gives exchange a relational quality. OTC securities derivatives markets face two important information challenges. The first is information about the value of the securities themselves. Several considerations impact valuation of asset-backed securities (‘ABS’) or credit default swaps. Most ABS involve chopping up similar financial assets with different credit quality, such as mortgage loans, and recombining them into a new product with a credit rating assigned by a ratings agency, in an opaque process (BIS 2008: 132). The first valuation problem is understanding the sub-components of the securities derivative. The market can value these products, but when markets involve bilaterally negotiated exchanges with no trade disclosure requirements, it is hard to use this ‘marking to market’ valuation (SEC 2008).
Postmortems of the crisis show valuation problems in increasingly frequent “mark disputes” in the pre-crisis years (SEC 2008). A mark dispute refers to a situation where there is a discrepancy between counterparties about the agreed price. A further indication is the discrepancy between the losses implied on securitized bonds by market prices relative to the losses that can reasonably be expected from actual defaults on the underlying assets (Bank of England 2008: 15). The size of this discrepancy, and its impact on bank balance sheets that increasingly marked assets to market, was sufficient to prompt a partial suspension of prevailing accounting rules (Hardie and Howarth, this volume).

Counterparty Risk in OTC Markets. Many derivatives transactions involve exposure to a counterparty which must make ongoing payments similar to a borrower under a loan. The information challenge therefore involves not only identifying the fundamental value of the security derivative, but also assessing the creditworthiness of the counterparty to the trade and the value of any collateral. The ability of a counterparty to fulfill their promise – and in the case of collateral deliver on unknown future promises – is an important calculation. The distribution of risk in this way is very different from the outright sale of a security. At best it is a more partial distribution of risk; at worst, risk is concentrated on the creditworthiness of the derivatives counterparty.

Relationships in this financial system only partly solve the information problem regarding counterparty risk, and using collateral only increases market risk (see below). The information problem regarding the component parts of securities derivatives remains. Relational exchanges in a modern market-based system are therefore different from relational exchanges in the classic bank-based system as well as from the non-relational exchanges of the archetypal market-based system. In relational exchanges in both traditional bank-based and modern market-based systems, information is husbanded between the parties to the trade rather than being shared more widely, leading to informationally opaque systems. In classic bank-based systems, banks have sufficient information about the borrower from their relationship. In a system where the counterparties are financial institutions, all the evidence of the breakdown of lending between financial institutions, and of the unwillingness to take any form of credit risk during the crisis, points to repeated interactions and supposedly close relationships\(^8\) that did not yield sufficient information either about counterparty risk or underlying securities to have an impact on creditor behavior. Markets involving frequent interaction between counterparties who are well known to

---

\(^8\) See, for example, the friendship between the heads of Morgan Stanley and Lehman, that the head of Citibank had worked at Morgan Stanley and the head of Merrill Lynch at Goldman Sachs (Sorkin 2009).
each other collapsed in the crisis, necessitating the rescue in the UK of both RBS and HBOS as a result of interbank market problems, and Bear Stearns’ takeover and Lehman’s collapse as the repo market faced difficulties. Goldman Sachs increased margin calls on AIG effectively started a ‘margin run’ on AIG (see Gorton 2008). In the case of Lehman, the final collapse was arguably the result of increased collateral demands by JP Morgan, Lehman’s ‘clearing bank’ and therefore the bank with which it had probably the most frequent interaction (Sorkin 2009: 281). None of the supposed benefits of relational exchange materialised.

**Risk Concentration**

In the traditional market-based model, risk is highly dispersed to non-financial firms. Risk is therefore dispersed due to both one non-financial firm’s low systemic importance and non-financial firms’ likely heterogeneity. However, developments in both the US and the UK in recent years have moved the risk far more default by commercial and investment banks or other very large financial institutions that facilitate market-based banking (such as AIG). The risk of financial institutions not lending to one another replaced the risk of households withdrawing deposits. Risk in this system was concentrated far further than expected in a market-based system on the solvency of financial institutions. A market-based system looked increasingly bank-based in its locus of risk on increasingly large – thanks to the lack of constraint from retail deposits – financial institutions.

