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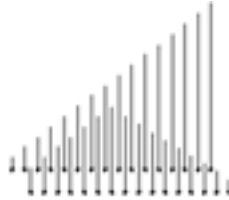
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A BETTER HOUSING FINANCE SYSTEM

Angus Armstrong*

Housing finance has long been recognised as a particular weakness of the UK economy, associated with demand and house price booms and busts for decades. The lack of regulatory response to innovations in housing finance over the past two decades has allowed the system to become even worse. There remains a particular shortage of affordable long-term fixed rate mortgages, the supply of mortgages is influenced by the animal spirits of high yield investors and wholesale funding vehicles directly contributed to the fragility of banks' balance sheets.

In a well-functioning financial system real economic transactions are matched, as far as possible, by funding with similar characteristics. So, for example, long term utility investment projects are often funded by long term debt contracts. In most advanced economies the same is also true of mortgages; the preferences of young borrowers are matched by those of older savers through long term contracts, often on fixed interest rate terms. The UK stands out as an exception. Prior to the crisis our long term savings funds, such as pension funds and life assurance products, together worth around £1.8 trillion, invested in only 5 per cent of all our mortgage backed securities. And with over 10,000 retail mortgage products on offer, there was negligible take-up of long-term fixed rate mortgages.

Putting the needs of households, as both borrowers and lenders, at the centre of our financial system requires reform of the retail and wholesale mortgage markets. The Miles Review (2004) looked at some of the market failures in the retail market. This commentary looks at the market failures in the mortgage securitisation market and presents the case for reform. This requires a change in the mindset of our regulators. The distinction between bank and capital market based finance is now redundant. They are fully integrated and therefore regulation cannot be targetted only at banks. Regulators

must ensure that the infrastructure for capital markets supports an efficient allocation of capital from a macro-financial perspective. This matters for financial stability and competition and therefore falls squarely within the remit of the Financial Policy Committee.

Financial infrastructure

Two revolutions occurred in finance in the 1980s. The first, emphasised by Morrison and Wilhelm (2010), was in information technology where batch processing meant that the loans of retail banks could be coded and traded. This shifted the craft of banking from old-fashioned qualitative credit assessments through local branches to assessments based on what can be measured, aggregated and benchmarked. The emergence of global capital markets for syndicated loans and early forms of asset-backed securities were dominated by banks with large capital bases and expertise in loan origination and evaluation. The second was an intellectual revolution where efficient markets and rational expectations came to dominate finance theory. It followed that private capital markets would allocate resources efficiently and therefore that there was less justification for state intervention. This provided the rationale for deregulation, in particular the removal of barriers between different types of financial firms.

The combination of these two events triggered a wave of mergers, as banks sought to build operations that straddled retail funding and wholesale capital markets. Investment banks secured the large capital bases they needed to increase transaction volumes, and retail banks and building societies secured the know-how to deploy their existing loan books to create new financial products. The new global banks created waves of new assets through financial engineering using existing collateral from the loan books of traditional banks. These securities are mostly incomplete contracts, in the

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sense that many of the embedded features are difficult to hedge and cannot be valued across all possible states. They therefore straddle the traditional domains of investment and retail banking.¹ These innovations ended the earlier neat distinction between bank-based finance and market-based finance. Shin (2010) points out that this is the first post securitisation crisis in which banking and capital markets are closely intertwined.²

Regulators abrogated their responsibility and allowed market participants to develop the infrastructure for the new securities. Financial infrastructure includes, *inter alia*, disclosure requirements, legal status of contracts, accounting treatment and the structure of market making for securities. These rather technical issues have long been recognised as profoundly important to how markets evolve and economic efficiency. Douglass North (1994) has suggested that the creation of an appropriate financial infrastructure was central to economic development in the West.³ Responsibility for setting benchmarks was accepted by industry organisations such as the British Bankers Association and European Bankers Federation, and for creating appropriate contractual frameworks by the International Swaps and Derivatives Association.⁴

As a consequence of the *laissez faire* approach to the financial infrastructure, new global banks are able to create new securities, make markets in them and even take proprietary positions in the same securities. Prices are disclosed on a party-to-party basis and for those securities which cannot be valued by a third party (level 3 assets) the bank can set its own valuation. Only haircuts limited the number of times the same security could be re-used in collateral backed intermediation (e.g. repo and some derivative markets).⁵ The new market place allowed bankers to extract rents through the control of information and greater leverage from extending the chain of intermediation. The result was an egregious misallocation of credit and vulnerability in financial institutions.

