

The geographies of securitisation and credit scoring

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Abstract

This thesis draws upon contemporary research in economic geography and the social sciences to explore the spatial relationships that exist between residential mortgage lenders, investment banks and investors and the subsequent geographies that are produced through these intertwined networks. The research is informed through empirical material collected through semi-structured interviews with directors and associates working in the financial sector to see how consumer mortgages are produced and restructured into debt securities. There is a particular focus on how the UK financial sector has undergone restructuring, as a consequence of the politics of financialisation since the 1990s, which aligned the residential mortgage market with the circuits of international capital. The thesis examines three areas of banking and finance to comprehend how retail mortgages have become embedded within international finance. First, the thesis explores how deregulation in the UK initiated a spatial reorganisation of mortgage production networks and funding. Second, the research investigates the migration and adoption of automated decision-making technologies, highlighting how these devices have reshaped the geographies of banking, and are inherently geographical themselves. Third, the thesis focuses on how mortgages are (re)engineered into debt-securities, with a particular focus on how geography is used to mitigate credit and tax risks. It is argued that the restructuring of the UK retail sector and its increased integration with the international circuits of capital exacerbated the exposure of the UK's economy to the effects of the international credit crunch. Furthermore, the thesis underlines the effect of geography which has shaped the adoption, of new financial technologies and strategies, through local regulations, epistemic cultures and histories.

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Chapter 1

Introduction

“Northern Rock’s a good example, because it’s, a very prudent securitiser...if you’re a shareholder in Northern Rock then it’s brilliant, there’s no risk for you, you’re just getting paid, it’s almost risk free...” (Interview 29: Director of Retail, large UK building society, February 2007).

“The government is drawing up plans to nationalise Northern Rock, the stricken UK bank which yesterday announced the immediate departure of chief executive Adam Applegarth, as uncertainty surrounding its future mounted,” (Financial Times, 14th December 2007).

In 1965 the Northern Counties Permanent Building Society, founded in 1850, and the Rock Building Society, established in 1865, merged to form a new society named Northern Rock. Northern Rock gradually expanded by absorbing numerous local societies, but the roots and operations of this mutual organisation remained firmly grounded in the North-East.¹ By 1997 Northern Rock had steadily acquired 53 smaller building societies, and like many mutuals at the time, it decided to convert to a bank in order to raise more capital from the wholesale financial

¹ Mutual organisations, such as building societies, are owned by their members who have savings accounts or mortgages with the society. As such, the managers of these institutions attempt to run the organisation for the benefit of their members, unlike retail banks, for example, that are run for the benefit of the private shareholders that own the bank.

markets (Marshall *et al.* 1997). A year later, this mortgage lender was floated on the London Stock Exchange and it began to prepare ambitious plans for growth. Unlike its larger competitors, this small, regional bank had a geographically limited branch network overwhelmingly concentrated in the North-East of England (Hallsworth and Skinner 2008), an historical legacy inherited from the societies that it had absorbed. This posed a serious challenge to Northern Rock's expansion plans as the spatially concentrated branch network would impede its ability to increase mortgage sales outside of the North-East region. In addition, the geographically limited branch network would have struggled to collect sufficient consumer savings to fund a growing mortgage business.

Northern Rock's answer to its inherently geographical problems was to pioneer a new business model, which was later replicated by other UK retail banks. Instead of expanding its branch network, Northern Rock began to actively reduce the number of its branches to decrease costs and began to sell its mortgages through third-party brokers and intermediaries. This strategy enabled the mortgage bank to extend its geographical reach quickly and cheaply, offering its mortgage products across the UK, without the need to expand its branch network. However, Northern Rock's growth was still restricted by its inability to raise sufficient volumes of consumer deposits to fund its growing mortgage business, so it underwent a further round of restructuring so that it was less reliant on its savers' deposits. This was initially accomplished in two ways: First, the bank borrowed short-term funds from the interbank money markets which could be used to issue mortgages. When Northern Rock needed to repay a creditor, frequently other retail banks or investment banks, Northern Rock would simply refinance this credit facility with another creditor allowing long-term assets to be financed by short-term funding (Hallsworth and Skinner 2008). Second, the bank began to access cheaper, long-term funding by selling mortgage-backed bonds to investors, including retail banks,

investment banks, asset managers and insurers, through a process called securitisation.² Northern Rock sold these residential mortgage-backed securities (RMBS) for a small profit, but as it began to write larger volumes of mortgage business from across the UK, it was able to repeat this process of securitisation on a regular basis and the collective profits soon increased the bank's earnings. Northern Rock's business model transformed it into the UK's 6th largest lender in less than a decade, a model applauded by financial commentators and celebrated by shareholders (Wainwright 2009).

Given the plaudits and admiring commentary lavished upon Northern Rock, the banking industry, government officials and consumers were shocked to learn that on the 13th of September 2007, the company's bubble had well and truly burst. It emerged that Northern Rock was struggling to fund its short-term operations, forcing it to approach the Bank of England to seek emergency funding. Northern Rock's funding difficulties were compounded by the media's commentary on its demise. Despite reassurances from Northern Rock's management and the government, panicked consumers rushed to withdraw their savings, fearful that the bank would collapse imminently (Hallsworth and Skinner 2008). The Bank of

² Securitisation is a process which allows lenders to convert portfolios of credit cards, consumer loans and car loans into bonds. These are known as asset-backed securities (ABS) where the yield on the bond is derived from the repayments on the underlying assets (Langley, 2006). Bonds backed by residential mortgages are known as residential mortgage-backed securities (RMBS). The financial returns from the asset pool are not divided equally between the bonds that have been issued, but are financially engineered, to produce a range of different bonds. These variants range between high risk-high yield and low risk-low yield bonds, denominated in different currencies, and redeemable between one and five years. The advantage of securitising mortgage assets as opposed to simply selling them as a portfolio of mortgages was that a pool of residential mortgages could be engineered into a large number of high-quality bonds that were rated by bond-rating agencies as being as safe as government bonds. The credit risk of all the mortgages is theoretically concentrated in a small number of high risk bonds that provide a higher return to investors willing to accept the greater risk, providing the bond pays its coupon. The popularity of RMBS bonds with investors was enhanced as the notes paid higher yields than government bonds, but the RMBS bonds were tailored to the specifications of investors.

England provided Northern Rock with emergency funding and the government began to search for a buyer to rescue the stricken bank. By the 22nd of November 2007, the government had failed to find an investor to purchase Northern Rock leading the government to take the extraordinary step of nationalising the bank. Early post-mortems into the collapse of Northern Rock focused on the bank's flawed business model, where it had 'borrowed short and lent long'. Northern Rock had funded the majority of its mortgage issuance through short-term money markets and the sale of its mortgage assets to investors through securitisation. Both funding strategies had been adversely affected by the US subprime crisis, to the degree that Northern Rock's business model was no longer viable. This raises a critical geographical question: how could the defaults of US subprime consumers lead to the collapse of a prime UK mortgage bank that did not issue mortgages in the US?³

The global credit crunch and the demise of Northern Rock can be traced to the development of the US subprime market, its reliance on securitisation and the subsequent US subprime crisis. The US subprime market was originally developed to supply consumers who had adverse credit histories or unusual circumstances (Burton *et al.* 2004) with mortgages, which proved popular as it increased American homeownership. Although subprime consumers are statistically more likely to default on their repayments than prime consumers, the market was attractive to US lenders and capital market investors as the higher likelihood of defaults enabled lenders to legitimise the products' high-interest rates and exorbitant penalty fees. As a result, the subprime market was profitable despite the higher rates of default. In the build-up to the US crisis, many subprime products were sold by mortgage intermediaries who used aggressive sales tactics to sell

³ While Northern Rock offered a 125 per cent LTV product, associated with the sub-prime range of products, the majority of its products were of prime quality.

mortgage products to financially vulnerable individuals could not realistically repay their debts (Agnew and Corbridge 1989; Wyly *et al.* 2004; Kirchhoff 2007; Blackburn 2008). Other examples of miss-selling included consumers being sold overpriced mortgage insurance that they simply did not need (Aalbers 2008) and, in many cases, greedy, fee-driven mortgage brokers sold expensive subprime mortgages to low-risk consumers who were eligible for cheaper interest rates (Blackburn 2008; Immergluck 2008).

Dymski (2007) argues that before securitisation became widespread in the US, mortgage lenders would exercise caution and avoid lending to subprime consumers altogether, as the credit risk of mortgages was held on their own balance-sheets. Securitisation meant that high-risk mortgage assets were removed from lenders' balance sheets and sold to investors, so lenders were no-longer exposed to the associated credit risk (Dymski 2007). This enabled subprime lenders into designing increasingly riskier products, a trend epitomised by so-called NINJA mortgages, sold to consumers with No-Income-No-Job-or-Assets. The expansion of US mortgage lending was also supported by a benign macroeconomic environment and the Greenspan Put, where the US government manipulated monetary policy to gain market stability⁴.

Although the foundations of the credit crunch were laid through the issuance of US subprime mortgages and their sale through securitisation, the effects of the crisis did not begin to unfold until 2004 when the US Federal Reserve began to increase interest rates. These increases placed a heavy burden on the already vulnerable subprime consumers who witnessed unaffordable increases on their monthly

⁴ For example, in times of crisis such as the dot-com crash and the September 11th terrorist attacks, the US government reduced interest rates to maintain stability – low interest rates that fuelled cheap mortgage lending.

repayments, triggering unprecedented levels of defaults. Subsequently, mortgage lenders were unable to repay subprime RMBS investors in the US and around the globe. It became clear that the financial reengineering applied to US subprime securitisations had been grossly miscalculated as many RMBS bond investors began to experience heavy losses on their subprime investments. As investors witnessed the write-downs on their investments, they stopped purchasing new RMBS bonds from mortgage lenders and the global market for RMBS bonds effectively closed. By June 2007 Bear Stearns admitted it was exposed to heavy losses stemming from subprime RMBS bonds. Bear was soon declared bankrupt and investors began to question if any other banks around the globe might collapse from their exposure to these toxic US subprime investments. This uncertainty materialised as volatility in the global financial markets and the share prices of banks depreciated substantially, while the volumes of money being traded on the interbank markets began to diminish rapidly as banks were reluctant to lend money to their competitors in case they collapsed (Hallsworth and Skinner 2008).⁵

As discussed earlier, the 'success' of Northern Rock's business model was dependent on its ability to access cheap interbank funding and to issue securitised bonds. The sudden closure of the international RMBS market, coupled with the haemorrhaging of the interbank money markets witnessed Northern Rock's business model become defunct within a matter of weeks. The growth of the wholesale financial markets, on which the Rock had become dependant, emerged as a consequence of macro-imbalances that had developed since the 1970s, where countries, such as China and Japan had accumulated trade surpluses and high volumes of savings, while the US, UK, Ireland and Spain, for example, amassed deficits. These imbalances were accompanied by a reduction in interest

⁵ Equity investors were wary of having a large exposure to financial stocks because they were concerned that more banks would collapse.

rates, as countries with trade surpluses lent large volumes of money to countries with trade deficits, which fuelled borrowing further.

Meanwhile, investors had witnessed a reduction in the returns on their investments due to the low interest rates and they began a search for higher yielding products, which included RMBS notes. Investors also sought exposures to funds that invested in RMBS bonds, which often leveraged the size of their investments by using borrowed money to purchase more RMBS notes, producing additional demand for RMBS bonds (Martin and Turner 2000; Wainwright 2009). During the 2000s, Northern Rock experienced rapid growth, as the interest rates on interbank funds had remained low and the market for RMBS bonds had grown. RMBS bonds are complex, but the development of sophisticated mathematical modelling which attempts to predict the future risk of an asset based on historical data reassured investors and helped expand the market (Martin and Turner 2000). The UK securitisation market expanded in an environment of low interest rates and plentiful access to money. Between 1997 and 2007 the average price of a UK house rose by 193 per cent, fuelled in part by the cheap money available from the capital markets, and UK consumers willing to buy homes as an investment (Langley 2008)⁶. Compared to the equity and corporate bond markets, the RMBS market had not suffered from any adverse events in its short history, so there was little historical evidence available to Northern Rock's management to suggest how vulnerable the lender would be if the liquidity of these two markets were significantly reduced. Although Northern Rock was the first UK retail bank to suffer from the credit crunch, because it had a greater dependence on external funding compared to its competitors, it was certainly not the last. By September 2008 Bradford & Bingley had been nationalised and its branch network had been sold to Banco Santander,

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<http://www.communities.gov.uk/housing/housingresearch/housingstatistics/housingstatisticsby/housingmarket/livetables/> (Accessed 14/04/09)

the owner of Abbey, who later purchased a struggling Alliance & Leicester. The British government also bought substantial volumes of preferential shares in the Royal Bank of Scotland, while HBOS and Lloyds, under heavy government pressure, merged to form the Lloyds Banking Group, of which the government also became a majority shareholder.

The reduced liquidity from the interbank markets and the inability of lenders to securitize their assets forced banks into initiating an unofficial policy of credit rationing. Consequently, lenders would only issue low-risk mortgage products leaving many consumers unable to refinance their mortgages onto new, lower priced deals which caused an increase in UK mortgage defaults. The illiquidity of the banking system also stimulated the withdrawal of corporate credit for businesses, which increased unemployment levels and consequently accelerated mortgage defaults, exacerbating the effects of the credit crunch within the UK.⁷ As building societies did not use securitisation as a funding mechanism, they should have been impervious to the negative conditions experienced by securitisers.⁸ However, the societies were still exposed to an increase in mortgage defaults by consumers who were unable to refinance their mortgages or because they had become unemployed. Many smaller building societies began to amalgamate, including Nationwide's takeover of The Derbyshire and The Cheshire, and Britannia's merger with the Co-Operative as the stability of these smaller institutions was called into question as they were exposed to rising levels of bad mortgage and corporate debts.⁹

⁷ While the impact of the credit crunch on the 'real economy' is a worthy topic of research, it lies outside the scope of this thesis.

⁸ Building societies do not have shareholders, but are owned by their members, who include depositors and mortgagees. Since securitisation involves selling the assets to a third party, the Directors of building societies have agreed that it would be unacceptable to effectively sell-off their members to investors.

⁹ Many building societies were also adversely affected by the collapse of Icelandic banks which were managing substantial portions of their capital.

The mutation of the US subprime crisis into a global credit crunch has had dire consequences for the UK's economy. The migration of the crisis raises important geographical questions as to how the UK financial services industry, especially mortgage lenders, became dependent on securitisation. This thesis argues that the industry's reliance on securitisation repositioned the UK economy to become more vulnerable to exogenous financial shocks such as the credit crunch. This repositioning was orchestrated by the restructuring of the UK financial services industry through deregulation and the adoption of new technological innovations from the US which led to the spatial reorganisation of UK retail banking. This instigated a shift from localised and regional forms of mortgage funding and lending, into regional command centres that used the City of London as a gateway which embedded the UK mortgage market firmly within the international circuits of capital. This thesis poses three key questions which seek to understand how the strategic restructuring that transformed the UK financial sector enhanced the exposure of the UK economy to the credit crunch:

Question One: What are the geographies of mortgage production, credit-scoring and securitisation?

The dissertation will map and interrogate the geographies of mortgage production, securitisation and credit scoring; where credit-scoring is understood as a decision-making tool used by mortgage lenders to distinguish between applicants that are deemed: good risks and those deemed bad risks, where the latter are denied credit.¹⁰ The aim is to account for the geographies of the particular institutions and

¹⁰ What is defined as 'good' and 'bad' risk varies between lenders and their different mortgage products. For example, a consumer categorised as a 'bad' risk when scored for a prime product, may be categorised as a 'good' risk for a sub-prime product that is targeted at consumers that are statistically more likely to default.

companies that are responsible for the production of consumer credit and securitisation.

Question Two: How did the geographies of mortgage production, credit-scoring and securitisation emerge?

The research will account for the changing geographies of mortgage production, providing a narrative which explains how these geographies have historically evolved to create the conditions that have allowed consumer credit, credit-scoring and securitisation to flourish. In particular, the thesis will focus on the epochal regulatory and technological transformations that occurred in the 1980s. This thesis will examine the development and role of new technologies and organisational structures so as to understand how the UK mortgage market was expanded and how the packaging of mortgages into debt securities was orchestrated.

Question Three: How have these geographies been maintained and reconstructed?

The thesis will explain how these geographies were reproduced by investigating how these institutions encouraged and enabled the expansion of consumer credit and securitisation through the 1990s and early-2000s against a back-drop of burgeoning financial engineering and the development of a sophisticated risk analytics industry. It will also explain how the systematic risks within the international finance system that led to the spread of the credit crunch were generated. The remainder of this dissertation is organised as follows:

Chapter 2 reviews the different theories and accounts of the emergence, role and functions of money that have developed in the social sciences. In particular, the chapter will review the early debates within political economy, drawing on work from Adam Smith and David Ricardo, who developed the idea of commodity money, which derives its value from labour power. Karl Marx drew upon these ideas to scrutinise the exploitative relations that capitalists hold over the working class proletariat. Marx exposed the contradictions within capitalism and began to derive an analysis of the role of credit money in overcoming these contradictions. The chapter analyses how David Harvey built on Marx's work in order to offer an explanation of the geographies of capitalism and in so doing the ways in which the operation and circulation of credit money are integral to the functioning of capitalism. The chapter then turns to the work of Albert Weber and Georg Simmel to understand the social narratives that explain the function, roles and circulation of money before exploring the contributions of anthropology and the sociology of scientific knowledge (SSK) in understanding the formation and operation of money from a social perspective. This chapter also discusses the work of the French Regulation School on financialisation and the viability of a finance-led regime at the scale of the nation-state, as well as the literature produced by the Critical Social Accountancy School (CSA), who consider the effects of the paradigm of shareholder value on corporations and households. The chapter concludes by exploring the writings of the Cultural School of financialisation which explores the mechanisms by which commensurate financialised subjects are being elicited.

Chapter 3 reviews the ongoing debates emerging from the geographies of money literature. This theoretical body of work is used in two ways. First, these narratives provide a contextual background with which to frame the research. Second, the literature has been used to pose new questions concerning the production of new geographies that have emerged from the production of mortgages and of

securitisation. This chapter discusses the formation of the Bretton Woods System (BWS), which provided the institutional architecture for a new international finance system after the Second World War, and later enabled the idea of securitisation to migrate to the UK. The chapter explores the collapse of the BWS and its succession by the new international financial system (NIFS) which was coordinated through powerful financial centres (Leyshon and Thrift 1997), in particular London, which was subjected to waves of competitive deregulation and a spatial reconfiguration as information technology increased the volumes of available financial data. This stimulated the emergence of a new generation of spatially concentrated epistemic elites to interpret these flows of information. The chapter then shifts its focus to study the rise of city-regions that are home to processing sites that complete automated and often standardised processing for lenders.

Chapter 4 reviews the contemporary debates that are currently shaping the application of research methods in economic geography, especially the important implications of the cultural turn. The chapter then discusses the methods used in this research project, mainly semi-structured interviews with corporate elites, coupled with the analysis of secondary data, including corporate reports. The chapter explains why these research methods were chosen and evaluates the success of these methods in the context of this research. Uneven power relations emerged during the research, owing to the powerful status of the financial elites who were the main source of empirical data. Chapter 4 seeks to define what makes these financial elites 'elite' and how their status affected the research. The timing of the research corresponded with the credit crunch, the impacts of which are discussed in chapter 4, along with how a flexible methodological strategy was used to minimise the effects of access during the research.

Chapter 5 analyses the changing geography of residential mortgage credit production in the UK and develops a geographical history of mortgage production beginning in the 18th century, focusing on the development of dispersed mortgage production networks that operated on a regional scale. Chapter 5 then discusses the consolidation of mortgage production in the 1980s into specialised and frequently automated processing centres outside of London in regional centres. This reorganisation occurred as a response to deregulation and technological innovations in the 1980s and was instigated across the industry by lenders in a bid to reduce operational costs and to manage credit risk more effectively. The thesis argues that these regional centres are powerful, if overlooked, spaces that are responsible for producing the multi-billion pound 'collateral' used in the production of RMBS debt-securities.

Chapter 6 examines the development of credit-scoring, a technology which has revolutionised the production of residential mortgages in the US and UK. Credit-scoring has been criticised for its reductionist epistemology and exclusion of consumers from cheap credit, but its adoption by UK lenders has successfully reduced operating costs and, to a degree, has standardised the way in which credit risk is measured. This chapter explains what credit-scoring is and reviews work from the social sciences, statistics and operational management, as well as drawing upon empirical material, to trace the history of credit scoring, but also how this technology was transferred from the US to the UK. The chapter then discusses how credit scoring became central to the expansion of the UK mortgage market, and how credit-scoring technology is produced, evaluated and maintained by epistemic elites. This chapter also discusses the uneven geographies of governance that determine what information is available for use in credit-scoring and risk management.

Chapter 7 explores the geographical construction of RMBS through securitisation and highlights the spaces that are critical in the production of RMBS bonds. The chapter discusses how mortgage assets are converted into redeemable RMBS bonds, of different maturities, which are designed to offer different rates of return, through a complex process of socio-financial engineering. The chapter scrutinises how space is manipulated and homogenised by epistemic elites in an attempt to tame the credit risk borne by consumers and their (in)ability to repay their mortgages. The chapter documents the role of mortgage lenders, corporate service providers, investment bankers, and bond-rating analysts, to analyse their roles and to develop an understanding as to how each organisation seeks to manage credit risk across space.

Chapter 8 discusses the empirical contributions of the research, focussing on how changes in regulation spurred the adoption of US based technological innovations and business models by UK mortgage lenders. This chapter summarises how the geographies of mortgage production were transformed through credit scoring and discusses the range of financial service providers and actors that contribute to the development of securitisation transactions, such as law firms, investment banks, and bond-rating agencies. The chapter also explores the contribution of the findings towards political economic theory, and how RMBS notes can be viewed as a form of credit money, in an attempt to see how the value of contemporary credit instruments can be viewed as being socially constructed by epistemic elites. The conclusion also outlines how the politics of financialisation have become more deeply embedded in financial institutions through securitisation, a technology that enabled lenders to increase their profits between the mid-1990s to mid 2000s. In addition, the chapter reflects upon the thesis' contributions to economic geography, and its focus on epistemic elites in both the City and in regional centres. Finally,

the conclusion suggests the ways in which the study could have been completed differently.

Chapter 2

Financialisation(s) and monetary forms

“...Mlle Zélie, a French opera singer, in the course of a world tour gave a concert in the Society Islands and for her fee received one third of the proceeds. Her share consisted of three pigs, twenty-three turkeys, forty-four chickens, five thousand coconuts and considerable quantities of bananas lemons and oranges. Unfortunately the opera singer could only consume a small part of this total...thus a handsome fee which was equivalent to some four thousand pre-1870 francs was wastefully squandered,” (Jevons, 1875 cited in Davies, 2002:13).

2.1. Introduction

In 1949 Bill Williams, an electrical engineer turned economist, completed his work on the Philips Machine, or MONIAC (Monetary National Income Automatic Computer). The MONIAC was an early simulator or economic model, which represented a national economy and used coloured water that flowed through perspex pipes to simulate the flow of money through the economy. The flows were represented as income, savings, imports and exports that could be adjusted to emulate government interaction where transparent water tanks represented stocks of money held as reserves (Bissell 2007). At the time, Williams’ early attempt at modelling flows of capital through the economy was revolutionary, bearing in mind that modern

computers and spreadsheets would not be available for several decades. The MONIAC, see Figure 2.1 for a diagram, was completed four years after the Bretton Woods System (BWS) was implemented. It could be argued that the MONIAC is iconic for its time, as the fixed flows of the MONIAC's perspex pipes mirrored the common assumptions, prevalent at the time, that the new financial system was now stable, ordered and predictable.

HYDRAULIC ANALOGUE OF U. S. MONEY FLOW
By
Phillips & Newlyn

The diagram illustrates a complex hydraulic system designed to simulate the flow of money in the U.S. economy. The system consists of numerous interconnected tanks, pipes, valves, and recording devices. Key components and their functions include:

- INCOME:** The primary input at the top left, which flows into the system.
- TAXATION:** A valve that diverts a portion of the income flow.
- CONSUMPTION EXPENDITURE:** A tank that receives the flow after taxation.
- GOVERNMENT EXPENDITURE:** A tank that receives a portion of the income flow.
- INVESTMENT EXPENDITURE:** A tank that receives a portion of the income flow.
- FEDERAL RESERVE:** A large tank that receives a portion of the income flow.
- SURPLUS BALANCES:** A tank that receives a portion of the income flow.
- IMPORTS:** A tank that receives a portion of the income flow.
- EXPORTS:** A tank that receives a portion of the income flow.
- INTERNATIONAL MONETARY FUNDS:** A tank that receives a portion of the income flow.
- MONTHS LAG IN CIRCULATION:** A tank that receives a portion of the income flow.
- PUMP:** A device at the bottom left that maintains a constant level in the fluid chamber below.
- MINIMUM WORKING BALANCES:** A tank that receives a portion of the income flow.
- TANK CAPACITY ADJUSTER:** A device that varies the relationship between quantity held and fluid level.
- TAPERED SLOT:** A device that is shaped so that the rate of outflow from the tank is proportional to the fluid level.
- FLOAT VALVE:** A device that maintains a constant level in the fluid chamber below.
- FLOAT:** A device that activates recording device and moves adjustable cam which, in turn, controls a rate of flow.
- ADJUSTABLE CAM:** A device that is driven by a float and, by means of a slot, moves a plunger valve. The cam shapes and slopes can be changed easily.
- UNLIMITED SUPPLY OR DISCHARGE TANK:** A device of which can be held constant at any desired position.

Several graphs are included to show the results of the simulation:

- INCOME vs TIME:** A graph showing the fluctuation of income over time.
- INTEREST RATE vs TIME:** A graph showing the fluctuation of the interest rate over time.
- IMPORTS vs EXPORTS vs TIME:** A graph showing the fluctuation of imports and exports over time.

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However, as early as the 1960s the stability of the BWS began to show signs of strain, and by the 1970s this ambitious project had failed, undermined by the new Eurodollar markets centred in London. It became doubtful that the international financial system could never be successfully, fixed and controlled, for it is mediated through various forms of money that (are) operate(d) and perform(ed) in different ways, and as new types of money enter circulation, old variants are displaced. Subsequently, the operations of some types of money are more familiar to bankers, regulators and economists, for example state-paper money, making them easier to understand, regulate and model. On the other hand, new financial innovations are often less well understood, regulated and modelled. In the case of RMBS, they can, and have been, entirely misunderstood. It is argued that new financial innovations can often fall outside of existing regulation, while poor familiarity with their social construction, can frequently lead to a poor understanding of the risks associated with particular forms of money, making them difficult to stabilise and control.

To return to the MONIAC metaphor, the economy has become far more complex and if Philips were to build a MONIAC today, it would need to reflect the unstable and diverse nature of the contemporary financial system. Perhaps the capital, represented by water moving through the perspex pipes, would be represented by a multitude of different colours, and maybe gaseous states, to represent the different types of monetary instruments, while the intimately related flows of consumer savings and credit would undoubtedly need to be included. Philips would also have to consider connecting a series of MONIACs together, to signify the integrated flows between different states and the flows of consumer investments and savings between them. Such an endeavour would be useful to represent the politics of financialisation that have become more powerful in coordinating the flows of capital

into different sectors of the economy, while drawing attention to the multitude of different monetary instruments in circulation today.

This chapter has three broad aims. First, the chapter will explore the theories and philosophies of money which have been developed in the social sciences, to be discussed in section two. This will enable the development of a comprehensive understanding of research conducted on money and credit in order to contextualize and frame the research on consumer credit and RMBS. The second aim is to review the contemporary literature on financialisation to understand where RMBS and consumer credit can be situated in the context of the deepening significance of the role of financial markets in everyday life. This will be explored in section three. The third aim is to highlight the spatial sensitivity of these social science narratives to understand their attentiveness to the spaces and boundaries of money, credit and financialisation, which will be discussed in sections two and three. Section four will conclude this Chapter.

2.2. Adding it all up: the theoretical and philosophical narratives of money

Money was symbolised in the MONIAC through the simple flow of coloured water, but even a brief foray into the history and philosophy of money immediately highlights the inadequacy of this portrayal due to the sheer diversity of different monetary forms that have existed through time and across space. Leyshon and Thrift (1997:1) observe how the power and complexity of money makes it tempting to consider money as a 'supernatural deity', but they do not recommend this approach and instead suggest that money needs to be historicised and socialised in order to understand its 'real' incarnations. Here I seek to historicise money by focussing on narratives which are sympathetic to the operation of money, but more

importantly the particular spaces in which money circulates. This will be important to contextualise how RMBS notes can be understood as a monetary instrument.

Dodd's (1994) monograph, *The Sociology of Money*, attempts to develop a systematic account of the nature of money and, in doing so, discusses the four social functions of money, that are generally accepted by social scientists. The first two functions; the ability to act as a *medium of exchange*, and as a *store of value*, enable it to adopt two additional roles, as a *unit of account* and as a *means of payment*. These functions combined, enable money to exhibit a dual function where it can act both as a lubricant of exchange and as an expression of value (Leyshon and Thrift 1997). According to Dodd (1994), these four functions are useful for identifying money as each monetary instrument performs these functions to different degrees, and demonstrates how particular monetary forms are used for different purposes in specific societies, histories and spaces. For example, cash is an excellent medium of exchange as it is accepted readily as payment, but it is a poor store of value as inflation diminishes its purchasing power over time (Dodd 1994). On the other hand, government bonds, backed by the state, are excellent stores of value as they produce a return over time, but are not accepted as payment for everyday goods and services. Leyshon and Thrift (1997) identify five forms of money; premodern money; commodity money; money of account; state money and virtual money. Each monetary instrument is sustained through networks of trust, habit and faith that are reinforced through complex webs of technology, institutions and cultural attributes. Such qualities lead Dodd (1994) to assert that the production of money is more a craft than a science.

Money has a long history, but it was not until the eighteenth century when formal debates on the philosophy of money began to occur. Before the fifteenth century there has been little formal analysis of economic activity, and the analysis that did

exist was piecemeal (Landreth and Colander 1994). Early writings on money in the 1600s were the product of merchants, rather than scholars, reflecting a shift at the time from feudalism to mercantile capitalism. Trade between cities and nation-states, was facilitated by the merchants, whose writings highlighted this fundamental shift and began to underline the importance of money in smoothing trade. Precious metals in the guise of commodity money were used to purchase raw materials and the means of production (Landreth and Colander 1994). These initial accounts did not seek to theorise money but instead focussed on the functions of commerce and trade. For example, the early work pioneered by the French Physiocrats, Cantillon and Quesnay, argues that agricultural land was the source of wealth because its products sustain humanity (Boss 1990). The Physiocrats argued that the wealth was born from land, and was released by agricultural labourers, as once the harvest had been collected, the surplus food could be sold or exchanged for other commodities. Debates on the value of money continued through the 16th century, where philosophers such as William Petty began to question the source of value in money (Roll 1992). Petty stipulated that value of an object was derived from the human labour necessary to produce it, whilst writers such as Locke and Hume argued the value of money was in fact imaginary (Roll 1992) and projected onto commodities. A successful transaction would be completed when a quantity of gold, representing a specific imaginary value and denominated numerically, was exchanged for a commodity with an equivalent imaginary value (Roll 1992). The eighteenth century witnessed the acceleration of industrial capitalism as serfdom disappeared and industrialists seized the power of production causing an epochal shift in the history of western Europe (Roll 1992). This economic transformation undermined the authority of the Church which had previously attempted to repress the expansion of scientific knowledge. This is a key development, because individuals began to freely explore

philosophy, which would later be used to develop frameworks to explore the relationships which existed between money, the economy and the state.

2.2.1. Money and political economy

One of the earliest writers contributing to this domain was Adam Smith (1976 [1776]). His theorisations were informed by debates on moral philosophy, which argued that the state's only function was to protect political freedom and property rights, where markets would effectively regulate themselves, through exchange, facilitated by money. Smith's (1976 [1776]) attentiveness to moral philosophy placed the worker, protected by the state, at the centre of the economy. In order to facilitate exchange and trade between specialised workers, Smith's theory operated within the territorial space of the state and asserted that there had to be one commodity that no worker would refuse to accept, which would act as a benchmark for exchange. This was 'commodity money'. Smith (1976 [1776]) identified tobacco, salt and cattle as early forms of commodity money, which were accepted as almost universal payment in the societies within which they circulated. However, Smith (1976 [1776]) elaborated on how precious metals such as gold are the most preferable money commodity as their physical properties render them scarce, non-perishable and easy to divide, making them a privileged commodity to lubricate trade. Earlier writers, such as Locke and Hume, considered money to have an imaginary, magical quality (Roll 1992), but Smith (1976 [1776]) sought to examine the power that gave commodity monies their universal, social power. In doing so, Smith identified two types of value, known as 'utility value' and 'purchasing power'¹¹. Ricardo (1951) elaborates on the importance of utility value, arguing that a commodity must have a use within society, otherwise no-one would

¹¹ Karl Marx would later refer to Smith's 'utility value' as 'use value' and 'purchasing power' as 'exchange value' in his analysis, to be discussed later.

want to purchase the object. The second value that Smith (1976 [1776]) attributed to commodities was its purchasing power, quantified by the amount of labour power embodied in it. This, Smith believed was the true universal value embodied within commodities.

Based on this theorisation, Ricardo (1951) asserted that precious metals, such as gold, are the most appropriate money commodity because their scarcity demands that substantial hours worth of human labour must be expended to extract the material, making gold money extremely valuable (Ricardo 1951). While Smith's narrative of political economy marginalised the role of the state (Landreth and Colander 1994), Ricardo (1951) began to examine the explicit role of the state in the management of non-commodity money. Ricardo observed that although gold is the most valuable commodity money, it is not necessarily an ideal medium of labour value, as fluctuations in its supply can distort the labour power that it represents, and it is notoriously difficult to transport. As such, Ricardo considered paper money, albeit fixed to gold, as being superior to commodity money, although it has no direct intrinsic value as a paper-commodity, and so it does not express the labour power in the same way as gold or silver. Ricardo argues that state-paper money is superior to commodity money because it represents the value of gold but can circulate more cheaply as money, due to its comparatively low weight. However, the success of state-paper money's circulation is contingent on the ability of the state to protect the source and legitimacy of its legal tender.

Karl Marx developed the ideas of Smith and Ricardo, borrowing extensively from their earlier research (Landreth and Colander 1994) to provide a sophisticated account of the role of money under capitalism (De Brunhoff 1973). Unlike Smith and Ricardo, Marx's account of political economy focused on how the exchange value of labour is exploited by capitalists, which causes Marx to place money at the

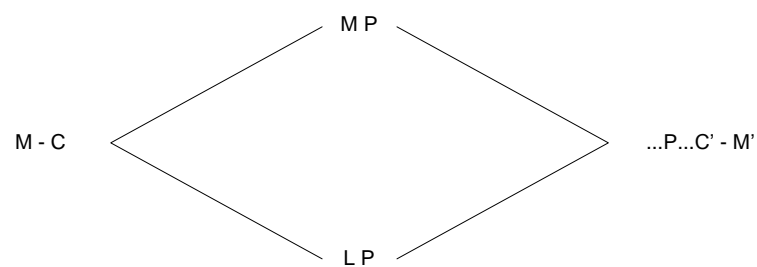
heart of capitalism. Marx's systematic work on capitalism lead him to identify the ways in which money is converted into capital and credit money, so as to overcome the contradictions of capitalism, which as I shall argue later is an important process in understanding the emergence of RMBS notes, a product of securitisation.

For Marx, commodity money has two values. First, *use value*, based on Smith's (1976 [1776]) utility value, requires a commodity to have a specific use. Second, drawing on Smith's thesis of purchase power, Marx highlights the problem in trying to compare the value of two qualitatively different commodities in exchange. Marx argues that this quandary can be addressed through the concept of *exchange value*, where the value of a commodity is measured by the quantity of labour time required to produce it; a universal value that can be measured in all commodities (Marx 1990 [1867]; 1993 [1939]). Subsequently, two commodities can be valued by comparing the amount of labour time that has been exerted in their production. As with Smith and Ricardo, the universal equivalent of labour power can be embodied in any commodity and Marx, like his predecessors also suggested that gold is the most appropriate commodity-money.

The nascent political economy theories that were pioneered by Smith and Ricardo, had, on the one hand, primarily sought to theorise money and trade in an economy where property rights were protected and respected (Smith 1976 [1776]). On the other hand, Marx's aim was to synthesise this research on commodity money and capitalist production to understand the complex relationships that underlie capitalist accumulation, with the specific aim of revealing how workers are exploited by capitalists (Marx 1990 [1867]). Leyshon and Thrift (1997) identify three types of capital within Marx's writings. The first is known as productive capital where money is converted into capital when capitalists attempt to make a profit through

commodity production (Marx 1990 [1867]). This transformation occurs when money is used to purchase materials, the means of production and labour to produce commodities (Leyshon and Thrift 1997). Under capitalism workers sell their labour to an industrial capitalist who pays them in exchange for their labour time, but Marx (1990 [1867]) argues that the workers are exploited as their wages are not proportional to the labour time that is used to produce the commodities. This fraction of unpaid work is known as *surplus value* and is the profit that capitalists amass as a return on the capital employed (Marx 1990 [1867]). Once capitalists have sold their commodities they reinsert the money and profits back into the production process and the capitalist receives greater returns as this cycle continues. This process can be summarised in Figure 2.2 below:

Figure 2.2: Marx's circuit of productive capital



Source: Leyshon and Thrift (1997)

Under Marx's circuit of productive capital, M represents the money that is used to buy raw materials or commodities (C) that are transformed through the means of production (MP), such as machinery, and the labour power of the workers (LP). The materials are subjected to the production process (P) which results in the development of a new commodity (C'). Once this commodity is sold, its value is converted back into money (M'). The final result is that the capitalist receives a

return on their capital above and beyond that which was first invested (M) as the workers have been exploited during the production process and the capitalist manages to extract surplus value, realised as money.

The continuation of this cycle is fraught with difficulties as capitalists have to wait until the new commodities have been exchanged for money before they can buy the fresh labour power and materials necessary to produce more commodities. Capitalists offset this problem through the production of a second type of capital, known as financial capital, which is provided by a second type of capitalist, known as money owners, (Harvey 1982) who advance interest-bearing financial capital to industrial capitalists in exchange for a promissory note enabling them to continue production (Leyshon and Thrift 1997).¹² The role of the money capitalist is performed by wealthy investors, or banks that have pooled the savings of businesses and workers, and effectively purchase debt from the industrial capitalists. The interest that the money owners receive is derived from the profits of the industrial capitalists. In effect, it is a fraction of the surplus value that has been extracted from the workers (Marx 1990 [1867]). This system of credit allows capitalists to increase the velocity of capital circulation and the metamorphosis of commodities into money, which results in increased capital accumulation (Harvey 1982).