The distribution of risk evolved in the same way in both countries: it was concentrated as the result of how banks traded securitized assets, financed their liabilities, and hedged their risk. Asset securitization is essentially secured, wholesale borrowing, and frequently unregulated. In fact, wholesale funding risk was often disguised as off balance sheet. Accounting rules and the general belief that it disperses risk allowed banks to use securitization to minimize their liabilities for regulatory purposes. Securitization partly dispersed market risk, as intended, but in practice heavily concentrated market risk. Much of the distribution of risk, so central to a market-based system, was largely illusory. Banks were unable to distribute the ‘super senior’ – the largest and most creditworthy – tranches of securitizations on anything like the scale necessary for the overall volume of transactions, and retained them on their balance sheets, frequently with credit insurance from the insurance company AIG (which insured US$79 billion [Financial Crisis Inquiry Commission 2011: xix]) or a small number of monoline insurers, a further huge concentration of risk. One estimate is that of the US$240 billion super senior tranches of some of

---

9 Genuine risk dispersion did occur through the distribution of loans to institutional investors (Ivashina and Scharfstein 2009).
the most problematic securitizations – CDOs of ABS issued in 2006-07, two-thirds of the risk remained with arrangers, either deliberately or after a failure to distribute, with the remainder hedged with a small number of monoline insurers. Importantly, nine arrangers were responsible for over US$10 billion of this risk each, and one for over $50 billion (Alexander et al. 2007: 32).

The counterparties in derivatives involved in supposed risk dispersion were (and are) concentrated in a very small group of financial institutions, rather than being widely distributed. Although a broad range of institutions were involved, by 2009, exposures in OTC derivatives in the US were concentrated in just five banks (Singh and Aitken 2009), with the largest bank, JP Morgan, responsible for 17 percent of the $500 trillion notional outstanding (authors’ calculations from Duffie 2010: 7). Furthermore, the hedge funds that did provide some apparent diversification of risk were themselves heavy borrowers from, and depositors with, their prime brokers, a highly concentrated group of institutions (one market survey showed the three largest prime brokers, including Bear Stearns, provided brokerage to 62 per cent of hedge fund assets at the end of 2006) themselves heavily involved in the CDS market. The overall result was ‘the extreme concentration of risk in a highly leveraged financial sector’ (Cabellero and Krishnamurthy 2009: 1).

Chains of transactions concentrated risk at the chain’s weakest link (Pozsar et al. 2010: 70). Those weakest links, for example AIG, the monoline insurers or one of the investment banks like Bear Stearns or Lehman involvement in many such chains gave rise to concerns regarding an institution being “too connected to fail”. The locus of risk in this system was very large opaque financial institutions, not relatively smaller non-financial institutions. These financial institutions were not heterogeneous, as non-financial corporations are, but rather faced ‘common market exposures’ (BIS 2008: 133). The only variation was, in the US, in ways, such as a lack of access to lender of last resort facilities, which increased fragility. Indeed, in the years leading to the crisis, homogeneity had markedly increased, and not only as a result of commercial banks in both countries (as elsewhere) increasingly carrying out investment banking. In addition, investment banks made, and particularly traded, loans, and an insurance company like AIG became active in CDS. Much of this activity involved the use of collateral, and homogeneity was readily apparent in the false comfort of this use of collateral.

Collateralised lending is as old as lending itself, and underpins modern banking. It hedges risk. Its underlying logic is simple: in the event of default a lender can seize an asset. Lending that is protected by the underlying value of collateral is therefore lower risk lending. In the case of

---

10 Lehman’s collapse left many hedge funds unable to access funds deposited with Lehman, their prime broker.
retail mortgage lending, secured on housing, this is clearly the case, problems in subprime notwithstanding. The experience when collateral is comprised of financial assets has not, however, been as straightforward and can concentrate risk.

Events in the repo market, the main source of short term secured financing, illustrate this. Volumes in this market have doubled in the US since 2002 (Gorton and Metrick 2010: 10). Lending is secured by financial assets, and because these assets are a broad range of different credits, borrowers’ funding risk is theoretically highly dispersed. If institutions hold assets acceptable to repo counterparties, funding should be available. Yet the 2007-08 crisis was ‘a run on repo’ (Gorton and Metrick 2010). In the crisis, the terms and availability of repo financing worsened dramatically, pressuring institutions dependent on this form of financing. This was particularly the US investment banks, which relied on this market for about half their funding (Figure 3 above). The nature of the assets – financial instruments – effectively homogenized the risk. That risk is both that the borrower might fail, and, if that occurred, the collateral would not prove as valuable as expected, especially if others were simultaneously selling the same collateral. The borrowers, financial institutions, are not only themselves far more homogenized than non-financial companies, but are themselves exposed, as discussed throughout this special edition, to the values in the same financial markets that value the assets they are pledging as collateral. Furthermore, activity in the repo market was heavily concentrated on a small group of financial institutions (Federal Reserve Bank of New York 2010: 14).

The two market-based systems did not disperse risk as would be expected, but rather concentrated risk on financial institutions (e.g., Basel Committee on Banking Supervision 2008; Adrian and Shin 2010) who were themselves heavily exposed to financial market prices. The concentration is more typical of bank-based than market-based systems, but involves market-based commercial and parallel banks. The result is exacerbated liquidity risk.