The importance of infrastructure is illustrated by Robert Merton's old analogy to innovation and train networks. When a faster train is invented this is a beneficial innovation. But if the rail track infrastructure is unable to handle the faster trains this becomes a vulnerability to the system. If the new train crashes this is a problem for the company and passengers who, perhaps unknowingly, took the risk. If the track is also damaged, then there is an externality on all others users of the network. The best solution is neither to ban the faster train nor allow them to use the outdated track. The faster train must be introduced when – but only when – the track

infrastructure is updated and can be introduced safely. Financial regulators failed to upgrade the financial infrastructure to take account of the integration of banks and capital markets.

RMBS and economic imbalances

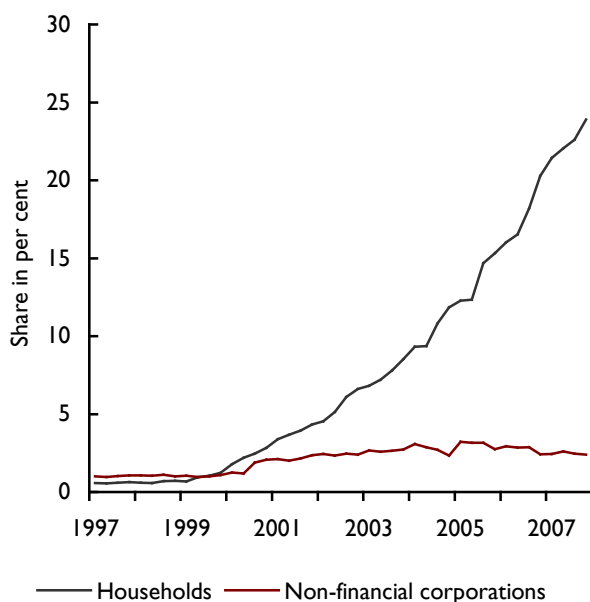
Issuance of UK Residential Mortgage Backed Securities (RMBS) began in the early 1990s. The market was small and most securitisations were issued by non-bank financial institutions which competed with the large bank franchises. The securities were in the form of 'pass-through' securities where the cash flows of payments from the mortgage pass straight through to the investor. This is often characterised as the 'originate-to-distribute' model of securitisation.

From 2000 RMBS issuance became a very significant source of mortgage finance in the UK. In 2007 RMBS funded almost half of all net new mortgages with the total stock of outstanding securities reaching around £400bn. However, the structure of the RMBS issued changed in very important ways. They were no longer pass-through securities but issued using master trust technology imported from the securitisation of credit card receivables in the US. The trusts are connected to the issuing bank and are very economical in that they allow many issues of securities from a single vehicle.

The role of RMBS in UK economic imbalances is alluded to in Barwell and Burrows (2011), who compare two periods of rapid financial expansion. The first was associated with the run-up in equity prices in the dot-com boom. As most of the funds were channelled from outside the banking system e.g., from equity investments, when asset prices fell there was only a secondary impact on banks. The second period, 2001–7, was associated with rapid household borrowing, rising house prices and current account deficits. The authors show that the household sector had a net lending (dis-saving) deficit of £175bn over this period. However, households borrowed £782bn from the banking sector while only contributing £370bn in deposits. The shortfall of £412bn was covered by funding from the wholesale markets. Figure 1 shows the rapid rise in the share of bank lending to the household sector funded by securitisations.

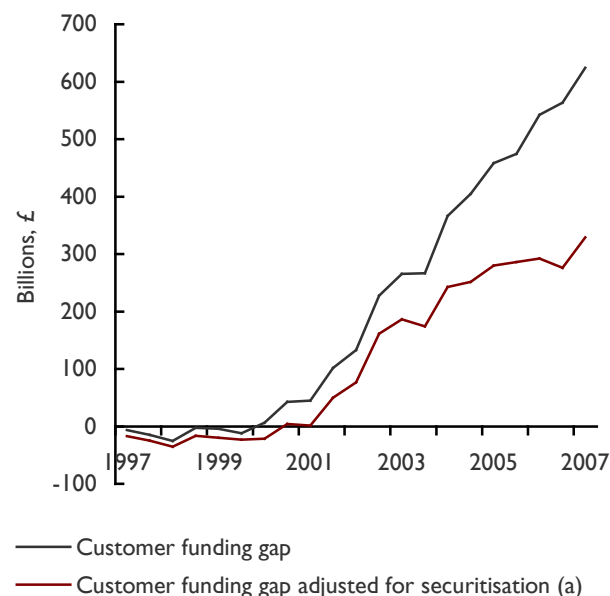
The converse of the reliance on wholesale funding became known as banks' customer funding gap. This is the total customer loans less their deposits, which must be funded from the wholesale markets. This reliance on wholesale funding is widely recognised as one of the main vulnerabilities in the banking sector in the run-up to the crisis (especially in the case of Northern Rock).