Marx (1990 [1867]) argues that credit-money and bills of exchange act as a monetary instrument as they are exchanged for other commodities, even though they are not fixed to the circulation of government or metallic money and they do not hold value-since no labour and extraction of surplus value has yet taken place. This develops a secondary market where the bills circulate, but Marx (1990 [1867])

¹² A bond or contract where the debtor, in this case the industrial capitalist, promises to repay their debt to the money owner, at a specific date with a predefined rate of interest.

insists that the value of these instruments are based solely on trust and the belief that credit-money will be repaid in the future by commodity money. Marx refers to this as fictitious value as the credit money, if issued, should theoretically have labour value in the future once the debt has been repaid (Marx 1990 [1867]). This is similar to the corporate bond markets that are part of the contemporary financial system, where corporations raise funds for production and repay the debt using profits at a later date, which would be repaid from the surplus labour extracted from workers. The third type of capital is commercial capital where commodities are purchased and resold at a higher price through arbitrage (Leyshon and Thrift 1997). This also occurs with money capitalists, when they sell the bills of fictitious capital to other money capitalists at a discount.

David Harvey's (1982) extensive work on Marx attempts to develop his unfinished thesis on credit money further, arguing that although credit money acts as a temporary fix to capitalism's internal contradictions, it eventually exacerbates crises. Despite the importance of credit money, Harvey bemoans the fact that Marxist writers have frequently neglected the study of credit and maintains that credit and bills of exchange are unlike commodity money as commodity money is widely accepted in exchange whereas credit money is not. Harvey (1982) argues that credit money is a private debt, where the borrower has to repay the creditor directly which limits the circulation of credit money amongst money capitalists. Following this argument, it is essential that banks control the production of their private credit money to ensure they do not produce and circulate high-risk, low-quality money as credit. This leads to the development of a hierarchy of banks, where central banks regulate the money produced by national banks, whose bankers can refuse the convertibility of private credit money, emphasising the role of the nation-state in regulating private credit monies. The pinnacle of this

hierarchy was held by the US during its period of hegemony over the Bretton Woods System (BWS) which helped govern national economies.¹³

If bills of exchange circulate as money and are used for private payments, the monetary value of the bills is not fixed to the collateral of unsold commodities, but they are commensurate with the future labour value used to produce the goods. As the bonds are duplicates of real capital, they exist as fictitious capital, which extends beyond real production, and allows fixed capital to circulate (Harvey 1982). Marx suggests the idea of fictitious capital in an attempt to persuade us that future revenue is not 'real' capital, as the value has not yet been produced, which distorts the supply of credit money and produces financial crises (Harvey 1982).

Fundamentally, Harvey (1982) sought to view Marx's work through a spatial lens to understand how capitalism's social relations have been adopted more rapidly and deeply in particular spaces. For example, the expansion of credit money has been driven by its geographical mobility, allowing money capitalists to seek out superior returns in different locations and markets, which has been enhanced by the pooling of deposits in banks, which employ a special social class - the money capitalists - who are adept at managing fictitious capital and credit money. This leads Harvey to conclude that the act of exchange unites particular places through social relations which allows the flow of universal value. However, exchange can only occur if capital and money are free to circulate within different spaces, achieved by transport networks, which leads to spatial integration (Harvey 1982). In the context of contemporary capitalism, Harvey (1982) contends that credit money is the most mobile of monies due to its ability to pass between spaces through electronic communications, which reduces physical barriers. Despite this, Harvey continues to place emphasis on the role of the nation-states that are instrumental in

¹³ The BWS will be discussed in greater detail in Chapter 3.

regulating the flows of credit money and stresses that capitalism can only expand if the law, property rights and the transport infrastructure of a nation-state are compatible with capitalism's logics.

These narratives of political economy were the first to situate money within a broader understanding of society and capitalist production, but there are several issues that undermine their applicability to adequately examine the operation of the contemporary financial system. The most prominent issue surrounds the labour theory of value, where value is only derived from the labour exerted in material production (Dodd 1994). This emerges from Marx's desire to elucidate the exploitation of industrial workers under capitalist accumulation, but in using this theorisation he inadvertently ensured that it would become difficult to reconcile his theories of labour with today's contemporary economic geographies. This difficulty emerges from the prevalence of the tertiary and quaternary sectors of advanced capitalist economies (Williams 1997) where service products would potentially be viewed as having no labour value, leading both Harvey (1982) and Boss (1990) to ponder how Marx would have viewed the burgeoning role of banks, the service sector and consumer finance under the latest regime of accumulation.

Sayer and Walker (1992) attempt to resolve this problem, by arguing that many economic activities have been mislabelled as services. They assert that applied technical knowledge, research and development and project management, activities that are frequently classed as services, are in fact integral elements of the productive labour process as although they are not acts of material production, these activities have an important affect in fashioning raw materials into new objects, imbued with use-values. This leads Sayer and Walker (1992) to suggest that bankers in the financial services industry also contribute to the productive labour process as they arrange the finance that frequently facilitates the material

production of goods. Sayer and Walker attempt to address the weaknesses of the labour theory of value by widening the social division of labour to encompass technical and managerial activities with direct material production.

However, this defence only glosses over some of the deeper theoretical issues that plague the labour theory of value. For example, Doel (2006) reminds us how different quantities of two different commodities, while being qualitatively different, can be described as being equivalent in value, although it is only when they are compared with money that they *become* equivalent. At this stage of exchange, Doel argues that it is difficult to accurately translate the exchange value, and labour value, of a commodity into a monetary price.¹⁴ Doel's (2006) critique also destabilises the distinction between use-value and exchange value, in that the use-value of a commodity is perversely divided. While consumers purchase a commodity because of its particular use-value, capitalists produce the commodity in order to produce a profit, giving the commodity a second use-value. Doel argues that this second use-value causes labour power to take on a use-value, which he suggests removes the distinction between use-value and exchange value.

Leyshon and Thrift (1997) list four additional weaknesses that restricts the applicability of Marx's analysis to contemporary research on capitalism. First, Leyshon and Thrift (1997) suggest that the idea of commodity money is not flexible enough to comprehend new forms of money like derivatives and futures contracts. Second, Marx believed that credit money would aid the downfall of capitalism. Although capitalism has frequently stumbled since Marx's time, it has not yet been replaced by an alternative, and the use of credit under capitalism has grown.

¹⁴ The discrepancies in effectively translating values to prices also highlights how Marx's labour theory of value is insensitive to price changes emerging from the pressures of supply and demand. Although Marx borrowed the concept of exchange value from Smith (1976[1776]), Smith was aware that supply and demand detached prices from the labour theory of value.

Leyshon and Thrift (1997) assert how the international credit markets have expanded dramatically and that speculation has increased since the 1980s.¹⁵ Third, Marx, Ricardo and Smith minimised the role of state regulation in their narratives, but Leyshon and Thrift (1997) note how state regulation plays a constant and powerful role in the contemporary financial system by developing rules that are designed to enable the operation of 'free-markets'. The final criticism of political economy's theory of money is that Marx's, in particular, failed to account for the cultural dimensions of money and the social institutions of trust that permit the circulation of money and credit within society. The chapter will now turn to examine a series of theories that begin to explore the cultures of money.

2.2.2. Anthropological and sociological accounts of money

Subsequent work on the philosophies of money and finance departed from the labour theory of value, central to the political economy theories of Smith, Ricardo and Marx. These new accounts, discussed below, began to focus more frequently on the role of the state, individuals and other actors in the production of money and value. One such narrative is the sociological analysis of the economy by Albert Weber at the turn of the 1800s, which began to uncover the relationships between economic actors which underlined the role of the state in the production and regulation of money, neglected in the earlier accounts of Smith and Marx (Swedburg 2005). Although Weber did not intend to develop an in-depth and detailed theory of money, he felt that economic sociology could be used to analyse money's role in economic theory (Swedburg 2005). In contrast to the earlier work of Smith, Ricardo and Marx, who all consider commodity money and credit to be produced through labour, Weber situates the state at the centre of monetary

¹⁵ The credit crunch, initiated through the devaluation of fictitious capital via sub-prime securitisation, may not have destroyed capitalism (yet), but it has been left badly shaken.

production, where he considers money to be a legal means of payment (Weber 1968), similar to the work of Harvey (1982), and in doing so, embeds the circulation of money within the space of the state. Money, as a means of payment, is produced when a state mobilises its power to assume a monopoly in the production and regulation of money: “By passing a suitable law, a state can turn any object into a ‘legal means of payment’ and any chartal object into ‘money’ in the sense of a means of payment,” (Weber, 1968: 167-168).¹⁶

Whether or not a state is able to successfully protect the integrity of its money, is borne out of its aptitude to exercise administrative control over money (Weber 1968) which is sanctioned through its production and management, or the detection and destruction of counterfeit money. Political economists argued that commodity money existed to facilitate the ease of trade between producers and capitalists, but Weber distinguishes the exchange function of state money from the general economy and argues that the primary aim of state money’s exchange function is to enable the state to tax its population, to accumulate wealth and to fund wars (Weber 1968). The provision of a state money with a universally acceptable exchange value is necessary to collect taxes in the same medium and value, but also to ensure the state money circulates as the dominant monetary instrument within the economy. Consequently, the state coerces the population into circulating its own government-controlled money to ensure that value can be accumulated for the state. Gold, or paper money fixed to gold, is important to Weber’s analysis because gold is scarce, and therefore valuable, but he argues that money’s value is only realised through its relation with other definitive types of commodity. As such, money has no intrinsic value of its own, as with commodity money, and so money only gains value when it acts as a means of exchange, reflecting the value of the goods being exchanged.

¹⁶ A ‘chartal object’ is an object created or supported by a state.

Like Weber, Simmel (2003[1907]) rejects the labour theory of value in his analysis of the relationships between money and individuals. Simmel (2003[1907]), disagrees with Marx's thesis that labour is the ultimate measure of value in commodities and Simmel argues that if labour was the definitive measure of value, then commodities would be priced purely in hours of labour time, not money. Simmel continues to problematize the idea of labour power, where all labour time is equal, as he believes that the brain articulates a central role in production as it coordinates the body's muscles in what he refers to as the role of 'mental production' (Simmel 2003[1907]). Simmel argues that specialised labour requires more 'mental production', leading him to conclude that a skilled worker would produce more value in the production of one complex object in contrast to an unskilled worker producing a different, larger quantity of products, but with less skill and expertise which destabilises the theory of a unified labour value as being a tenable argument. Simmel's view has, to a degree, been supported and replicated, by contemporary research on local currency systems (LCSs), especially time dollar schemes. Such schemes have failed to attract professional members as they are unwilling to exchange their services with unskilled members of these localised economies as they perceive their time to be more valuable (Lee *et al.* 2004).¹⁷ Simmel replaces the labour theory of value with utility value, common to the earlier political economy narratives, and scarcity value which makes objects more

¹⁷ LCSs are localised economic systems that are forged by social groups and involve the production of goods and services. They are self-regulating, issuing and administering their own currencies (Lee, et al. 2004). These alternative economic systems are detached from the state and have been set up in areas of deprivation by their members to enable them to produce and consume services and goods outside of the formal economy. Members offer goods and services to each other and are paid in the local currency, once a price has been negotiated with the buyer. Members amass the currency by undertaking work for other individuals in the system, which can then be spent on services offered by other members. With time dollar LCSs, the value of the skills used in the production of goods and services are equalised as the goods or services are perceived to be worth the amount of time required to produce them, regardless of the skills required (Lee, et al. 2004). . For example, five hours of baby sitting would be rewarded with five time dollars, which could be used to purchase five hours of gardening.

valuable to individuals.¹⁸ According to Simmel (2003[1907]), humans order objects hierarchically where a society will perceive some object to be worth more than others and where objects derive their value through psychological and metaphysical qualities that individuals identify in an object (Leyshon and Thrift 1997).

Simmel views exchange as a process where an individual balances 'sacrifice and gain', where the values of an object are partially sacrificed to gain from the values of another object in the transaction. Money acts as a measure of value for Simmel (2003[1907]), where a specific quantity of money becomes equal to the object being exchanged with a buyer being '...willing to sacrifice this money...only if we obtain a reasonable equivalent,' (Simmel 2003[1907]:141). As such, money has no inherent value itself, and it is only considered valuable because of its role as an exchange medium. This makes trust and social relations important to Simmel's theory of money, as they legitimise money, which is important since it consists of a symbolic medium of exchange, and is used to express the perceived value of an object. If money suffers a loss in confidence it can no longer reflect the values of objects which can cause monetary systems to collapse (Lewis and Weigert 1985). Unlike Marx, Simmel does not explore the role of credit money in any depth, but he does recognise that credit money is reliant on trust, where it represents the values of objects in the future, which emphasises the importance of the social relations that underwrite money (Leyshon and Thrift 1997).

Research conducted by economic anthropologists has also provided rich insights into money, by focussing on the monetary systems of different societies. Early work conducted by European and North American academics in the 1900s,

¹⁸ Simmel rejects the idea of labour power being the sole value of a commodity and subsequently refers to objects instead of commodities.

focussed on so-called 'primitive tribes' in South America and in Africa to identify and examine the different types of indigenous money and the social networks in which they operate. Anthropologists sought to embrace the social and contextual experience of money in line with the culturally inflected work of Karl Polanyi, in contrast to orthodox economics, which ignores the significance of money and its social relations, in favour of abstract economic terms (Dalton 1965). Davies (2002) contextualises these studies by discussing how money emerged out of the inadequacies of barter exchange which was an inconvenient and inefficient method of enacting trade, and highlights how different cultures around the world use common commodities as a standard of uniformity to make payments.

'Primitive monies' use a variety of diverse objects for payment that include(d), woodpecker scalps, sea shells, goats and dog teeth (Dalton 1965); with more contemporary examples including local currencies produced and administered in LCSs. On the one hand, Maurer (2006) shows how primitive money differs to modern monies used by western states, where state money is used as payment in commercial activity as well as for gift payments and the redistribution of wealth. On the other hand, primitive monetary systems have different monies for conducting commerce and trade, with alternative monies for non-commercial activities. For example, one money may be used to purchase food, whilst other another currency may be used by the same community in symbolic social events such as bride money exchanged between families in marriage (Maurer 2002). Primitive monies studied by early economic anthropologists were organised so that particular monies could only be used by specific members of a tribe, as discovered by Armstrong's work on Rossel Island (Armstrong 1924). Anthropologists later turned their attention to the introduction of state-based colonial money and its effects on homogenising monies in circulation amongst subsistence economies which altered the relations within the societies as the idea of suffered deferred payment and

credit was introduced (Ofonagoro 1979; Maurer 2006). Leyshon and Thrift (1997) conceptualise this as a 'fluid' geography of premodern money which reveals a myriad of monetary systems across space and time, reflecting historically different social systems and cultures. Subsequently, as societies have become more interconnected, different monetary systems have become amalgamated or completely displaced. For example, the Roman Empire distributed its currency through Europe through the construction of a network of official mints to produce money to pay its soldiers (Davies 2002) which expanded the geographical coverage of Roman money, which began to homogenise Europe's monetary spaces (Leyshon and Thrift 1997).

Gilbert (2005) advocates the investigation of monies through an anthropological lens as to do so exposes the power and authority that is necessary for the successful circulation and operation of money, although she bemoans that this same approach has not been applied to modern monies. Consequently, Gilbert (2005) has attempted to analyse how state money is invested with social meanings, inscriptions and iconographies which naturalize the money object through banal representations, representations that fall into three categories. First, the history of an object, for example a British bank note's legitimacy may be represented, in part, by a decree where it can be accepted for payment as it is issued by the Bank of England. The second category is the function of an object, such as a bank note's value and the associated purchasing power that it commands. The third category is the notes identity; including serial numbers that are festooned with images, social and political seals and portraits, to exude trust. Although this provides an understanding as to how states ratify the quality of their money through trust it does not reveal how the value that the money represents can be comprehended. Gilbert (2005) finds the answer to this question in the earlier work of Baudrillard who explores the value of the images and symbols of

money. While Marx vehemently argued that the value of a commodity is derived through the labour power embedded in it during production, Baudrillard (1981) proclaims that the most important stage of an object's life is its consumption, where an object is invested with social meanings and codes. Baudrillard (1981) suggests that the importance of material objects are displaced by semio-linguistics where language, signs and meanings express the value of an object, which implies that value is produced through language, and that different societies in particular locations will attribute different values to objects. Under this argument the value of a quantity of money is commensurate with the value of an object as money has no value itself (Baudrillard 1981).

Gilbert (2005) examines how Rotman (1987) builds on Baudrillard's thesis, in an analysis of what he calls 'xenomoney'. Rotman traces the changing guises of money, over time, as the value of gold commodity money came to be represented by paper money. Rotman argues that the significance of paper money's relationship with gold became disembedded in day-to-day circulation, to the point where paper money's value became signified purely through signs and images. This is similar to the work of Goux (1990) who builds on Marx's idea of the money commodity and believes that the general equivalent and labour value of commodity money is merely symbolic, where the object of money is to represent, value rather than to have value. This body of work on the signs and meanings of value suggests that money is undergoing a process of dematerialisation where the value of commodity money, deriving from the labour value exerted on its materiality, has been replaced through a value of representation mediated through paper money, or electronic pulses, where the value is purely symbolic. Maurer (2006) argues that money is now generally seen as a sign that is humanly constructed and is culturally formed through conventions and social interactions (Maurer 2006). If contemporary accounts of money perceive it as having an imaginary value, this raises the

question as to how money is circulated and produced within networks of social relations that give value to these symbolic monies, where trust is essential in ensuring that the symbolic value in money is validated and regulated.

Dodd (1994) has suggested that the most effective way to understand money and the social relationships through which it is construed is through the lens of a monetary network, where the resilience of the monetary network is contingent on information and trust which operate across space. Dodd (1994) states that monetary networks have five common properties, which has been highlighted by research that has disentangled the operation and infrastructure of LCSs and their modes of self-regulation (Lee *et al.* 2004). First, monetary networks must have a standardised accountancy system that allows 'money' in the network to function as a medium of exchange, a unit of account and a store of value. Second, the money must be regulated so that it can continue to perform these functions. Third, the system must have reflexivity so that consumers can assume that the money will be redeemable in the future. Fourth, the network must have sociality to allow information about value and exchange to circulate through the network. Finally, these monetary networks operate through geographical frames of meaning and significance (Lee *et al.* 2004). Dodd (1994) argues that the information in these networks is instrumental in generating the trust that permits the successful circulation of money through distinct habits, routines and risk analysis which enables money to endure across particular spaces and times. The information that flows through these networks can be used to understand the social and cultural inflections which nurture the trust that allows the network to continue to operate.

Leyshon and Thrift (1997) discuss how it is now widely agreed that money is formulated through monetary networks that mediate trust, which has become arguably more important as financial innovations have led to the 'dematerialisation'

of monetary instruments. The mediums of money have progressively taken the form of electronic impulses, governed and authenticated by new structures of governance that are mediated through fluid, unstable networks of diverse actors. Leyshon and Thrift (1997) argue that these assemblages can be conceptualised as Actor-Networks, following ANT has been used extensively in sociology, anthropology, the philosophy of science, and economic geography to shed light on how new diverse forms of money have been created and how they are socially constructed.

Actor-networks can be defined as assemblages of elements, or actors, which can include people as well as non-human actors such as texts, computers, software and money that are brought together through a structure of power relations. Actor-networks are never stable and the actors are constantly redefining themselves through intermediaries, which are materials that are enrolled by powerful actors in order to maintain the stability of the network. The ability for an actor-network to be maintained is dependent on their ability to assemble other actors and intermediaries that enable a network to endure across space and time. Leyshon and Pollard (2000) review how these networks undergo what Callon (1991) calls socio-technical change which occurs through a sequence of processes known as problematization, translation, enrolment and stabilisation. Problematization occurs when a network is forced to reinvent itself through social and technological innovations. Translation occurs when the network attempts to realign its current actors and to align new actors with the network. Enrolment occurs when the actors are configured into a new socio-technical network, which if they are held coherently become stabilised (Leyshon and Pollard 2000). These stages can be used to understand the development of money as an actor-network, to raise awareness of the actors that facilitate the development and circulation of new money.

Davies (2006) accuses neoclassical economics of under-socialising the economy through its abstract, quantitative epistemology and comments on how ANT can be used to successfully reveal the wider social influences that affect financial markets which embeds narratives of the economic within society. Pryke and du Gay (2007) agree that this shift towards viewing the role of culture and social relations within finance seeks to capture the economic and organisational life of objects, people, markets, firms and consumers, which are frequently informed by debates in ANT. Mackenzie (2005) echoes this sentiment as contemporary studies that draw upon ANT have contributed to understandings of monetary networks and the impact of technology and social relations on the production and circulation of money. According to Amin and Thrift (2004:xxiii) 'One of the most expansive aspects of cultural economy has turned out to be the study of money in all its forms through detailed ethnographic research,'.

Leyshon and Thrift (1997) identify four overlapping actor-networks that govern the production and circulation of money. The first is the nation-state which regulates money and finance and has an effect on how money is designed as it must follow specific rules. The second network is the media, who disseminate information, through the medium of television, and publishing, which influences how money is accepted and exchanged. The third is the elite class of money capitalists who own or manipulate huge sums of money. The money capitalists are heavily reliant on trust and reciprocity which is needed to foster the creditability of money and monetary instruments within the financial system. The fourth network has been the growth of the objects that can be viewed as immutable mobiles (Law 1994), where elements of a network circulate without being altered which has increased the ability of financiers to access complex information, especially through the development of intelligent machines and software that make decisions.

Research that seeks to understand the relationships between these monetary networks that support the development and circulation of money has come to focus on the production of new monetary instruments. Davies' (2006) work, for example, highlights the calculative processes that are performed in setting the prices of particular asset classes, which provides a marked contrast to Marx's view of the labour theory of value. Rather than value being produced through human labour on material commodities, Davies (2006) outlines how capitalists now produce value and circulate money with the aid of actor-networks. The discursive knowledges developed and circulated by these professions dictate how money circulates through the economy (Davies 2006).

One specific type of money that has been of particular interest to academics is the emergence of derivatives, where the value of these financial products is derived from the risk and uncertainty that surround, interest rates, commodities, equities and indices that are engineered into a derivative. Allen and Pryke (2000) argue that derivatives - and their value - are construed through a series of calculative practices which they argue produce an idea of money which '...exists as a technologically charged form of money sign' (Allen and Pryke 1994:269). The idea that money is socially produced through the measurement of risks, leads Bryan and Rafferty (2007) to suggest that the value that emerged from new financial products, such as derivatives, can be found in the future social claims over different assets that are packaged within derivatives. Drawing on the work of Rotman (1987), they see the value of derivatives as being symbolic, for these instruments do not have value in, and of themselves, as Marx's commodity money does, and argue that it is the qualitative differences in the nature of the assets that underpin derivatives whether they are commodities or currencies are annihilated through the derivative, making them a new unit of account and a store of value, based on the (un)expected price movements of the underlying assets. As will be

discussed in more detail later, the construction of new financial products , whose value is based on other assets, can be used to understand how RMBS bonds are produced. The individual mortgage assets, on which RMBS bonds are based, are annihilated through calculative practices to produce new financial instruments that embody particular risks, which in the case of RMBS notes are the credit risks behind each individual mortgage, that are frequently engineered to produce RMBS notes bearing different levels of default risk.

Both Mackenzie (2005) and Callon (1998), have investigated the social and technical conditions that make markets work, where Callon introduces the term *agencement* to understand how agency and the ability to act is not confined to individuals; but through assemblages of people, tools, equipment, technical devices. This development has seen the emergence of research that considers the performance of the 'economic' through a cultural economy. For example, Knorr-Cetina and Bruegger's (2002) ethnographical research on foreign exchange markets focuses on the relationships formed between traders and non-human actors, such as screens, that provide traders with the necessary glimpses into the financial markets, for them to ply their trade. This thesis argues that it is important to understand how capitalists construe value through the use of technical devices and human knowledge, and that the discourses offered by anthropologists are useful in drawing attention to how these devices are used to produce the semiotic value numbers that represent the value of RMBS bonds. Having reviewed the diverse range of theories that have emerged from the social sciences and the humanities on money and credit, I will now turn to review the work on financialisation.

2.3. The liquidity of financialisation: flows of money and tides of change

Since the demise of the Bretton Woods System (BWS) in the 1970s, Anglo-American, and increasingly European economies (Jurgens *et al.* 2000; Stockhammer 2004), have turned towards financial services to generate wealth. Langley (2008) observes that the last two decades have witnessed the deepening of financial power and financial markets into everyday life within Anglo-American states, as the affluence of financiers and financial institutions has grown. Social scientists from a diverse range of disciplinary backgrounds have begun to mobilise the term financialisation and use it in two particular ways: First, financialisation has been used to describe changes in the economy and society where finance is becoming increasingly more powerful. Second, financialisation can be viewed as a series of processes that are reconfiguring the relationship between households, corporations and financial markets. The diverse background of academics writing about financialisation has granted it with a complicated history as its origins are situated in a set of diverse and contested narratives. For example, Blackburn (2006) sees financialisation as the growth of financial power, while Krippner (2005) sees it as a shift where economies come to rely increasingly on accumulation through financial services, not trade and commodity production. Financialisation can be viewed as an umbrella term that covers several intellectual theories. French *et al.*, (forthcoming), for example, identify three distinctive schools; a critical social accountancy approach; regulation theory; and a socio-cultural school. I seek to review each of these three schools in turn, where the former two are categorised as a political economy of financialisation and the later as a series of socio-cultural narratives. In so doing, I agree with Erturk and Solari (2007), in that securitisation can be viewed as a process of financialisation that integrates high-finance with everyday life, but also as a method of generating returns that the financial system has come to rely on, which proponents of financialisation see as a transition to a

finance-led growth regime. The chapter will now turn to review three prominent and contemporary schools of financialisation.

2.3.1. A political economy of financialisation

The most established school that has contributed to the debate on financialisation is the French Régulation School (RS). During the 1980s and 1990s Regulation Theory (RT) emerged as a critique of both neoclassical economics and orthodox Marxism. On the one hand, RT criticises neoclassical economics for its scientific epistemology which fails to account for non-economic and social phenomena, but also for the emphasis it places on a principle called 'general equilibrium', where a community is seen as being an autonomous collective where each actor acts rationally, but in unity, a theory which Aglietta (1979) believes is unrealistic. On the other hand, as a post-Marxist theory, RT draws on the heritage of Marxism and Kantian dialectics to interpret economic systems as the coexistence and resolution of two contradictory binaries: reproduction and rupture. RT also draws upon Marxism's institutional forms to understand how temporalities are stabilised to reproduce the economy through a series of relationships articulated within the system (Boyer 1990; 2002; Nadel 2002) and replaces Marxism's base-superstructure frame with two mechanisms called the regime of accumulation and the mode of social regulation (MSR) (Aglietta 1979; Boyer 1990). The maintenance of the regime of accumulation is supported through the MSR which is a group of state and private institutions that encompass habits, laws, customs and regulatory institutions which integrate, or coerce, individuals into acting in the interest of maintaining the regime of accumulation (Boyer 2002). The significance of the MSR, in contrast to general equilibrium theory, is that it allows the economic to be viewed through a social lens, allowing the refutation of general equilibrium's abstract laws of universal claims of rationality by economic actors. This enables RT to provide

insight into understanding the historical and social relations which organise the economic and non-economic into a coherent mode of production.

Aglietta (1979) stresses how RT's social sensitivity is important as it enables social components in the MSR to be identified which can be used to understand the nature of current crises and the ways in which they may be overcome. Grahl and Teague (2000) observe how RT is fluid as it has changed its terminology over time to accommodate new complex institutions in the MSR. RT has been used to analyse the crisis of Fordism, the failure of which is attributed to the rigidity of its MSR which was fixed through a deep division of labour, Taylorist management practices and the welfare state. The initial response to the crisis was to stimulate competition in labour markets and increase the flexibility of production through a new regime of accumulation described as post-Fordism, which was loosely modelled on Japanese lean production and a wage relation which would utilise new technology to overcome the rigidity of a Taylorist labour system (Grahl and Teague 2000).

Boyer (2000) has suggested a new finance-led regime where consumers who previously consumed the fruits of their own labour now own financial assets which earns them profits through participating in the financial markets, which become subject to new imperatives of profit and innovation. Aglietta and Breton (2001) understand that this new finance-led regime would focus on the development of shareholder value, aided through the expansion of ICT and mobile capital, which will provide investors with the ability to monitor individual firms' economic performance. There is evidence to suggest that the MSR and regime of accumulation have begun to move towards a finance led-regime as the second half of the 1990s saw an increase in capital mobility, corporate governance through improved accountancy and transparency, labour market flexibility, price stability,

optimism and a booming finance market. Aglietta and Breton (2001) do not believe that these changes should be seen as the development of a new economy but that these transformations should be viewed as the production of new institutional forms that will produce a new, if temporary, phase of growth. French *et al.*, (forthcoming) suggest that bond-rating agencies, which assign metrics to the risk of securities, act as a new set of institutional forms as they attempt to overcome information asymmetries which helps investors avert losses on their investments (Sinclair 1994; 2005) maintaining the regime of accumulation. Boyer (2000) shares this view arguing that a finance-led mode of accumulation is not sufficiently stable to survive, although Aglietta and Breton (2001) argue that a move towards a finance-led regime, whether viable or not, will affect the household, as labour flexibility is required to drive high returns for firms, generating a demand for flexible employment which could create volatile consumption, requiring households to increasingly rely on credit. Households will also have to engage with financial markets through equity investments and pensions to reap the rewards from this finance-led regime. Boyer (2000) argues that the geographical scope for finance-led regimes is limited, and suggests that only the economies of US, Canada and the UK are compatible with a finance-led growth regime, although there is a possibility for hybrid systems to emerge. For example, Germany's MSR is transforming the economy into a structure compatible with financialisation (Jurgens *et al.* 2000).

The RS is not the only school that has undertaken research on financialisation. Although the critical social accountants (CSAs) school emerged later than the RS, in the 1990s, it can be argued that writers from this tradition initiated the current debate on financialisation by making explicit reference to the term financialisation through their attempts to uncover new pressures and politics that have been applied to firms to increase shareholder value (Froud *et al.* 2000; Froud *et al.* 2002;

Erturk and Solari 2007; Froud *et al.* 2007). Froud, Williams and colleagues, based mainly in Britain, are located in the disciplines of accountancy and business management. Earlier research completed by the CSAs investigated the changing relationship between corporate governance with the pooling of pension fund capital as investments controlled by pension and savings funds has begun to dictate the behaviour of firms through the finance markets (Froud *et al.* 1998; Froud *et al.* 2002). For example, Hawley and Williams (1997) discuss how there have been several shifts in equity management, the most recent of which has entered a phase of centralised concentration in the hands of a few institutional investors, which they consider constitute 'fiduciary capitalism', based on the trust that investors hold in the fund managers to increase the value of their portfolios. Institutional investors use shareholders' voting rights, derived from their property ownership, to veto management policies which may jeopardise shareholder wealth. This shift concerns Hawley and Williams (1997) as a limited number of institutional investors collectively wield power over some of the world's largest companies, often forcing companies to reduce the size of their labour force, reducing consumer quality while externalising environmental costs, all in the pursuit of greater profits.

Williams (2000) observes that the term shareholder value emerged in the 1980s from US consultants who sought to sell value-based management to investors, which began to have material effects on corporate management strategies during the 1990s. The premise of shareholder value was to overcome management problems, as business consultants came to the conclusion that corporate managers did not maximise returns for investors; a result of reinvesting their profits instead of distributing them to shareholders, a corporate strategy that had been widespread up to the 1970s. Williams (2000) believes that shareholder value needs to be understood in the context of a late-capitalist regime where the production of value is heavily dependent on the investment of savings and pension

funds in finance markets, where Williams argues that financialisation is not a mode of accumulation, but rather, a new form of competition. Although financialisation has introduced new pressures on managers which has generated value through financial markets, Froud *et al*, (2002:131-32) argue only fifty per cent of US and UK firms are corporatized and only forty per cent of households can afford to invest in the finance markets so it is an exaggeration to view the US and UK's economies as being wholly financialised, in that they are pursuing a finance-led regime of accumulation. Froud *et al*, (2000) suggest that the geographical spread of financialisation into other national economies is not inevitable as there are three pre-conditions that need to be met. First, there needs to be the existence of value-seeking investors, domestic or external. Second, the economy or business needs to have the ability to generate investment. Third, the management needs to be willing to shed labour costs, and initiate perpetual reorganisation to increase yearly returns, for example, in a downturn a company may sell its fixed assets to a third party for a return before leasing the assets back.

Unlike the Regulation School's focus on the macro economy and nation-states, the CSAs seek to investigate financialisation through a series of detailed case studies of the UK and Us, at the micro and meso scales. This leads the CSAs to criticise RT's accounts for attributing structural stability to capitalism, which they understand to be an incoherent project, leading Folkman *et al*.(2007:339) to quote Fernand Braudel, who observed that capitalism is always sick, but never dies. Although the CSAs see financialisation as emerging from the breakdown of the Bretton Woods system in the 1970s they focus on particular scales and spaces which are affected by financialisation, which they see to be reconfiguring capitalism in the direction of a finance-led, socio-technical experiment (Froud *et al*. 2007:340). The CSA School also criticise the RS for limiting their analysis to national economic systems which obscures the roles of key actors that are involved in

perpetuating financialisation. This becomes more problematic as the CSAs contend that international political economy narratives that focus on neoliberalization have paid too much attention to US institutions like the IMF, and argue for a more nuanced approach that emphasises the role of specific financial institutions such as bond-rating agencies within a geographical context, as different actors operate differently in different national economies. Subsequently, the CSAs have focussed their research on specific actors that they argue are enabling the production of a finance-led regime. For example, the CSAs have analysed the production of consultancy metrics (Froud *et al.* 2000) which enable investors to assess a company's profitability and to quantify its performance, while Froud *et al.*, (2002) investigate the effect of restructuring in the automobile industry after managers reorganise their firms to comply with financialisation. Folkman *et al.*, (2007) illuminate the growth of fee-earning intermediaries such as lawyers, investment bankers and hedge fund managers who are involved in restructuring corporations to make them comply with the demands of financialisation. Froud *et al.*, (2000) criticise financialisation as it urges firms to increase their profits, to pay dividends, but in doing so they jeopardise the future integrity of the firm, as training and research and development are reduced. The CSAs conclude that financialisation is governed by myopic consultancy metrics that promote speculative, short-term investments and suggest that the increases in shareholder value is often due to the increase in middle-class savings being funnelled into shares, not due to successful management strategies.

The later CSA narratives have moved beyond shareholder value, to develop the concept of 'coupon pool capitalism' (Froud *et al.* 2002), which replaces the closed system of financialisation, with a narrative where financial markets regulate both firm *and* household behaviour - making financial markets the engine of financialisation. Coupon pool capitalism reveals a new space permeated by

financialisation - middle class households- who save towards deferred payment schemes through institutional investors, which places an emphasis on how household investments are pooled and how financialisation's politics dictate household saving strategies to maximise returns and savings growth. Under coupon pool capitalism the financial market becomes a space that actively governs institutional investors, firms and households through the politics of financialisation, pressurising them to maximise returns. Froud *et al*, (2002) argue that this is significant as it continues to illustrate how the logics, flows, rules and linkages of financialisation occur in specific spaces, for example, the national scale, but also within households. Froud *et al*, (2002) use this juncture to criticise the RS which predicts that a downturn in wages can be counterbalanced by the growth of capital market income as they assert that not enough people own shares to supplement and maintain their incomes through finance-led accumulation and that this varies between nation-states.

This leads Froud, *et al*, (2002) to suggest that financialisation's logics will exacerbate inequality as only the middle classes and wealthy CEOs paid in company stock are able to reap the benefits from financialisation. However, financialisation's ability to expand inequality is dependent on its ability to realise itself as a project, something CSAs doubt as managers and institutions already struggle to create the minimum 13 per cent return on capital employed, demanded by investors (Williams, 2000). The discourses of financialisation offered by the CSA School are more attentive to space, in comparison to the RS, by illuminating the particular spaces which financialisation has permeated such as the firm, and the household. These spaces of financialisation, viewed through a political economy lens, are more attentive to the micro-scale institutions that support a finance-led economy. The sensitivity of the CSA literature to these actors begins to converge

with the socio-cultural spaces inhabited by individual consumers which are highlighted and discussed in the next set of narratives.

2.3.2. Financialisation and the cultural-economy

A third body of work has emerged that addresses how financialisation is becoming embedded into everyday life. These sociological accounts focus on the micro and meso scales, like the CSA narratives, but this research has also mapped out how financialisation is being projected onto the individual. Unlike the RS or CSAs, the research emanating from this school has not been completed by a coherent cluster of academics, but these researchers are united through their common approach as to how financialisation has begun to govern the everyday life of consumers. This approach is illustrated by Martin (2002) who sees financialisation as a phenomenon that has led to the embedding of the financial world into people's everyday life as they are forced to manage financial risks that used to be the preserve of the professional. Martin (2002) maintains that a shift from the Keynesian welfare state towards a liberal economic market has accelerated the exposure of consumers to financial markets as workers have been forced to organise their own insurance and pension plans linked the finance markets. Dore (2000) asserts that the ability of financialisation to spread into society has been made possible by the transformation of the owner-manager capitalist into an organisation builder-manager employed by a fragmented mass of stockholders, where executives are paid in shares to enhance their performance. This development has been assisted by the emergence of an expertise bearing elite including business school professors, managerial consultants and accounting managers that have acted as a new MSR to promote a neoliberal agenda where financialisation is seen as a healthy mode of accumulation which is democratic and rewards those who manage money effectively (Dore 2000).

Research by Paul Langley has moved beyond the spaces of the corporation and household to consider the individual. Langley discusses how the UK and US governments are seeking to reduce state involvement in pension provision as Defined Benefit (DB) pensions - coordinated by employers and guaranteed by the state - are being replaced with Defined Contribution (DC) pensions that are organised by the individual and not guaranteed by the state. Langley (Langley 2006; 2007) argues that while neoliberal governments supposedly respect the freedom of individuals to be autonomous, they paradoxically promote the required disciplinary technologies that their citizens need to survive in this autonomous environment. Governments have attempted to equip individuals with the ability to regulate their bodies and thoughts by promoting financial literacy as the “care of the self increasingly involves a portfolio of financial market assets that, carefully selected by the individual through the calculated engagement with risk, holds out the prospect of pleasure through returns,” (Langley 2007:74).

Ewald (1991) has explored insurance as a technology, and developed the idea of ‘a personalised actuarialism’ where consumers become responsible for their own planning. Langley (2006) combines the idea of personalised actuarialism and Foucauldian governmentality to understand investment as a technology of the self, where the state preaches the act of self discipline, rationality, prudence and planning. Like the regulation theorists and CSAs, Langley is sceptical of financialisation’s ability to realise itself as a regime. Despite the growth of UK mutual funds in the 1990s bull-market, 2002 saw the UK income-to-savings ratio reach a record low of 4.8 per cent (2006; Langley 2007:79), which can be attributed to a lack of trust that UK consumers hold for the investment management sector, cultivated through poor market performance and miss-selling. This absence of consumer participation in the financial markets will constrain the advance of financialisation, an important precondition which has been overlooked by policy

makers. The ability of workers to save is also hindered by a gross contradiction within the finance-led accumulation regime, as the savings of workers are invested in companies who are under pressure to maximise shareholder value at the expense of workers' wages and job security placing them in a position where they are unable to save sufficient money to invest (Langley 2007).