**Liquidity Risk**

Debt is central to bank-based systems, as banks lend a multiple of capital by borrowing via deposits. In capital market based systems financial institutions make money from fees for services such as underwriting and trading and from proprietary trading for “the house”. In the existing understanding, bank-based systems are more vulnerable to liquidity crunches than capital market-based systems because the locus of risk lies with financial institutions. In contrast the archetypical market-based system disperses risk among non-financial institutions and offers more liquidity. The system operating in both the US and the UK in the decade leading up to the financial crisis was a hybrid in which the presenting problem was typical of bank-based systems
approaching crisis: a mismatch between short-term liabilities and longer-term assets.

Much of the popular discourse regarding the crisis has focused on losses on the purchase of ‘dodgy assets’. However, this is ‘a comparatively small part of the story’ (Borio 2008: 9). What is striking in both the US and the UK is the impact of the market sources and short-term nature of liabilities, and therefore liquidity risk. Many (although by no means all) deposits are subject to withdrawal on demand, but short-term market financing is far more likely to be withdrawn. Shadow banking, and to a lesser extent commercial and parallel banks more generally, rested precariously on short-term funds from US money market mutual funds. This borrowing was exceptionally short term: in July 2008, over 60 per cent was 1-4 days in maturity, and this reached over 80 per cent (Bank of England 2008a: 23). UK banks were also reliant on these US money market funds. The ten largest money market mutual funds at end 2007 were directly lending UK banks US$80 billion (Bank of England 2010a: 37), only slightly less than their lending to US banks. As already noted, the interbank market was an important source of funds, especially for the UK banks, and the majority of unsecured interbank borrowing was for less than a week (IMF 2009b: 75). At the end of 2006, a median of 44 percent of major UK banks’ wholesale funding matured within three months (Bank of England 2007: 34), suggesting even the exposure to the market suggested in figure 2 above is understated. Secured financing through the repo market was similarly short term. Repo activity by US bond dealers (a partial measure of overall activity) fell from US$4500 billion to $2500 billion in the year to April 2009 (Krishnamurthy 2008: 11). Globally, activity more than halved from June 2008 to December 2009 (Bank of England 2009: 40). Overall, the financial crisis was primarily a liquidity crisis, “a wholesale version of a bank run, with access to wholesale funding evaporating in a matter of days, if not hours” (Economist 9 October 2008).

Additional pressure on liquidity came from demands for collateral on other types of structured financial products. The total volume of collateral demanded in the OTC derivatives market doubled between 2007 and 2008, to US$4 trillion, and in this market 80 per cent of this collateral was cash. Some counterparties simply did not have this amount of cash. It was this “margin run” on huge volumes of CDS contracts – exacerbated by declining credit ratings – that forced AIG to seek government assistance (Brunnermeier 2009: 96).

Banks’ increasing use of short-term maturity instruments left them particularly exposed to a dry-up in funding liquidity. Both August 2007 and September 2008 saw sharp liquidity contractions, in the former especially on ABCP, in the latter more generally (Arteta et al. 2008). The liquidity explanation for the roots of the crisis is the focus of recent papers looking at elements of the interaction between margin calls and market liquidity and the cyclicality of
leverage (e.g., Brunnermeier 2009; Adrian and Shin 2010). The crisis demonstrates another aspect of the particular market-based system we outline in this special edition: liquidity was certainly high in the build-up to the crisis, financing the build-up of shadow and parallel banking and the increase in commercial banks’ balance sheets. However, liquidity proved transitory, with its disappearance the main reason that problems in a small asset class, sub-prime loans, became a global crisis of such magnitude. Once again, we have a market-based system with none of the perceived advantages of such a system.

Conclusion

We have argued that in the decade moving into the financial crisis both the US and UK were increasingly market-based systems, but with disadvantages, and few of the advantages, of bank-based systems. Identifying a new hybrid national system is not a new observation. Lall (2006) talks about traditional and “new” financial intermediation and develops an index for how arms-length intermediation relationships are. Allen and Gale (2000) speak about a system that is not bank or capital market based but bank intermediated, and Gorton and Metrick (2010) contrast securitized and traditional banking. Murinde et al. (2004) argue that the bank – capital market distinction is superseded by global convergence toward systems dominated by large, diversified financial institutions. However, we not only consider these issues in the light of the financial crisis, but also suggest some inevitability in convergence toward a system with many of the potential weaknesses of a bank-based system and few of the strengths. Many parts of the derivatives market, including CDS, involve transactions with longer term actual and potential cashflows, rather than the very short term buying and selling of securities that dominates a traditional conception of a capital-market based system. This ongoing credit exposure, even with the use of collateral, favors the apparently most creditworthy, and therefore normally the largest, dealers, thereby concentrating risk. The increased transaction costs associated with complex financial products (Allen and Gale 2000: 474) will also favor the large firms that can pay and recoup those costs, in part by maintaining opacity, at the same time that such innovation increases the chance that relational exchange between financial institutions has none of the advantages of such exchange when non-financial corporations are involved. A small number of firms, through the nature of derivative and funding activities, become omnipresent counterparties. Furthermore, profitable banking activities occurring outside the banks are highly likely to be ‘acquired back in’ (Pozsar et al. 2010: 71), increasing the possible concentration of risk. Similarly, the crisis has further concentrated risk.
For all the attention given to commercial banks in the crisis, the epicenter was in investment banks, insurance companies and government-sponsored entities linked together by the financial engineering of complex securitized derivatives. However, US investment banks are emerging from a crisis-driven interlude as commercial banks and insurance companies are unlikely to repeat AIG’s involvement with derivatives markets, leaving a US system dominated by more tightly-regulated universal banks, and therefore closer to the UK’s market-based banking than the archetypical Anglo-Saxon model. Using new markers for differentiating between national financial systems, we highlight systems where financial institutions increasingly intermediate between themselves in an increasingly concentrated sector, lack the stabilizing connection to household savers, and are increasingly disconnected from corporate borrowers.