Figure 1. Securitised lending as a share of bank lending to households and corporations



Source: Bank of England.

Figure 2. Major banks' customer funding gap



Source: Bank of England, *Financial Stability Report*, 2008.

Note: (a) Customer funding gap less securitised debt.

Figure 2 shows the customer funding gap both in total and excluding securitisations. The difference between the two measures shows the extent to which the customer funding gap was covered by securitisations.

If the securities issued were the old pass-through securities then this gap would not have appeared. The mortgages would no longer be on bank balance sheets and no longer need on-going funding. The risk would have entirely passed to the investor. However, with the new securities the banks were exposed through their obligations to the master trust vehicles and their holdings of RMBS assets. Many securities were bought or funded by UK banks seeking to improve the returns on their treasury book. Shin makes this point clear: “the reason for the severity of the crisis lies precisely in the fact that the bad loans were not all passed on to final investors. Instead the ‘hot potato’ was sitting inside the financial system, on the balance sheets of the most sophisticated financial institutions.”⁶

RMBS and bank vulnerability

Mortgages are usually long-term contracts where the borrower has an option to pre-pay at any time, perhaps due to a home move or decision to re-finance the mortgage. When mortgages are securitised in traditional pass-through securities the value of the security depends

inter alia on the actual maturity of the mortgages, which becomes the duration of the security. Estimating the actual maturity of mortgages accurately is complicated because the tendency to pre-pay differs by households and economic conditions, in particular interest rates.⁷ In the UK the task is complicated even further by the predominance of floating rate (or short-term fixed rate) mortgages and the sheer diversity of products available. Prior to the crisis over 10,000 different mortgage products were available.⁸

The cash-flows associated with pools of heterogeneous mortgages are unpredictable and not well suited to investors who prefer predictable cash-flows. The master trust technology is an ingenious partial solution to this problem as it creates bullet-style securities (an anticipated 1–5 year maturity with a coupon and single final payment) from a large pool of constantly changing mortgages. Note that while the securities are anticipated to be 1–5 year maturity, the legal term to maturity of the underlying mortgages is still 25–30 years. The trust is a financial structure which delivers all stages of a credit intermediation process, including credit, liquidity, currency and maturity transformation. This is a complex process and requires the sponsoring bank to provide ongoing liquidity support and credit recourse if the mortgages underperform.

The investor base is largely limited to those seeking short-duration assets, who understand complex structured products and have an ongoing relationship with the sponsor. Approximately 60 per cent of buyers were leveraged accounts such as banks, hedge funds and conduits and the same proportion was sold to foreign currency investors. This has important implications. First, the maturity mismatch between the mortgages and the issued notes resides in the trust (as does the risk inherent in a cross-currency swap). Second, the buyers are already 'within the financial system' rather than an additional source of funds. Third, leveraged investors are measured on a marked-to-market basis and therefore may respond to falling prices by selling assets to maintain their capital. This lack of diversity of buyers means that the assets are vulnerable to 'fire sales' (too few potential new buyers even at very low prices). Allen and Gale (2009) refer to markets with a lack of diversity investors as 'limited participation' markets.⁹

The master trust structure can also contribute to the vulnerability of the sponsor bank. The maturity mismatch between the underlying mortgages and issued securities is managed by the sponsoring bank having the option to call or repay the notes at set dates between 1–5 years. Sponsoring banks fund these calls by issuing new securities prior to the call date or by extending liquidity to the trust. However, if investors perceive that the securities may not be called – which would crystallise a mark-to-market loss from the sudden extension in maturity – this can bring about the very event that they fear. In distressed circumstances, investors' fear of extension will lower RMBS prices, making securitisation a less economical funding vehicle. This in turn can prevent refinancing and therefore precipitate the very extension risk they feared.