Harmes (2001) explores how governments and the financial sector have attempted to educate consumers and embed them within a widespread investment culture to aid their ability to self-govern their financial security which simultaneously aids the dominance of financial capital. Harmes (2001) argues that the ability of consumers to manage their financial needs is necessary if the state is to jettison responsibility for the protection of its citizens. This has been provided, in part, by financial supermarkets like Fidelity International, that offer access to a selection of mutual funds providing consumers with the ability to make their own investments, but also by educating consumers through investment seminars, books and school education. This has been viewed by some consumers as being part of a desirable, cosmopolitan lifestyle that has come to represent a veneer of social mobility and prestige through owning the means of production (Harmes 2001). However, in reality, education and the opportunity to invest offers no guarantee as to the ability of consumers to successfully manage and save for a comfortable retirement. This cultural-economy view of financialisation also highlights certain contradictions which jeopardise the financial security of worker-investor experiences which problematizes Boyer's (2000) finance-led regime, which Langley sees as being too coherent and unproblematic (Langley 2004).

The development of securitisation in the UK can be understood through the prism of financialisation as it enables banks to generate shareholder value as lenders are able to circulate their capital more quickly producing more mortgages (Leyshon

and Thrift 2007). It also enables lenders to produce higher-risk, more profitable mortgages that are removed from their balance sheets, generating shareholder value while being theoretically shielded from consumer default risk (Dymski 2007). Erturk and Solari (2007) believe that as banks have begun to disintermediate they have become active agents of financialisation selling a multitude of different financial products centred around fee generation. Langley (2008; French *et al.* forthcoming) highlights the power of disintermediation through securitisation to insert the role of capital markets into a narrative of financialisation stimulated by the development of a booming consumer credit industry in Anglo-American economies. Langley (2007) discussed the making of financial subjects, defined through prudence and thrift, but Langley (2008) argues that an alternative financial subject coexists where consumers manage and manipulate their financial obligations through extended borrowing which allows them to experience power and freedom by providing them with the ability to purchase objects immediately and deferring payment into the future. Key examples of this include 'the revolver' who never repays their full monthly balance of their credit card debt, but is also joined by another subject 'the rate tart' who enjoys taking advantage of 'teaser rates' and moves between credit card providers, avoiding paying full interest on their debt. These subjects also make use of credit referencing information to govern their behaviour to ensure they obtain the cheapest possible credit rates (Langley 2008). Langley (2008) argues that this alternate 'entrepreneurial self', has driven the growth of the consumer credit markets, an expansion made possible through the disintermediation and the securitisation of debt, which has integrated the self, the home and the high-street more intimately within high finance, a consequence of financialisation.

2.4. Conclusion

This chapter has attempted to review the diverse theories that have emerged from debates on the theories and philosophies of money and contemporary research on the theories of financialisation, while being attentive to the spaces in which different monies circulate and the spaces (re)shaped by the politics of financialisation. Such a review is useful in framing debates and ideas which the thesis will draw upon to investigate the geographies of mortgage and of RMBS production. In so doing, the thesis has stressed the complex nature of money as a social device and reviews how understandings of this object have varied over time as new types of money have emerged.

This chapter discussed what can be seen as some of the first holistic accounts of money and its role in society, through the writings of Adam Smith (1976 [1776]) who places the worker at the heart of the economy, the property rights of which are protected by the state. For Smith and Ricardo, the workers' labour on a commodity constitutes its value, but some commodities, are used as a benchmark in exchange, known as commodity money, which frequently takes the form of gold. Like Smith, Marx considered the value of commodities as being derived from labour time, and argues that the pay workers receive is not commensurate with their expended labour which leads to their exploitation. Marx sought to critique capitalism, but was aware that credit money is vital in permitting capitalists to continue production, as new means of production need to be purchased before the goods that have already been produced are sold, leading him to develop a theory of fictitious value where capitalists will buy debt from those that own the means of production, with cash, in exchange for a claim to the future labour exploited from workers.

David Harvey (1982) builds on the work of Marx, and focuses more explicitly on the role of the state and how it ratifies the quality of private credit bills, while attempting to view Marx's work through a spatial prism to explain why capitalism is more successful in some particular spaces, than others. In doing so, Harvey emphasises that credit money is widespread as a reflection of its geographical mobility, and its ability to liquefy fixed capital, placing it into circulation. This research provides useful insights into how credit money is produced, especially with reference to the performance of securitisation and the development of RMBS notes, issued by lenders to continue their mortgage lending and to increase their accumulation of capital.

The chapter then moved beyond the labour theory of value to review the social and cultural theorisations of money. Both Weber (1968) and Simmel (2003[1907]) reject the labour theory of value, and instead suggest that a quantity of money is in fact commensurate with the perceived value of an object or commodity, based on the psychological and metaphysical properties that individuals project onto an object. Anthropologists have focussed on the uses of particular primitive monies and the effect that the introduction of colonial monies have had on indigenous monetary systems (Maurer 2006). This social lens has been used to understand how western monies are also used and circulated, where signs and language are more important than the materiality of money, where symbols develop trust for the money, where the value is commensurate with the perceived value of objects (Baudrillard 1981). This has heralded a general shift in contemporary accounts to see money as being symbolic and debased from the earlier metallic monies which had led scholars to focus on the networks that provide money with trust and validity (Dodd 1994). This has seen the introduction of ANT in order to interrogate money which has been used to emphasise the power relations between actors that enable money to circulate, but also the key elements that are used to produce and control

new types of money, through calculation, where the value of new monies such as derivatives is situated in the myriad of other assets to which these financial instruments are linked, which provides a useful perspective to understand how monetary instruments, such as RMBS notes, are engineered and valued while being detached from human labour.

Finally, the chapter then turned to understand how money flows have been transformed through the advent of financialisation that has come to fill the lacuna left by the departure of the BWS. The chapter examines the work of the French RS which believes that the mode of accumulation in national economies and the generation of financial wealth will be generated through a finance-led regime that will be supported by a reconfigured MSR that will support the growth of a finance led systems. Narratives suggested by the French RS draw attention to new institutional forms of governance mediated through actors, such as bond-rating agencies that have filled a regulatory lacuna after neoliberal deregulation began in Anglo-American economies in the 1970s. On the other hand, the CSAs analyse the prevalence of investors seeking out enhanced shareholder value. More specifically, institutional investors use their voting power to maximise their short-term returns on behalf of middle-class savers and private pension fund holders, while jeopardising the future integrity of firms (Froud *et al.* 2000). One example of financial instability, brought about by the politics of financialisation, includes the credit crunch and how banks have produced and held high-risk assets, on order to maximise their returns for shareholders.

Langley's (2007) work has focused on the a cultural-economy of financialisation and the space of the individual to understand how the nation-state has attempted to develop a culture of prudent and responsible consumer investors who will regulate their bodies and thoughts appropriately - achieved, in part – through credit

scoring, as discussed in Chapter 6. This review of the narratives of money and financialisation, originating from the social sciences, will inform and frame the empirical work later in the thesis. In particular, the integration of consumers into the realm of 'high finance' through the performance of securitisation, will be investigated in Chapter 7. The next chapter will seek to explore the work of economic geographers and the geographies of money literature. This research is used to highlight the spaces of consumer credit production and the spaces in which international capital circulates, mediated through financial centres.

Chapter 3

The geographies of money: spaces of monetary circulation

“Beyond their long history as centres for international trade and banking, these cities now function in four new ways: first, as highly concentrated command points in the organisation of the world economy; second, as key locations for finance...third, as sites of production...and fourth, as markets for the products and innovations produced,” (Sassen 1991:3).

3.1. Introduction

The imagery currently used to advertise the services of ‘global’ banks - epitomised by HSBC and its claim to be ‘the world’s local bank’ - frequently conjures visions of financial institutions that operate across the world, unimpeded. Although HSBC’s slogan makes the concession that the organisation is sensitive to ‘local’ spaces, the bank’s advertisements suggest that its international reach remains uninterrupted by borders and distance as it circulates capital around the globe. The reality is that money flows unevenly, embodying value in a variety of different guises, whether as different types of currency, or as bonds, derivatives and exchange traded funds. It is vital to recognise that each different type of money is subject to particular social relations and rules of exchange that are forged by international financial elites and the regulators operating within each nation-state.

This thesis stresses that although flows of money produce particular geographies, for example, financial inclusion and exclusion (Leyshon and Thrift 1993), such geographies are themselves the product of a mosaic of financial elites, regulation and technology that are embedded in specific spaces (Martin 1999).

The broad literature surrounding the geographies of money has only recently come of age. Both Leyshon (1995) and Martin (1999) have bemoaned how initially there was little interest in the geographies of money, despite the fact that money and finance are integral to understanding capitalism. Martin (1999) reports how earlier scholarly work in economic geography focussed primarily on the industrial landscape, industrial development and fixed points of material production. However, by the 1970s work by US economic historians had begun to highlight the regional banking structures implicated in regulation and finance, which embraced money's spatiality (Martin 1999). Eventually geographers, notably Harvey (1974) and Conzen (1977), began to focus their attention on the role of finance in the production of urban landscapes. Despite this initial foray, Martin (1999) considered the sub-discipline to be underdeveloped as late as the early 1980s and it was not until the mid-1990s that this lacuna in knowledge began to be properly addressed. A new wave of research began to emerge on retail banking (Leyshon and Thrift 1993; Pollard 1996; Martin and Turner 2000), investment banking (Pryke 1994), financial centres (Pryke 1991; Thrift 1994; Sassen 2001), international finance systems (Leyshon 1994; Budd 1999), and later, local trading currencies that operate outside the control of the state (Williams and Windebank 2002; Lee *et al.* 2004; North 2005), as well as Islamic finance (Pollard and Samers 2007). The geographies of money literature began to flourish, examining different scales, ranging from the body to the global, as well as an exploration of the network approaches used to understand the relationship between money and space.

This chapter has two aims. First, the chapter seeks to review the geographies of money. Second, the chapter aims to highlight the particular networks and institutions that dictate the spatial flows of capital, identified through this literature. This chapter does not intend to review the entirety of the geographies of money literature, it is far too extensive to review here, but instead, will target the strands of the sub-discipline that engage with retail banking and international flows of capital. It is also important to insert a caveat here. The chapter reviews several bodies of work within the geography of money literature, and presents an ordered narrative. It is not intended to imply that the discourses, ideas and debates emerged in a coherent, fashion. In fact, the genealogy of these narratives are ideologically and chronologically complex and they frequently overlap. This review is important to the thesis for the following two reasons. First, it provides a theoretical and spatial context to the geographies involved in mortgage production, and the engineering of securitisations within the UK. Second, the review will provide a context for the development of an international finance system that enabled the credit crunch to spread from the US into advanced capitalist economies around the world. This chapter will review the literature in a historical context to unravel the development of a contemporary geography of money and finance. The remainder of the chapter is as follows. Section two will focus on the development of an international political economy through government (de)regulation that promoted the circulation of monies, and enabled flows of money through mortgage-backed investments. Section three will centre on the role of financial centres in coordinating international circuits of capital by distributing fractions of capital amongst capitalists, which include the issuance of RMBS notes. Section four will highlight the role articulated by regional financial centres that produce the mortgage assets which are later securitised. The final section will conclude the chapter.

3.2. Making (and breaking) a geopolitical economy

Earlier research on the geography of money emanated from the sub-discipline of International Political Economy where academics began to explore the development and demise of an international financial system. The creation of an organised, international financial system is significant as it formed the architecture of a financial system which would later become integral to the development of the securitisation market and movement of mortgage-backed securities. Pryke (1991) and Strange (1994) suggested that this financial system should be understood as a 'geopolitical economy' as the term both stresses and encompasses the powerful relationships between money, power and space. In other words, the political action and power of governments actively shapes the spaces through which money can flow, while money itself may alter the space(s) in which it flows. More particularly, Strange (1994) argues that the international political economy (IPE) exists through two layers of relations. First, a security structure ensures the security of states and their economies. Second, a knowledge structure underpins the ideas, knowledge and communication that enable economies to function. The research on this international, geopolitical economy centred on what came to be known as the Bretton Woods System (BWS), a financial system that was designed towards the end of the second world war, with the aim of stabilising the world economy, to facilitate reconstruction.

The system was named after a conference held in Bretton Woods, New Hampshire in 1944 which was hosted by the US government. Representatives from 44 nations attended, although the US was to be the main power behind the system, as it boasted a strong economic position and was willing to use its vast financial resources to support this monetary system (Woods 2006). The BWS was an ambitious attempt to develop an economic system that would allow member

nation-states to exercise economic sovereignty while enabling international stability to coexist. The BWS attempted to achieve financial stability by tightly regulating the international flow of money, coordinated through the maintenance of fixed currency exchange rates and the management of the balance of payment deficits between economies (Leyshon and Tickell 1994). The system was sustained by three institutions; the General Agreement on Tariffs and Trade (GATT) which promoted free trade; the International Bank for Reconstruction and Development (IBRD), which provided financial assistance for post-war reconstruction and the International Monetary Fund (IMF) that essentially provided a credit facility to nations that experienced problems in maintaining their balance of payment deficits. The money made available by the IMF would remove the temptation for governments to devalue their currency, to stimulate international trade, which in turn stabilised exchange rates and the international economy (Strange, 1994). The monetary standard for this system was the US dollar, fixed to gold as an 'anchor' of value, which acted as an international medium of exchange.

The discipline that governed the geographical flow of money soon began its deterioration, as early as 1947, when the US launched the Marshall Aid plan to fund the rebuilding of Europe and inhibit the spread of communism, which undermined the BWS, as the influx of dollars into Europe contributed to the creation of the Eurodollar markets which opened in London during the 1960s. The money from the BWS and the Marshall Aid plan was denominated in US dollars which led to the accumulation of substantial dollar deposits in European banks (Smith 1982). European bankers began to lend the money to borrowers in the US at lower rates than they could be borrowed from US financiers, which was possible as the US dollars were unregulated and untaxed, since they were held outside the jurisdiction of the US. The Eurodollar money was recycled back into the US which subverted the BWS controls and began to destabilise exchange rates (Strange,

1994). By 1971 the Euromarkets were awash with further dollar deposits as a result of the OPEC oil price rises, as oil producing nations began to funnel their substantial profits, from oil sales in the US, into the Euromarkets which exerted further stress on the exchange rates set by the BWS.¹⁹ The instability of the exchange rates forced the US to suspend the convertibility of gold to dollars, which disrupted the controls on which the system was based (Strange 1997; Woods 2006), which deteriorated further due to reduced savings in the US and increased government spending attributed to the Vietnam War. It can be argued that the BWS never became the coherent financial system that was planned (Agnew and Corbridge 1989; Gill 1992; Corbridge 1994), and was nothing more than an attempt by the US to derive economic and political superiority against rising Soviet influence. Leyshon (1995) argues that the disintegration of the BWS granted nation-states the ability to exercise greater autonomy over their economic policies which produced a series of diverse national economies. It became clear that a post-BWS would not stifle these national variations which secured the future of an international financial system that consisted of a collective of hybrid economic spaces.

Corbridge (1994) and Radice (1984) attempt to discredit the idea of BWS's hegemony and suggest, that in practice, the BWS did not run through state blocks of power, but through city-regions as flows of power that controlled the global economy through a post-hegemonic (dis)order. Academics began to depart from this hegemonic notion of a geopolitical economy, and instead looked towards the source of economic power within states and regions through a literature known as geoeconomics (Albert 1993; Storper 1993; Amin and Thrift 1994; Leyshon 1994; Hutton 1995). As academics working on the geography of money moved their

¹⁹ These dollar deposits were used to fund syndicated sovereign debt from which the developing world debt crisis would emerge.

attention to city-regions and their coordination of capital flows, it became clear that the power behind these city-regions was exercised through powerful financial elites which transcend these regional and national scales through a transnational network (Leyshon and Tickell, 1994). Utilising a neo-Gramscian version of hegemony, Van der Pijl (1984) argues that the US organised an Atlantic ruling class that sought to align national interests under an umbrella of US hegemony. Agnew and Corbridge (1989) maintain that the proliferation of transnational corporations and free trade emerged from the ashes of the BWS and was perpetuated through elites in finance and politics operating through political and financial centres. One effect of the failure of the BWS was the emergence of a new series of financial networks, no longer coordinated by governments, but through prominent financial centres, for example London - home to the Euromarkets. The fall of the BWS had enhanced the role of financial networks and powerful city-regions in coordinating the global economy, which would later include mortgage-backed instruments.

3.3. Financial centres: (re)assembling the pieces

Miller (1998) and McMichael (1998) argue that the key institutions of the BWS, the World Bank, International Monetary Fund (IMF), the General Agreements on Tariffs and Trade (GATT) and the International Bank for Reconstruction and Development (IBRD), became more powerful after its collapse, but without the firm regulation of the BWS, the international finance markets began to flourish. Although the early geographies of money literature had shed light on the development of the BWS it had only just begun to pay attention to the role of particular city-regions as financial centres. Financial centres such as London had previously been instrumental in financing trade and development within its domestic market, but also on an international scale, facilitating trade with its colonies and other imperial powers

(Michie 1986; Thompson 1997; Cain and Hopkins 2002). Although London had been a financial hub since medieval times (Thompson 1997), it was not until 1773 when the London Stock Exchange (LSE) began to operate (Michie 1986). The LSE was originally established to trade government securities, but it later began trading foreign securities, along with joint stock companies and bonds to fund infrastructure both at home and abroad. During the Edwardian era, half of the LSE's activity was accounted for by foreign securities (Thompson 1997). Although London began serving the British empire as an early port (Thompson 1997), it was a legacy which would see it develop into a merchant banking centre to settle trade, with financing provided by Barings, Warburg and Hambros. During this time, it was commonplace for imperial nations and colonies to develop financial centres including; Paris (Gueslin 1992), Berlin, (Tilly 1992), Tokyo, Osaka, Shanghai, and Melbourne (Jones 1992), while the New York Stock Exchange (NYSE) was established in 1792 to organise the trading of US government debt (Michie 1986). Porteous (1999) argues that these historical legacies become embedded in financial centres and influence their future success. Hence, these pre-existing financial networks dating back to colonial expansion would shape the (dis)order of the post-BWS.

A new international finance system (NIFS) (Leyshon and Thrift 1997) coordinated by new financial centres had emerged and economic geographers began to trace the geographies of money and how these centres controlled the post-BWS international finance system, against a landscape of deregulated national economies. The NIFS differed from the BWS as each nation-state controlled its monetary policy and set its own interest rates, while the market set exchange rates. Investors became more powerful under the NIFS as they began investing in corporations directly through bond markets - as opposed to lending through commercial banks - while financial centres became more technologically advanced

which also led to the development of new financial instruments and markets (Budd 1999). The NYSE experienced a wave of deregulation in 1975 (Budd 1999) which was soon followed by other nation-states (Budd 1999), who began a process of competitive deregulation in the fear that they would lose out to the NYSE's competitiveness. For the City of London, deregulation initiated a rapid reorganisation of the City, an event later known as the 'Big Bang' which occurred on the 27th of October 1986 (Leyshon and Thrift 1997; Budd 1999), while the Paris bourse later underwent Le Petit Bang on the 30th of June 1987. Previously, London had been viewed as an expensive centre to conduct business, which was hindered by inefficient exchanges and fixed rate commission systems, a characteristic that was soon overturned.

Another barrier to London's success was the social manifestation of its privatised credit markets (Thrift 1994) which were anchored to exclusive cultures of trust propagated between male bankers of a specific social strata. This has come to be known as 'gentlemanly capitalism' (Leyshon and Thrift 1997; Cain and Hopkins 2002) which consisted of a series of fixed social codes and spaces that the City functioned through. This social structure was soon challenged as the financial markets became progressively more innovative and volatile, but also as American business practices were increasingly adopted by British banks (Thrift 1994). On the 27th of October 1986, the LSE began the operation of an electronic trading system, which would be run in tandem with the open cry trading floor (Clemons and Weber 1989). Traders began to use the Stock Exchange Automatic Quotation System (SEAQ) above the trading floor, and within a week of opening, two thirds of the Exchange's trading had moved upstairs to the new electronic system (Clemons and Weber 1989:235). The automated system simultaneously reduced settlement costs and increased access to the market which achieved more accurate pricing

for the securities, but began to undermine the social system that had developed in tandem with the financial centre.

The spatial configuration of banking in London had centred on the City of London's Square Mile and the Bank of England, a pattern which had previously been enforced through a series of spatial codes. For example, the Bank of England required foreign banks to be located within the Square Mile so it could easily oversee their activities - a rule that was not relaxed until as late as 1985 (Leyshon and Thrift 1997). This spatiality was disrupted by an influx of foreign banks into London who realised that the strong demand for the limited office space in the City could not be met (Pryke 1991). The geography of financial services began to shift and financial firms began to locate in London's West End and Canary Wharf. It appeared that deregulation and technological change were beginning to weaken the bonds of gentlemanly capitalism that had previously consolidated the spatial form of the City.

The apparent disintegration of social bonds, due to the increased use of information technology, raised important questions as to why financial centres continued to exist, as it appeared that the necessity of spatial proximity had been reduced by information technology. The most extreme example was O'Brien's (1992) suggestion that geography's days were numbered as the uptake of telecommunications would render space increasingly unimportant. Thrift (1994) and Porteous (1999) responded to O'Brien's thesis and began to ask why financial centres continued to exist, if technology was rendering space obsolete. According to Sassen (2001), firms pay high costs to reside in financial centres which meant that a strong *raison d'être* must exist to explain these agglomerations. The geographies of money literature, having initially focused on an international

financial system, moved its focus to national economies coordinated through city-regions.

Thrift (1994) maintains that despite the apparent displacement of gentlemanly capitalism by a more diverse and socially mobile labour market - combined with new technologies that automated the markets - social relations are still imperative to the operation of financial centres, as face-to-face-interactions can only be conducted in close proximity (Amin and Thrift 1992). Focussing on finance in the City of London, Allen and Pryke (1994) discuss how the spaces of finance have been redefined through a combination of symbols, codes and noise to produce a hybrid landscape of exclusivity, orientated around gentlemanliness and 'clubiness' that have come to coexist with new financial technologies (Allen and Pryke, 1994). Leyshon and Thrift (1997) argue that the idea that social networks have been undermined by technological innovations, could not be further than the truth, as the need for face-to-face interaction has increased to allow analysts to interpret the substantial volumes of ambiguous data.

The sustainability of these financial agglomerations is reinforced by businesses that need to develop relationships to cultivate trust, give credence to information and to perform analysis (Goddard 1973; Beaverstock *et al.* 1999) which Goe, et al, (2000) insist promotes clustering. Sassen (2001) suggests that the relevance of territoriality to the NIFS is maintained by two types of information, standardised and non standardised data. While standardised data and pricing is available over computer networks, non-standardised information remains ambiguous and requires expert interpretation, evaluation and judgement, experience that can only be obtained through social networks (Sassen 2001). Finance centres are important as they provide spaces where the instantaneous flows of information and opinions can be processed by financiers and dealers, which is important as volatile markets

evolve quickly and analysts must be in close proximity so that they can interpret and act on decisions emerging from new data (Thrift 1994). Further research has placed the onus of finance on everyday actions through talking, trading and watching (Sidaway and Bryson 2002), but despite the introduction of new scientific, quantitative ecologies, investment management for many financiers continues to remain more of an art than a science (Sidaway and Bryson, 2002). Sidaway and Bryson (2002) emphasise that although advances in telecommunications enable analysts to access large volumes of financial information, proximity between investors and debtors remains important as investors still meet other bankers to discuss investment opportunities. Agnes (2000) contends that a significant flow of market information is informal, derived through complex webs of information from specific contexts and venues by individual employees, not coordinated, or company organised strategy. These flows of information are complex as they emerge from multiple sources including rivals which represent an unstable, contradictory cooperation-competition relationship that has to be carefully managed. Agnes (2000) outlines how these complicated exchanges often occur in relaxed social settings, such as City restaurants, bars and private members clubs which highlight the role of culture in stabilising financial centres.

Proximity is also important in the development of new financial instruments as they are produced at the boundaries of firms and are frequently bespoke (Schoenberger 1991), requiring producers and their clients to reside in close proximity to develop these products. The proximity of specialists also aids product innovation when financial institutions are agglomerated. Thrift (1994) concludes that social and cultural performances are important in explaining the persistence of financial centres that are integral to maintaining the reproduction of the international finance system. The need to find new business also requires proximity, and companies are able to compare their performance against competing firms (Thrift, 1994). Proximity

for developing and negotiating new deals is important to be close to corporate finance clients which is important due to the implications of contract and property law on borrowing money (Hartmann 1995).

Although economic geographers have identified spatial agglomerations of financial firms within financial centres such as the City of London, Clark (2002) warns the clustering of financial and advanced producer firms should not be taken for granted. The City of London is not immune to problems emerging from high costs and poor transportation infrastructure that can make London appear as a less attractive location for firms to operate from, reminding us that these agglomerations are maintained by face-to-face interaction (Clark 2002). Nevertheless, the geographies of money literature began to focus on the production of specific monetary instruments and the coordination of capital flows within financial centres, such as the work of Pryke and Allen (2000) on derivatives, Agnes (2000) on swaps, and Hall (2007) on corporate finance. More importantly for this thesis, a small body of work has been developed on securitisation. Pryke (1994) and Pryke and Whitehead (1994) explored the UK's early RMBS market as an investment vehicle that was used to switch capital from an over accumulating primary circuit of capital (the manufacturing sector) into the secondary circuit of capital (the built environment). Pryke (1994) identifies London as a key hub of the NIFS and discusses how securitisation uses international capital to construct the UK's urban landscape. These discourses on securitisation highlight how consumers and capital have become directly linked to the international financial system through global financial centres such as London and New York.

3.4. Restructuring space: retail banking and (de)centralisation

So far, this review of the geographies of money literature has focussed on the 'global' scale of the BWS and global cities, embedded within particular localities that coordinated the flows of capital through nation-states. I will now switch focus to examine the regional scale, descending the urban hierarchy to explore the roles of smaller cities which also coordinate flows of capital and influence the geographies of money. It is necessary here to critique the global and world cities literature, for example Sassen (2001), Knox (1995) and Friedman (1995), have frequently highlighted the prominence of global cities such as London, New York and Tokyo in controlling the monetary flows of the international finance system. In doing so, these so-called global cities have been placed at the top of an urban hierarchy at the expense of smaller cities rendering them invisible to world city research. Robinson (2006) bemoans this preoccupation with the dynamism and style typical of larger cities and argues that this obsession ignores the role of smaller cities embedded in peripheral regions. Amin and Graham (1997) have stressed that although large cities act as key command and control centres for the economy, as reviewed earlier, many of these world cities have become subject to decentralisation, a direct consequence of automation and improvements in telecommunications. This leads Amin and Graham (1997) to stress that specialist knowledge and epistemic communities exist outside of London, a notion that has been supported by French (2002) and Bailey and French (2005), who have illustrated the sustained decentralisation of the financial services industry from global financial centres into smaller, peripheral cities.

The decentralisation of the finance industry began in the 1970s once managers in the financial sector had begun to automate some of their more mundane, back office operations (Leyshon *et al.* 1989). It was soon realised that these functions

could be relocated away from their head offices in London to smaller cities and towns in the south east where labour costs were substantially reduced (French and Leyshon 2003). The finance sector began to increasingly process standardised information away from London as this kind of information did not require the face-to-face interactions usually required to interpret fast-moving and ambiguous information. The financial firms began to decentralise account administration, marketing, underwriting and consumer contact centres into bespoke processing units (Bailey and French 2005). This decentralisation led to the development of new clusters of administration and support centres that would benefit from shared labour pools and information spillovers (Bailey and French 2005). As such, economic geographers witnessed a shift in the geographies of money as elements of the financial sector were (re)centralised and embedded into new regional centres outside of London. The decisions and calculation involved in providing a consumer with a mortgage occurs in these spaces, which then connect consumers with money sourced from the international circuits of capital.

The spatial reconfiguration of bank administration was intensified - particularly for the retail banking sector - and was accelerated as a response to a crisis that emerged from the development of the Euromarkets (Leyshon and Thrift 1993) and subsequent developing world debt crisis. The dollar deposits in European banks began to saturate the traditional developing world markets as bankers began to recycle Eurodollars through Latin America, Asia and Africa. By the 1980s, declining commodity prices and increases in interest rates on high levels of indebtedness had hampered the ability of these nation-states to service their debts and were forced to undergo a decade of de-development in an attempt to repay their debts. Many commercial banks that had invested in these developed countries had failed to retain adequate reserves of cash and as their investments turned sour, they became insolvent and collapsed (Leyshon and Thrift 1993). The response of the

financial community was a 'flight-to-quality', where financial institutions effectively barred the developing world from accessing the international capital markets (Leyshon and Thrift 1997). Only 'safer' economies, namely North America, Europe and South East Asia were permitted to participate in the credit markets which culminated in an international geography of financial exclusion (Leyshon and Thrift 1997). This 'flight-to-quality' meant that banks began saturate their 'safer' domestic markets with capital - the majority of which was poured into the retail finance sector (Leyshon and Thrift, 1993).

This strategy also ended in disaster for many banks when money was funnelled into the housing market through consumer mortgages. By the 1990s the UK had entered a recession that exposed mortgage lenders to high consumer defaults, compounded by a backdrop of bad corporate debt and declining asset prices (Leyshon and Thrift 1993) . The economic downturn combined with losses derived from repossessions, forced retail banks to re-evaluate their businesses. According to the OECD (1992), 65 per cent of UK retail banks' income was subsumed by their operating expenses, so to increase their profitability the banks sought to reduce their overheads. This resulted in the rationalisation of much of the physical bank infrastructure as branch networks were pruned and unprofitable branches were shed (Leyshon and Pollard, 2000).

The reorganisation of the British retail sector was heavily influenced by innovations that had been pioneered decades earlier in the US, on the west coast. Pollard (1999) has argued that California was instrumental in the development of new banking technologies and conventions which are a product of the tight governmental regulation, coupled to the highly competitive environment. One of the earlier innovations was the development of Magnetic Ink Character Recognition (MICR), in San Francisco in the 1950s (Fisher and McKenny 1993), which was

used to rapidly process cheques and deposit slips. The main aim was to reduce the costs associated with cheque processing whilst increasing the processing speed, a success which led to an endorsement by the American Banking Association and promoted its spread throughout the US. MICR's ability to realise savings through economies of scale made it desirable to British banks and it was soon realised that MICR's cost reductions were optimised further, when operated in a regional processing centre serving a series of different bank branches. Other innovations that centralised and industrialised bank administration include the introduction of Automated Teller Machines (ATMs) reducing the need for bank staff and bank branches which further reduced operating costs for retail banks (Leyshon and Thrift 1993; Leyshon and Pollard 2000). US retail banking had begun to pioneer the idea of telephone banking where customers would conduct their business by telephone - not in person - which appeared to offer the opportunity to eliminate bank branches. American retail banks also began to use geo-demographic systems for marketing and to sell financial services to specific groups of customers, which enabled them to collect information on their customers through third parties, not in person through bank branches situated within the community (Pollard, 1999). These innovations increased the speed of processing and reduced costs leading to the industrialisation of banking, which was frequently exercised in cities outside of 'traditional' financial centres²⁰.

Leyshon and Pollard (2000) estimate that it was a further five to ten years before these new innovations crossed the Atlantic into Britain. The UK retail finance sector began to readily adopt these new automated technologies that assisted in the deskilling of bank branch staff which would further reduce costs (Leyshon and Thrift 1999). Arguably, the most relevant technology adopted by the UK consumer

²⁰ As retail banking became automated, it also became standardised, as with mass production in manufacturing, leading Leyshon and Pollard (2000) to refer to the introduction of these technologies as the 'industrialisation' of banking through mass-produced, standardised products.

finance market is a computerised process called credit scoring. Hand and Henley (1997) define credit scoring as a technology that utilises statistical methods to classify credit applicants into 'good' and 'bad' risk customers, where the latter are denied credit as they are seen to bear an unacceptable level of risk. These models use the data and performance of previous customers to predict the future propensity of new potential customers to repay their debts (Hand 2005). The characteristics of consumers that previously defaulted on their debts, such as particular age groups and occupations (Leyshon and Thrift 1999) are recognised, as are the characteristics of consumers who successfully repaid their debts. Characteristics associated with an ability to repay are given a high number of points, whilst a lower number of points are attributed to characteristics associated with riskier consumers. The applicant's characteristics are then weighted, and if the sum of points passes a predefined threshold they are granted credit. Leyshon and Thrift (1999) discuss the widespread adoption of credit-scoring software that enables retail banks to discriminate between potential 'good' and 'bad' customers and review how credit scoring has enabled banks to 'cherry-pick' the most profitable, low risk customers, which they argue can be seen as new forms of surveillance and governmentality.

The roots of credit-scoring, albeit in a manual form, can be traced to the US in the 1930s. Early forms of credit scoring were initially used by mail order companies who naturally did not have access to their potential customers through high-street stores (Marron 2007) and relied heavily on postcode data to discriminate between 'good' and 'bad' consumers. If a specific postcode had a high level of defaults, applicants from that area would be denied credit. Marron (2007) reports how this technique was later used in department stores, although subjective judgements were still integral to the credit granting process. However, it was not until the US entered the Second World War that credit scoring became more technical and

scientific as male underwriters were enlisted and women - inexperienced in underwriting - were given prescriptive tables and strict rules to govern their decision-making. It was not until the 1980s that computer processing power enabled this practice to be automated (Leyshon and Thrift 1999). Argent (2002) argues that the removal of decision-making from bank branches actively reduced the levels of bad debts that were attributed to poor decision-making by bank managers while the centralised processing allowed lenders to reduce operational costs by reaping economies of scale, making this innovation a successful adaptation for banks.

As credit scoring used information held in databases at centralised processing centres, branches became less important in the collection of consumer information which allowed banks to reduce the number of their branches (Leyshon and Thrift 1994). The introduction of credit scoring produced more consistent decisions, as to who should be granted credit which has enabled banks to accurately predict what their potential losses could be. This consistent decision-making process is referred to as a 'frozen organisational discourse' by Bowker and Star (1999) which fixes specific codes and rules into everyday life. The emergence and operation of these automated systems produced new processing centres located in urban areas which exercise decision-making. These regional centres are important as their decisions are used to produce mortgages that are later placed into circulation, once they have been securitised, through the international financial markets. Although RMBS notes are structured in financial centres such as London, their stability is reliant on the quality of the underlying mortgages that are issued to consumers. It is argued that these regional centres are powerful locations as they 'decide' who is eligible for a mortgage, which indirectly affects the credit quality of UK RMBS notes. This thesis will provide a narrative which is sympathetic to Robinson's (2002) argument and 'developmentalist lens' by highlighting the power

exercised by these processing centres, located in 'ordinary cities'. Although these peripheral spaces have been overshadowed by world city financial centres these processing clusters can be perceived as powerful spaces. Subsequently, these centres and technologies are integral to understanding the geographical restructuring of the UK mortgage markets during the 1990s, and the expansion and operation of securitisation within the UK consumer credit market.

3.5. Conclusion

This chapter has discussed the geographies of money literature which began to emerge in the 1980s, shedding light on how financial networks, institutions and governments control and dictate the spatial flows of capital. This dissertation has reviewed the geographies of money literature as it is necessary to obtain an understanding of the contemporary international financial system and its evolution. The review has paid particular attention to the role of financial centres that direct circuits of capital and the smaller regional centres that produce consumer credit. A review of these particular discourses is essential as it provides a spatial and theoretical context to the research on mortgage production that will be discussed in Chapters 5 and 6, and the processes of securitisation, the subject of Chapter 7.

This chapter suggests that the early geographies of money narratives that focus on the BWS are integral to understanding the development of an international financial system that would later be compatible with the trading of securitised portfolios of mortgages. The BWS literature is significant as it emphasises the intimate relationship between money, the state and space (Strange 1994). The demise of the BWS, triggered by the sale of dollars in the Euromarkets, produced a regulatory vacuum and it is argued that this regulatory lacuna was filled by financial centres, such as London. This is important as these centres articulate a significant

role in the structured finance industry through the production of mortgage-backed investments, as discussed in Chapter 7. The geographies of money literature emphasises the importance of face-to face knowledge and London's cultural embeddedness which is significant to understand how securitisation transactions are developed in investment banks in London, integrating mortgage debt and home owners into international circuits of capital. The literature acknowledges the technological changes and financial innovations that emerged as part of the NIFS, which highlights the development of new financial markets which is useful to conceptualise the creation of a European market for securitisation.

The geographies of money literature is also attentive to the influence that regional financial centres have on the geographies of money and the international financial system. There has been criticism of the disproportionate amount of financial power attributed to 'global cities' by the likes of Robinson (2002), who argues that peripheral cities should not be overlooked. This thesis accepts that finance centres like London are central to the coordination of financial markets that produce the geographies of money. However, the research is acutely aware of the important functions exercised in regional financial centres that contribute to direction of monetary flows within the international financial system. The thesis draws upon this literature in Chapter 5 to highlight a series of regional financial centres that are involved in the production of mortgages, but also to understand their powerful role in producing the mortgage assets that are later restructured and sold through global cities.

The most important retail banking innovation in the context of this current study is the development of credit scoring, a technology that is used to discriminate between 'good' and 'bad' risk customers and is used to decide whether a mortgage applicant should be offered a mortgage or not. This technology allowed mortgage

lenders to reduce their dependence on branch networks allowing the marketing and distribution of mortgages over the telephone, internet and through brokers. It can be argued that credit scoring has played a significant role in the expansion of the UK mortgage market in the late 1990s and early 2000s, by lowering the costs of processing, and enabling banks to assess their credit risk more accurately. The work reviewed in this Chapter is mobilised later in Chapter 6 to discuss the geographical development of credit scoring and the geographies therein. Chapter 6 will also elaborate on how credit scoring contributes to the production of UK mortgages and the credit quality of the assets that underpin RMBS notes. The dissertation will now turn to review the methodological techniques that were used in the research. This will also include a discussion of the research strategies that were developed and an evaluation of how successful the research methods were in practice.

Chapter 4

Hide and seek?: Investigating the financial elites of UK mortgage production and securitisation

“Economic geography, like other branches of the subject, must be treated scientifically: cause and effect must be studied. Thus the facts fit together and the structure of the science is built. It promotes clear thinking to distinguish between the science and its application. Facts are recorded, explanations traced and tendencies indicated,” (Rudmose Brown 1936:ix).

“Respondents’ have not responded to my letters, have not returned telephone calls, lost my surveys, cancelled appointments, cut interviews short, lost interest in my research, withdrawn from the project and so on...I have become a ‘shameless eclectic’ and adopted a methodologically opportunistic approach to fieldwork...making the best of what you get, rather than the ideal hoped for when planning the research,” (England 2001:212).