At its best, the financial engineering-heavy market-based system facilitates bond issuance by non-financial firms because securitization and derivatives creation and trading allows for risk dispersion and risk insurance, both of which can minimize credit risk. When not at its best, however, the financial engineering heavy system fuels bank intermediated systems with incomplete markets (characterized by opacity, liquidity vulnerability, risk concentration) that pose an even greater danger to the non-financial sectors of the economy than the impatient capital associated with a market-based system. Regulation has a significant influence on outcomes, but the actions of agents are of considerable importance. Government regulation may influence outcomes, but private authority and self-regulation are increasingly recognized as the dominant mode of financial market regulation. Our study also has implications for the principles that should be involved in regulation. Problems of opacity are unlikely to be resolved simply by increased transparency, supporting initiatives to move OTC derivatives onto centralized exchanges. That should also have some (possibly marginal) impact on the concentration of these businesses in a small number of market players. Ultimately, however, regulation needs to be targeted directly at risk concentration and high liquidity risk. Current initiatives have sought to target the latter. The question of risk concentration, however, remains largely unresolved.
References


*Journal of Economic Literature* 35 (June): 688-726.
*BIS Quarterly Review* (March): 47-60.
Murinde, Victor, Juda Agung and Andy Mullineux. 2004. ‘Patterns of Corporate Financing and  
(November): 693-705.
Federal Reserve Bank of New York Staff Reports no. 458 (July).
SEC. 2008. Report and Recommendations Pursuant to Section 133 of the Emergency Economic  
Stabilization Act of 2008: Study on Mark-To-Market Accounting. Available at:  
Consolidated Supervised Entities Program’, Report No. 446-A. Available at:  
Trichet, Jean-Claude (2008),’ Remarks on the recent turbulences in global financial markets’.  
Keynote address at the Global Economic Policy Forum 2008, New York University, New  
York, 14 April. Available at www.ecb.int/press/key/date/2008/html/sp080414_1.en.html,  
Speech at Barclays Annual Lecture, London (22 October). Available at  
February 2011.
Table 1: Markers of National Financial System Differentiation

<table>
<thead>
<tr>
<th></th>
<th>Capital Market</th>
<th>Bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital markets</td>
<td>Comprise high percentage of financial sector assets, many issuers participate and trading volume is high</td>
<td>Comprise a relatively small percentage of financial sector assets, relatively few issuers participate and trading volume is lower</td>
</tr>
<tr>
<td>Sources of nonfinancial firm finance</td>
<td>Equity and bond issues</td>
<td>Long term bank loans</td>
</tr>
<tr>
<td>Household role</td>
<td>Household finances enterprise</td>
<td>Household finance bank, which finances enterprise</td>
</tr>
<tr>
<td>Concentration of financial sector</td>
<td>Relatively low</td>
<td>Relatively high</td>
</tr>
<tr>
<td>Qualitative nature of financial and non-financial firm interaction</td>
<td>Arms-length interaction</td>
<td>Relational exchange</td>
</tr>
<tr>
<td>Information</td>
<td>Requires transparency, markets gather information</td>
<td>Protects opacity, information is concentrated</td>
</tr>
<tr>
<td>Liquidity</td>
<td>Can satisfy large financing needs &amp; offers liquidity through robust capital markets</td>
<td>Relative illiquidity</td>
</tr>
<tr>
<td>Locus of risk</td>
<td>First-order risk is enterprise insolvency</td>
<td>First-order risk is bank insolvency</td>
</tr>
</tbody>
</table>

Figures

Figures 1 & 2
US Commercial Bank Funding

Source: IMF 2010a: 67

Figure 3
Source: IMF 2010a: 68