Information asymmetries

The main weakness of the RMBS market is that the securities are issued to meet the demand from mostly short-term, leveraged and often overseas investors who they frequently engage with. This creates a 'limited participation' market and a maturity mismatch between legal maturity of the mortgages and the securities. The lack of robust market infrastructure meant information problems prevented a wider investor base from developing, even as securities prices fell way below reasonable asset values. The maturity mismatch is worse than mortgages being funded by bank deposits because when prices fall leveraged investors are constrained to sell further to protect their capital.¹⁰ Bank depositors are unconstrained and insured. The outcome was

'fire-sales' and no-trading, which contributed to the vulnerability of the sponsoring bank. There are two information based market failures for this outcome:

- Information asymmetries in the wholesale market,
- Information asymmetries in the retail market.

Long term investors need to convince their trustees that RMBS is an established and well understood asset class. Yet the complexity, heterogeneity and opacity of the issuing vehicles and securities creates a fundamental difference in information between issuers, market makers and traders or short-term investors ('insiders') and the natural long-term domestic investor base ('outsiders'). Despite the introduction of the EU Prospectus Directive in 2005, the offer documents differ for each issuer (reflecting the different trust mechanisms) and the numerous supporting documents for interest rate, funding and currency swaps etc. mean that there is a very high information barrier for non-specialists.¹¹ While this is inevitable given the design of the securities, it was often taken to extremes.¹² There is even a lack of agreed basic definitions across issuers for standard concepts such as 'arrears' or even what constitutes a 'prime' mortgage. Loan level data was only provided to the credit rating agencies and not to the market, preventing independent verification of the characteristics of the mortgage pool. Market makers post securities prices which are 'indicative' rather than 'last traded prices' thus leading to uncertainty when prices are volatile.¹³

In each instance the lack of infrastructure leaves an asymmetry of information between the 'insiders' and the 'outsiders' who are the more natural counterparties. This is merely a new application of Gresham's Law which has been central to financial markets since the sixteenth century. Akerlof (1970) famously showed how asymmetries of information in the used car market can lead to socially sub-optimal outcomes and even closing markets. Pagano and Volpin (2010) show how conventions in securitisation markets are in the interests of issuers and primary market makers while liquid secondary markets are a public good and hence underprovided by the market.¹⁴ Real and perceived imbalances of information undermine markets, especially in times of stress leading to illiquidity. This also explains why, after numerous attempts, market participants are unable to establish a 'market-based' solution. It is difficult for issuers to overcome investors' suspicions and credibly demonstrate that structures have not been created in line with issuers' private incentives.

The second hurdle in attracting long term domestic investors is that they prefer longer duration assets. Long-term fixed rate mortgages (with minimal early repayment charges) would benefit investors by creating more duration and, importantly for households, by minimising the interest rate risk they cannot otherwise hedge (which contributes to the volatility of consumer spending).¹⁵ Surveys by the Council of Mortgage Lenders have suggested that households would, in fact, prefer these mortgages.¹⁶ Yet the UK is unique in having a negligible market share of long-term fixed rate mortgages, in contrast to North America, Continental Europe and Asia. The Miles Review (2004) suggests that banks cross-subsidise from existing to new customers and are biased towards repeat transactions, which distorts the price of longer-term products. It is also possible that there is an infant industry argument – until there are fixed rate mortgages there can be no information on prepayment patterns to assist investors with hedging the duration risk.

Policy options

This commentary argues for a macro-financial approach to financial stability. The objective is to have domestic long-term investors participate in mortgage securitisations. This would match the underlying preferences of borrowers and lenders for long term and fixed rate contracts (index linked would be even better). At the peak of the market our long term domestic savings base of pension funds and life assurance companies managed around £1.8trn but accounted for only 5 per cent of the RMBS investor base. In the past, this scarcity of suitable long term sterling fixed rate securities has meant that such investors have typically held much higher foreign equity allocations than their overseas counterparts.

There would be three benefits from this better matching of borrowers and investors. First, the better matching of maturity would mean that there is less systemic risk from old-fashioned bank runs, slower capital market runs or encumbering assets through covered bond issuance. Second, the supply of housing finance would be less subject to the animal spirits of high yield investors as long-term investors are not subject to the same accounting or capital constraints. Third, this will allow challenger banks to have access to a new investor base and so allow more competition against incumbent banks. Moreover, if reform is not introduced, past methods of securitisation cannot be un-invented – so these markets are likely to re-emerge with the same vulnerabilities. Reform is therefore both necessary and desirable.