4.1. Introduction

While economic geographers have been receptive to the adoption of new methodologies, the sub-discipline’s self evaluation of the ways in which it produces knowledge have been rather sporadic. Just as the relationship between research methods, theory and policy become the subjects of hot debate and scrutiny, these

discussions periodically lose their lustre, (Barnes *et al.* 2007). This is despite the fact that the research subjects of economic geography have become increasingly more diversified over time. For example, economic geographers turned their research away from the statistical analysis of industrial production, popular in the 1960s and 1970s and began to explore the service sector in the 1980s and the diversity and multiplicity of the cultural industries in the 1990s²¹. During this period, the practitioners of economic geography have innovated accordingly, adopting new methodological practices from the wider social sciences, techniques that can be seen to be more appropriate in exploring these 'new' geographies, which has in turn stimulated lively debate concerning the validity of knowledge.

An insight into the changes and shifts in academic sentiment is illustrated by the two contrasting views above. Rudmose-Brown (1936) understood economic geography as being constructed through a factual and logical framework, mobilised through the privileged, and in his view objective, judgements of western male academics. In contrast, England (2001) highlights the ambiguities and 'messiness' of her research, ambiguities that are frequently concealed behind the scientific rhetoric employed by Rudmose Brown, for example. The differences between England and Rudmose-Brown's attitudes to research serve to illustrate the shifts in the philosophical and methodological approaches utilised by economic geographers over the history of the discipline.

This chapter aims to discuss the particular methodologies used to produce this thesis and will critically evaluate how these techniques were specifically used in the context of this research. The chapter will highlight the contemporary debates that have shaped the development and adoption of the particular methodologies used

²¹ This thesis is aware that these 'shifts' in economic geography did not occur as clean breaks, but overlapped, and that some research is still conducted on the industrial sector.

by economic geographers and social scientists. In addition, I will explain why specific techniques were chosen for the research, before evaluating the success of these methodologies, especially in the light of the credit crunch that generated additional challenges and unexpected opportunities. The remainder of the chapter is divided into four sections. The second section will discuss the turbulent history of qualitative research methods in economic geography and the reasons for their applicability to this particular project. The third section will briefly discuss the social context of this research, while the fourth chapter will examine and evaluate the use of interviews as the research's primary methodological tool. The final section will conclude the chapter.

4.2. Choosing the right tools for the job: Qualitative research methods

Recent attempts to promote debate on the reflexivity of the research methods used in contemporary economic geography include *Politics and Practice in Economic Geography* - a collection edited by Tickell *et al.* (2008)– which addresses the issues surrounding the use of particular research methods in the dynamic and heterodox field of economic geography. In doing so, the authors illustrate and discuss the transitions and adoption of different research methods that have subsequently reshaped the field of economic geography. The book reflects on the profound effect that Doreen Massey and Richard Meegan's book, *Politics and Method*, had on the sub-discipline which is used as a starting point to historicise the debates that revolved around theory, policy and method in the 1980s. This period was especially significant to economic geographers who, at the time, were witnessing the onset of deindustrialisation and restructuring that had begun in the 1970s. This led academics to explore the ways in which new methodologies could be used to conduct research that would explain the drastic changes that were occurring in North America and Western Europe. This debate was stimulated, in

part, by Massey's (1984) claim that the statistical outputs produced from quantitative research methods, that were widely used by economic geographers at the time, were in fact, incapable of understanding and explaining these new patterns and the politics of industrial change.

This is significant as deindustrialisation had begun to sweep through North America and Western Europe in the late 1970s, and academics had become politically critical of these changes. Factories were no-longer seen as data centres that compiled production statistics, but spaces of class struggle and decision-making as economic geographers turned to surveys and interviews to understand how they operated. As such, extensive research that identified the typical features of different taxonomies of firms were cast aside for intensive in-depth interviews and case studies, in an attempt to uncover the processes behind deindustrialisation, not merely describing them through statistical datasets. This shift leads Barnes, et al (2007) to observe how politics and methods became more closely entwined in the 1980s as a result of the intense, but sporadic, debates witnessed throughout the decade. Although the momentum that had sustained these discussions waned, one outcome that enjoyed greater longevity was the widespread adoption of new research methods by economic geographers including: interviews; discourse analysis; and ethnography, as the sub-discipline underwent, a series of cultural, institutional and relational 'turns'. The increased use of these 'new' methods, developed in the wider social sciences - later stimulated new debates in the mid-1990s as some geographers began to view what became known as the 'qualitative revolution' as a dangerous manoeuvre that could undermine the reputation of economic geography within the social sciences, as it was believed that these methods lacked 'scientific' rigour and policy relevance (Barnes *et al.* 2007).

These debates frequently centred on the advantages and disadvantages of using either quantitative or qualitative research strategies, although it can now be argued that qualitative methods have been broadly accepted by the sub-discipline, through the widespread use of the corporate interview. It is useful here to briefly outline the key characteristics between quantitative and qualitative research methods to understand the issues that produced this rift. Quantitative research methods are generally characterised as techniques which process numerical data, or social observations that have been 'quantified' where observations of the social world become represented through numerical values. Quantitative social research uses statistical procedures and models that were developed in what are known as the 'natural sciences' and use empirical, observed data to statistically support, or reject hypotheses formulated by researchers (Bryman 2004)²². The use of quantitative methods in social science research is appealing to researchers, according to Sayer (1984), as its grounding in mathematics supposedly provides it with a precise, unambiguous language that provides logical reasoning and certainty which satisfies those frustrated by the contestable nature of the social sciences.

Scientific methods are used to establish general laws using large datasets and numbers of observations of many individuals. This data is used 'inductively' where theories are produced using this data, which can be problematic as values can be projected onto individual subjects, because of their association with similar subjects, even though an individual does not in fact have those values (Pratt 1978)²³. Conversely, these tests can be used 'deductively' where hypothesis can be used to reject hypotheses (Pratt 1978). Advocates of quantitative methods believe that analysing social phenomena observed through natural science

²² The natural sciences include; biology, chemistry, physics, geology, and mathematics.

²³ One example includes credit scoring where a borrower may be discriminated against because a lender believes younger consumers are more likely to default on their repayments, when in fact that individual may be credit worthy, but through their association and their age cohort they may find it more difficult to obtain credit.

methods is the only method able to adequately produce verified knowledge. As such, proponents of these methods believe that social research conducted using quantitative methods exhibit 'scientific qualities' that are hierarchically superior to qualitative methodologies (Bryman 2004).

One of the key criticisms of quantitative research within the social sciences that undermines the claim to credibility is that complexities of social life cannot be adequately reduced to numerical properties (Bryan and Rafferty 2007). In addition the process of quantifying social phenomena is a qualitative subjective procedure that problematizes the scientific values attributed to these methods. This criticism is compounded because observing social phenomena, and attempting to code them with numerical values, does not provide any insight into the attitudes, emotions and decision-making processes that influence the behaviour of individuals. Undertaking analysis of empirical data through statistical tests may have been useful to researchers exploring industrial production, but the use of these methods are problematic, as according to Sayer (1982), statistical associations, however strong, do not explain events. As such, the use of quantitative methods is unable to provide any further insight into the politics and decision-making driving deindustrialisation in the 1970s.

Qualitative research techniques, on the other hand, including corporate interviews, participant observation, discourse analysis and participant activism, are not reliant on numerical and scientific rhetoric, but focus on the actions of individuals. It can be argued that qualitative research methods are more effective at highlighting the cultural and social elements of economic phenomena, as these methods offer an insight into how and why people act, and how their attitudes and responses shape the operation of capitalism (Schoenberger 1991). Qualitative methods emphasise elements of the social world that the advocates of quantitative methods would

reject, such as the individual responses and opinions of important actors like corporate executives, or idiosyncratic case studies on the performance of the economic development of a particular region. Despite this criticism, these detailed examples provide insight into the operation of capitalism in particular spaces, perpetuated by particular individuals. So, although the uptake of qualitative research methods in economic geography slowly increased during the 1990s, it initiated a series of fierce debates, as geographers became divided into three groups.

First, there is a group of economic geographers who are highly critical of what they see to be the inappropriate use of qualitative methods. Martin (1999:389) called into question the usefulness of qualitative research suggesting that some of its practitioners are theoretically and empirically lazy. For example, Martin and Sunley (2001:153) argue that qualitative research lacks the rigorous qualities of 'scientifically' informed research. Meanwhile Baxter and Eyles (1997) contend that the jargonised semantics of qualitatively informed research methods, engenders a private understanding of knowledge, as the specialist languages limits how far these new knowledges can travel. Markusen (1999), Martin (2001) and Martin and Sunley (2001), also raise concerns as to how solely qualitative research studies have no policy relevance, which risks geographers being displaced by geographical economics.

The protagonists of a second group, who embraced the use of qualitative research methods, began to problematize the uncritical application of qualitative techniques and engaged in critical debates to promote the use of these research tools. Qualitative techniques were promoted as being sympathetic to a knowledge based, cultural economy, which was developing in advanced capitalist economies and was seen to be eminently useful to geographers who have become increasingly

interested in the cultural industries since the 1990s (Schoenberger 1991; James 2006). James (2006) has questioned the preoccupation of critics who defend the use of quantitative methods on the basis of its 'rigour'²⁴. James suggests that the credence of this argument is misplaced as policy blueprints based on rigorous scientific methods are often found to be ineffective in regenerating regions. Moreover, James (2006) argues that claims to 'truth', frequently used in neoclassical economics, will never be anything more than optimistic works in progress. Schoenberger (1991) also questions the superiority of quantitative research methods in economic geography. Quantitative methods are perceived to have a privileged status, but the transfer of quantitative methods from the natural to the social sciences is questionable, as data derived from questionnaires may boast scientific qualities, but the relationships established through quantitative methods do not necessarily demonstrate causality (Schoenberger 1991).

A third group (for example, Plummer and Sheppard, 2001) recommends that the sub-discipline should become more receptive to a pluralistic research approach which uses both qualitative and quantitative methods where appropriate. Over the past two decades, the debates surrounding the adoption of qualitative methods have matured. For example, Schoenberger (1991) observes how early reviews of qualitative methods were written in a defensive prose to counter their critics but a decade later, this had begun to change. Crang (2002; 2003), for example, reflects on how qualitative research methods have finally become part of an acceptable suite of research techniques after undergoing a period of reflection and evaluation (Barnes 2001). Despite this progress in academics adopting a more reflexive approach to their research, Barnes, et al (2007) complain that economic geography fails to sustain sufficient debate around research methods and practice, subsequently rendering economic geography's research methods opaque. This

²⁴ James is a student of Ron Martin.

thesis argues that qualitative methods were the most appropriate techniques to be used to conduct the research as they enable the complex social relations, processes and practices (Schoenberger 1991; Valentine 1997; Kitchen and Tate 2000) that constitute contemporary capitalism to be revealed. As qualitative research techniques have the ability to capture ambiguous social relations, this chapter will now turn to discuss the research questions, and later, how elite interviews can be used to explore the social relations mobilised to produce mortgage assets and RMBS notes.

4.3. Situating the research: the geographies of securitisation and credit scoring

While it is often taken for granted, or indeed forgotten, Schoenberger (1991) reminds us how researchers are influenced by their academic environments, both past and present, conditioned by the academics that have taught them, and the current debates that circulate within formal literatures and social ties. It is also important to acknowledge how the products of academic labour are often shaped by the political and economic events experienced by researchers (Clark 2007), and without stating the obvious, I am no different. The questions posed in this thesis have been partially derived from my educational legacies in economic geography, which were and still are, heavily influenced by political economy as well as the emergence of culturally inflected academic research emerging from the cultural turn in the 1990s.

This research is also set against the shifting economic landscape of the 1990s and 2000s. The financial landscape changed for consumers, driven partially through financialisation, and realised through unsustainable house price inflation and growing consumer indebtedness which emerged from a voracious appetite for

consumer credit that had become naturalised in the minds of many consumers as they forgot the virtues of thrift. Although social and political commentators argued that the UK's consumer credit bubble would burst due to its inherent instability, it was the external effects of the credit crunch rooted in the US sub-prime crisis that triggered a dramatic rise in home repossessions and personal insolvencies. This thesis is a product of this social and political environment, which made interested in how consumers were able to access large credit lines and how they had become inexplicably embedded with high finance through the mortgage markets.

4.4. 'Finding' elites and practicing research

I will now turn to review how interviews, a qualitative methodology, were used to analyse the production of risk management tools, mortgage production and the development of RMBS notes. Interviews were selected as this research tool can be used to successfully gain insight into the meanings of life in particular social settings (Smith 1988) and as such, they have been used successfully and extensively in the social sciences (Burgess 1996). Schoenberger's (1991) review of interviews can be used to highlight why interviews are an appropriate research tool for this particular thesis as she reaffirms how the actions of corporate executives have marked effects on the world, and how interviews with executives are useful in uncovering how these actors initiate change. Furthermore, Smith (1988) highlights how interviews are useful as a geographical research tool as they are particularly adept at unveiling everyday individual practices that are performed in specific temporal and spatial locations which will be useful at uncovering the everyday practices used in underwriting mortgages and developing RMBS notes.

Burgess (1996:102) defines interviews as 'conversations with a purpose' that provide rich, detailed data that cannot be obtained using other research

techniques, whereas Keats (2000) views interviews as being controlled situations where questions are asked systematically of others. Burgess draws on Zweig's (1948) research on the working classes of London to illustrate how interviews can be used to collect information on subjects where there is no current data and where quantitative data cannot explain social phenomena. Interviews also enable the researcher to explore the reasons behind a respondent's answers thus allowing the researcher to explore the motivations of their participants.

Interviews, in practice, can take the form of; surveys that require short specific answers; semi-structured interviews that allow the interviewer to digress from the pre-prepared questions and themes developed by the researcher; through to unstructured interviews where the research subject is given the freedom to talk at length about issues that they think are important to the research (Burgess 1996). Following the example of Schoenberger (1991), this thesis made use of interviews that were semi-structured, utilising a non-standardised, open-question format that is effective in understanding corporate behaviour and the complex entangled relationships that exist inside, and outside, of organisations (Schoenberger 1991; Valentine 1997; Kitchen and Tate 2000). Subsequently, corporate interviews enable the researcher to gain valuable insight into the rich, ambiguous decision-making and behaviour that occurs in firms, in particular the relationships that occur within, and between, different epistemic elites in the production of scorecards, mortgage assets and securitisation within the UK.

Although interviews were used extensively in the research, it is important to discuss why participant observation was not used as a research method. Dunn (2007) argues that although the corporate interview, frequently used by economic geographers, is useful in revealing how economic decision making is exercised, there are additional methodologies that geographers frequently make reference to,

but do not use, such as particular ethnography, for example. When undertaking ethnonography, researchers immerse themselves in the settings of a particular environment to develop a cultural understanding of codes, norms and customs to enable them to gain additional insight into the meanings behind people's behaviour and actions (Bryman 2004). Researchers utilising ethnomethodology in economic geography, also known as observational research, have frequently managed to successfully negotiate access to an organisation (Mountz 2007) enabling them to be close to their research participants to observe their day-to-day practices.

One of the weaknesses of corporate interviews is that the respondents often omit problems from their stories which obscure the 'messiness' of economic life, resulting in the production of a narrative where the storyteller, is a rational actor. Ethnomethodology allows this issue to be overcome by observing how day-to-day economic life is mediated, highlighting how it is not rational, but problematic and contested (Dunn 2007). Evans (1988) highlights the limitations of ethnomethodology, as observations are descriptive and interviews are still needed to gain greater insight into the meanings of everyday practices. Observant participation was considered as a potential research technique as it would have enabled an examination of the everyday life of credit risk production and securitisation, and the difficulties experienced in its production. However, while participant observation is a useful research technique, it is often difficult to utilise in a research project due to several practical issues that curtail its use, which made it an impractical method for this project. For example, it is difficult for researchers to obtain the permission necessary to maintain a presence in an office with access to their employees for long periods of time, an issue that was realised in several different ways in the research.

First, as the adverse effects of the credit crunch mounted, it became increasingly difficult to organise a one hour interview with managers of financial institutions, so obtaining access to perform ethnomethodology in these offices was highly unlikely and such requests to individuals may have jeopardised my ability to have secured an interview with them. Second, as banks were subject to further scrutiny by the government and media they became hesitant in revealing information – this will be discussed in more detail later - and I suspected that they were attempting to deliberately construct particular narratives to distance me from particular business strategies that had become controversial in the media, power that they would have struggled to exert over me had I been persistently present. Third, it became clear in the interviews that I would be unable to view particular ‘objects’, such as spreadsheets and contracts, to understand the day-to-day relationships between them and analysts, as these organisations were legally bound to ensure the secrecy of the buyers of their products. While undertaking the research, the issue of data protection had become heightened by the media in the wake of several scandals of consumer data being lost, and banks tightened their security. As consumer data is located around the offices, which would have been the focus of an ethnomethodological study, participants were very reluctant to grant me access to their offices. At one meeting, before engaging on a tour of an open plan office, my participant had to ensure that everyone’s desks were clear of any sensitive data, and such a security blanket could not be maintained if I were conducting research through ethnomethodology. As such, it was decided to primarily utilise corporate interviews.

Having decided to use interviews, it became necessary to select individuals from financial service firms to interview, to uncover the individuals involved in the production of mortgages and RMBS notes. However, as Smith (1988) observes, interviews provide access to rich sources of information, but the collection of

interview data is complicated and problematic. Parry (1998) observes how the effects of key individuals can be seen through the media, corporate reports and everyday life, but that while these resources are available, their locations are often obscured and spatially segregated. The relational ties of powerful, corporate executives go beyond the institution they are based in, as they are linked, electronically and organisationally through what Knorr-Cetina (1983:132-33) refer to as a trans-epistemic community, that comprises of a collective of different professions in different corporations. This makes it complicated to identify the elites involved in mortgage production and securitisation as they are spread across different financial organisations.

The research used two strategies to surmount these problems to recruit individuals for the research. First, I used the same methodology used by Parry (1998) who scoured corporate reports to locate individuals who worked in what appeared to be areas relevant to the research. This information was combined with internet searches on corporate websites to locate specific individuals which were used to build a database on the details of potential research participants and their organisations. This was problematic as each company is structured differently and uses different job titles for similar roles, making it difficult to identify which individuals would be useful to the research. This was complicated further by the fact that each individual has a specific knowledge based on their career experience. One strategy to alleviate this problem was to identify the individuals who directed specific divisions of each organisation and to ask them for help in the research – where they would become a ‘gatekeeper’ and would introduce me to individuals that were able to contribute to the research. This strategy was useful, as these individuals could direct me to people who would be able to answer the questions I would pose, but would also give me access to names and contact details not available on the internet, or in corporate reports. The problem with this

strategy was that these gatekeepers may not necessarily direct me to the most knowledgeable people, while others attempted to bar my access to these individuals.

Second, 'snowballing' was used, where I asked research participants if they knew of anyone who would be willing to help me, within their firm, or other external companies. This strategy, while successful in gaining access to these epistemic networks, was hindered by three issues which reduced the number of situations when it could be used. First, there were legal issues. RMBS originators are legally obliged to not disclose who buys their RMBS notes, while lawyers do not wish to disclose information on their clients. Second, due to the secrecy surrounding investment strategies, investors did not want to discuss who they purchased their RMBS bonds from. Third, the success of snowballing is contingent on the connections of gatekeepers, which is inherently based on cultural capital. Some interviewees did not want to provide details of their contacts; as one interviewee explained, how I had the ability to damage his cultural capital within the industry if I had asked controversial or 'critical' questions of a participant that he had referred me to.

An initial network of potential research participants was established using these two strategies. Interviewees were sent a letter outlining the details of the thesis, and requesting an interview. If a respondent did not reply to a letter after two weeks an email was sent, followed by a telephone call a week later. Forty interviews were conducted, between December 2006 and December 2007, with a combination of, local authorities, trade body spokespeople, credit referencing agencies, building societies, centralised lenders, retail banks, investments banks, corporate service providers, bond-rating agencies, regulators and investors. The length of the interviews varied between 30 minutes and two hours, with the

average length being an hour. The interviews, as discussed earlier, were semi-structured and were divided into three sections.

The first section sought to gain insight into the background of the interviewee to build a rapport and understanding of that person's positionality, career history and knowledge. Second, the interview would focus on the role played by that individual and their department in articulating a specific stage of mortgage asset production, credit scoring development, or securitisation. The third section focussed the participant's view of the credit crunch and the specific difficulties that the financial sector was experiencing. This semi-structured nature of the interviews enabled the participants to provide additional information that they deemed to be relevant, which would be guided by additional questions, while the interview schedule ensured that each interview covered common ground which enabled me to compare and contrast the responses of the interviewees. Following the advice of Burgess (1996), the questions were worded carefully, to avoid using leading questions and questions overloaded with academic terms that may be unfamiliar to the respondents.

The interviews were conducted in England and Scotland reflecting the geography of mortgage, securitisation production and consumption within the UK. Five interviews were conducted by telephone as the interviewees felt they were too busy to meet in person or because they thought that it was not necessary to meet face-to-face.²⁵ In retrospect it would be easier for these individuals to cut short an interview over the telephone if my questions became critical of them or their company, than if I were there in person. Five interviews were not recorded as three respondents were not comfortable with this procedure and two interviews were conducted in noisy environments. As such, notes were made in the field, while the

²⁵ These interviews took place over the telephone despite several requests for a face-to-face meeting.

remaining interviews were recorded. The taped interviews were transcribed as soon as possible after the interview had occurred as this made it easier to interpret any sections of tape with excessive background noise. The transcriptions were then coded by being cut and pasted into Microsoft Word which were then imported into the individual chapters.

The success of gaining access to the individuals involved in mortgage asset production and RMBS bond production was limited to two factors. First, Ward and Jones' (1999) stress the importance of spatio-temporality in conducting research which is crucial in gaining access to research participants. They argue that access is not open or closed, but varies temporally and securitisation was no different. RMBS notes are issued frequently - throughout the year - although market activity decreases over the summer as many city executives take annual holidays. This made it easier to gain access to some participants as they had additional free-time available, providing they were not on holiday. This was significantly compounded by the credit crunch, which had a substantial impact on the research. Paradoxically, the credit crunch initially aided the research. It emerged that investors were available for interviews, as they were not buying RMBS notes due to the market uncertainty. It also became clear that mortgage lenders were not issuing RMBS deals as the demand for RMBS notes declined. Subsequently, analysts and managers had more free time as they were not working on transactions, so research was conducted on mortgage production and RMBS investment. This was later followed by interviews at investment banks, bond-rating agencies, and corporate service providers.

Towards the end of the research it became progressively harder to obtain research access as the effects of the financial crisis began to deepen. Many centralised lenders had ceased lending, while others had been closed down, which made

obtaining research access difficult. The turbulent economic conditions meant analysts were busy working to save their companies from becoming another Northern Rock. One Director's secretary told me I could no longer meet him because he had to attend frequent, short notice (crisis) meetings, which made it hard to arrange an interview. Another gatekeeper informed me that it was impossible to set up interviews with members of his structured finance team in his investment bank as it was highly probable that they were to be made redundant.

While I have discussed how research participants were found and contacted, up until now, I have deliberately avoided referring to these individuals as 'elites' as this term is problematic and needs to be explored in more detail before understanding what makes these individuals unique - and what effects this status had on the research. The term elite has been applied to a multiplicity of individuals and actors. For example, Parry (1998) sees an individual's 'elite' status as emerging from a series of knowledges, which provide these groups with substantial shares of control over powerful companies. On the other hand, McDowell (1998) perceives elites to be members of 'prestigious' financial institutions, while Cochrane (1998) views political elites as deriving their power from their positions within a political network. The problem in theorising elites is summarised by Reisman (1964:528), quoted in Smith (2006), who describes how he is uncomfortable with using the term elite - due to its connotations of superiority - but he knows of no other term that highlights the special treatment that must be given to these research subjects.

Although the term 'elite interviews' has gained currency as a research technique in economic geography (McDowell 1998), critical reflections have cast doubt on the accuracy of the term 'elite' (Smith 2006), as the contestation of this term has become more complicated, as its meaning has changed over time. According to Smith (2006), political economy and Marxist conceptions of power highlighted the

power of the 'elite' ruling classes, whether capitalist money owners, or powerful political figures of the state apparatus. However, as elites have been viewed through a poststructural lens, the term has become exposed as being under-theorised when compared with theorisations and debates surrounding sexuality, race and gender (Woods 1998). The term elite has been loosely classified as political and economic groups that are hard to gain access to, but Smith (2006) outlines how research on drug dealers and working class lesbians and other marginalised groups are also hard to access, which would – under the same theorisation – see them become viewed as elite research participants.

Drawing on work by Foucault (1980) and Simmel (1955), Woods (1998) attempts to delineate elites and non-elites, and suggests that elites are derived from the power of social relations embedded through strong political, professional or economic ties. This is a useful approach where Foucault (1980) stipulates that power is not acquired or possessed, but is exercised through action which can be used to explain how elites are fluid - people obtain and lose power over time. Members of the elite are able to exercise power based on the connections they have with other members of an elite. The power of individuals over others, derived through these social relations, is subject to change and Latour (1986) argues that power is a capacity to act, which can be mobilised through networks. The power of an elite can also be generated through non-human actors such as machines, software and texts, which was useful when seeking to understand how credit scoring derives its power. By viewing power as being exercised through actors, it is possible to derive who the epistemic elites are that produce, scorecards, mortgage assets and securitisation that derive their power through networked objects and individuals.

This thesis will argue that status of a financial 'elite' is fluid as individuals in banking and finance have power over some individuals, but not others. These financial elites have power over three different groups. First, I have not uncritically designated the research participants as powerful members of elite epistemic communities without careful consideration - I have deliberately elevated the status of these individuals in relation to this research project, because they had the ability to aid my research, or indirectly hamper it, by barring me from the information needed to complete the thesis. As the credit scoring and securitisation sectors employ small teams, a small number of refusals, would be detrimental to the research as outlined by England:

"I am dealing with corporate elites employed at six banks. So rejection is more devastating to my research than if I were dealing with a more plentiful supply of potential interviewees," (England 2001:206).

Second, these research participants, indirectly through their day-to-day practices or directly through the engineering scorecards, exercise the ability to provide people with mortgages, and the ability to buy a house, wielding significant levels of power over the financial security and shelter of UK consumers. However, these elites do not have power over those who do not need a mortgage, so their power is fluid. Third, the actors who convert mortgage debt into securities and purchase the debt also have power, as they control and direct circuits of capital. They facilitate the exchange of debt for cash, to finance housing, while institutional investors invest consumer savings in debt, and the shares of other institutions that hold such debt which has an effect on pensions. These elites exercise power by directing global flows of capital which affect the savings and investments of individuals. This thesis argues that this small group of individuals have power over the financial security of

UK consumers who participate in the mortgage market and have private savings and pensions. Langley (2008) observes how the responsibility of the financial security of consumers has been passed from the state to individuals, who have turned to the financial markets to offer investments to protect their financial futures. The ability for people to buy a house and pay off their mortgage before retirement to ensure they have shelter, and financial security through their investments to provide them with a living in retirement, is embedded in high finance. Investments can be backed by RMBS notes, and prior to the credit crunch, mortgage funding in the UK was highly reliant on securitisation. Some individuals are unable to obtain mortgages, while other consumers do not require, or desire them, nor will all pension and mutual funds be backed by RMBS paper. However, this thesis argues that these financial elites exercise power through social relations over the UK's financialised consumers, who are active in the mortgage market and have come to rely upon private savings for their retirement.

Having discussed the contested variations of the term 'elite' and how these conceptualisations can be used to view the individuals involved in this research as elites, I will now turn to discuss the implications that these powerful individuals had on the research and how additional problems in the research process were mitigated. One issue revolves around the power of the participants and the settings where the interviews were conducted, as the location can have an effect on the researcher since the space is controlled by the research participant and it is important to acknowledge this effect. The interviews for the research were conducted in corporate meeting rooms or communal office areas with the exception of one interviewee who had a meeting area in his office and another where the interview took place in a café, which perhaps reduced the effects of the interviewee-interviewer power relations by not being present in the participant's office.

An additional issue stemming from power relations is the effect of the researcher's positionality that affects the researcher-researched relationship and the privileged knowledges that are discussed. Crang (2003) raises the issue that a researcher's positionality is fluid and unstable, and observes how researchers refashion themselves, which leads him to argue how these positionalities need to be accounted for, while the importance of appearance and the body is also noted by McDowell (1998). My positionality changed throughout the research as my limited understanding of mortgage production and securitisation grew. I became more proactive in interviews as my understanding of the market developed and I was keen to demonstrate my knowledge, in order to be taken more seriously by the interviewee, which I argue reduced the lacuna in my knowledge and reduced the gap in the researcher-researched power relationship, which had three implications. First, by demonstrating a greater command of knowledge and terminology interviewees would provide greater detail in their answers and facilitated a debate of practices and operations. Second, by being viewed as an informed researcher I was more interesting to talk to, and perhaps had useful information, and views of the market (within the bounds of confidentiality) which enabled me to increase the duration of the interviews. Third, as I became an informed researcher, individuals became more willing to act as gatekeepers, as it was perhaps perceived that I would not undermine their cultural capital. Although my positionality changed over the period of the research, I would not say that I became an 'insider' but I did move closer towards the banking and financing community, which may have affected my positionality (McDowell 1998).

The appearance of the researcher is also important to the research process which includes their personality, class, gender and dress which Ward and Jones (1999) refer to as the 'mode of entry'. Cochrane (1998) suggests that a researcher should

adjust their positionality - or disguise it carefully - as it may be a way of manipulating elites, by dressing in their uniform, but he argues that we are manipulating ourselves and may not be aware of the effect it has on our positionalities and power relations. I adjusted my positionality by wearing sober, dark suit with black shoes. I adjusted my hair into a sober style and would walk briskly and confidently in an attempt to mimic the City norms and codes of dress. McDowell (1998; 2007) believes that the researcher's positionality forces them to consider whether values and beliefs should be presented to interviewees and sees that a researcher's social background can affect the participants. I found it useful to outline my own viewpoint, once I had time to develop a considered view of the credit crunch to respondents to reveal my positionality.

McDowell (1998) raises an important issue which emphasises that the researcher has the power to include and suppress parts of the research in their written narrative, which traditionally has included the identity of respondents to protect them and any commercially sensitive information. The interviews in this research were completed on the understanding that the participants and their employers were given anonymity. This was vital to gaining research access and the names of individuals, their companies, and products were removed from the transcripts, which reverses the researched-researcher power relations as I had the power to revoke their anonymity from this thesis – a power I did not exercise. Despite these precautions, it became clear that an extra layer of insulation was required to protect the identities of the participants and their companies as several respondents highlighted that the securitisation community is close knit²⁶. Many different firms work with each other on a regular basis and different firms meet at industry events such as the annual Global ABS Conference, which attracts

²⁶ If a company is named in this thesis it is because the information is publically available.

individuals and speakers from all sections of the securitisation community²⁷. Despite removing specific names from the narrative, particular innovations or strategies used by individuals or firms may be inadvertently revealed to individuals within the industry who may potentially read the research. Subsequently, some empirical material in the research has been omitted completely, or altered in an attempt to remove any suggestions to the identities of key research participants.

Triangulation was used, where the responses from the research participants were compared and analysed, to identify any incorrect or questionable information gleaned from the interviews. However, it is important to acknowledge some issues that surround the use of triangulation. For example, James (2006) and Baxter and Eyles (1997) believe that triangulation's ability to provide more rigorous results is undermined by two problems. First, powerful actors do not have access to perfect information (Crang 2002), but they may 'reveal' a sanitised, coherent narrative which may differ from 'reality'. Second, different organisations may conduct specific practices in different ways, for example, underwriting uses different data sets and procedures. This is a pertinent point insofar as capitalist firms will constantly aim to move into different markets and change the way they do business to obtain a competitive advantage. This raises the question: Is it appropriate to triangulate empirical material in an attempt to obtain rigour? James (2006) believes that triangulation generalises a series of different narratives, in a fallacious attempt to maintain the scientific value of rigour. As such, this thesis did not use triangulation, per se, but did eliminate statements that appeared to be wholly incorrect, or could not be substantiated. For example, if there were two contradictory statements on a legal issue, between a lender and a lawyer, the thesis would use the lawyer's statement to clear up this ambiguity as it is the lawyer's area of expertise.

²⁷ http://secure.imn.org/web_confe/index.cfm?sc=20080601_SF_0024&pg=Agenda (Accessed: 7/08/2008)

4.5. Conclusion

This chapter recognises the diversity of the research methods used in contemporary economic geography and its continual adoption of new methodologies that have frequently changed the lenses through which economic geographers and social scientists view the economy. This thesis also acknowledges that these new methods are not readily accepted by academics as a whole, but are open to frequent contestation, debate and controversy. The new directions of research in economic geography have stimulated the use of qualitative research methods, which developed an unwelcome fissure between geographers splitting them broadly into two camps: one in favour of using qualitative research methods and another favouring quantitative methods in the belief that qualitative methodologies lacked rigour. One positive outcome from this split was a lively and constructive debate on the use of qualitative research which led to the increased reflexivity and evaluation of these methods, assisting their acceptance within the discipline.

The chapter has explained how interviews are an ideal technique that can be used to collect ambiguous and non-standard information and as such, they have been used extensively by economic geographers to record the complex practices, processes and behaviours exhibited by managers and analysts in finance. As the production of mortgages and RMBS securities is practiced through a small series of epistemic elites it was decided that interviews would be the most appropriate technique to explore these diverse sets of knowledges. The chapter addressed the issues that arose in interviewing the epistemic groups involved in mortgage production, scorecard development and securitisation. Although the head-count of these elites are relatively small – these groups are disproportionately powerful -

and so they can be viewed as financial elites owing to the power that they exercise over society. The chapter sought to problematise the term elite to understand where financial elites obtain their power from – to determine what makes them 'elite'. These three epistemic communities exercise power by providing access to consumer credit, and by affecting the value of assets in the capital markets, but are also elite as the research's success is based on the ability to identify and locate these individuals. In addition, the chapter discussed who was interviewed and how the empirics were triangulated.

This methodology chapter has strongly highlighted the importance of temporal research access and the consequences that can occur if a researcher's access to important individuals is suddenly withdrawn. In the context of this project, the credit crunch paradoxically aided the research in its initial stages as many individuals developed an abundance of spare time as the markets became inactive, although it later became difficult to gain access to the mortgage and securitisation community as the consequences of the crisis deepened. Although the transcripts and quotes were edited to remove the names of individuals, companies and products associated with the interviewees, it became clear that other interviewees reading the thesis may recognise other interviewees, or companies, from details such as corporate strategies, dates and innovations. It became necessary to remove sections of texts and to exclude some of the quotes from this thesis to protect the identities of those interviewed for the research. The next chapter will turn to explore the changing geographies of mortgage production and how its spatial restructuring in the late-1980s led to the formation of powerful new financial centres and business models whose success would hinge on high-volumes of liquidity and low interest rates in the inter-bank markets.

Chapter 5

(Re)building mortgages: The geographies of credit production by UK lenders

The [financial] system is aptly described as a well kept- and orderly zoo. Different species...were neatly housed and fed in separate cages segregated by function and geographical scope...The deregulation of the 1970s and 1980s destroyed this idyllic arrangement...tantamount to smashing the barrier separating the animals in the zoo...There were far too many animals in each cage, and in the zoo as a whole, to survive in open competition. Most of the animals had enjoyed a sheltered existence like that of farm animals or even household pets. Now they were freed, each to become predator and prey in an unfamiliar jungle (Wojnilower 1992, quoted in Marshall et al, 1997: 1-2).

5.1. Introduction

At the end of 2006 the Office of National Statistics estimated the value of the UK's total assets at £6,525 billion, with housing assets accounting for £3,915 billion.²⁸ This proportion can be explained by the high prices of UK property. According to HBOS, the average price of a UK property in March 2008 was £191,556, far beyond the average consumer's annual income which requires most homeowners

²⁸ ONS (2007) www.statistics.gov.uk/cci/nugget.asp?id=479 (Accessed 01/05/2008).

to fund their house purchases, either partly, or entirely with a mortgage²⁹. As discussed in Chapters 1 and 2, mortgage lenders securitize their mortgage assets and sell the RMBS notes through investment banks located in 'global' financial centres. In 2007 alone, €116.2 billion of mortgage debt passed through London³⁰. This chapter suggests that although the production of UK RMBS bonds occurred in London, the actual mortgage assets, and a substantial proportion of the UK's asset base, are constructed in a series of regional centres located around the UK. This leads the thesis to highlight a unique geography of regional finance centres that have emerged through a series of social, political and economic legacies. The chapter argues that it is important to acknowledge that the important functions of these 'ordinary' cities that have been previously obscured and hidden by 'global city-centric' narratives.

This chapter has three key aims. First, the chapter will provide an overview of the development and transformation of the UK's mortgage market, which is important as it explains how mortgage assets are produced, prior to their securitisation. Second, this chapter will map the contemporary geography of UK mortgage production. Third, the chapter will attempt to emphasise the financial power exercised by 'peripheral' UK cities, by illustrating how mortgage production culminates in the financial inclusion and exclusion of consumers. The remainder of the chapter is structured as follows. Section two will critique the world cities literature and will argue that although London can be seen as a 'global' city and the UK's financial hub, this privileged status inadvertently obscures the role of other important city-regions. The third section will provide a historical account of the UK mortgage market's development, which will also demonstrate how mortgage production has historically been distributed throughout the UK due to the legacies

²⁹ HBOS (2008) www.hbosplc.com/media/pressreleases/articles/halifax/2008-04-08-Halifaxhou.asp?section=Halifax (Accessed 01/05/2008).

³⁰ ESF (2008) www.europeansecuritisation.com/ESFDataRpt1107.pdf (Accessed 01/05/2008).

of small building societies that were locally embedded within regional markets. The fourth section will review the spatial restructuring of the UK's mortgage market in response to deregulation that occurred in the 1980s, that led to the production of a new geography of mortgage decision-making and which gave rise to the production of large volumes of mortgage assets that could be securitised. The fifth section will conclude the chapter. This chapter, along with chapters 6 and 7 will make extensive use of the empirical material collected during corporate interviews.

5.2. (Re)placing the 'global' city: Financial power and asset production in the periphery?

This chapter will draw upon the geographies of money literature discussed in Chapter 3 and will engage more specifically with three strands of literature - the global and world city narratives, a postcolonial developmentalist critique and regional financial centres – to assist the research in developing a geography of mortgage production, and also to contextualise these findings within the wider debates of economic geography. In doing so, the chapter will critique the contemporary global and world cities literature's use of hierarchical models. These models are frequently used to explain geographies of financial activity, but they simultaneously obscure the role that 'peripheral' city-regions perform in mortgage production. It is important to draw attention to the production of mortgages in these 'peripheral' cities as the stability of UK RMBS bonds, based on mortgages, can be attributed to the decision-making enacted in centralised processing centres where underwriters attempt to avoid lending to consumers who are seen to bear unacceptable levels of credit risk. Although these sites may appear to be mundane spaces of financial production, the importance of these sites was demonstrated in the US subprime crisis, where analysts and underwriters failed to effectively distinguish between high and low-risk borrowers (Immergluck 2008). Their failure

to adequately distinguish between such borrowers resulted in the production of high-risk mortgages which contributed to the credit crunch, as detailed in Chapter 1, as the collateral base of many RMBS bonds were based on these mortgage assets.

The first literature, that focuses on global and world cities, investigates what are perceived to be the most powerful financial cities, cities that according to Sassen (1991), mediate the flows of globalisation. This in itself is problematic, as it is difficult to define what characteristics make a city a 'world city' (Beaverstock *et al.* 1999), although such cities often demonstrate dense inter-city relations that are associated with globalisation. The early proponents of world city research considered locations that were home to a disproportionate number of multi-national corporation headquarters as being a world cities (Beaverstock *et al.* 1999) as they performed key roles in governing the global economy. This inevitably led to the ranking and compilation of city hierarchies that aimed to identify the most important cities involved in globalisation. Knox (1995) and (Friedmann 1995) observed how these hierarchies were frequently centred around economic power. According to Beaverstock *et al.*(2000) most studies of urban hierarchies are based on John Friedmann's (1986) research that ranked cities based on their concentration of finance, multinational corporation headquarters, business services, and transportation links. More recent research on global cities has used data to produce new, fluid hierarchies that assess the current positions of world cities in this global hierarchy, leading Beaverstock, et al, (1999) to identify ten cities that provide the prime global banking services that coordinate the world economy³¹.

³¹ Prime global banking service centres are defined as being a city with eight or more significant bank presences. The bank 'presences' are branches belonging to ten of the top 25 banks defined by assets (Beaverstock, et al. 1999).

Once these hierarchical models had identified key world cities, more specific research was undertaken to understand their formation and operation. Sassen (1991) contends that New York, London and Tokyo were the three most important global cities in the global economy as they were highly concentrated sites that act as command points for the global economy. As globalisation came to be conceptualised as a collective of flows and networks (Castells 2000), social scientists observed how the geographically dispersed global economy was locally controlled through an elite set of powerful cities (Robinson 2006) and that world cities formed the hubs of dense networks of flows (Taylor 2004). Sassen (1991) argues that this control was orchestrated through advanced producer services, legal and financial organisations and financial innovations that were located within world cities that rely on each other's knowledge and expertise to coordinate the economy.

Economic geography has continued to build on the hierarchical bones of world city research, emphasising the dominance of the City, and how its seemingly perpetual innovations have managed to maintain London's position at the top of these hierarchies. For example, Faulconbridge (2004) focuses on the role of knowledge, capital and people in maintaining London's ranking in a relational world city network. Clark (2002) recognises London's economies of scale and regulatory legacies as being key rationales for London's persistence in being the UK's key financial centre. Perhaps the most powerful critique of this literature is its tendency to embed narratives of finance solely within world cities, which dismisses and obscures the role of other financial centres. This argument is central to the second strand of literature's critique of world cities that originates from the work of Jennifer Robinson.

Robinson (2002) draws on postcolonial theory to critique the absence of smaller cities from world-city hierarchies. Through a 'developmentalist' lens, Robinson (2006) strongly argues that urban theory has become transfixed with the apparent success of global cities that are perceived to be dynamic and innovative and bemoans this preoccupation with global cities which eclipses the majority of third world and smaller western cities that are embedded in peripheral regions owing to their perceived lack of 'city-ness' (Robinson 2006). Taylor (1997) observes how these hierarchies are central to world city analysis, but also notes how they have simultaneously become the sub-discipline's Achilles heel. The key weakness that undermines the validity of these city taxonomies is the quality of data that is used to produce them (Robinson 2006). Short et al, (1996) refer to this issue as 'the dirty little secret of world cities research' where researchers struggle to obtain comparable data sets for cities that adequately and accurately quantify their global flows. The data that is available to social scientists is often state-centric and is dominated by city attributes - not relational data – which makes it difficult to authoritatively define the linkages that exist between world cities (Taylor 1997). As this chapter will argue later, if data on which the relational power of world cities is calculated is flawed, then some cities will be fallaciously omitted, while other cities are categorised as being 'economically irrelevant' (Knox 1995:41), when in reality their roles in the global economy are more substantial. This chapter will demonstrate how many 'peripheral' UK city-regions play a significant role in UK finance, and the international finance system, as the mortgages which they produce finance the housing market which accounted for more than half of the value of UK's assets in 2006.

Amin and Graham (1997) contribute to the third strand of literature, relevant to the argument being pursued here, by insisting that urban theory has only highlighted a small selection of paradigmatic cities and that although large cities act as key

command and control centres - incorporating financial markets - many have become subjects of spatial decentralisation as advances have been made in telecommunications. Robinson (2006) and Amin and Graham (1997) suggest a turn to the investigation of what they call 'ordinary cities' that exist as unique assemblages entwined in wider processes, where each city is 'distinctive in a category of one' (Robinson 2006:109). With regard to regional financial centres, Leyshon et al. (1989) have highlighted the emergence of regional financial centres as financial service providers began to remove their back-office processing functions from London to the South-East during the 1970s, while Neil Marshall and Randal Richardson (1997; 1999; 2000) have led research that has highlighted the emergent role of regional cities that specialise in processing financial data. Indeed, Bailey and French (2005) have suggested that regional financial centres perform many important supportive roles to financial service firms, providing administrative role, and marketing, but with the exception of French's (2002) research on life assurance underwriting in Bristol – which draws attention to the expert epistemic communities that perform actuarial analysis - there is little geographical research that has targeted powerful financial elites in regional centres. It is argued that while geographers have identified the role of regional centres, most studies have been preoccupied with mundane processing tasks. Amin and Graham (1997) have argued that although face-to-face contact is important in urban environments, the localised development of tacit knowledge are not confined to large cities and can exist in other locations. This thesis suggests that the mortgage processing centres, discussed in this chapter, can be viewed as powerful centres as they produce a substantial volume of the UK's financial assets, created under the watchful eye of epistemic elites, discussed in the next chapter.

Robinson (2006) and Amin and Graham (1997), acknowledge that cities emerge from overlapping networks, but assert that the identification of economic, social

and political circulations need to become more diverse, and reflexive with particular reference to tacit knowledge exchange and proximity. This thesis is not disputing London's position as one of the world's global cities, especially as it is the location where mortgage assets are structured into bonds by investment banks. However, this thesis suggests that the role of the largely invisible geography of mortgage production in the UK's peripheral cities need to be understood and taken seriously.

5.3. Sowing the seeds for growth: A history of mortgage finance

The production of UK mortgages is geographically dispersed and to understand this distribution we need to scrutinise the histories and legacies of building societies which were the first organisations to offer mortgages to UK consumers. Historically, access to bank credit was a privilege reserved for the wealthy, and provided by commercial and clearing banks (Davies 2002). Formal, organised networks of working class saving and borrowing did not emerge until the 17th century. These financial provisions were mediated through 'friendly societies' that initially provided protection for urban immigrants from unemployment and illness. These societies - not dissimilar to today's credit unions - enabled their members to borrow money, providing they made regular contributions to their friendly society in the form of savings. The societies became so important that in 1793 they gained legal recognition under the Friendly Societies Act, which developed to protect the societies' savings and members (Davies 2002). It was not until 1775 that the first building society was founded by Richard Ketly, the Landlord of the Golden Cross Inn in Birmingham (Cleary 1965; Davies 2002). Building societies were different to banks in that they looked to the Victorian virtues of thrift and mutual self-help to promote and facilitate home ownership, whereas banks sought to profit from lending (Boddy 1980). The mutual society idea proved popular and societies soon

began to appear beyond Birmingham, in the wider Midlands region and the North of England.

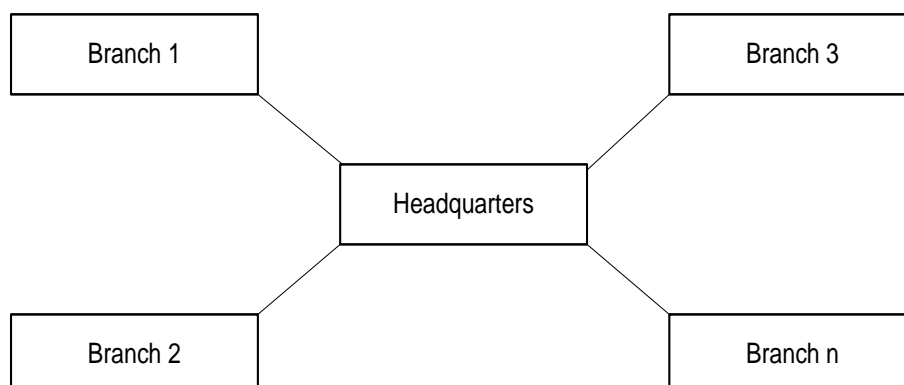
The geography of the building societies movement expanded, but the geographical operation of the individual societies remained local. The early societies did not operate through branch networks, or individual offices. Meetings were held in public houses which articulated a key role in coordinating the trust that maintained these societies. Public houses were central to the operation of building societies as they offered a neutral location where members would meet and pay monthly subscriptions, and many early societies were often coordinated by landlords (Boddy 1980). The members were required to pay a monthly subscription to provide funds to build homes, and members who did not pay were punished with fines. This procedure constituted an early form of surveillance as the reliability of members was monitored and recorded at the monthly meetings of the societies. The members usually consisted of skilled working class professionals, such as carpenters, weavers and stone masons who were relatively highly paid compared to the rest of the working class population (Boddy 1980), so although the schemes provided housing for the working classes they were still exclusive organisations (Davies 2002). The Methodist Church began to run friendly societies in their churches, allowing church members to participate in mortgage schemes without having to meet in a public house (Davies 2002). The early societies would disband once all the members had been provided with a house, although some of the societies, often maintained by landlords, began to operate on a permanent basis to provide new members with the ability to purchase homes.

Once the building societies became permanent, they began to accept money from middle class savers who did not intend to purchase a house, but who benefitted from the interest paid on their savings. Consequently, building societies began to

grow rapidly as an influx of middle class capital entered the societies. This caused a dramatic change in the structure of the relatively informal societies as middle class savers did not want to be involved with management. As the volumes of money deposited with the societies grew, it became clear that skilled management was required to run these permanent societies which resulted in the development of building societies with their own premises, outside of public houses (Boddy 1980). This began to formalise the structure of building societies who became subject to stricter government control, through the Building Societies Act (1874) which gave building societies a corporate status which limited the liabilities of their members (Boddy 1980). During the 1890s, many small regional lenders began to absorb smaller societies which culminated in the development of national and regional societies that began to rollout new branch networks to attract additional investment (Boddy 1980). The branch staff had four key roles (Leyshon and Thrift 1999). First, the staff would collect information on the local market conditions. Second, the staff would collect deposits with which to fund the society's mortgages. Third, the branch would be a site of decision-making, where a saver who had applied for a mortgage would be interviewed by the branch manager. Finally, the branch acted as an administration unit to service the mortgage accounts. The building society branch became a relatively autonomous actor, with the power to issue mortgages, exercised exclusively by the branch manager.

Figure 5.1 provides a diagrammatic representation of the relationship between the building society branches. This decentralised topology situated the power to produce mortgages within the individual branches, which were overseen by the head office which would circulate the society's savings between branches.

Figure 5.1: The 'decentralised' mortgage production structure



Source: Author

Mortgage applications were processed by the manager who used qualitative guidelines written in manuals and circulars that were supplied by the building society headquarters. These were not prescriptive rules, but guidelines, and the manager had discretion at all times as to who would be allowed a mortgage (Boddy 1980). Borrowers were frequently required to save with a building society to provide the society with a track record of their financial performance which was another early form of surveillance and data collection. Successful applicants would often frequently have to wait until the society had enough capital to fund the consumer with a mortgage, an early form of credit rationing. Borrowers who did not have a savings record with the building society could apply if they were introduced by an agent, such as an accountant or independent adviser who would know about the applicant's financial history (Boddy 1980), although savers had priority and these applications were only successful if the society had a surplus of funds.

The information used by the branch manager to make lending decisions included information on the house to be purchased, applicant income, and career history

(supplied by an employer), and family status³². Information on borrowers was derived through informal contacts, where branch managers would directly contact employers who would confirm an applicant's current job status and socioeconomic prospects. The societies would also write to landlords and other building societies who would have a record of financial transactions that could be used to judge whether the applicant was credit worthy or otherwise (Boddy 1980).

By 1919 only 20 per cent of British households owned their own homes, but by 1979 this had increased to 54 per cent. This increase can be attributed to the easing of credit rationing as building societies, and the volume of their deposits, grew (Boddy 1980). By 2003 the ONS reported householder ownership as having increased to 70 percent³³. The strong demand for home ownership in the interwar years was promoted by conservative governments who sought to reduce local authority housing subsidies (Boddy 1980). Although successive labour governments overturned this policy in an attempt to satisfy housing demand through public housing, US foreign policy played a role in influencing the UK government into meeting its housing needs through private housing. Following the end of the Second World War the US provided tied-aid to European countries through the Marshall Plan, where the UK received money for reconstruction, providing it conformed to US demands. One demand was to reduce public service provisions, including housing, as public housing was perceived as a political threat in line with communist ideals. As such, the US believed that nation-states who moved increasingly towards market orientated solutions would inhibit the spread of communism (Boddy 1980) and so it rewarded countries that complied which increased the demand for private UK housing and public housing stock was

³² This would involve historical information on an applicant's previous jobs, but also information on if the applicant's potential future, including promotions and potential pay rises and if the consumer was a perceived to be a 'responsible' individual.

³³ <http://www.statistics.gov.uk/CCI/nugget.asp?ID=1105&Pos=6&ColRank=2&Rank=224> (Accessed: 25/04/08)

reduced. In this sense, private housing provision became a political tool and by the 1970s the Conservative government used private property ownership as a technique to legitimise privatisation (Boddy 1980). The geographical distribution of mortgages sales through building societies began to shift as the societies began to sell mortgages through alternative distribution channels including accountants, solicitors, estate agents and insurance brokers (Boddy 1980). These distribution channels later become responsible for greater volumes of sales compared to the branch networks during the 1990s, when branch networks were pruned and mortgage production became centralised.

5.4. Centralisation: Restructuring the UK mortgage Market

During the late 1980s and early 1990s, the organisation of the UK mortgage market underwent a dramatic transformation. Three events would initiate the disintegration of decentralised mortgage production and the funding structure that building societies had traditionally employed (Leyshon and Thrift 1999). The first event was the liberalisation of banking in the UK through the introduction of The Financial Services Act (1986) and The Building Societies Act (1986), which promoted greater competition in the retail banking sector and caused lenders to innovate dramatically, in response to the intensified competition (Leyshon and Thrift 1997; 1999). This led to a second event which was the transfer of credit scoring technologies and a business model known as the 'centralised lender model' from the US to the UK. These innovations would later be adopted throughout the UK, when a third event, the developing countries debt crisis, forced UK lenders into restructuring in an attempt to reduce their operational costs.

The subsequent deregulation of the banking and building society sectors allowed two new entrants into the mortgage market. First, UK clearing banks began to offer

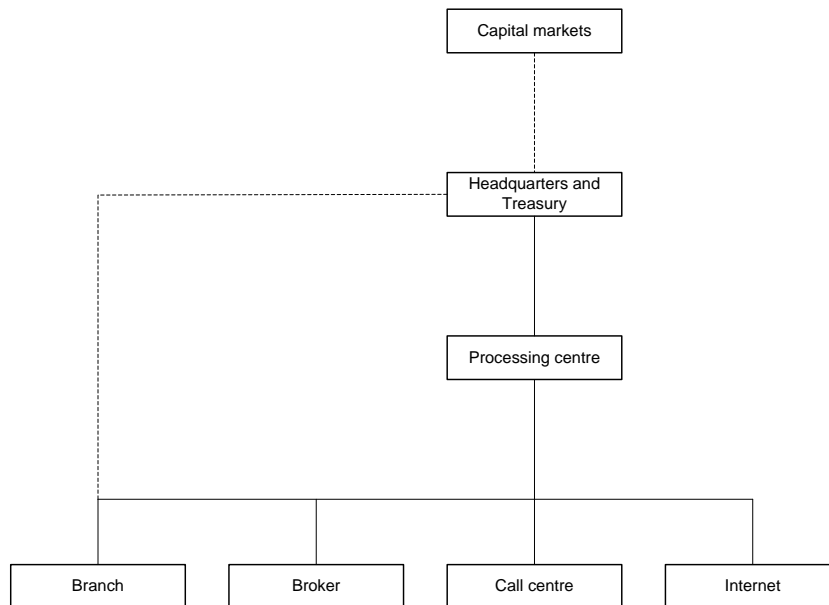
mortgages under The Financial Services Act (1986), while a limited number of larger building societies elected to become banks as they rescinded their mutual status' (Martin and Turner 2000). Many societies had been frustrated about not being able to access the wholesale money markets to fund the expansion of their mortgage portfolios, but demutualisation enabled them to overcome this barrier (Martin and Turner 2000). Abbey National became the first building society to demutualise in 1989 as it attempted to increase its market share and offer new services to customers as the mortgage market became more crowded (Martin and Turner 2000). The UK's financial liberalisation also witnessed the emergence of mortgage lenders that utilised the centralised lender model, originally pioneered in the US. Instead of developing extensive branch networks that domestic lenders had completed over hundreds of years, networks that were also expensive to maintain, they sold their mortgage products over the telephone, or through brokers and later the internet (Willis *et al.* 2001). As these lenders could not collect consumer deposits to fund their mortgage issuance, they were financed exclusively through the capital markets.

This heralded a significant shift in the UK mortgage sector as it had previously been funded through local branch networks, and for the first time it became integrated with the international capital markets. Building societies, according to Harvey (1982), are detached from the circuits of capital accumulation, as the money saved by workers was redistributed to provide housing for workers, not profit accumulation (Harvey 1982). In this regard, building societies can be viewed as redistributive systems that were isolated from national and international circuits of capital. This is debateable as contemporary society members 'profit' from interest on their savings, although Harvey is correct in that their money did not travel outside these localised circuits of circulation. Subsequently, it can be argued that the UK mortgage market previously operated as a closed circuit of capital. As

a result, mortgage availability was dependent on building societies having sufficient deposits which in turn were regulated by people's earnings, savings and the UK economy as a whole.

This changed under the new regulation as centralised lenders and retail banks began to sell mortgage debt which integrated the UK's mortgage market into the wider capital markets. The centralised lender model had an additional impact on the mortgage market, as mortgage applications began to be reviewed in specialised mortgage processing centres, where mortgage decision-making and management were performed. Marron (2007) discusses the operations of mail-order processing centres where the companies offer credit to consumers, and process their accounts without ever meeting the clients, a system of which the centralised lender model is a descendent. Figure 5.2 illustrates the topology of the centralised lender structure which is different to the building society organisation shown in Figure 5.1. Instead of using bank branches to collect consumer deposits to fund mortgages, this would be achieved by securing funds via the capital markets at the treasury function and headquarters of the lender.

Figure 5.2: The 'centralised' mortgage production structure



Source: Author

The centralised lender sells mortgages through mortgage brokers, which include independent financial advisers and estate agents, as well as websites and call centres (Marshall *et al.* 1997) that also collect the consumer's application information, which is then reviewed at the processing centre. This is usually located at the headquarters of the lender or at a separate site. Centralised lenders were able to offer competitive pricing on their products as they minimised their operational costs by not maintaining a branch network, while maintaining their ability to offer their products across a wide geographical area through intermediaries, as outlined in the quote below:

“[Intermediaries] can be independent financial advisors, or mortgage brokers, the software is available so mortgage brokers can access the systems of a panel of lenders and rather than a borrower going into a bank and filling out a form half a dozen times they can go to a broker who will take down the necessary details...take those details...and knowing the products in the markets, what the best products are for you...most of the market is broker driven, especially sub-prime and buy-to-let...they are becoming important to the market for lenders who don’t have a branch network because they aren’t interested in raising retail deposits,” (Interview 12: Industry trading body spokesperson, February 2007).

The successful operation of these early centralised lenders came to rely on credit scoring, the development and adaptation of which will be discussed in more detail in the next chapter. When a potential consumer applies for a mortgage their application details and characteristics are processed at a specialist centre. The characteristics of the consumer, once digitised, are allotted specific points. An individual who is older and has a higher paying job will generally receive a higher point allocation for those characteristics. This produces a score for the potential consumer based on their characteristics. There is a threshold whereby if an applicant’s score is high enough, the application is automatically accepted, and if it is too low, the application is rejected, or referred to a human operator to investigate further. The points and thresholds are determined by each individual lender using a series of statistical procedures based on the performance and behaviour of previous consumers.

The decision-making process for these lenders was no-longer made by branch managers, as it became increasingly automated through the use of computers, supported by underwriting staff that analyse ambiguities that arise in the 'standardised' sets of consumer data. This allowed the centralised lenders to make mortgage lending decisions in regional processing centres and eliminated the need for lenders to use branches. As more consumer data became available, through channels such as credit referencing agencies, as well as the lender's own historical data, they were able to compile extensive relational databases which enabled the process of credit scoring to become more accurate (Alexander and Pollard 2000). This data is also used to gain an understanding of consumer spending patterns through the segmentation of customers into categories based on risk (Alexander and Pollard 2000). One key outcome from the quantification of consumers was the ability segment their consumer populations into those who were profitable and unprofitable (Argent 2002).

Access to this data changed the landscape and spatial structure of mortgage processing as most mortgage lenders were later forced by competitive pressures into adopting credit scoring and elements of the centralised lender model. In the 1980s the operating expenses of British banks accounted for 65 per cent of gross income (OECD 1992) and increased competition in the 1980s and the recession in the early 1990s had forced the hand of banks to reduce their operating costs (Leyshon and Thrift 1993; 1997). It was perceived by the banks that the centralised processing model could solve this problem in two ways. First, by outsourcing the bank branch functions to brokers, mortgage

lenders could offset some of the operating costs of sustaining a branch network - by closing their unprofitable branches - while retaining their geographical coverage through mortgage intermediaries. Second, the standardisation of data and its processing through credit scoring proved more reliable than a branch manager making lending decisions, for as lenders began to control consumer credit risk centrally, they were able to predict defaults more consistently. Argent (2002) discusses how significant bad debts can be traced to poor decision-making in branch networks during the 1990s, which resulted in the removal or reduction of the branch manager's discretionary limits. Eventually, retail banks and building societies began to centralise their application processes which became more significant as financial products were offered through disintermediated mortgage channels (Marshall *et al.* 2000). The industrialisation of mortgage processing also enabled lenders to achieve economies of scale, enhanced by the adoption of credit scoring. This made the centralised processing model attractive for the retail banks, but it was also adopted by building societies as they could also reduce their operational costs which would benefit their members with higher rates of interest, or lower mortgage rates (Marshall *et al.* 1997). The building societies that established buy-to-let mortgage subsidiaries, such as The Derbyshire, also made extensive use of the centralised lender model.

The management of credit risk became more tightly controlled by the lenders' credit committees once application processing was centralised which also aided them in deciding which products and markets that they wanted to participate in and how much credit risk they were willing to accept. Previously, lenders undertook a bespoke risk assessment of each consumer in different branches,

but this was now completed by a single set of codes in one location which gave lenders more control over credit risk, compared to branch managers' assessments of applicants³⁴. Using data from previous applicants and credit referencing agencies, lenders began to segment their customers, as illustrated by the following quote:

"[We] then work out who we want to do business with, so this would be...the account recruitment bit...do we wanna do business with high-net worth individuals, high indebtedness, high income, high loss rates [?]...we've got tools for that like scorecards and policy rules...if you send an application out...you want to know what sort of customers are going to reply, so there's work to be done first...there's no point in sending a load of applications out to near prime customers who you don't want to do business with...you're managing the application process," (Interview 5: Director, UK retail bank, February 2007).

Once the level of credit risk has been determined, the risk teams in the mortgage processing centres begin to analyze their data and begin to produce credit scoring models, or arrange to have them built by a credit referencing or analytics agency. From the interviews it became clear that some processing centres use underwriters to assess the applications of riskier subprime borrowers whose circumstances cannot be effectively accommodated by credit scoring due to the non-standard nature of the information supplied or if the

³⁴ Decision-making was not consistent amongst branch managers due to their flexible interpretation of underwriting criteria.

application is 'referred'³⁵. This organisational shift represented the transfer of financial power from branches to processing centres as mortgage lenders began to adopt elements of the centralised lender model. The generation of this financial power in these centres will be discussed in more detail in the next chapter, but it is essentially derived from the outcomes of credit scoring which seek to either include, or exclude, consumers from mortgage finance. While the senior management of mortgage lenders, usually located in headquarters in various city-regions and in London, wield the power that decides which type of customers they want to offer products to, these decisions and consumer characteristics are encoded into credit scoring software. This leads the thesis to argue that this day-to-day power - which includes and excludes consumers - is embedded within the frozen organisational discourse (Bowker and Star 1999) of credit-scoring software, which is exercised in centralised processing centres.

The centralised processing centre is also responsible for transferring the money to the applicant to purchase the house, as well as ensuring legal documentation is in order and that the property survey has been approved. These processing centres also ensure the timely collection of the repayments from consumers and the servicing of the accounts, practices that were previously completed at the branch level³⁶. The centralised processing centre will also coordinate repossessions of property from defaulted accounts. However, centralised

³⁵ 'Referred' applications are applications that have been credit scored, but have fallen short of the required score by a low margin. As a result, a human underwriter will check the applicant's details to see if any mistakes have been made in an attempt to see if the application can be passed.

³⁶ If a payment has not been made, computer software alerts an analyst who will contact the consumer to determine why the payment has not been made. The timely repayments are recorded and are used to enhance the information available on the consumer's credit worthiness. If the mortgage lender has securitised an account, they will continue to service and manage the account on behalf of the RMBS note holders.

processing centres have not completely replaced the role of branches. Branches are still important for banks and building societies as they still use deposits to fund mortgages, although this too has changed as through the advent of electronic settlement systems and online savings accounts (Leyshon and Pollard 2000; Bergendahl and Lindblom 2007). More specifically, the centralised lender model undermined the role of the branch in three distinct ways (Leyshon and Pollard 2000): First, the branch was a site that collected information on its customers and local markets. Second, the branch operated as a space where consumers could be sold financial products. Third, the branch was a place to settle the transactions. The first role has been undermined as customer information is now collected through automated processing systems, databases and credit scoring, while products are sold over the telephone and internet and payments are processed in centralised cheque payment centres or are settled electronically in real time (Bergendahl and Lindblom 2007).

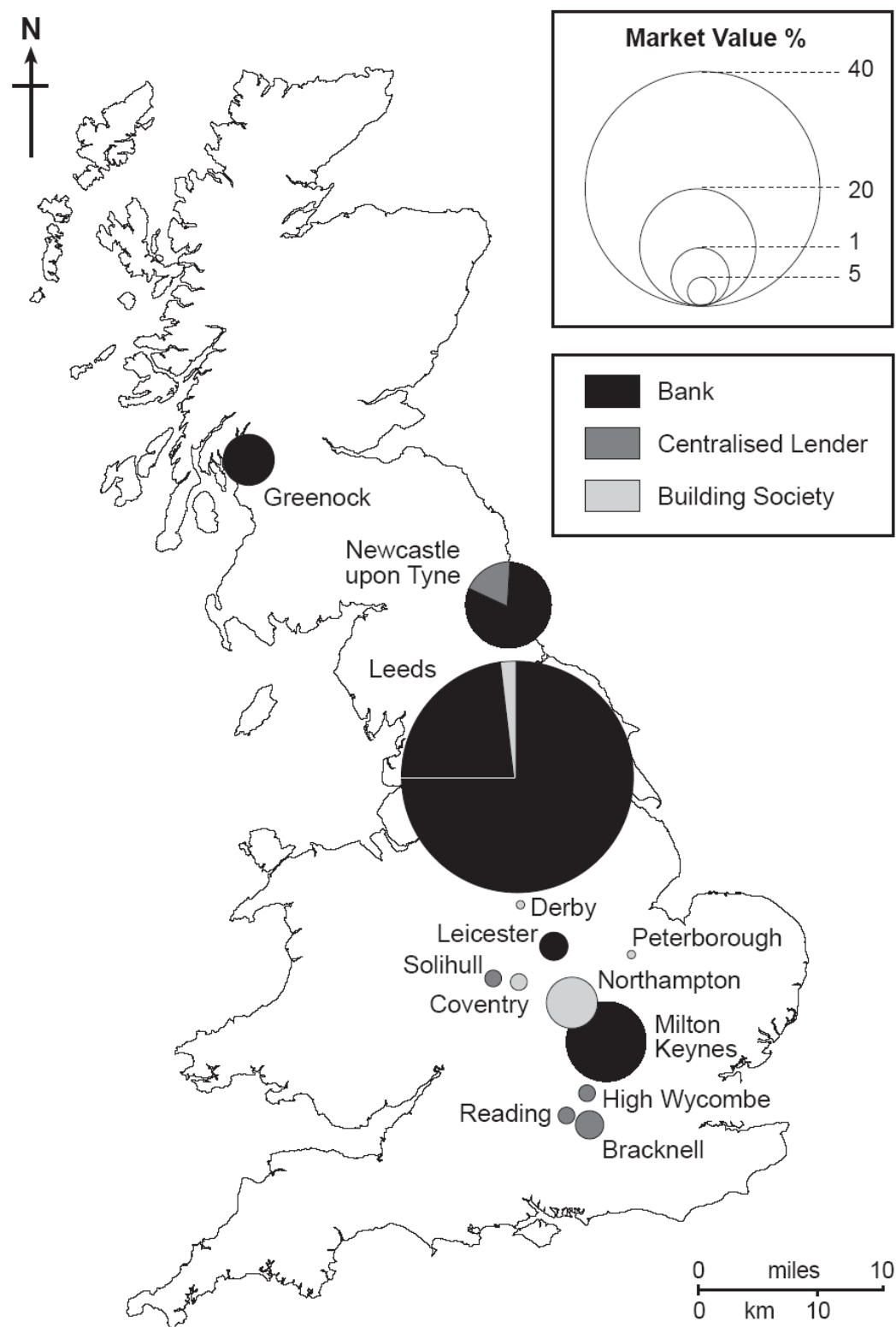
The second role has been undermined by a process of disintermediation that has been on-going since the 1970s, whereby independent mortgage brokers and intermediaries have taken over the role of advising consumers on the different types of mortgage products from lenders. Instead, brokers introduce consumers to the mortgage products available from a wide range of different mortgage lenders and collect the personal information of consumers on behalf of the mortgage lenders. Consumers consider brokers to provide a useful service to consumers because they are able to access a wider range of products than a single bank, or building society branch. Brokers are also convenient for consumers as they are able to rapidly check all the products available to the consumer in one office as opposed to the consumer having to

visit separate mortgage lenders and complete application forms for each supplier, as illustrated below:

“...intermediaries make up between 69-70% of the mortgage market...we have developed significant networks with some of the larger estate agents...the consumer likes brokers, they feel like they get a better deal, going through a broker,” (Interview 28: Director of Retail, large UK Building society, February 2007).

The topology of mortgage production and decision-making has changed since the centralised processing model was adopted by large mortgage lenders. Application processing became increasingly centralised and automated in ‘peripheral’ cities and towns that decide which consumers are eligible for mortgages. According to Bailey and French (2005), these regional centres have experienced a rapid growth in financial jobs as the financial sector began to decentralise from London. This geography is shown in Figure 5.3 with additional details in Table 5.1:

Figure 5.3: UK mortgage underwriting centres



Source: Author and CML

Table 5.1: Lender locations and size

Lender	Mortgage Origination 2006 (£Billion)	Type	Headquarters	Processing locations
HBOS	73.2	Bank	Edinburgh	Leeds
Abbey	32.6	Bank	London	Milton Keynes
Northern Rock	29	Bank	Newcastle	Newcastle
Nationwide	21.1	Building society	Swindon	Northampton
The Royal Bank of Scotland	20	Bank	Edinburgh	Greenock
Barclays	18.4	Bank	London	Leeds
Alliance & Leicester	12.6	Bank	Narborough	Leicester
GMAC-RFC	12.1	Centralised lender	London	Bracknell
GE Money Home Lending	4.5	Centralised lender	London	Newcastle
Kensington Mortgage	4.1	Centralised lender	London	Reading
Lehman Brothers	4	Centralised lender	London	High Wycombe
Coventry	2.9	Building society Centralised	Coventry	Coventry
Paragon/Mortgage Trust	3	lender	Solihull	Solihull
Leeds	1.7	Building society	Leeds	Leeds
Norwich & Peterborough	0.8	Building society	Peterborough	Peterborough
Derbyshire	0.7	Building society	Duffield, Derbyshire	Derby

Source: Author and CML

It is clear from Figure 5.3 that there is an absence of mortgage production activity in London. This can be explained by the histories of the three types of lenders operating in the UK, which will be discussed shortly. Figure 5.3 also provides little evidence of clustering for UK mortgage production as the sites are distributed around the UK, with the exception of Leeds and Newcastle. The Leeds city-region is home to two of the largest mortgage processing centres that are responsible for generating substantial amounts of mortgage assets, later sold into the debt capital markets as RMBS. Potentially there are additional city-regions that may show further evidence of financial agglomeration - as

centres of consumer credit production. For example, Northampton is home to Nationwide's mortgage decision-making operations, known as underwriting, as well as Barclaycard's credit card underwriting. The mapping of city-regions that underwrite consumer credit in the UK more generally falls outside of the scope of this project, although the patterns illustrated in Table 5.1 raise two interesting points. First, mortgage underwriting is not clustered and exists outside of London. Second, the data suggests that there is a different set of rationales that determine the particular locations of mortgage production for the three different types of mortgage lender.

The first point can be explained through Amin and Graham's (1997) thesis which suggests that face-to-face contact, tacit knowledge and epistemic communities are not confined to world cities, as implied by the world-city literature, and exist in other locations such as peripheral cities and processing centres as the processing of standardised information still needs to be interpreted and placed into circulation. It can be argued that credit scoring and underwriting involve the interpretation of standardised data, but specialist skills and training is still required to interpret the information. Furthermore, data ambiguities are still prevalent and require special attention from underwriters and analysts. The research that has been conducted on the centralisation of the retail financial industry has been limited to the development of call centres (Bailey and French 2005), with the exception of work by French (2002) on insurance underwriting. The relative lack of research has created a lacuna of knowledge on the development and practice of marketing, underwriting, credit scoring and account administration. Bailey and French (2005) argue that processing centres in general, not just mortgage production centres, undergo

clustering to take advantage of the skilled, experienced labour pools that can be found in city-regions.

This brings us to the second point: the three different types of mortgage lender have different rationales that underpin their locational choices for centralised processing centres. Earlier, it was discussed how building societies have strong historico-regional ties, contingent on where they were initially established. For example, the Leeds building society has never had a managerial or processing presence in London, because it has no need to. On the other hand, HBOS and Bradford & Bingley, both demutualised mortgage lenders with roots in Yorkshire, developed a presence in London because of their reliance on securitisation and the capital markets. As Marshall *et al.* (2000) point out; the community links of smaller, regional building societies frequently mean that many of their employees are customers, which also makes them members. Subsequently, relocating a processing centre outside of a society's local region and making staff redundant is not in the interest of a society's members. In addition, being based outside of London allows them to maintain low operational costs.

The processing centres for retail banks are more widely dispersed and spread further away from their bank headquarters. There are three reasons that underpin this distribution. First, unlike building societies, banks offer a more diverse range of products, such as private and corporate banking, and have extensive branch coverage, so as the following quote suggests, the banks are used to operating as geographically dispersed organisations:

“...we have a network of support offices, area offices and processing offices, as well supporting the branches,” (Interview 20: Risk Manager, large UK Retail bank, February 2007).

Second, banks such as Abbey and Barclays are based in London where operating expenses are very high, so these lenders conduct their standardised processing functions outside of London as it is not necessary for these tasks to be undertaken in the City. This led the financial sector, in general, to locate their backroom operations outside of London, a trend that began in the 1970s and 1980s (French and Leyshon 2003). This trend spurred the emergence of a spatial division of labour, where the performance of lower paid, mundane tasks became clustered in low cost locations away from London (Marshall et al. 2000). As information technology allowed the financial sector to remove its mundane practices from their head offices, they could be located at alternative sites which benefit from low labour costs as well as financial incentives, such as tax cuts, offered by local government (Richardson and Marshall 1999). The quote below suggests how low operational costs have a propensity to explain the locational choice of newer lenders, who do not have a series of historical legacies to consider:

“...there is a strong pool of labour...for the kind of business we do, and it’s always cheap, I would never setup one of these businesses in London, why pay someone 40k a year, when you can pay, for the same skill set, 25k a year,” (Interview 32: Director of Finance, UK centralised lender, September 2007).

Third, when the retail banking sector underwent a round of mergers and acquisitions in the 1990s (Including the high-profile mergers of The Royal Bank of Scotland with Natwest, and The Hong Kong and Shanghai Banking Corporation Limited with the Midland Bank), financial organizations would also have acquired a series of processing centres and skilled members of staff situated in specific cities and towns. Some processing centres are used to fulfil new roles (Marshall et al. 1997), but if their functions were duplicated, processing centres were amalgamated and closed. However, some banks realised that the skills of their employees were important to the business and that some expert staff would not necessarily be prepared to move to new sites which had the potential to disrupt their ability to effectively process mortgage applications, while a reduction in the quality of skills within a new centre could jeopardise the quality of the risk management procedures, as suggested below:

“...it’s historic, erm, we’ve got [Lender x] erm, [Lender x] bought [Lender y], erm who were based in [location A] then [Lender x] and [Lender z] merged then that all became part of [Lender xz], so the reasons the loans operation is based in [location A] is because that is where [Bank y] is based, the reason why credit cards are in [location B] is because we bought [Lender w]...who ran out of [location B]...it’s very costly to move a business, it’s very risky...people who work in the business have to be willing to up and move, some will, some won’t,” (Interview 20: Risk Manager, large UK retail bank, February 2007).

Most centralised lenders, such as, Kensington, GE Money and GMAC are headquartered in London, although their processing centres are located outside of London. When US mortgage lenders began to move into the UK in the 1980s and 1990s, they became established in, or close to London, where securitisation was being pioneered. For example, The Mortgage Corporation's processing centre was based in Surrey, while its parent company, Salomon Brothers had a presence in the City. It was useful for these lenders to be located near investment banks and law firms when producing their mortgage products and their early securitisation programmes. Early processing centres were located in the south-east, outside of London, but where the proximity allowed bankers to visit analysts and underwriters at the new processing centres. Many early centralised lenders were part of US investment banks who already had office space in London. With the exception of GE Money, mortgage processing takes place outside of London; for example, Kensington's processing centre is in Reading, as these mundane practices of processing can be conducted outside of London.