The good news is that it is also achievable. Prior to the crisis, plain vanilla pass-through securitisation markets had operated in other countries for over three decades. Other countries with similar institutional frameworks have also succeeded. Australia has a well functioning mortgage securitisation markets with simple pass-through securities where the risk is passed to investors with no residual risk in the banking system. Canada has a more elaborate state-owned securitisation vehicle which accepts RMBS containing insured and conforming mortgages and transforms them into state-backed homogeneous bonds. This removes all information asymmetries, lowers the cost of mortgages and increases competition in the lending market.¹⁷ There is a contingent liability to the state, but the insured mortgages have such little risk that the state has this contingent liability through the banks anyway. As the flip-side of the securitisation method is the bank funding model, it comes as no surprise that Australia and Canadian banks have proven more robust.

What would be an appropriate model for the UK? This goes back to Merton's analogy with the train track. To reduce asymmetric information a regulated standardised RMBS pass-through vehicle would be outlined with clear conditions and limits on the types of mortgages which could be included. The terms of the vehicle could only be changed by the regulator, presumably after learning from the experience from non-regulated RMBS. To be sure that the securities would qualify as an investable asset class, the regulator would set disclosure requirements depending on the needs of the intended investor base. They achieve this in Holland and Australia and even Northern Rock's Granite bonds now trade as pass-through securities perfectly well.¹⁸ Detailed loan level data on the mortgages within the securities would be available in a public data repository as a public good to allow long term domestic investors to manage prepayment risk.

Mortgage lenders in the retail market of course seek to differentiate their products. However, we need to go beyond *caveat emptor*; we know enough about biases and imperfect decision making to understand that some products are more predatory than welfare enhancing. For most households this is by far the most important financial transaction in their life and the aim of regulation should be better decision making. This is not always the same as profit maximising. Just as in other markets, such as for food products, clear and transparent labelling of the risk characteristics is possible. It would be necessary to introduce a 'conforming mortgage contract' which sets out conditions (such as loan to value etc.) and to

introduce better stress testing on the ability to pay based on total household credit exposures which must be met for inclusion as regulated pass-through securities.

Once these securities are permitted, given the low credit risk and contribution to financial stability, they could be favourably treated with respect to access to the Bank of England's liquidity facilities. The regulated RMBS would need to be treated the same as covered bonds in discussions on eligibility in banks' liquidity buffers. It may be necessary to begin with a buying programme, such as the Australian Office of Financial Management RMBS investment programme or quantitative easing though buying credit securities as in the US. A more radical alternative would be to introduce a Canadian style agency. Interventions on this scale to address specific market failures are not therefore subsidies. Finally, since this form of securitisation transfers risk to the investor, ring-fenced banks ought to be encouraged to use only this method of securitisation. This would allow households to benefit from financial innovation without jeopardising the stability of a ring-fenced bank.

NOTES

- 1 See Armstrong (2012) for further information.
- 2 Shin (2010) p152.
- 3 See North (1994).
- 4 ISDA is a trade body which oversees collateral intermediation and derivatives. According to Katerina Pistor they successfully campaigned national governments so that net counterparty balances prevail over other creditors which no doubt contributed to the growth of a \$60tn market.
- 5 Claessens *et al.* (2012) estimate that on average one unit of collateral supported three times more collateral based intermediation (e.g. repo, swaps and CDO contracts).
- 6 Shin (2010) p.157.
- 7 In the US there is a sizeable cottage industry estimating and hedging prepayment risk.
- 8 See FSA (2011). Comparing re-payment profiles of two mortgages in the context of life cycle income model is highly complex, see Campbell and Cocco (2003). This suggests that the number of products was more to do with exploiting information problems than efficiency.
- 9 Allen and Gale (2009) refer to this condition as a limited participation market.
- 10 See Shin (2010).

- 11 Murphy (2012).
- 12 There was often very little time between posting the offer documents and subscription deadline.
- 13 This is the same as past practice in the US corporate bond market. In 2002 a system of reporting consistent prices based on last trades called TRACE was introduced. While this was heavily resisted by market makers, the outcome appears to have been a success in terms of improving market liquidity.
- 14 See Pagano and Volpin (2010).
- 15 See Campbell and Cocco (2003).
- 16 See Housing Finance Review (HM Treasury 2008), p. 41.
- 17 The state conduit does not hold securities unlike Fannie Mae and Freddie Mac in the US which held large inventories of sub-prime securities.
- 18 After the non-asset trigger event in November 2008 the extension risk was crystallised and Granite bonds transferred from bullet style to pass-through securities.

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