The credit crunch may stimulate a further restructuring of mortgage production, out of which a new set of geographies could emerge. First, HBOS and Lloyds have merged, while Banco Santander, owner of Abbey, has purchased Alliance & Leicester and Bradford & Bingley's branch network, which could initiate the amalgamation and closure of centralised processing centres, imbuing the remaining centres with more financial power as they become responsible for originating larger volumes of finance to fund homeownership. Second, mortgage lenders have realised that borrowing money from the interbank markets and selling RMBS notes to raise capital can be unreliable, as the

volumes of available money and the price of capital can fluctuate substantially. These factors may stimulate the roll-out of new branches to enhance the collection of deposits - although it is highly likely that these branches would be located in affluent areas (Leyshon *et al.* 2008).

5.5. Conclusion

Since its inception, the UK mortgage market has undergone a series of dramatic transformations - both organisationally and geographically. This chapter has argued that a substantial proportion of the UK's assets have been financed through a series of 'mundane' processing centres situated around the UK, outside of London. This chapter has questioned the myopia of the world cities literature in failing to acknowledge the significant role of smaller financial centres - a consequence of using flawed hierarchical models - that only highlight cities that are perceived to have global links. This is not to deny that London is an important finance centre, especially with regard to this thesis as it is an essential space involved in the production of securitisation. This chapter contends that not only do regional financial centres perform an integral role in the production of finance; there is evidence to suggest that these centres are deeply embedded with global financial networks as they produce the assets that are engineered into RMBS bonds. Subsequently, the chapter asserts that - in addition to London - a substantial fraction of the UK's financial power is exercised in 'peripheral' cities around the UK. The chapter discussed how the geographical dispersal of mortgage production can be understood through the historical legacies of building societies. These societies, initially savings clubs for members of the working class, produced a series of localised circuits of

capital used to finance working class housing. These small societies eventually spread across Britain but it was not until they developed larger branch networks and began to amass middle class savings that they were able to expand their geographical reach and increase home ownership.

The next substantial shift in the geography of mortgage production occurred as a result of the financial restructuring through The Financial services Act (1986) and The Building Societies Act (1986). This deregulation allowed building societies to shed their mutual status in favour of that of a fully fledged bank, allowing them to access interbank money markets which allowed them to rapidly expand their mortgage portfolios. The deregulation permitted banks to issue residential mortgages, while centralised lenders were also able to enter the mortgage market. The localised circuits of mortgage funding thus became integrated with the international capital markets as mortgage lenders accessed the interbank markets. Centralised lenders, who funded their mortgage issuance exclusively through securitisation, processed mortgage applications in specialised centres using credit scoring technologies. This had two profound impacts on the industry. First, it reduced the operational costs of lenders. Second, credit scoring reduced the number of mortgage defaults and allowed lenders to exercise a consistent lending policy. This new model was soon adopted by banks and building societies, who like centralised lenders, began selling their mortgages through intermediaries, initiating a rationalisation of branch networks.

The geography of the centralised processing centres is not clustered, but is dispersed across the UK. The thesis argues that the geography of these centres

is largely a reflection of their institutional legacies. Building society processing centres are located close to the building society headquarters, to facilitate more effective management. This geography is reinforced by the historical locations of building society headquarters that are distributed around the country. The location of bank processing centres are more widely distributed which can be explained by the large networks of processing centres that banks have, but also because they operate on national scales compared to building societies and are more likely to locate their centres where they can exploit low operational costs. Centralised lender processing centres are located outside of London to benefit from low operational costs while their headquarters are located in London as it provides them with access to the capital markets, as well as, law firms and investment banks, key actors in the processes of securitisation. The contemporary geography of mortgage processing is dynamic and will continue to change in response to regulatory transitions and technological innovations. The current credit crunch may initiate a new phase of restructuring, which may produce new geographies. The dissertation will now turn to discuss the implementation of credit scoring within the UK and will explore how scorecards are developed and used in the production of consumer mortgages.

Chapter 6

Accept(ed), Reject(ed), or Refer(ed)?: The uneven geographies of credit information and automation.

“We believe that credit scoring is fair and impartial. It does not single out a specific piece of information as the reason for declining an application. We test our credit scoring methods regularly to make sure they continue to be fair and unbiased.

Responsible lending is essential for the good of both applicants and lenders. The Office of Fair Trading regulates credit and considers credit scoring to be an aid to responsible lending,” (FLA 2000:15).

6.1. Introduction

Both the UK mortgage industry and government agencies have welcomed the adoption of credit scoring (FLA 2000; Van Dijk and Garga 2006). Credit scoring had previously been used more intensively in the processing of credit card applications and loans, but has been adopted rapidly by the mortgage industry

in recent years. A report commissioned by the Council of Mortgage Lenders and Standard and Poor's revealed that 71 per cent of mortgage lending decisions in 2005 were made using credit scoring (Van Dijk and Garga 2006)³⁷. As the technology and accuracy of credit models improve, this number will undoubtedly grow. Credit scoring has enabled lenders to make rapid lending decisions and the automation of application processing has allowed many larger lenders to reduce their processing and operational costs, while reducing the number of customers who are likely to default (Leyshon and Thrift 1999).

Despite widespread praise by the mortgage industry, credit scoring has not escaped criticism. Social scientists have argued that these systems exclude some borrowers from cheaper mainstream credit, and reject individuals who do not meet specific criteria (Leyshon *et al.* 2004). Perhaps the most dogged criticisms of credit scoring centre upon its scientific epistemology and its ability to accurately discriminate between 'good' or 'bad' consumers (Capon 1982). The development of scorecards is problematic and the production of these scientific tools are frequently shaped by subjective practices, which raises questions as to whether this technology can be crowned with its unblemished, scientific status. However, it can also be argued that credit scoring has allowed mortgage credit to be extended to consumers who would have previously been denied credit, while these standardised systems simultaneously prevents applicants from being excluded due to gender, race and sexuality (Aalbers 2007). This thesis views the system sympathetically; as although credit scoring is clearly problematic, it is arguably more accurate at identifying consumers who

³⁷ The Council of Mortgage Lenders is the UK trade body for mortgage lenders and Standard & Poor's is a bond-rating agency.

may (or may not) default, compared to the face-to face interviews conducted by branch managers.

While social scientists have found it easy to critique credit scoring, many of its criticisms can be drawn directly from social science's own evaluations and methodological tradition (Leyshon and Thrift 1999). For example, economic geography shares part of its antecedents with credit scoring. During the 1960s, economic geographers began to use 'objective' statistical methods and modelling to accept, or reject hypotheses in economic geography (Barnes 2001). During the 1970s and 1980s, bankers began to use similar statistical methods to decide whether applicants for consumer credit should be accepted, or rejected. While economic geography's 'quantitative revolution' was a short lived affair, soon migrating towards Marxist, post-Marxist and poststructural epistemologies, retail banking's adoption of these methodologies was more epochal, leading to the substantial spatial restructuring of banking infrastructure in the late 1980s and early 1990s, which enabled the UK's mortgage market to expand dramatically.

For retail banking, the term 'quantitative revolution' heralded a shift from face-to-face decision-making by a building society, or bank manager, to a quantitative and automated, decision-making system (Leyshon and Thrift 1999). The decision to lend money to a borrower has always been hampered by what Stiglitz and Weiss (1981; 1992) call information asymmetries. An information asymmetry emerges as borrowers naturally have a more detailed knowledge about their own financial background, future intentions and ability to service their debts than a potential lender, who does not immediately have access to

this information. Lenders aim to overcome these asymmetries to decide who will be a 'good' or 'bad' credit risk by amassing data on that consumer. In this sense, the consumer is rendered into a financial subjectivity, or an electronic representation, where information is used to describe a consumer's financial and socio-economic characteristics which are then stored in databases. There are three key disadvantages with face-to-face decision-making between a bank, or building society manager, and a prospective lender. First, face-to-face interviews are a time consuming and costly process (Leyshon and Thrift 1999; Marron 2007). Second, the manager can only collect a very geographically limited set of information to help them make a judgement and consequently the process was not efficient at uncovering riskier borrowers (Leyshon and Thrift 1999). Third, the lending decision's made by the managers was extremely inconsistent. The solution was to adopt a new automated system that would use information from shared, electronic databases, where lenders could report on which of their consumers had made their repayments on time, or not. This data would then be analysed by computer software which has proved to be more successful in detecting consumers who had previously, or were likely to default.

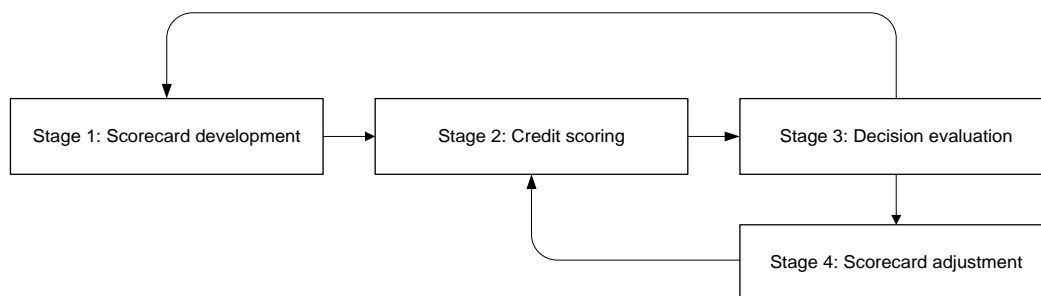
The aim of this chapter is to draw upon research from the social sciences, statistics and operational management to review how credit scoring, a decision-making system, was initially developed and how it was exported from the US and implemented into the UK. This chapter will also discuss the geographies of consumer information to explain where credit scoring operates. The remainder of this chapter is as follows: section 6.2 briefly explores in more detail what credit scoring is. Section 6.3 will explore the origins of credit scoring and its implementation in the UK. Section 6.4 will discuss how credit scoring has

become a powerful tool within mortgage finance. Section 6.5 will explain how scorecards are produced, evaluated and maintained. Section 6.6 will discuss the uneven geographies of credit scoring practice and section 6.7 will conclude the chapter.

6.2. What is 'credit scoring'?

There are many definitions of credit. For example, Hand and Henley (1997), writing from a statistical background define credit scoring as a term used to describe the formal statistical methods that are used to classify applicants into 'good' and 'bad' classes. Hand (2005) goes on to discuss how retrospective information is used to build models that predict the behaviour of new customers based on past characteristics and separates consumers into one of the binary classes of 'good' or 'bad' risk. On the other hand, credit scoring systems have been defined by Batt and Fowkes (1972:191) as 'statistically based management tools for forecasting the outcome of extending credit to individuals' (cited in Leyshon and Thrift, 1999). In what follows, I want to take issue with such unitary definitions as they singularly fail to acknowledge that there are four discrete stages involved in the development of automated decision-making, that have been identified in this thesis. These four stages are shown in Figure 6.1:

Figure 6.1: The four stages of credit scoring



Source: Author

The first stage is the development of the scorecard, which currently takes the form of a piece of software. The development of a scorecard is different to the use of a scorecard, a distinction that previous accounts have failed to acknowledge, referring to both stages as ‘credit scoring’, (for example, see Hand and Henley, 1997) which frequently ignore the development process, which is arguably more important than the credit scoring process³⁸. In order to produce a scorecard, which is discussed in more detail later, statistical techniques are used to isolate consumer characteristics (such as income, occupation and age) that may be useful in predicting whether a consumer will default, or not. The chosen characteristics are then given weightings and included in a scorecard. The second stage, the practice of credit scoring, is where a consumer’s characteristics are entered into a computer running the scorecard programme, by a lender or broker. This process is the quantification of a consumer’s life, where their personal details and characteristics are captured and encoded into the computer software running the scorecard programme, producing an electronic representation of a consumer. This data is

³⁸ The reason for this is discussed later in the chapter, which reveals the source of a scorecard’s power.

then despatched to a central computer at the lender's processing centre and is combined with information from credit referencing agencies. The points, or weightings, calculated in the first stage are then added to the consumer's particular characteristics.

Figure 6.2 provides an early example of how different consumer characteristics are allotted different points, or scores. The sum of the points are calculated by the software and the consumer will fall into one of three categories. The first is 'Accept', where a customer is accepted for credit. The second is 'Reject' where a customer is declined credit. Finally, 'Refer' is a category where a consumer has failed to gain enough points to be accepted. However, in this case, the consumer has failed marginally, and so a human underwriter will look at the information on a consumer's credit file to determine if there is any supplementary information available to decide whether the consumer should be accepted or rejected.

The third stage of scoring is the continual evaluation of the scorecards to ensure they continue to accurately discriminate between 'good' and 'bad' customers. This leads to the fourth stage, where the scorecard is recalibrated if necessary, and new weightings are assigned to different characteristics, or the 'accept', and 'decline' thresholds are altered. If the scorecard is deemed to be inaccurate, a new replacement scorecard will be developed. The use of credit scoring was discussed in Chapter 5, but the production, evaluation and adjustment of the scorecards will be discussed in greater detail in section five. There are two main types of credit scoring. The first type is application scoring that decides if a consumer will default or not on a mortgage. The second type is

known as behavioural scoring and is a more recent development which uses the same principals of application scoring but seeks to determine the size of debt that can be offered to a consumer based on their credit history (Thomas 2000). Behavioural scoring seeks to predict the future behaviour of a consumer and is also used by lenders to target specific consumers with particular financial products as well as determining how aggressively to recover an account in default (Thomas 2000).

Figure 6.2: Mercantile Credit's scorecard, 1993

Residence status		Court Judgements		Employer	
Owner	9	0	22	Government	27
Tenant	3	1	-21	Private business	18
Parents, etc	0	2	-41	Self-employed	10
Unspecified	3	3	-62	Part-time	19
				Military	18
				Unemployed	27
				Unknown	20
Loan amount (£)		Occupation		Time with bank	
0-500	30	Unknown	11	Less than 1yr 6m	0
501-1000	26	Director	11	1yr 7m-4yr 6m	8
1001-1500	22	Senior manager	31	4yr 7m-6yr 6m	30
1501-2500	16	Junior manager	22	6yr 7m-10yr 6m	34
2501-7500	0	Skilled	19	10yr 7m- 15yr 6m	36
7501-9999	-20	Unskilled	14	Over 15yr 7m	40
Unspecified	0	Military	31	No bank account	0
		Semi-skilled	16	Unspecified	20
		Clerical	22		
Time with employers		Unemployed		Bank account	
Less than 8 years	14		11	Current	15
8-15.5	18	Age		Deposit and savings	4
Over 16	26	Under 24	10	Deposit only	4
Unspecified	14	24-28	26	Savings only	4
		29-32	34	No response	2
Home phone?		33-35	39		
Yes	21	36-42	40	Cards held	
		43-45	42	Barclaycard	14
Reason for loan		46-49	50	Visa	14
Debt consolidation	0	50-54	53	Access/Mastercard	14
All others	20	Over 55	56		
		Unspecified	32		
SCORE					
224 and above	ACCEPT				
202-223	REFER				
201 and below	REJECT				

Source: Norman (1994) cited in Leyshon & Thrift (1999:446).

Each individual lender has a series of different scorecards for their particular products, including; personal loans, credit cards, hire-purchase agreements and mortgages - each with different weightings and thresholds³⁹. The use of credit scoring to produce mortgages in the UK did not become common place until the 1990s and its adoption is still uneven depending on the credit product, lender size and the type of market (Van Dijk and Garga 2006). For example, small, regional building societies have not adopted credit scoring, as they do not produce the volumes of mortgages to make implementing credit scoring economically viable. On the other hand, some subprime products are another area where credit scoring cannot be used, as the non-standard, consumer information cannot be accommodated by scorecards as borrowers vary significantly.

My research has identified four different types of data that are used in application and behavioural scoring: short-temporal, long-temporal, positive and negative data, as illustrated in Figure 6.3. This data can be classified as *Long-Temporal-Positive Data*, as these attributes do not vary frequently and contribute to a higher credit score, which increases an applicant's chance of being granted credit. *Long-Temporal-Negative Data* includes county court judgments (CCJs). Paradoxically, if a scorecard contains a characteristic for which an applicant has no information it is deemed as being of a higher risk as there is greater uncertainty. These attributes are usually used in application scoring, and are often supplied by the consumer in their application as well as credit referencing agencies. *Short-Temporal Data* is information that is updated on a monthly basis and is frequently used in behavioural scoring to judge how well a consumer has been managing their credit

³⁹ Different products require different scorecards because of the different risks involved for each product. For example, a secured loan is seen to bear less credit risk than an unsecured loan, due to the underlying security. As such, different weightings are required and so each product has a different scorecard to reflect this.

obligations⁴⁰. *Short-Temporal-Positive Data* includes a record of a consumer's monthly credit repayments that have been made on time. *Short-Temporal-Negative Data* includes a history of missed payments on consumer's accounts that will be penalised in credit and behavioural scoring. An underwriter is also able to review accounts in default to see how much money is owed and the value of the outstanding debt.

Figure 6.3: Ontology of credit referencing data

	Positive Data	Negative Data
Long-Temporal Data	Age Income Home ownership Employment type	CCJs Lack of data
Short-Temporal Data	Repayment on time Current account management	Defaulted accounts

Source: Author

There are three main groups of actors involved in mortgage application decision-making. The first are the mortgage lenders. They obtain money-capital and decide who to lend to, which they do in two ways. First, many of the larger mortgage lenders produce their own scorecards and decide how to allocate the weightings

⁴⁰ A consumer with no credit history or a limited history will be discriminated in the same way someone with a poor record would be, as there is not enough credit data to calculate a score.

that are used in the scoring. Second, lenders exchange their consumer data through a second actor: credit referencing agencies. Credit referencing agencies collect and compile databases based on information from lenders, and then distribute it to their clients for use in their credit scoring and underwriting procedures. There are currently three companies in the UK that act as credit referencing agencies, Experian, Equifax and Callcredit. Together with Fitch, an analytics, consultancy, they also produce decision-making metrics and scorecards for smaller lenders and also provide marketing products for direct mailing marketing campaigns and provide services that aid the retrieval of cash from defaulting consumers.

The third set of actors are government institutions, including the electoral roll units of local county councils and the Registry Trust⁴¹. Despite the advanced statistical models used in the development of credit scoring and the rich array of data mobilised, the names and addresses of consumers continue to form the foundation of credit files. Although the distribution of credit data is privatised, credit referencing agencies and lenders are still reliant on databases maintained by the state to verify the location of consumers.

Credit scoring has become a powerful technology within the UK mortgage industry, and by 2006 it was used by 95 per cent of prime lenders and 62 per cent of sub-prime lenders (Van Dijk and Garga 2006). Despite its popularity amongst lenders, credit scoring has been the subject to much criticism. Aalbers (2005) argues that the profiling techniques used to stratify consumers into groups means that some consumers will be rejected for credit even though they may not constitute an immediate credit risk. As such, they are excluded on the perception of how other

⁴¹ The registry trust provides details of CCJs from county courts that are added to the credit records.

consumers in their sub-group have performed in the past. In addition, Burton *et al*, (2004) question credit scoring's ability to operate effectively in an unstable neoliberal economy, as currently now being witnessed, and they argue that temporary labour markets have destabilised the linear life experiences that are central to credit scoring methodologies, which rely on stable credit histories.

6.3. The origins and geographies of credit scoring

Having briefly discussed what constitutes credit scoring, and the actors involved, this chapter will now turn to develop an understanding of the history and evolution of credit scoring in the United States and its subsequent adoption and adaptation in the UK. Marron (2007) explores how US department stores that offered consumer credit on purchases initially used specialised, in-house credit officers to process credit applications, by performing qualitative assessments of a consumer's wealth and income, while observing consumers to see how 'shifty', 'evasive', 'seedy' or 'flashy' they looked (Jeacle and Walsh, 2002:743). The enhanced coding and the systemisation of consumer data in the 1920s and 1930s saw the development of nascent credit databases, that continued to grow as lenders began to view consumers as populations and not individuals. Marron (2007) sees this as the beginning of the development of a technocratic and epistemic community whose skills and knowledges constitute the origins of credit scoring technology. At the same time, mail order companies, who were unable to interview customers, were forced to make lending decisions based on the consumer data that they had amassed. As such, they would only issue credit to customers from specific postal areas that had a history of repayments, while denying it to applicants in post codes where its own customers had failed to make repayments in the past (Capon 1982; Leyshon and Thrift 1999). These practices began to form the foundations of contemporary credit scoring.

Thomas (2000) traces the technocratic genealogy of credit scoring to the early work of Fisher (1936) who developed the idea of using statistical techniques, such as discriminatory analysis, to develop categories with which to separate natural phenomena into particular groups. Thomas (2000) argues that Durand (1941), undertaking research for the US Bureau of Economic Research, realised that the same technique could be used to isolate good and bad loans, by applying discriminatory, statistical procedures on consumers, using Chi-Square tests to identify the variables that distinguished 'good' and 'bad' loans (Johnson 1992). It became possible to utilise 'scientific' methodologies to determine which variables identified consumers that were statistically more likely to default on their loans. The implementation of these new scientific procedures met resistance from the credit officers and underwriters employed by lenders as they feared that they would become victims of deskilling. However, economic pressures, high default rates and the second world war ensured the displacement of underwriters (Johnson 1992). Lewis (1992) reflects on how mail order stores eventually underwent forced deskilling, as they lost the tacit knowledge and expertise of the, predominantly male, credit officers to conscription, which in turn led to the development of manual scoring as a generic knowledge system.

Female clerical employees who had no experience of underwriting were given 'credit scoring forms' that were encoded with the accumulated knowledge of the male underwriters, so that new, inexperienced underwriters could give weightings to specific, predefined characteristics, dividing customers into the binary categories of 'good' and 'bad'. Although these early weightings were arbitrary, they enabled inexperienced operatives to make lending decisions (Lewis 1992). Lewis (1992) suggests that it was not until the 1950s, when William Fair and Earl Isaac, with their backgrounds in engineering and maths, began a business consultancy in the

field of operational research, where they realised that they could produce and market scorecards as a decision-making tool for lenders⁴². Once adequate computing power became available in the 1960s and 1970s, the practice of credit scoring became automated, which was important for the consumer credit industry as it allowed the growing volumes of credit card applications to be efficiently processed, both quickly and at low cost (Thomas 2000).

The origins of credit referencing in the UK can be traced to the 1970s in the mail order industry which, like its US counterparts, could not meet face-to-face with its customers to decide if they were a bad credit risk. Subsequently, the only information that credit risk decision-makers was a name and address. These companies began to collect data on their customers that could be used in credit-scoring to decide whether the customers would repay their credit lines, a model that would soon become the standard for the UK's retail finance industry as power was removed from bank and building society managers to make lending decisions. The decision making capability of consumer lending was transferred to the centralised processing centres developed in the 1980s and discussed in the previous chapter. This was the beginning of the 'quantitative revolution' within retail financing, as suggested in the following quote:

"[It was not until] the early to mid-1980s when it [credit scoring] started to take off with the banks, there was added competition in the banking sector, they were under pressure to improve efficiency, reduce costs, decision-making had been distributed around a large branch network, that was subjective, there was lots of variability, the branch manager was making decisions, it was an expensive way of making money, so

⁴² Now a leading scorecard and analytics consultancy.

one by one, they began application scoring,” (Interview 10: Director of Risk, credit referencing agency, November 2007).

The decision by mortgage lenders to implement credit scoring enabled them to make more consistent lending decisions; this allowed them to measure their credit risk more effectively so they could forecast to a reasonable degree, how many defaults they could expect (Aalbers 2005). The use of credit scoring technologies began to reduce operational costs in an industry where margins were tightening under increased competition, spurred by The Financial Services Act (1986) and The Building Societies Act (1986). In an attempt to refine this technology, lenders began to demand increasingly rich sources of data to enhance the accuracy of their models, which credit referencing bureaus sought to provide. This data took the form of relational databases that could segment the UK's population into specific groups for which they could tailor generic financial products.

This provided two very significant outcomes for the industry. First, as the data quality improved, the mortgage market became more segmented and new market opportunities such as the sub-prime market became visible. Sub-prime consumers are usually excluded from mainstream, low-priced credit because credit scoring is a standardised procedure and some individuals lives are not standardised enough to be accommodated by scorecards, such as agency workers who frequently have unstable incomes (Burton *et al.* 2004). Other borrowers in the sub-prime market include consumers with impaired credit histories where they have previously defaulted on credit agreements, increasing the risk of credit default in the eyes of lenders (Immergluck 2008).

Extended analysis of this new consumer data revealed that people who had been previously denied access to credit would not necessarily default. For example, self-

employed individuals were previously rejected for credit due to the perceived instability of their income, but forensic analysis of credit data revealed that this excluded high paid contractors and consultants who did not pose a high likelihood of default. As lenders began to offer credit to 'riskier' borrowers, additional data became available and lenders began to identify some groups of sub-prime consumers who occasionally defaulted on their monthly repayments, but frequently recovered and repaid their instalments, making them profitable if penalty charges were taken into account. Second, as the industry began to identify different groups of consumers through the segmentation of the credit market, it began to price credit according to the probability of default by consumers, which saw 'riskier' consumers gain access to mainstream credit products, but at higher interest rates.

The development of these databases occurred at the same time as the banking industry began to slowly automate their day-to-day banking practices. Fisher and McKenny (1993) highlight how banking was traditionally reliant on the manual sorting of checking accounts until the Bank of America instigated the production of one of the world's first banking machines ERMA (the Electronic Recording Machine Accounting) in 1955. ERMA and similar machines enabled American banks to keep pace with the rapid expansion of checking accounts and the substantial volumes of associated paperwork that needed to be processed (Fisher and McKenny 1993). Eventually, these electric calculators were adapted to calculate interest on accounts and these machines became programmable. Eventually, these 'early' computers were able to manipulate data statistically, which enabled them to run automated scorecard systems (Neukom 2004). The development of temporal database systems became instrumental in ordering information that could be both accessed rapidly (Jensen and Snodgrass 1999; Leyshon and Pollard 2000). Leyshon and Thrift (1999) argue that in the 1980s a prevailing marketing discourse underpinned the consumer finance industry's adoption of credit scoring

technologies, where lenders began to pre-approve consumers through geo-demographics systems. Under this strategy lenders would send application forms offering credit to consumers living in particular postcodes, promoting specific products. This improvement in data and technology coupled to the construction of niche markets witnessed the generation of substantial data sets that have made scoring more accurate, as the following quote suggests:

"[We] moved from having a little scorecard, where you have name and address, to know where you are, how long you've been there, now if you want better scorecards you want better data, it's such as house, type of house, what your income is, have you got children, do you own your house, have your own phone," (Interview 5: Director of Risk Management, large UK retail bank, February 2007).

Lenders now have access to credit scoring products that recommend how much debt a consumer can afford to 'service', as lenders can purchase information on a consumer's spending patterns. This allows lender to calculate a consumer's maximum level of indebtedness to avoid over-lending, which could trigger consumers into defaulting on their credit agreements.

Regulatory pressure has also had an impact on credit scoring's adoption in the UK, as credit scoring has allowed lenders to centralise their processing operations, as discussed earlier, enabling lenders to control more consistently who is offered credit. This has allowed lenders to meet the demands that have been put in place by regulators, as illustrated by the following quote:

"...banks are under pressure from the regulator in the UK to be seen to do everything above board to manage credit...a lot of the lending

done this way has made money, it provides better, or at least more consistent, but also we can control it better, if we want to change our lending policy we can do it centrally, if it was down to individual bank managers it would be nigh on impossible...so the reason why things have changed in that perspective is external pressure from the FSA to lend better and also it's cheaper," (Interview 7: Director of Trade Body, January 2007).

Credit scoring's use has also become increasingly important with the introduction of Basel II regulation. If a lender has credit scored its consumers, it can quantitatively state the magnitude of default risk which it is potentially exposed to - if the lender follows the Basel II guidelines. Since Basel II stipulates that the amount of regulatory capital a lender must retain on its balance sheet is proportional to the credit risk of its mortgages, these more sensitive ratios can reduce the amount of regulatory capital that they must hold.

6.4. Tracing the source of credit scoring's power

Credit scoring plays a central role in decision-making as the pre-programmed judgments of a scorecard dictate who is permitted access to mortgage credit, and for many, the ability to become a homeowner. I will now seek to conceptualise the power of credit scoring through the lens of actor-network theory (ANT), which was discussed earlier in Chapter 2. ANT is a useful tool as it can be used to conceptualise the relations of human and non-human actors that are integral to the production, execution and evaluation of scorecards. The heterogeneous components used in credit scoring consist of texts, machines, people, software and money, which are used in an attempt to solidify and stabilise social relations that endure through space and time (Murdoch 1998). In this sense, credit scoring and

scorecard production can be seen as an actor-network which seeks to crystallise the social relations that produce financial inclusion and exclusion through the automation of judgements, which can be seen as a techno-economic network (Callon 1991).

Scorecards are similar to other socio-technical networks; they use people, knowledge, codes, computers manuals, skills, ideas, software and information to operate. Once a scorecard has become stable and ordered, it can be viewed as an actor in itself, when it becomes part of the mortgage production network, operating as an obligatory passage point⁴³. However, credit scoring takes on a more unique role as, contrary to other actor-networks that attempt to enrol other elements such as consumers, the scorecard actively seeks to exclude specific actors, considered to have characteristics associated with a high probability of default, from joining the network of mortgage production. The scorecard, as an actor-network, is embodied with power by coercing a series of assemblages, including consumers into meeting its objectives (Allen 2003), in this case the avoidance of bad debts and acquisition of profitable customers. Credit scoring derives its power through three mechanisms:

First, power is derived from a scorecard's position in the network of mortgage credit production. A prospective borrower is temporarily enrolled into the network as they need money, to satisfy their desire to purchase a property, developing a power asymmetry⁴⁴. As the practice of credit scoring stands between the applicant and the lender's money, the practice of scoring acquires power, as an obligatory

⁴³ In order of an actor to enter a network it must satisfy the interests and politics of the network that have been defined by the most powerful actors in the network, known as passing through the 'obligatory passage point'.

⁴⁴ The consumer must want a mortgage, for the assemblages of mortgage production cannot force a consumer to take out a mortgage.

passage point, as the applicant must pass information to the lender to obtain a mortgage.

Second, the ability of credit scoring to amalgamate and control credit information provides it with power. The increased accumulation of credit data has not annihilated information asymmetries; indeed it never will, although the increased surveillance and data collection has reduced the asymmetries - and likelihood of defaults - for many lenders. The practices of data collection and credit scoring produce a virtual consumer; their characteristics are encoded in computer software and elements of their life become duplicated as a discourse, or subject. Miller and Rose (1990) refer to this discourse as a 'technology of thought' that uses technical devices, listing and numbering to understand reality, arguing that language is a translation device with which to perceive reality. Similarly, application forms, consumer data and credit scoring are all devices that translate the consumer into a series of quantitative immutable mobiles that enable the 'outside' to be represented on the 'inside' of credit decision-making, whose aim is to eradicate information asymmetries and to exclude undesirable consumers.

The surveillance exercised by credit decision-making systems acts as a disciplining mechanism. Previously, the social stigma of consumer debt was a mode of discipline within the UK, although as this has now waned as consumer credit's availability has grown. Miller and Rose (1990) argue that power is exercised through assemblages of state institutions, procedures and analysis, which highlights the multiplicity of materials needed to exercise power, a concept can be used to understand how lenders, and credit rating agencies, act as an assemblage of institutions and procedures, mobilised through actor-networks to reduce defaults by disciplining consumers. Credit referencing agencies have attempted to raise consumer awareness of their credit reports, which in turn articulates a form of

consumer discipline, as consumers have become aware that their financial activities are recorded and monitored, they are also aware that they must not fall foul of the credit databases by defaulting. This disciplinary technique is formalised by a consumer's ability to view themselves through the eyes of lenders by subscribing to frequent credit record updates, or by requesting an isolated check to enable them to maintain, modify and regulate their behaviour.

Third, the scorecards exercise power through the encoded epistemic knowledges of credit risk analysts who organise the necessary elements for the development, use, evaluation and recalibration of scorecards. The development of scorecard point allocation and the corresponding thresholds combine the social relations and knowledges fostered by analysts, which takes the form what Bowker and Star (1999) call a frozen organisational discourse, where the scorecard can be viewed as embodying a series of pre-defined judgements from the credit analysts.

6.5. Raising (and lowering) the bar: the production, evaluation and maintenance of score(card)s

Academic research on credit scoring can be broadly divided into two schools. The first, in the social sciences, has been discussed in sections two and four. The second, on the statistical methods used in scorecard production, an exemplar of which is, Thomas, et al, (2005). Although statisticians recognise credit scoring as being an important device for ranking the population into 'good' and 'bad' risk consumers, they are not concerned with how these devices are produced, and how this affects the geographies of financial inclusion and exclusion. The chapter will now elaborate on four stages involved in scorecard engineering used to produce the majority of the UK's mortgages. There are two different ways in which scorecards are developed in the UK. As the next quote suggests, scorecards were

originally developed by consultants with expert knowledge in scorecard production, such as Fitch Ratings, Experian, Equifax and Scorex:

“...certainly in the 1980s no-one had their own in-house team, [but] over time the larger organisations have started to take more in house, the big banks have their own teams now,” (Interview 16: Director of Risk, credit referencing agency, December 2007).

Later, as credit scoring became more widely used by lenders, the expert knowledges and skills of analysts became more widely available and larger retail banks and building societies began to accumulate and organise small groups of analysts to start producing their own scorecards, as illustrated below:

“...there is a team of people who provide a centre of expertise who provide...those businesses loans, credit cards, mortgages...[with] scorecard development” (Interview 20: Risk Manager, large UK retail bank, February 2007).

Credit scoring consultants, who work for the credit referencing agencies, continue to provide bespoke scorecards for smaller lenders who are not large enough to merit having their own analytics team, or lenders who lack the expertise to produce their own scorecards. The first stage of scorecard production is to understand what the lender is aiming to do. They may want their scorecard to reduce the number of defaults on their loan book, or they may want to increase the number of ‘accepts’. Additionally, the lender may be seeking to increase the efficiency of their operations, by reducing the number of underwriters involved in manually processing applications. There is an art to the science of producing scorecards

where the 'quantitative' technologies are embedded in a social milieu, as one interviewee explained:

“what the skill, if you like, in the development of scorecards is, is firstly having a good understanding of the business, so understanding what are the factors surrounding, how can you understand the business...it's not just, sit down at a desk and erm, and you know, press the buttons and do the analysis, you've got to contextualise the, the results to make sure you understand why certain trends or arrears are there,” (Interview 20: Risk Manager, large UK retail bank, February 2007).

The statistical analysis conducted by analysts often reveals trends that exist within the consumer data, such as the trend whereby younger consumers are statistically more likely to default, for example. However, these results alone do not provide enough information to produce a scorecard; there are two other aspects of this data that need to be understood in order to contextualise the information. The first issue is the need to understand the difference between correlation and causation. This has been highlighted by Sayer (1982), within the context of economic geography, in that statistical associations do not in themselves explain events, and that there is a risk of making accidental associations. For example, Sayer (1982) cites the statistical relationship between Swiss interest rates and divorce rates, which boasts a strong numerical relationship, but which is, in reality, entirely coincidental. This issue also concerns scorecard production. Capon (1982:90) reports how one early US scorecard used the first letter of consumer surnames as it was found to have a statistical relationship with the borrower's ability to repay their credit. Although an extreme example, it is essential that analysts understand the mechanisms behind these relationships, which requires a further layer of

interpretation, embedded within the tacit knowledge shared by scorecard analysts. The second issue involved in interpreting the information is to understand the meaning of the data and how it can be implemented into the lender's business model, and who the lender wants to produce mortgages for. There is no point in producing a scorecard that will penalise applicants who have an unstable credit history if the company is seeking to lend to subprime customers.

The second stage of scorecard production is to order and amalgamate heterogeneous sources of data. The data will come from one, two or perhaps three credit referencing agencies, as most lenders do not use the services of all three agencies. This is largely because the underwriting software used by many lenders is not compatible with all of the different credit referencing agencies and to upgrade these systems would be expensive and disruptive to the lenders activities. The effect of this configuration is that defaults from some consumers will become 'invisible' to other lenders as they do not all use the same credit reference agencies. This scenario is changing as some lenders have realised that the use of multiple agency data can reduce their defaults significantly. The data from the credit referencing agencies is then combined with the historical data from the lender's own portfolio of mortgages, as outlined in the following quote:

"...the most recent data is worth more than old data and directionally [over time, the recent] data is worth more than static data [address, ages etc] so if you're increasing your credit appetite that tells you a lot more," (Interview 5: Director of Risk Management, large UK retail bank, February 2007).

This enables the analysts to reveal which previous borrower characteristics distinguish between 'good' and 'bad' consumers. The minimum amount of data

needed to build a scorecard from a company's own historical data is 12 months, although three years is perceived as the industry standard to check for seasonal variations in defaults over the year (Interview 16: Director of Risk, credit referencing agency, December 2007). As one interviewee explained, there are problems in initially organising all the data sets into one coherent database to begin the analysis that will lead to the development of a scorecard, especially for outside consultants:

"...250 mainframe tapes can arrive in a box one day, no description of what's in them, or indication of which file goes with which, so a lot of work is getting the data compiled into a usable format and that can take from a week to a year...what data do they have for us to work with...what is the meaning of the data in the archive, what does M, S and D mean in the file called marital status, and why is this file of data X, Y, Z, instead of M (married), S (single) and D (divorced)," (Interview 16: Director of Risk, credit referencing agency, December 2007).

The third stage is to begin analysing the database that has been compiled. Leyshon and Thrift (1999) view scorecards as being coded, day-to-day systems of power using taken for granted protocols. However, here I want to argue that although scorecards are important in shaping the landscape of consumer credit, their power is provided by the analysts who decide, using statistical tools, which characteristics are numerically significant. The role of analysts in developing these power geometries is important, as it is their judgements that decide which characteristics identify defaulters, and to what degree they should be penalised in the scorecard. This is not to dispute the fact that scoring software is central to decision making practices but they need to be situated within a wider milieu to avoid attributing these systems with too much power. It is the architects of these

technologies, the analysts who are the elites of the socio-technical scorecard network. The aim of the database exploration is to separate out which characteristics of past customers are affiliated to accounts that were defaulted and accounts that did not, which are often derived from a lender's own historical data:

"...if you're an established bank with a history of lending... you can look back retrospectively ...and you can look at the performance of that group of customers...to work out which ones (the customers) had a disproportionate effect on, on performance...you might give more points to the person who's a homeowner, because history, the numbers told you, that the people performed better," (Interview 20: Risk Manager, large UK retail bank, February 2007).

The scorecard analysts then use statistical software to isolate a number of consumer characteristics from their entire consumer database and those of credit reference agencies, which is achieved by processing characteristics through regression analysis. Once these characteristics have been chosen they will be used in the scorecard, as suggested below:

"...we throw those at the regression, and the regression process will handle the interactions between the data items... the way that the process works is that you set in the variables one at a time and there are various statistical packages that allow you to do that one at a time, you can drop things out later on, when new variables come in," (Interview 16: Director of Risk, credit referencing agency, December 2007).

The research could not find a clear consensus regarding what qualifies as a statistically significant value for the correlation between two variables, although analysts use manuals and texts to help them decide. One lender accepted consumer characteristics when there was a 95 per cent probability that there was a relationship between a variable and the probability that it will lead to a default. The analysts look for strong statistical relationships, for example, people who have lived at the same address for a longer period of time are statistically more likely to repay their debts. Once again, analysts seek to understand the mechanisms behind these statistical relationships to minimise the risk that these relationships are accidental. This variable will then be accepted for the scorecard as illustrated below:

“...you take a sample of data and then you may extract 30-40 pieces of information from the application form, we store over 200 pieces from the credit bureau so you have 250 potentially explanatory variables, so stage one is look at the relationship between each of those variables, individually, good-bad, default, non-default, then we look at them one at a time and say there is some predictive power there...” (Interview 16: Director of Risk, credit referencing agency, December 2007).

Although each UK lender undertakes analysis using their own data and produces a different scorecard to the other lenders, the characteristics are very similar according to one interviewee:

“...everybody thinks they have the holy grail, but they tend to have pretty much the same characteristics, typically you can take 20

characteristics and 8 feature in all⁴⁵ [scorecards],” (Interview 12: Trade Industry Spokesperson, January 2007).

Once the predictive consumer characteristics have been chosen, the analysts develop the scores that will be associated with characteristics, as illustrated in Figure 6.2. The coefficients from the regression analysis are used to develop the scores. Once this has been achieved, analysts develop the numerical ‘accept’, ‘refer’ and ‘decline’ thresholds by applying the scorecard to the customer database to see how many people will default on their accounts and if this is acceptable for the business. The thresholds can then be altered to increase or decrease the number of potential defaults, as detailed below:

“...you might do a regression, that way, is there any link between this [characteristic] , how are they weighted to these [characteristics], [in] the old days you’d guess how many points you’d give to them, play with it, a statistical programme will decide the weightings, time at address [will be allocated a score of] 0-1, 1-2, 2-5, 5-10, the programme will do it for you, it might split into stupid chunks like 3.965-4.713, you use judgement...so these tools split the data into something and come up with an algorithm that weights them” (Interview 5: Director of Risk Management, large UK retail bank, February 2007).

The new scorecard is then tested on the available data of past customers that the lender has previously financed, as the lender already knows which consumers were ‘good’ and ‘bad’ debts. The consumer data is processed by the new

⁴⁵ This does not mean that all scorecards have the same 8 characteristics, but that 8 out of potentially 20 characteristics may be present in any one scorecard.

scorecard to see how accurate it is at uncovering past losses, which can be checked against the record of actual defaults. Once the lender knows how accurate the new scorecard is, it can be used to forecast how many potential bad debts may occur, as an interviewee explained:

“...you can apply the scorecard that you’ve developed to those people and work out what they would [have] all scored, to get the distribution which shows, lets say the score was between 0-50, and you could see how many people scored 0-10, 11-20...if you looked at 41-50 you could see what the arrears rate was, it might be 5 per cent, erm now...what you’re really saying, is that what you’re expecting in the future...basically we use it as a tool so that we know what level of arrears we’re prepared to accept, and that’s how we base our decisions and confidence,” (Interview 20: Risk Manager, large UK retail bank, February 2007).

Once these scores and thresholds have been developed, the points can be used to update the lender’s credit scoring software. When a mortgage applicant’s details are added into an online form, whether in a branch, mortgage brokers’ office, or over the internet, they are scored in accordance with the lender’s new scorecard.

The fourth stage to scorecard production is to check that the card is continuing to accurately separate ‘good’ and ‘bad’ customers over time. There are three ways in which a scorecard can fail to discriminate between good and bad customers accurately. The first factor is time: Hand (2005) argues that as soon as a scorecard is implemented it is out of date, because the scores and thresholds are based on the performance of historic customers. Once a scorecard is used, new customers

are added to the lender's database, and the scorecard is no-longer based on all the available information:

"...scorecards are based on the assumption that the past will predict the future, if you have no information about the past or you are going into a new future then the assumption doesn't hold," (Interview 16: Director of Risk, credit referencing agency, December 2007).

The second issue concerns societal changes. For example, Burton et al, (2004) observe how many self-employed consultants earn large amounts of money, but were previously perceived by bankers to have an unstable income, and were included with other, often low paid individuals, who also had unstable, non-linear incomes. As this has changed, some scorecards slowly became out of date as they would reject self-employed applicants, even if they were wealthy. The third factor is due to a shift in the market. For example, a prime lender may want to offer mortgages to subprime customers, which its prime customer scorecard would immediately reject. Consequently, scorecards are reviewed on a regular basis taking the companies business model as well as new data into consideration, as illustrated below:

"...every scorecard will have an annual review, which will be, is it still fit for purpose? Is it working? Do we think it's time we rebuilt it because the population's shifted or [the] Gini [coefficient], what's used to measure the performance of it has fallen?" (Interview 5: Director of Risk Management, large retail bank, February 2007).

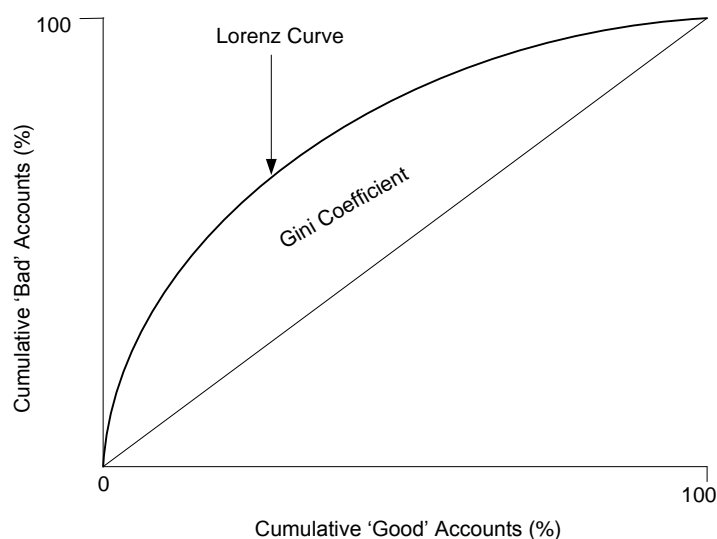
Some lenders will check their scorecards every three months, or more frequently, during an economic downturn. During this time the ability of a scorecard to distinguish between 'good' and 'bad' customers will fluctuate, requiring the scores

on the scorecard to be either recalibrated, or the 'Accept', 'Refer' and 'Decline' thresholds to be adjusted. The deterioration of a scorecard can be measured in two ways. First, there may be a steady increase in defaults on the lender's mortgage book. The second method is to analyse the Gini Coefficient that measures the ability of a scorecard to rank order risk⁴⁶.

The Gini Coefficient has in the past been used by economic geographers as an alternative to nearest neighbour analysis and utilises the comparison of percentage frequencies (Smith 1975). During the quantitative revolution, the use of techniques such as the Gini Coefficient became commonplace in order to investigate the concentration of economic activity across space, such as, the density of industry (Smith 1975). A series of paradigm shifts in economic geography soon displaced the popularity of quantitative methods, which were dismissed for their lack of explanatory power, powerlessness to contribute towards the overturn of class struggle and inability to capture the creativity of the cultural industries. However, as discussed earlier in this chapter, the statistical methods continued to be used outside economic geography by credit analysts and the Gini coefficient became an important tool in the evaluation of scorecards.

⁴⁶ <http://www.rhinatorisk.com/Publications/Gini%20Coefficients.pdf> (Accessed 14/04/2008).

Figure 6.4: A Lorenz Curve showing a selection of 'good' and 'bad' accounts selected by a hypothetical scorecard.

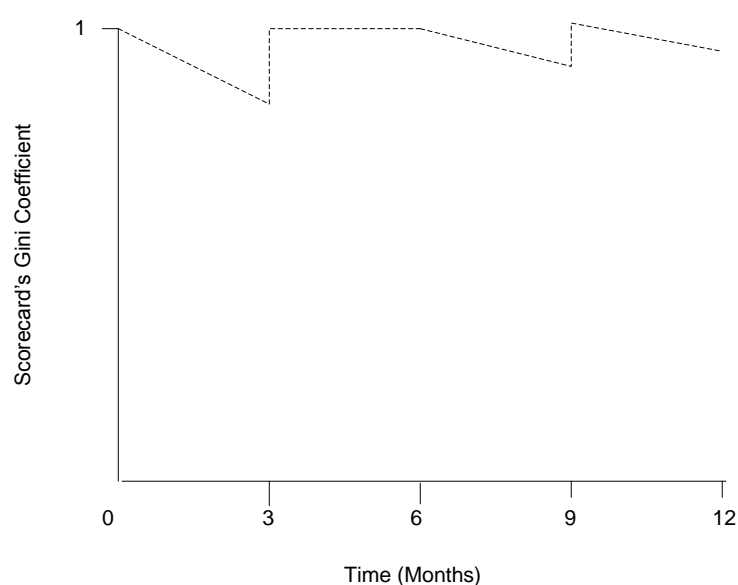


Source: Author

Figure 6.4 shows a Lorenz Curve that is used to illustrate the effectiveness of a scorecard through two distributions, which are cases of 'good' and 'bad' credit accounts, selected for a hypothetical scorecard. The Lorenz Curve is used as a measure of statistical dispersion (Shaw and Wheeler 1994), and as scorecards seek to split 'good' and 'bad' customers into two separate groups, scorecards that have a greater dispersion are better at sorting customers into the two categories. The two distributions are illustrated through the Lorenz Curve. If the Curve were to follow the diagonal line, then there would be no distribution difference between the two variables. In such a scenario, the scorecard's ability to differentiate between 'good' or 'bad' risk consumers would be no better than chance or luck, a trait belonging to a very poor scorecard. The area between the diagonal line and the Lorenz Curve is the Gini Coefficient (Smith 1975; Shaw and Wheeler 1994), which is used to measure a scorecard's ability to successfully separate 'good' and 'bad' customers. If the Coefficient is one, then the scorecard is working perfectly but as it

decreases towards zero, it shows a decrease in the scorecards ability to separate potentially 'good' and 'bad' customers. This is shown in Figure 6.5, using a hypothetical example. As the Coefficient decreases over time the level of defaults will increase. Figure 6.5 also illustrates how the scorecard's performance is improved once it has been reviewed and recalibrated, in this case every three months, demonstrated by the breaks.

Figure 6.5: The hypothetical migration of a scorecard's 'predictive power' over time.



Source: Author

The scorecard, the final product of the analysis, is constantly evolving as its thresholds and scores are frequently adjusted and it should be viewed, not as a static set of codes, but a dynamic network of human expertise, skills and techniques. The corresponding spaces of financial inclusion and exclusion are also dynamic as they are reshaped by these scorecard changes. As scorecard production continues to evolve, introducing new techniques and data sets, the spaces of inclusion and exclusion will come to reflect these changes.

This review of the production and management of scorecards begins to problematize some of the key tenets of credit scoring. On the one hand, credit scoring can be considered fair and unbiased as claimed by the FLA (2000), as all consumers are judged on the same criteria and are allotted the same number of points. On the other hand, credit scoring can be seen as a standardised technology, but it cannot be seen as having the 'scientific' qualities of being an objective and quantitative technology. Credit scoring technology does not, and cannot, find universal truths, and should be viewed as a decision-making tool that is constantly subject to revision rather than a scientific artefact, leading to the conclusion that the 'objectivity' of credit scoring's methodology is questionable. Even though scorecards use statistical techniques favoured by the natural sciences, the chapter has argued that the data and practices used are not purely quantitative; they consist of a quantitative-qualitative hybrid. This information is subjected to the application of human judgements and tacit knowledge to understand and add meanings to produce the scores and thresholds.

6.6. The uneven geographies of credit data

The accuracy of credit scoring is determined by the quality and range of the available consumer data maintained by credit referencing agencies. However, the geographies of consumer data vary significantly by country dependent on a series of tensions between the different actors who regulate and own the data. As such, there is a significant difference between the information held on consumer characteristics used in the UK and US. In the US, the credit referencing agencies own consumer data, while in the UK data is owned by the lenders, even though it is stored by the credit referencing agencies. This led to the development of an informal steering committee in the UK called the Steering Committee On Reciprocity (SCOR) that mediates the regulation of data exchange. As one

interviewee explained, SCOR's committee consists of industry representatives and consumer credit lenders and it aims to govern what types of consumer data can be used for in applicant selection:

"... [SCOR] was set up in the early 1980s, it has a very clear mandate and set of instructions ... the 3 CAs [credit reference agencies] have a seat on SCOR and each of the trade bodies, depends on the size and scope, so BBA, APACS, CML, FLA... so new ideas on how the data can be used goes to that body and all of those decisions get referred back to the trade bodies, they make a decision on if their members are happy with the use of that data," (Interview 10: Director of Risk, credit referencing agency, November 2007).

This committee seeks to synthesise a dialectal problem experienced by lenders. Lenders benefit from maximising their access to consumer information through SCOR, as it allows lenders to expand their credit portfolio by correctly identifying 'good' consumers using the data, while excluding customers who potentially represent adverse credit risks. Access to additional credit data also allows lenders to segment the credit market more accurately, and promote new products to the 'right' people. This becomes a competitive problem, as some lenders will benefit more than others, so SCOR seeks to decide how much information to share, and retain, as suggested below:

"...I think a number of organisations realised that there were some competitive aspects to whether or not they wanted their competitors to do some things with their data and there was a realisation that there was a need for regulations and what could and could not be done with

the data,“ (Interview 10: Director of Risk, credit referencing agency, November 2007).

In the UK, licenses are required from the Office of Fair Trading (Interview 9: Electoral Services Manager, borough council, October 2006), to permit credit referencing agencies to gain access to electoral information. This information includes consumer names and addresses from councils and forms the foundations of all credit reports. The use of data is also covered by the UK's Information Commissioner's Office (ICO) who police the enforcement of the UK's Data Protection Act (1998) regulating what consumer data can be used, and how it is used. Credit reference agencies are exempt from having to ask permission from consumers to use their data to create credit files⁴⁷. When comparing the introduction of regulation with credit scoring's longer history, it becomes clear that the regulatory landscape has undergone significant changes since credit scoring began. As the following quote suggests, the industry has changed accordingly:

“...the data protection regime in this country has changed a lot over the past 20 years, we can't release the sort of data that we have in the past... and [it] will continue to evolve over time,” (Interview 16: Director of Risk, credit referencing agency, December 2007).

Over the years SCOR has also changed its view on what information can be shared amongst lenders. There has been a tendency for the industry to disclose information on consumers that previously would have been kept private, as an interviewee explains:

⁴⁷

http://www.ico.gov.uk/upload/documents/library/data_protection/practical_application/credit_%20agreements%20-%20data_%20sharing.pdf (Accessed: 28/02/2008).

“...at one time you couldn’t use the data at all for any non-risk or fraud activity but SCOR’s view has changed...so if somebody, who was a customer in the last few years, you can check their appetite for further credit and more credit from you, 15 years ago that was a no, no...[“]I’m not having Bank X poach my best customers[“] but attitudes have changed,” (Interview 16: Director of Risk, credit referencing agency, December 2007).

An important limitation of SCOR’s regulation is that it currently prevents the sharing of credit information with other actors that would find the information useful in preventing, or reducing, adverse economic events, in particular the bond-rating agencies. Bond-rating agency access to SCOR-regulated data is restricted to a few datasets from individual lenders, datasets which include information on CCJs and the loan-to-value ratios of mortgages. If bond-rating agencies were able to access additional credit referencing agency data they would be potentially able to measure default risk more accurately, and independently, which could be used to structure RMBS notes, making them more robust. However, due to the reciprocal arrangement of data exchange between lenders, bond-rating agencies are currently blocked from accessing consumer data by SCOR, because bond-rating agencies do not provide any information.

There is a changing national geography of credit scoring and this geography is underpinned by the political geographies of different nation-states and their specific regulatory powers, or absence of them, which governs the control of consumer data. Controlling which types of data credit bureau’s are permitted to hold and which data sets lenders can use in their scorecards. A second geography is centred on the quality of available credit data, as countries that have a more extensive and advanced retail consumer credit market have access to more

detailed data. Although some geo-demographic data can be used in the UK, it is only a small part of the many variables used in credit scoring and it cannot be used solely to reject an application.

One scorecard analyst discussed how they had not used postcodes in UK scorecards for a number of years as the UK now has access to a substantial amount of historical data on individual consumers, especially their repayment histories. Although the implicitly geographical postcode indicator has been removed, this does not mean that geography has ceased to matter in the UK housing market. Socio-economic status and the desire to live in particular areas, for example urban living with young executives, or suburban living near high-quality schools, continue to reinforce clustering of consumers with particular characteristics into specific postcodes. The key difference is the delineation of postcode areas in exchange for more clusters of consumers, whose individual demographic and financial characteristics are more explicit and effective at explaining default rates, than segmented postcode data. Consequently, red-lining is not as useful at preventing defaults as are other variables which provide a more granular narrative of a consumer's financial history, such as age or occupation. Based on this premise, the UK can be considered as having the most advanced credit referencing agency data in Europe and countries without this data, such as the Netherlands, continue to use postcodes (see Aalbers 2005a; 2005b) as these codes provide a rudimentary, but predictive indicator of an individual's ability to repay their debt. There is a specific geography to the quality and range of the credit referencing data available within Europe, which is dependent on the historical legacies of consumer credit markets. According to one interviewee, the availability of credit data varies markedly between countries:

“In France there is no credit bureau, you can get [data] from Banque de France, [but] you can get a negative-only file, so if you’re prosecuted it’s on file. In Spain it’s a negative only-file so...the quality is nowhere near as good, Germany is a halfway house in that you don’t have positive data, but you have delinquent data as well as defaults. It’s the same in the Netherlands. Italy’s a bit better as they have positive data...it’s different countries, with different cultural histories, different regulations,” (Interview 16: Director of Risk, credit referencing agency, December 2007).

As the UK credit referencing agencies hold positive data, it allows the market to be segmented more finely, and has enabled the development of the UK’s complex range of mortgage products. However, having access to better data does not guarantee immunity to consumer defaults. It can be argued that the US – where credit scoring and credit data collection has its roots - had some of the highest quality credit data in the world, but this did not prevent US consumers defaulting in large numbers on their mortgage repayments. Credit scoring’s methodological shortcomings were undermined by lenders’ misuse of data to produce high-risk mortgage products, and the poor quality of data supplied by consumers and lenders, either as a result of fraud, or through negligent mortgage brokers miss-selling products (Immergluck 2008). As has become painfully clear, credit scoring is only ever as reliable as the data on which it is based.

6.7. Conclusion

This chapter has sought to provide a detailed explanation of credit scoring, and in doing so, it has sought to demystify its internal workings. The aim was to elaborate

on the specific stages involved in credit scoring, by situating the process of scoring in a wider context of its production and maintenance, so as to view it as a socio-technology. This is contingent on the different types of available information that are viewed as having the ability to distinguish consumers as being 'good' or 'bad' risks. The circumstances surrounding credit scoring's origins, and expansion, in the US were explored. The implementation of credit scoring in the UK was a result of lenders having to reduce their bad debts, and to reduce the cost of processing mortgages while increasing processing speeds, against an environment of increasing deregulation. The chapter also attempted to explain how credit scoring's power is derived through the alignment of heterogeneous materials and human relations. This leads the thesis to identify the source of credit scoring's power from its ability to position itself as an obligatory passage point that provides access to credit for those who desire it, through the practice of surveillance and epistemic knowledge. As such, I have argued that credit scoring, as an actor-network, in addition to enrolling borrowers, actively works to exclude specific actors bearing particular attributes from joining the network.

This chapter has also highlighted the process used to develop scorecards, and in doing so, sought to stress the importance of human expertise developed in a specific epistemic community that is responsible for developing the codes used by credit scoring software. Although credit scoring is automated and quantitative, it is still reliant on social judgements. It was outlined how the spaces of financial inclusion and exclusion evolve over time as the ability of scorecards to segment consumers accurately, varies over time too. There is not a homogenous geography of credit data, but multiple geographies of credit data that are subject to self-regulation by lenders, but are also governed by nation-states. These interactions affect the geographies of credit information temporally within a state, but also between different nation-states. This is dependent on governments who decide

what credit data can be used, but is also governed by the history and extent of a country's credit market. Countries that have a longer legacy of consumer credit have records of consumer behaviour that are more extensive and predictive when used in credit scoring. However, the chapter also argues that the standardised and objective politics of credit scoring and its subsequent data are open to abuse. The US, arguably, has access to some of the most extensive credit data in the world but its misuse, or omission, contributed to the US subprime mortgage crisis, and the development of the credit crunch. Immergluck has drawn attention to fraudulent applications made in the US and if the data passed through credit-scoring systems is not legitimate then the scorecard will not perform its job effectively.

The dissertation will now turn to look at how the mortgage assets produced in regional finance centres, through the assistance of credit scoring, are financially reengineered into RMBS bonds by investment banks and law firms before they are sold to investors.

Chapter 7

(Re)structuring and the spaces of RMBS production

“[C]ommodities are not sold for money, but for a written promise to pay for them at a certain date...Such bills of exchange in their turn circulate as means of payment until the day on which they fall due; and they form commercial money in the strict meaning of the term. To the extent that they ultimately balance one another by the compensation of credits and debts, they serve absolutely as money, since no transformation into actual money takes place,” (Marx 1909 [1876]:469-70).

7.1. Introduction

When Northern Rock began its demise, prior to its nationalisation, the media's preoccupation with long lines of ordinary consumers queuing on British high-streets to withdraw their savings neglected to follow the other emerging stories surrounding the bank, including its role in establishing a family of independent companies that had proved critical in facilitating the mortgage bank's rapid growth. Attention was drawn to these companies when it was revealed that a small, regional charity, the Down's Syndrome North East Association (DSNEA), was linked to an offshore, Jersey based company called the Granite Master Trust, associated with Northern Rock's ambitious securitisation programme. DSNEA had

been named – without their knowledge - as the beneficiary of a charitable trust that owned Granite; a company with no employees, offices, or assets with the exception of billions of pounds of UK mortgages (Cobain and Griffiths 2007). The organisers of DSNEA were stunned to learn that they were the beneficiary of a company that owned more mortgage assets than Northern Rock, and confused as to why they had never received any 'benefits', despite being named as a beneficiary.

The geographical relationships that connect a regional charity based in the north east and an offshore company in Jersey, while appearing obscure, form a legal structure commonly used in structured finance transactions in the UK by centralised lenders and retail banks. For example, Birmingham Midshires operated its securitisation programme through a family of companies called Pendleford; Abbey's associated companies are named Holmes, while the troubled lender HBOS's companies were ironically called Permanent. The development of these companies enables lenders to financially engineer the income streams from mortgages in an attempt to reduce the risks borne from both taxation and credit defaults, before selling the residential mortgage-backed bonds to investors.

Earlier, this thesis outlined how mortgages are produced and how lenders attempt to manage credit risk by financially excluding consumers who are considered to be unlikely to successfully repay their mortgage. It also illustrated how mortgage lenders attempt to repackage their mortgage assets (Langley 2006) through securitisation in order to increase the volumes of their consumer lending and profits. The aim of this chapter is to explore the geographies involved in the performance of securitisation and the attempts of epistemic elites to minimise two specific types of risk: the risk of taxation and the restructuring of credit risk. Section 7.2 will briefly outline the roles of different actors that are involved in

performing securitisation. Section 7.3 will explore the geographies of securitisation that emerge in an attempt to reduce tax risk. Section 7.4 will examine how epistemic elites engineer space in an attempt to reduce the geographical effects of credit defaults for selected RMBS notes. The final section, 7.5, will conclude the chapter.

7.2. Interfaces, boundaries and expertise

Once a mortgage lender has decided to securitize all, or part, of its mortgage portfolio, it will usually take between two and four months to complete the transaction. Thrift (1994) highlights how financial products and innovations are produced at the boundaries of firms, where they require additional skill sets and knowledges to supplement their own expertise and production of financial products. The performance of securitisation is no different, as mortgage lenders require the unique, expertise from a variety of different financial service providers to successfully complete each securitized transaction. These firms, and the expert knowledges embedded within their analysts and managers, include: investment banks, law firms and corporate management firms. Both contemporary economic geographers and social scientists have drawn attention to the importance of epistemic elites, especially within finance and legal professions, (Thrift 1994; Pryke and Lee 1995; Leyshon and Thrift 1997; Faulconbridge 2007; Pryke and du Gay 2007). These epistemic elites are involved in the development of RMBS bonds through their ability to interpret and manipulate complex information, perform analysis; and to collect and disseminate new financial knowledge through formal networks such as training (Hallsworth and Skinner 2008), but also through informal networks consisting of trusted colleagues and associates (Thrift 1994).

The social relationships, shared languages, knowledges and interpretational skills of financial elites are central to the development and practice of financial markets. Leyshon and Thrift (1997) argue how the City of London can be represented by four overlapping actor-networks: the nation-state; the media; money capitalists and machine intelligence – which can be used to interpret how these networks enable the City to function as a finance centre. This perspective can be used to understand why London became the European centre for securitisation. The City of London is constituted through dense networks of financial expertise, is inhabited by money capitalists who are assisted by professionals practicing accountancy and law, is provided with favourable political regulation that allows new financial innovations to be nurtured, facilitated by machine intelligence, while information technology, circulates knowledges and ideas through the media. The adoption and development of securitisation in the UK can be attributed to the City's heritage in implementing new financial innovations and technologies. Clark (2002) discusses how London has historically engineered financial instruments for the European market, the City's innovations aided by the interactions between different financial institutions that have emerged over time (Leyshon and Thrift 1997).

The clustering of financial institutions was spatially enforced by the Bank of England which demanded that banks reside within the Square Mile, for clearing and surveillance purposes, a rule not relaxed until as late as 1985 for foreign banks (Pryke 1991). The effects of this spatial regulation and the consequent clustering of financial institutions fostered the development of what Knorr-Cetina (1999) refers to as an epistemic culture. Epistemic cultures are networks of individuals, that become entwined through affinity, necessity and 'historical coincidence' which governs what people know, and how they know it (Knorr-Cetina 1999). These 'cultures of knowing' determine how knowledge is generated and validated, which became solidified as banking professionals began to form epistemic communities,

through their spatial proximity and shared financial knowledges, circulated through face-to-face networks that became entrenched within financial markets. The epistemic cultures of London's financial community have continued to evolve, stimulated by social and regulatory change. For example, the homo-social nature of 'gentlemanly capitalism' that existed prior to the Big Bang' governed the behaviour and practices of financial firms and their employees, through tight-knit, self-regulation (Leyshon and Thrift 1997; Augar 2000; Cain and Hopkins 2002). After the Big Bang, new epistemic elites became embedded in the fabric of the City, which were no longer exclusively male and from public schools, but were literate in complicated modelling procedures and banking techniques ready to adopt new financial innovations, technologies, and later managerial discourses (Pryke 1991).

US investment banks developed a strong presence in the City, through representative offices during the 1960s due in part to their participation in the Euromarkets (Plender 1986), and deregulation in the 1970s, which witnessed an expansion of services offered by these investment banks while, additional US investment banks began to locate their European headquarters in London (Augar 2000) as they were allowed membership of the London Stock Exchange. By the 1980s Salomon Brothers, the firm that had pioneered and developed securitisation in the US, introduced RMBS securitisation to the City, when it began to securitize the mortgages of its centralised lender, The Mortgage Corporation, a company that it had established after the Financial Services Act (1986) (Lewis 1989; Pryke and Whitehead 1994). Salomon's activities introduced an epistemic culture of securitisation into London, based on its emergent expertise in securitizing residential mortgages in the US. These knowledges and skills were later introduced to continental Europe through the London headquarters of US investment banks.

The epistemic communities of lawyers in London provide essential services to the corporate finance sector, due to legal uncertainties and technicalities that concern everyday financial transactions. The legal advice supplied by these firms can include, but are not limited to, the legal implications surrounding contract and property law (Hartmann 1995) that affect lending and borrowing; which ensures that the knowledges of law firms and their partners becomes indispensable to investment banks involved in the development of new financial products. The skills of UK law firms enabled the US practice of securitisation to become compatible with the UK's legal landscape which, as with the US investment banks, contributed to London's status as the European centre for securitisation. As London is the seat of the UK's Government, its legal system is situated in London, especially with regard to the prominent law firms located around London's Law Courts and law societies in Holborn (Goddard 1973). Faulconbridge (2007) argues that this clustering is necessary as new knowledge is circulated through the law societies, including their extensive social networks, and that being close to regulators enables law firms to lobby for new regulation, which this thesis argues can have a profound affect on the feasibility of new financial innovations and technologies, such as securitisation. The proximity of lawyers is important, as face-to-face interactions fosters trust between legal practitioners, which grants credibility to new knowledges and interpretations surrounding the legal system (Goe *et al.* 2000). This also enables lawyers to discuss and interpret new ideas that are not easily transferable without face-to-face interactions (Faulconbridge 2007). The location of these firms in London is important to securitisation, as the lead managers of securitisations and corporate service providers are both located in London, making proximity an important attribute, necessary to nurture and maintain client relationships (Beaverstock *et al.* 1999). This is illustrated by the location of the law firms such as Clifford Chance and Allen Ovary in Canary Wharf, and other firms

such as Slaughter and May and Freshfields, close to the City, that are located near to the investment banks that manage and perform securitisation.

London became the centre of UK securitisation, though the skills of the epistemic communities that are merged to produce RMBS notes on behalf of mortgage lenders. Before the complex and problematic process of securitisation begins, it is necessary for a mortgage lender to select the expert skills and knowledges from investment banks, law firms and corporate service providers, securitisation is performed on the boundaries of these different firms, and where mortgage-backed securities emerge as a product of their combined efforts. As one interviewee explained, the securitisation process begins when the lender invites investment banks and law firms to a meeting about the proposed issue of the notes:

“We start off, and have the [investment] banks and the lawyers in and we have what we call a beauty parade and say we’ve got another deal coming up, this is the collateral we’ve got, how’s the market looking at the moment...we choose which [investment] banks we want to work with and which lawyers we want to work with,” (Interview 22: Finance Director, centralised lender, September, 2007).

The mortgage lender will select the supporting firms based upon the experience and particular attributes of these partner firms. If a lender has a frequent securitisation programme, where it securitizes its assets on a regular basis, there is a tendency for the firms to enlist the expertise of the same legal firms and investment banks, as their shared understanding of previous securitisations and intimate knowledge of the lender’s business, ensures that the execution of the securitisation is performed smoothly as the lender, law firms and investment banks share tacit knowledge. On the other hand, mortgage lenders who make less

frequent securitisations - or indeed, may be securitising a pool of assets for the first time - seek to enlist the services of investment banks that are experienced in facilitating successful securitisations for other lenders. The competency of investment banks can be considered to be the most important attribute valued by mortgage lenders, especially if they are themselves inexperienced in securitisation, as the investment bank's role will be more significant in structuring the transaction. In this case, the analysts of investment banks are invited to meet the lender's treasury analysts to compete for the roles and promote their structured finance services, as suggested below:

"...you look at leading investment banks, what their track record is, which other deals there've been involved in, then we invite a number to come and present to us, or some may have already come in and presented to us, as a part of a routine funding visit, but then we select the ones that we think have the best competency and fit for what were looking for," (Interview 4: Securitisation Manager, retail bank, September, 2007).

The investment bank that manages the securitisation of the mortgage assets and reengineers the income streams is known as a 'lead manager', and this firm coordinates the transaction. Additional investment banks are involved in the marketing and sale of the RMBS notes, as they have access to different types of investors, different countries and different sectors, providing wide market coverage. This enhanced market coverage is required as large quantities of RMBS notes are produced from each securitisation, requiring a proportionally large pool of investors to purchase the notes. One manager highlighted how it was important to have working relationships with a series of different investment banks as the expertise and knowledge necessary for securitisation is embodied in specific analysts and

teams - and consequently the specialist knowledge desired by a lender is mobile, circulating through specialist labour markets to competing investment banks:

"We have a panel of banks who work for us on securitisation transactions, so yeah, we'll give it to two or three banks for the transactions...you don't want to be reliant on any one bank or any individual at any one bank because obviously teams and individuals can move from bank to bank...and these are pretty big transactions so you need a big sales force to do this," (Interview 31: Securitisation, Manager, large retail bank, April, 2007).

Law firms and the legal expertise of their lawyers are also integral to the performance of securitisation, as the sale of the mortgage assets and the RMBS notes generate a series of complex, multifaceted legal implications that are affected by contract, securities, tax and property laws. The geographies of securitisation also experience the indirect projection of the legal systems of different political economies onto UK lenders and their RMBS notes. Within the UK, for example, property law is different in England and Scotland, which requires the mortgage lender and investment banks to seek legal counsel from law firms in both England and Scotland, but when the RMBS notes are to be marketed in the US, which they frequently were, prior to the credit crunch, these notes must comply with US securities regulation, which requires legal advice from global law firms with expertise in US financial markets.

Once a mortgage lender has selected the investment banks and law firms that best suit their needs, it will appoint the assistance of a corporate service provider. Corporate service providers perform an important role in securitisation because they manage and perform the administrative responsibilities on behalf of special

purpose vehicles (SPVs). Legally, SPVs function like any normal company, they produce annual reports and pay tax but effectively outsource all of their day-to-day operations. They do not have offices, or employees, and are managed by independent trustee managers, provided by the corporate service provider (Ferran 1992; Langley 2006). The SPVs provide an important role in the securitisation process because they enable the ownership of mortgage assets to become legally separated from the mortgage lender (Langley 2006). The Granite Master Trust, for example is an SPV that holds the mortgage assets produced by Northern Rock on behalf of RMBS note investors.

The separation between the mortgage lender and the assets that it has originated is essential for two reasons. First, it allows a bank to reduce its regulatory capital reserves providing the bank with more capital that it can deploy within the financial markets. Second, the assets become 'bankruptcy remote', a legal term which means that if the lender were to go bankrupt the repayments of the RMBS bonds to investors would continue uninterrupted, because the assets are owned by a company (a SPV) that is legally independent and separate from the lender⁴⁸. Each time a lender develops a new securitisation programme, a new family of SPVs are established by the lender to provide ownership of the mortgage assets on behalf of the investors. The chapter will now turn to examine how these families of SPVs are used to perform securitisations and reduce the exposure of the mortgage assets to the risk that rates of taxation, to which they are liable, may increase.

⁴⁸ If the lender goes bankrupt then the corporate service providers will appoint a 'back-up servicer' or lender to collect consumer mortgage repayments on behalf of the investors.

7.3. Securitisation: building a transaction structure

As highlighted earlier, once a mortgage lender initiates the securitisation of a pool of its mortgages, it will, with the assistance of its chosen law firms and corporate service providers establish a family of SPVs. The securitisation process is complex, as one interviewee explained, because the mortgage assets are sold by the lender to a SPV which holds the titles of the mortgages, which then passes the mortgage repayments of consumers through a series of SPVs - known as the 'securitisation structure':

"...people say you have sold your mortgages to the bond holders, in fact you haven't, you've sold your mortgages to a trust...the trust owns UK mortgages," (Interview 1: Treasury Director, large retail bank, December 2007).

The research identified two reasons which explain why these mortgage assets are sold to SPVs and are not kept on the mortgage lender's balance-sheet. First, retail banks choose to securitize their mortgage portfolios to obtain regulatory capital relief from Basel regulation – a mechanism that governs UK retail banks. The introduction of capital adequacy ratios in 1988, called Basel, was a policy developed by the Bank of International Settlements, which was then applied and enforced by national governments⁴⁹. The ratios were used to dictate the size of a bank's capital reserves to curb the disastrous effects of illiquidity problems experienced by commercial banks after the developing world debt crisis (Leyshon and Thrift 1997). The capital ratio for mortgage assets is calculated by multiplying eight per cent of the value of a bank's mortgage portfolio by a risk weighting of 0.5.

⁴⁹ The regulation became known as Basel, after the place where the ratios were developed. These ratios are currently being replaced with new capital regulations, known as Basel II which is more sensitive to the particular risks of individual assets.

For example, if a bank has £1 billion in mortgage assets - and it is not uncommon for *single* RMBS issues to be measured in *billions* - it would have to retain £40 million in capital reserves under the Basel regulation (Wainwright 2009). Consequently, the lender cannot maintain possession of the mortgage assets if it wants to reduce its regulatory reserves, but the investors do not want to buy the individual mortgage assets either, they want to purchase RMBS bonds bearing specific degrees of credit risk and bond yields. As such, the mortgage assets are transferred from the balance sheet of the bank to an intermediary, an SPV.

Second, mortgage lenders frequently use securitisation to fund their mortgage business by exchanging the RMBS bonds with investors for fresh capital to be recycled through their lending business. The securitisation of a portfolio of mortgages enables the revenue streams from the mortgage assets to be reengineered – which produces a range of new bonds that are exposed to varying ranges of credit default risk, identified through bond-rating metrics, illustrated in Table 7.1. The bond-ratings of RMBS notes usually range from AAA notes through to BB notes⁵⁰. The bonds that are perceived to bear the least amount of credit risk, by the rating agencies and investors are the AAA notes, which prior to the credit crunch were seen to bear a level of credit risk that is broadly equivalent to that of sovereign bonds⁵¹. The interest repayments to investors of AAA bonds are low, as the bond is assumed to have a low risk of credit default, while bonds exposed to greater credit risk, progressively moving towards the BB bonds, pay a greater return to investors, associated with the higher-likelihood of default⁵². As such, the investment banks attempt to reengineer the revenue streams to maximise the

⁵⁰ Moody's uses slightly different lettering for each type of bond, but the metrics of all three are broadly equivalent.

⁵¹ For example, a UK RMBS AAA bond's risk of default would be the same as a UK gilt.

⁵² AAA RMBS interest rates usually pay investors less than one percent, plus the most recent three month LIBOR rate.

number of AAA bonds that can be issued from the pool of mortgages – which enables the mortgage lender to obtain money from investors at the lowest possible price.

Table 7.1: Bond-rating metrics for RMBS bonds

	<i>Low Risk</i>			<i>High Risk</i>	
Standard & Poor's	AAA	AA	A	BBB	BB
Fitch Ratings	AAA	AA	A	BBB	BB
Moody's	Aaa	Aa	A	Baa	Ba

Sources: Standard and Poor's, Fitch Ratings and Moody's.

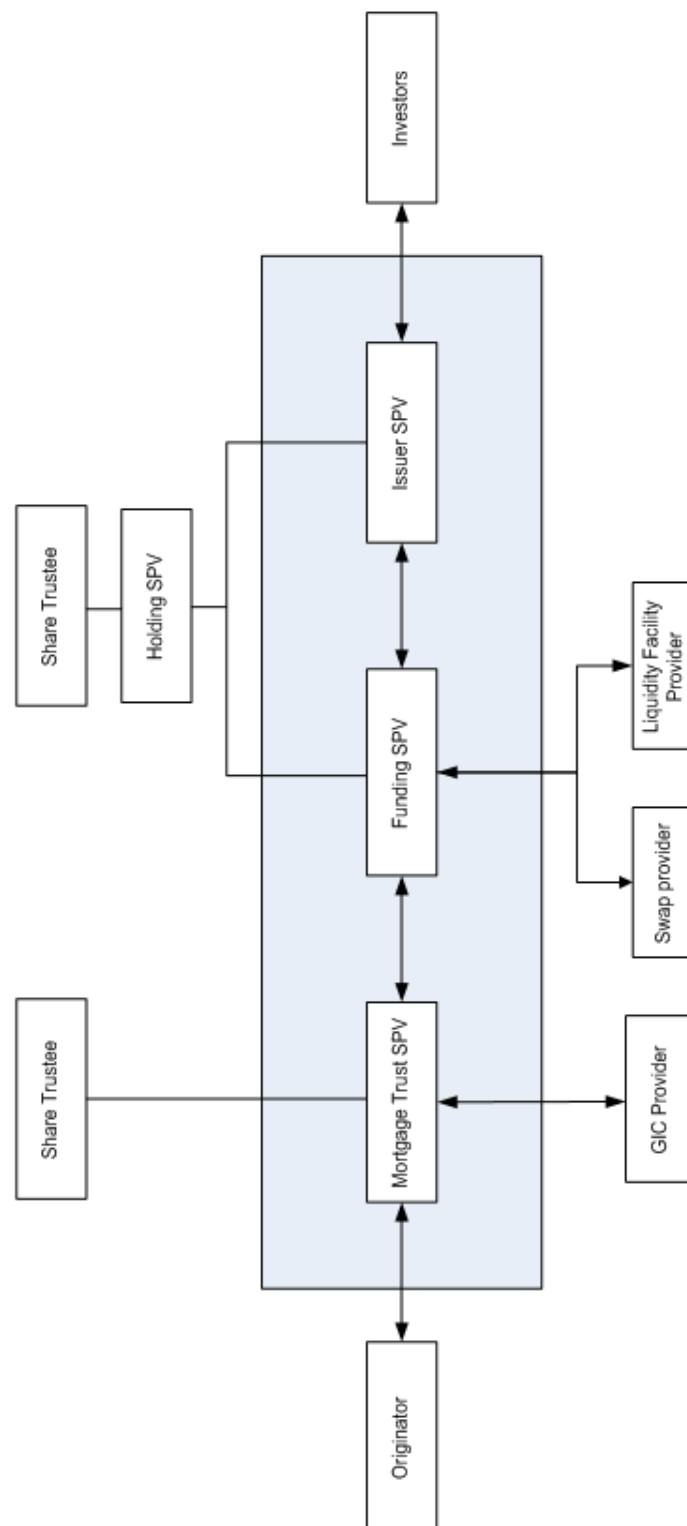
In order to obtain a AAA rating from the bond-rating agencies, the mortgages are moved to an SPV. Once the mortgage assets have been transferred to an SPV, the credit risk of the emergent notes is strictly limited to the mortgage assets – as the assets are isolated from the credit risks of the lender. For example, if Bank A which has securitised its mortgages owes money and is in default to Bank B, Bank B cannot legally claim revenue from the mortgage assets because they are technically owned by a separate company. As such, a AAA metric can be issued by the bond-rating agencies as the assets are not linked to the issuing lender. The use of SPVs has enabled retail banks with lower credit ratings such as AA or A, to issue AAA rated RMBS notes, providing them with access to cheaper credit which they could not obtain through issuing MTNs⁵³. In effect retail banks like Northern Rock, through the Granite Master Trust and its associated SPVs, establish a series of new companies to hold their mortgage assets – managed by corporate service providers, before handing the ownership of these companies to charitable trusts, where the beneficiary is a registered charity, such as the DSNEA.

⁵³ Medium-Term Notes (MTNs), are similar to corporate bonds and mature over 5-10 years and can only receive a bond-rating as high as the rating of the institution.

As SPVs operate like 'traditional' UK companies, they continue to be liable for tax and are obligated to file the company's accounts with Companies House. As highlighted earlier, SPVs are unique because they have no employees or infrastructure, but as they are required to perform tasks such as filing accounts, independent directors are appointed to administer the company in advance by the mortgage lender, who in turn appoints auditors to file the annual accounts. SPVs are established in advance by law firms, before they are 'sold' to mortgage lenders at which point the ownership of these companies, and their mortgage assets, are transferred to a charitable trust. The directorship roles at these companies are transferred from the law firm to the directors of corporate service providers - for example, SFM Management and the Law Debenture Trust – before the SPVs are prepared for use in the securitisation deal, as illustrated below:

“Some of the Magic Circle law firms, like Clifford Chance, Linklaters, Freshfields, just have, they keep these companies on the shelf, it's then simple, it exists as a company, it has shareholders, a company secretary, then those roles are transferred to us...I can guarantee that an Ikea flat pack is infinitely more complicated,” (Interview 28: Director of a Corporate Service Provider, June, 2007).

Figure 7.1: A securitisation structure



Source: Author

Figure 7.1 illustrates the main SPVs that are used in a typical securitisation. These SPVs include; the Mortgage Trust SPV, Funding SPV and Issuer SPV. Once the SPV structure has been developed by the deal's lawyers and corporate service providers, the deal is launched and the SPVs begin to fulfil their individual tasks, as suggested in the following quote:

“...one day everything goes across [the structure] instantaneously, the SPV [mortgage trust] buys the assets off the originator, the SPV [Funding] passes the interest of those assets up to the trustee, the SPV [issuer] issues the notes and the cash [is passed] back to the originator...and what you're left with is a company that performs, it still operates as a company, in the sense it has to produce accounts, it has to do companies house filing, it has to have directors,” (Interview 28: Director of a Corporate Service Provider, June, 2007).

The originator, or mortgage lender, will sell the mortgage assets to the Mortgage Trust SPV to remove the assets from its balance-sheet and the mortgage repayments to the lender are then passed into a guaranteed income contract account (GIC), effectively a current account, operated by a commercial bank, on behalf of the SPV. The money is held in a GIC until it is required to pay the bondholders, usually every 90 days⁵⁴. The Issuing SPV, that issues the notes to the bondholders, provides a series of loans to the Funding SPV, and the money received every 90 days from the GIC is used to repay the loans, where each loan corresponds to the categories of AAA, AA, A, BBB, BB, used to repay the investors. The money that the Funding SPV received from its loan to the Issuing SPV is used to purchase the mortgage payments from the Mortgage Trust SPV. The Funding

⁵⁴ As the money is stored in another bank account the money from mortgage repayments will not necessarily be from homeowners but from other deposits with the commercial bank.

SPV's main role is to provide funding for the transaction and also stabilises the revenue flows of the transaction through the use of currency and interest rate swaps to transform the repayments into different currencies for investors and to balance fixed mortgage repayments with floating interest rates. The Funding SPV may also have a liquidity facility provider that may provide cash in the form of a short-term loan to repay the bondholders, if the structure experiences a temporary shortfall in revenue flows, due to consumer defaults.

The Mortgage Trust, Funding and Issuer SPVs are all owned by charitable trusts, for example the Granite Mortgage Trust, because under UK law there must be an owner for these companies, but it cannot be the mortgage lender. Using trust law, the charitable trusts are able to hold the shares of the SPVs on the behalf of charities, the named beneficiaries, who are unable to affect the day-to-day operations of the SPVs, but are able to benefit from any remaining monies from the company once the securitisation structure has been dismantled and the investors have been repaid. The 'charitable trust' status is important for the Mortgage Trust SPV, as charitable trusts benefit from not having to pay income tax, investment tax, corporation tax, and capital gains tax under UK legislation. As one interviewee explained, once the mortgage assets were transferred off the lender's balance-sheet they are converted into new revenue streams and securities that would be liable for different taxes:

"...let's move some assets, whatever they are, into an SPV, right, when you move assets, stamp duty... oh, right, well there goes one per cent maybe out of the deal...second problem so we think ok, we need someone to service those assets, ...are they acting as agent for the SPV collecting that money, err, yes ok, right in which case they are undertaking a service, that service is then presumably VATable,

oh, exit 17.5 percent on VAT, bad idea, ok, next problem, [the] Trust sells consumer assets to an SPV, does it make a gain on those assets when it sells, them, maybe it did, ahh, capital gains tax, another capital tax hits you, does perhaps, is the income re-characterised, for instance...did you write any interest rate swaps...were there any profits from those swaps...all those sorts of things become serious problems, next thing is, how are you going to put flow, income flows from the assets into the SPV, they have to be divided between principle and interest flows, you also want a mechanism by which the lender can take back the excess spread back...by selling the cash flows into a trust, which is a curious thing, this device, you can then reallocate the flows over the trust and they only become taxable, when they end up in their own taxable domain,"

(Interview 34:Ex-commercial Bank Director, July 2007).

The use of SPVs during a securitisation enables the investment bankers, lawyers and the mortgage lenders to pursue a strategy of legal tax avoidance (Roberts 1994; Quirk 1997), which minimises the exposure of the transaction's revenue streams to taxation and reduces the potential volatility that could emerge through the alteration of tax rates. The changing rates of taxation have the potential to increase over time and even minor increases in tax rates can have a marked effect upon the cash flows passing through the transaction structure, due to the substantial amounts of money passing through the transactions. These reductions in the capital flowing through the securitisation structure could reduce the repayments to investors, or trigger defaults on some of the RMBS bonds, incurring downgrades from bond-rating agencies on the RMBS notes, which would jeopardise the ability of the mortgage lender to raise low-cost capital through securitisation, as their reputation amongst investors could become tarnished. The

exposure of the revenue streams from mortgage repayments to taxation is managed through the use of SPVs, as suggested below:

“...you would, only ever pay tax on net income, you wouldn’t pay tax on the cash flow, because these things would be blown out of the water, because they are very, very big numbers...they are structured in such a way as to make sure they don’t make any money, you just don’t want the SPV to make money, if the SPV is making money then the structure isn’t efficient...if you suddenly have the SPV generating taxable income, you don’t know what the tax rates are going to be, and then, the rating agencies say, this is a variable here, and if it starts becoming taxable on it’s income maybe something else will get taxed, there’s uncertainty and markets hate uncertainty,” (Interview 27: Director of a Corporate Service Provider, June, 2007).

The SPVs incur profits from providing their services to investors, whether this involves holding mortgage assets, or issuing repayments to investors, but as SPV profits are taxable, the research found that profits are kept deliberately low to reduce the flow of capital lost from the revenue streams that are used to repay the investors. The aim of SPVs is to maximise the amount of money flowing to investors, as the more money that is available to investors, means that more money can be effectively borrowed by the mortgage lender from investors, through the SPVs, hence the importance of minimising the flows of capital that are removed by SPVs. Geographers such as Cobb (1999), Roberts (1994) and Hudson, (1998) have highlighted the role of offshore financial centres in assisting corporations to reduce their rates of taxation by registering their companies, or subsidiaries, in offshore financial centres, that boast favourable tax regimes. Although mortgage lenders and lead managers attempt to reduce the exposure of securitised

transactions to taxation, there is a particular geography to UK RMBS SPVs, which is concentrated in London, not offshore financial centres. The complex geographies of international taxation - determined by the different political economies of nation-states – have inadvertently constrained the spatial location of RMBS SPVs, making it difficult for lenders to move their UK RMBS assets outside of the UK, to offshore financial centres that offer lower taxes, such as the Cayman Islands and Bermuda:

“... jurisdiction is quite important, now sometimes you don’t have a choice, or not a very straight forward choice, so residential mortgages, it’s very difficult to transfer those to a non-UK entity...mortgage payments by the borrowers would cause huge payments if you subjected borrowers to the risk of withholding tax, if they were suddenly paying to Luxembourg...so typically residential mortgage transactions use a UK vehicle [whereas with]...CDOS, the underlying collateral is structured so it is not susceptible to withholding risk...so some assets are more mobile than others,”
(Interview 18: Partner, law firm, July 2007).

The SPVs are registered at the addresses of the corporate service providers – for accounting and legal purposes – as this is where the SPVs are administered. The result of this practice concentrates large numbers of SPVs and the high-value of their assets within a compact geographical cluster. For example, Table 7.2 illustrates the RMBS SPVs administered by Structured Finance Management, a corporate service provider, located in London, between 2000 and 2008, to outline the concentration of RMBS SPVs, an outcome of international tax regimes.

Table 7.2: RMBS SPVs administered by Structured Finance Management (2000-2008).

Year	SPV	Value Bn(£)	Originator-Servicer
2000	Fosse Securities No. 1 plc	£0.250	Alliance & Leicester
2000	Shipshape Residential mortgages No. 1 plc	£0.300	Bank of Ireland
2001	RMAC 2001-NS1 plc	£0.227	GMAC
2001	RMAC 2001-NSP2 plc	£0.833	GMAC
2002	RMAC 2002-NS2 plc	£0.528	GMAC
2002	RMAC 2002-NS1 plc	£0.604	GMAC
2003	RMAC 2003-NS4 plc	£0.498	GMAC
2003	RMAC 2003-NS2 plc.	£0.503	GMAC
2003	RMAC 2003-NS3 plc	£0.539	GMAC
2003	RMAC 2003-NS1 plc	£1.000	GMAC
2003	Permanent Financing (No.2) plc	£4.772	HBOS
2004	RMAC 2004-NS3 plc	£0.500	GMAC
2004	RMAC 2004-NS1 plc	£0.597	GMAC
2004	RMAC 2004-NSP4 plc	£0.800	GMAC
2004	RMAC 2004-NSP2 plc	£1.035	GMAC
2004	Aire Valley mortgages 2004-1 plc	£2.000	Bradford & Bingley
2004	Permanent Financing (No.5) plc	£3.520	HBOS
2004	Permanent Financing (No.4) plc	£6.200	HBOS
2005	Farringdon Mortgages No.1 plc	£0.125	Rooftop
2005	Farringdon mortgages No.2 plc	£0.200	Rooftop
2005	RMAC 2005-NS4 plc	£0.400	GMAC
2005	RMAC 2005-NS3 plc	£0.481	GMAC
2005	RMAC 2005-NS1 plc	£0.753	GMAC
2005	Aire Valley mortgages 2005-1 plc	£1.000	Bradford & Bingley
2005	RMAC 2005-NSP2 plc	£2.000	GMAC
2005	Permanent Financing (No.8) plc	£2.250	HBOS
2005	Gracechurch Mortgage Funding plc	£4.500	Barclays
2006	Landmark Mortgage Securities No.1 PLC	£0.200	Amber/Unity/Infinity
2006	Mansard Mortgages 2006-1 Plc	£0.509	Rooftop
2006	Aire Valley Mortgages 2006-1 plc	£2.000	Bradford & Bingley
2006	Clavis Securities Plc	£10.000	Basinghall Finance
2007	EuroMASTR plc	£0.201	Victoria Mortgages
2007	Mansard Mortgages 2007-1 plc	£0.250	Rooftop

2007	Eurohome UK Mortgages 2007-1 plc	£0.354	DB UK
2007	Landmark Mortgage Securities No.2 plc	£0.358	Amber/Unity/Infinity
2007	Eurohome UK Mortgages 2007-2 plc	£0.500	DB UK
2007	Aire Valley Mortgages 2007-1 plc	£2.500	Bradford & Bingley
2007	Fosse Master Issuer plc. 2007-1B	£2.500	Alliance & Leicester
2007	Pendeford Master Issuer plc	£2.531	HBOS
2007	Bracken Securities plc	£10.300	Alliance and Leicester
2008	Permanent Master Issuer plc, 2008-1 Issue	£9.000	HBOS

Sources:

Structured Finance Management:

http://www.sfmlimited.com/transactions/transactions_asset.php (Accessed 29/05/2008).

Fitch Ratings:

http://www.fitchratings.com/corporate/sectors/issuers_list_struct.cfm?mm_id=§or_flag=3&marketsector=2&detail=&body_content=issr_list&start_alpha=R&start_row=151&searchText (Accessed 29/05/2008).

Although the geography of RMBS SPVs is determined by a myriad of tax regimes, controlled by different nation-states, the location of SPVs in the UK is dictated by the locations of the corporate service providers. Corporate service providers are located within the City, so that they are in close proximity to the lawyers and investments bankers that perform securitisation, to facilitate convenient face-to-face meetings, but also to promote their services to industry contacts, to seek out new business opportunities.

7.4. Securitisation: building the waterfall structure

One of the particular attributes that makes securitisation a unique financial technology is the financial engineering used to produce a range of different RMBS bonds, exposed to different degrees of credit risk, from AAA, though to BB. Folkman et al, (2007) have discussed the function of new financial intermediaries and elites that are involved in the development of financial products, such as investment bankers, which Hall (2009) argues, articulate a particular role in organising financial transactions. It is important to understand the role of

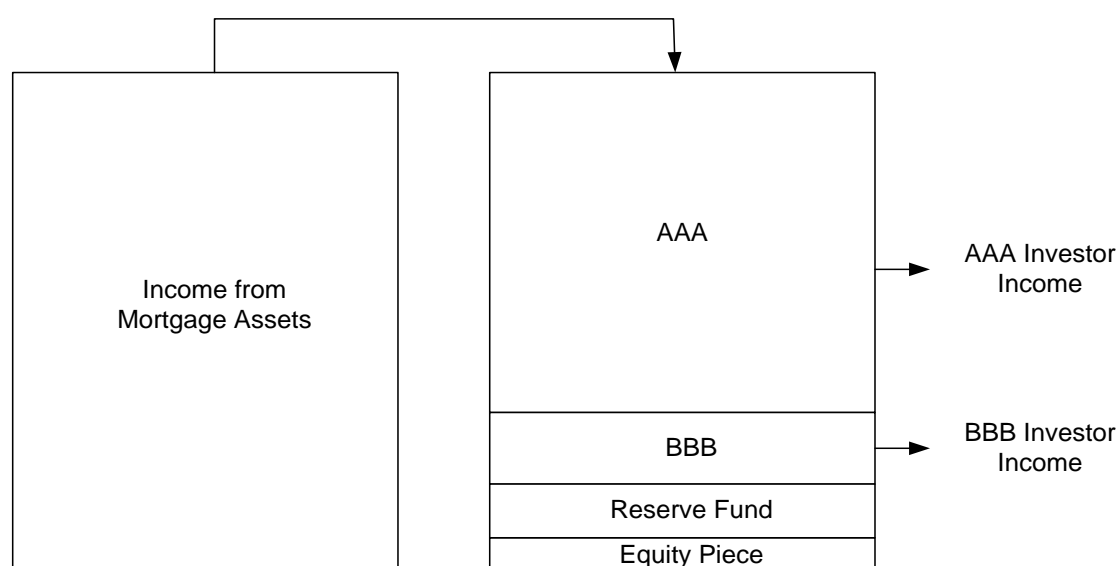
investment bankers, in particular structurers, who use complex financial techniques to reengineer the revenue streams from mortgage assets that are converted into RMBS notes.

Bond-rating agencies also provide a dominant role in the production of RMBS reengineering through their governance of the financial sector. Successive government policy and dominant neoliberal ideologies have sought to minimise formal state legislation in favour of 'light touch' regulation, a role that has – to a degree – been fulfilled by the operation of bond-rating agencies (Sinclair 1994; 1994; Augar 2000). Bond-rating agencies have performed a central role in the financialisation of Anglo-American capitalist economies (Erturk *et al.* 2004), through their judgements on the quality of investment products. As discussed in Chapter 2, bond-rating agencies perform 'independent' analysis and assign metrics to the quality of each new investment, in an attempt to provide investors with the ability to overcome information asymmetries and avert losses (Sinclair 2005). However, the research conducted in this thesis has identified how this role has become extended such that bond-rating agencies have begun to perform a powerful role in securitisation by indirectly shaping the financial engineering of UK RMBS notes. As such, the analysts of bond-rating agencies can be viewed as actors that, in combination with the structurers of investment banks, control the financial engineering, and credit quality of RMBS.

Social scientists and economic geographers have drawn attention to the socio-cultural technological practices that are exercised by investment bankers to produce complex financial products (Pryke and Lee 1995; Li Puma and Lee 2005; Bryan and Rafferty 2007). The socio-cultural technology used to reengineer the income streams in securitisation, flowing from consumer mortgage repayments to investors, is performed through the production of a mathematical model called the

‘waterfall structure’ (Wainwright 2009). Figure 7.2 illustrates how the waterfall structure works operates, where the interest and principal repayments from consumers, are not divided up evenly and distributed to investors, but flow, as the metaphor implies, down through this hypothetical structure. The repayments first ‘fill up’ the top tranche of AAA notes, before flowing to the BBB notes and reserve fund, where investors who have purchased AAA notes are repaid first, reducing their exposure to consumer credit risk, while the BBB investors are paid last.

Figure 7.2: The ‘Waterfall Structure’



Source: Wainwright (2009)

The aim of the ‘waterfall structure’ is not to spread the credit risk related to each mortgage asset, but to concentrate any consumer defaults in the lower tranches of the waterfall structure. The rationale behind the separation of revenue flows into tranches is that if a significant number of consumers default on their mortgages, the BBB notes known as junior notes may not be repaid, but in theory, it was calculated by bond-rating agencies that AAA investors, purchasing so-called senior

notes, would be protected from the defaults. The use of junior notes to protect the senior notes is called subordination, where the junior notes are subordinated by a reserve fund⁵⁵. The waterfall structure, prior to the credit crunch, enabled the production of high-quality, AAA notes to be produced for investors, while also providing a series of BBB notes that had a greater exposure to consumer credit defaults, but paid a higher return for investors.

The structurers produce a mathematical model of the waterfall structure - based on mortgage and consumer data supplied by the mortgage lender, where they calculate the number of notes that can be produced for each tranche in the structure. The construction of the waterfall structure resonates with research by Mackenzie (2005) who argues that the performances of financial theory, reformat the economy, producing a virtualism where abstract models become reality (Miller 1998). This is illustrated through the engineering of the waterfall structure, which is a mathematical model, or representation, that is used to reorder income streams which dictate which investors are exposed to the disproportionate number of credit defaults from consumers, based on calculations by bond-rating agencies. Knorr-Cetina and Bruegger (2002) have highlighted the role of post-social relationships, where financial markets and the economy, are represented and performed through screens and technical devices. In the performance of securitisation, the relationships between investment bankers, computers, software, training and the manuals are used to construct these abstract waterfall structures through heterogeneous networks (Callon 1991). The structurers, as epistemic elites, are important because their expertise generates trust amongst investment bankers, investors and bond-rating agencies, which is important as each bond and its coupon is not fixed to a physical commodity, but is construed through the mutual

⁵⁵ More cash is funnelled through the waterfall structure than is necessary to repay the investors. This excess cash is stored in a reserve fund which can be used to cover any temporary shortfalls in future mortgage repayments.

understanding of epistemic elites and their attempts to tame credit risk through financial engineering.

Early waterfall models in the UK were produced independently by individual investment banks, but as the expertise of bond-rating agencies has grown since the early 1980s, the calculations that underpin their metrics have become more sophisticated as they developed detailed codes and standards, circulated through manuals to structurers to aid their development of their waterfall models, so that the RMBS notes that they are seeking to issue, are awarded the agencies' bond ratings. This codified knowledge is used to determine the tranches in the structure, and the structurers use these templates to develop a waterfall structure that will obtain the desired ratings from the bond-rating agencies. Once structurers begin to produce waterfall models that conform to these manuals, the bond-rating agencies' role has moved beyond rating RMBS notes to co-producing them. Once the structurers have developed their model, it is tested to observe how the revenue streams from consumers and the structure would perform in specific situations that are stipulated by the rating agencies, as illustrated in the following quote:

"...you run through all the models, do all the different stresses, each [bond rating] agency has different stresses, so there's, it's just CPR [Constant Prepayment Rate- the rate at which consumers refinance their mortgages with another company] all prepayments from 40 per cent to half a per cent, stress arrears going up to, erm, it's different for different rating categories, err, if you look at the rating methodology of the agencies, so it's running the cash flow models, coming out with your loss severity which would give you a AAA...there are different triggers, you play with the model the whole time...so if arrears go to four per cent you start trapping cash, so the whole time you're

playing around trying to maximise the structures you can get... if we made a swap and put an interest rate cap, how much AAA? So your main aim is get as most AAA out of it as you can and reduce, so there's different things that you can do to maximise AAA," (Interview 25: Structurer, investment bank, June 2007)

The data used to develop the waterfall structures includes the loan-to-value ratio of each mortgage and the value of each mortgage, as the industry perceives that if a consumer has made more repayments then there is less outstanding debt in the structure, which reduces the severity of a credit default on the revenue streams passing through the waterfall structure. The number of consumer mortgage arrears and CCJs are also included in the model, as the bond-rating agencies argue that if a consumer is more likely to default on their repayments, then additional junior notes are required to support the senior notes⁵⁶. This is important, because unlike credit scoring, where the lender attempts to predict which consumers will default, the model must include all the mortgage assets to be securitised and seeks to protect investors by calculating how quickly the mortgage lender can repossess a property and resell it to ensure that money continues to pass through the waterfall structure.

Due to this feature of securitisation, geography becomes an important factor in the credit quality of the RMBS notes. House prices and the performance of local housing markets vary, based on levels of employment and demand for housing, but also house price inflation, which can substantially alter the value of a property once it is repossessed. Investors and bond-rating agencies alike are interested in

⁵⁶ For this reason subprime securitisations consist of higher proportions of BBB and BB notes to support the AAA notes due to the increased probability of credit defaults. For example, the proportion of AAA bonds produced from the securitisation of a UK subprime lender called Rooftop Mortgages securitisation accounted for 80 per cent of the notes, compared to 90 per cent for a prime Abbey securitisation.

the geographical concentration of mortgage assets, especially if the mortgages backing RMBS bonds are strongly concentrated in an area where the residential property is perceived to be overvalued. In a recession, the value of these houses may drop significantly, and if they are repossessed, there may be a significant reduction in the income streams used to repay the investors, which will reduce the value of their bonds and repayments. House price volatility was an issue that put severe strain on building societies based in London and the south-east during the 1990s housing downturn, who experienced higher repossession rates compared to other parts of the country (Marshall *et al.* 1997).

Table 7.3: Average UK house prices before and during the credit crunch, by region

	North		Yorkshire and Humberside		North West		East Midlands		Outer MET	
	House Price (A£)	Change	House Price (A£)	Change	House Price (A£)	Change	House Price (A£)	Change	House Price (A£)	Change
Q2 2005	125374		139688		144159		143646			
Q2 2006	126609	1234.7	146209	6521.2	149896	5737.2	146521	2875.0		
Q2 2007	134623	7914.3	155159	8950.2	158614	8717.8	156512	9990.5		
Q2 2008	129700	-4823.9	146074	-9085.1	150162	-8462.2	147413	-9098.0		
Q2 2009	112348	-17351.2	131675	-14398.5	131704	-18457.6	130579	-16834.7		
	West Midlands		East Anglia		South East		Scotland			
	House Price (A£)	Change	House Price (A£)	Change	House Price (A£)	Change	House Price (A£)	Change	House Price (A£)	Change
Q2 2005	152671		160838		185245		221679			
Q2 2006	155467	2796.3	168398	7559.6	192808	7563.1	228938	7259		
Q2 2007	164679	9212.2	181409	13010.9	212811	20002.6	253323	24386		
Q2 2008	156219	-8460.3	172164	-9244.4	204292	-8518.9	248263	-5061		
Q2 2009	138254	-17864.6	153345	-18818.9	181552	-22739.9	217145	-31117		
	London		South West		Wales					
	House Price (A£)	Change	House Price (A£)	Change	House Price (A£)	Change	House Price (A£)	Change	House Price (A£)	Change
Q2 2005	241344		177659		137769		118943			
Q2 2006	252724	11379	183904	6245	144323	6554	129513	12571		
Q2 2007	292409	39686	200940	17036	154969	10646	148593	19079		
Q2 2008	295568	-6842	194714	-6226	143147	-11821	149541	948		
Q2 2009	256496	-29072	169077	-25637	134291	-8856	134391	-15150		
	Northern Ireland									
	House Price (A£)	Change								
Q2 2005	117149									
Q2 2006	146367	29217.7								
Q2 2007	225447	79080.6								
Q2 2008	183476	-41971.6								
Q2 2009	135862	-47614.1								

Source: Nationwide: http://www.nationwide.co.uk/hpi/downloads/All_prop.xls (Accessed 23/07/09).

Table 7.3 illustrates the regional differences in house price appreciation and decline prior to, and during the crunch. It is interesting to note the overall percentage change in the average house price for each region to understand the geographical differences in price changes. For example, house prices in the second quarter of 2009 decreased by 6.2 per cent in Wales, compared to the previous year, while house prices in Northern Ireland decreased by 26 per cent over the same period. Northern Ireland's average house prices had grown significantly during 2006 and 2007, in comparison to other regions, suggesting that house prices in this region were becoming over-inflated in comparison to price increases in the rest of the UK.

If a mortgage lender had lent a disproportionate amount of capital to borrowers in Northern Ireland and then suffered from a high rate of repossessions, then the changes in house prices would make it difficult for the lender to recoup the entirety of capital. In the event that the mortgage assets have been securitised, the lender acting as a servicer will repossess the houses from borrowers who have defaulted on their payments on behalf of the RMBS investors. In an attempt to reduce the effects of this scenario, investment banks and bond-rating agencies attempt to build additional protection into RMBS transactions for investors. This is achieved in two ways. First, the structurers seek to model the potential decrease of housing values in a market downturn. Second, they attempt to increase the number of subordinate notes below the AAA bonds, if there appears to be an excess of geographical concentration. The bond-rating methodologies used by investment banks contain calculations and standards devised by bond-rating analysts that forecast the potential decreases of house prices in economic downturns. These standards are used to calculate whether the mortgages that are due to be securitised are overly represented in particular regions, which the bond-rating agencies call 'an excess concentration', as one interviewee explained:

“...so our model takes the postcode, and though the postcode we can, are able to, get a table [in a spreadsheet] of geographical distribution, the more granular it is, the better it is...we have different assumptions of market value in the underlying properties in relation to the regions or counties...so it's important for us to assess for each loan per region, because we apply a different assumption in terms of market value of a property...a lot of it's to do with repossessions and market value, decline whether we expect values to decline, due to repossession, so we do repossession studies, all the mortgage lenders get data, from there, and assess the evaluation that they have in their systems against the sale price and that's the market value at the time,” (Interview 17: Bond-rating Analyst, November 2007).

For example, Table 7.4 below shows an example from a Moody's bond-rating methodology. The table lists the benchmark, or the 'ideal' geographical concentration of a mortgage portfolio, as well as the actual portfolio composition of a hypothetical pool of mortgages. The lender is permitted a ten per cent margin of error, known as the Allowed Concentration Portfolio. If the geographical concentrations of the mortgage assets that are going to be securitised exceed these parameters, then they are penalised by the rating agencies, and additional subordination has to be produced to protect the AAA bonds. The excess concentration in this example is calculated as 6.9 per cent which is multiplied by 50 per cent, which is then multiplied by the value of what will be rated as the AAA tranche. This is calculated in the example using data including the loan-to-value, seasoning and other information, to be €87,055,212. The total adjustment is calculated to be €2,995,535, which means that out of the initial portfolio valued at €1,010,000,000, an extra 0.3 per cent of the portfolio has to be used to support the

Table 7.4: Credit enhancement for excessive geographical concentration

Region	Benchmark (%)	Portfolio (%)	Allowed Concentration	Excess Concentration
North	2.6	2.5	2.8	0
Yorkshire/Humberside	6	7	6.6	0.4
North West	7.3	4	8	0
East Midlands	6.8	3	7.5	0
West Midlands	7.6	4.5	8.3	0
East Anglia	11.1	8	12.2	0
South West	9.9	12	10.9	1.1
South East	20.4	25	22.4	2.6
London	17.6	21	19.3	1.7
Wales	3.6	4	4	0
Scotland	5.3	7	5.8	1.2
Northern Ireland	1.8	2	2	0
		Sum of Excess Concentration (%):	6.9	
		Regional Concentration Adjustment Factor (%):	50	
		Absolute Adjustment (€):	2,995,534.99	
		Adjustment as % of total pool balance (%):	0.3	

Source: Moody's (2005)

AAA notes because of the extra risk borne from what is perceived to be an excessive geographical concentration.

Once the structurers have completed their model, and have calculated the number of notes that can be issued for each tranche, the deal documentation is sent to the bond-rating agencies who will review the transaction to see if it complies with their standards, before they give the notes their ratings. They will test the structure of the SPVs and the waterfall structure to see that these structures meet their guidelines. The bond-rating agencies simulate what the effect of an increase in interest rates or consumer defaults would have on the structure, to view how the securitisation would perform in stressed scenarios such as recessions of varying severity. For example, a UK BBB note should have been able to withstand the defaults and interest rates of the UK's 1990s housing crisis, a scenario that may be reviewed in the light of the recent crisis. The bond-rating agencies will check that the SPV structures insulate the assets from the mortgage lender and if they are not satisfied with the transaction structure and waterfall model they may request additional changes to these structures.

The credit crunch, and the failure of US subprime RMBS notes to repay their investors, has resulted in bond-rating agencies undergoing extreme scrutiny from investors, the industry and the media, raising questions about the viability of 'light touch' regulation. Early UK RMBS bonds were structured independently by investment banks which would be verified by the bond-rating agencies and while this ensures that investment banks are performing securitisations to particular standards:

"...bankers used to model the transaction and we used to validate the model, and now we model our own transaction so it's a lot more

independent and easier to understand what's going on with the transaction, I think that's the main change, so we can reconcile our model with the banker's model and we know the bank isn't hiding anything," (Interview 33: Bond-rating Analyst, April 2007)

However, the role of bond-rating agencies as institutions that provide governance should be strictly limited to the provision of risk metrics concerning transactions, but this separation has become blurred as they have begun to inadvertently structure RMBS transactions through the methodologies distributed to structurers, which have become used as templates. Some investment bankers and investors interviewed during the research discussed how these ratings may lose importance amongst investors, as the ratings underestimated the credit risk underlying US RMBS bonds. While it is doubtful that bond-rating agencies will cease to produce metrics for investors on the quality of RMBS notes, there is early evidence to suggest that additional modes of governance may emerge in the UK through private consultancies that can provide additional analysis on the credit risk within a portfolio of mortgages that investors may chose to utilise to enable them to monitor the credit quality of their notes. A centralised lender in the UK – Edeus - has reengineered its credit scoring and underwriting system to perform credit risk analysis on existing mortgage portfolios, which could be operated on behalf of investors, providing them with additional transparency towards the underlying credit quality of RMBS notes.

7.5. Conclusion

This chapter has attempted to outline how individual mortgages are converted - through securitisation, into bonds, where epistemic elites reengineer the income streams from mortgages to produce a range of bonds that bear differing exposures

to credit risk, while attempting to reduce the exposure of the transaction to taxation. The initiation of securitisation - despite being coordinated by mortgage lenders - occurs on the boundaries of the lender, where it interfaces with other financial service providers; investment banks, corporate service providers and law firms. The chapter discussed how mortgage banks attempt to choose particular financial service providers before uniting and solidifying the relations between these epistemic elites to perform securitisation, where the skills and knowledges of these epistemic elites are performed - through mathematic modelling and law - to ensure that their performance of securitisation conforms to codes developed by bond-rating agencies.

These advanced producer services and the elite technical expertise of their employees are based in London. The chapter examined how de-regulation and the 'Big Bang' led to the transference of securitisation from the US to the UK, through investment banks, which imported the idea of securitisation into the City and introduced and nurtured the formation of new epistemic elites who began to perform securitisation in the UK for mortgage lenders. London later became the European centre for securitisation, as investment banks began to structure deals for European mortgage banks. The chapter highlighted how the clustering of the UK's prominent law firms in London, fostered through the necessity of face-to-face proximity with clients, and also to interpret alternations to UK legislation as well as lobby for new regulation with the Law Courts, has also been important for the adaption and performance of securitisation within the UK.

I then turned to explore the important role of SPVs in the performance of securitisation as they insulate originators from credit risk, reduce regulatory capital reserves, while reducing the effect of tax liabilities on the revenue streams involved in the transaction. This section discussed how these financial structures are

produced by law firms and are managed by corporate service providers to ensure that the SPVs function in the interests of the securitisation structure while being legally detached from the lender and outlined how these SPVs are designed to minimise their profits and use charitable trust statuses to minimise their tax liabilities, which reduces the likelihood that changes in taxation rates will reduce the repayments in RMBS investors. The SPVs are located within London, constrained by the variations in tax regulation of different nation-states which produces a geography whereby mortgage assets - valued in millions of pounds are located in a few select locations.

The reengineering of consumer income streams was investigated to explain how the associated credit risk of consumers is (re)engineered into a series of RMBS notes that bear different exposures to credit risk and offer varying returns. This practice is completed by investment bankers - in particular, epistemic elites known as structurers - who devise mathematical models that are used to prescribe the number of AAA through to BB bonds which can be issued to investors, from a particular portfolio of mortgage assets. The structuring of RMBS transactions has spatial implications as the spatial attributes are encoded within the waterfall structure models to account for the effect of large concentrations of mortgages that are located in regions where bond-rating agencies believe that the houses are overvalued, which can expose investors to losses on their notes in a recession.

As such, the waterfall structures are adjusted to provide additional protection for the AAA investors against the magnified effect that credit risks, concentrated in selected regions, can have on reducing bond payments. In addition to the inclusion of geographical data for the mortgage assets that have been securitised, information on the value of the mortgages, loan-to-value data and CCJs are also encoded into the waterfall structure. The chapter has argued that while bond-rating

agencies provide financial governance through the production of risk metrics, the use of rating methodologies by RMBS structurers, has seen bond-rating agencies indirectly extend their role from governance to structurers. As bond-rating agencies have been subject to criticism since the credit crunch, this chapter suggests that new modes of governance may emerge to supplement the role of the three main bond-rating agencies. The thesis will now seek to draw conclusions and summarise the key findings of the research.

Chapter 8

Conclusion

“Political leaders, and their opponents, like to pretend that they are still in control of their national economies, that their policies have the power to relieve unemployment, revive economic growth, restore prosperity and encourage investment in the future. But recent years have shown again and again how the politicians’ plans have been upset by changes that they could have not foreseen in the world outside the state,” (Strange 1986:3).

8.1. The beginning of the end

Despite being written over 20 years ago, the quote from Strange, above, is startlingly accurate in describing the political response to capitalism’s latest crisis, the credit crunch. Strange stresses how politicians consistently fail to foresee financial crises and that once capitalism begins to shudder from its insurmountable, internal contradictions, politicians around the globe struggle to successfully overcome the effects of financial crises. As discussed in the introduction to the thesis, the UK’s experience of the credit crunch was caused by the illiquidity of the capital and interbank markets, a consequence of the US subprime market, and, in a way that supports Strange’s argument: beyond the UK’s jurisdiction. It can be argued that the British government - along with the financial services sector – was

slow to foresee and acknowledge the potential effects of the credit crunch, unfolding beyond its shores. As late as July 2007, newly appointed British Prime Minister Gordon Brown was calling for banks to increase their use of structured finance products, and their dependence on the international capital markets, to fund 25 year fixed mortgages to aid first time buyers⁵⁷. By September, a few months later, the government had begun to prepare for the nationalisation of Northern Rock, the first of several high-profile fatalities within the UK's financial sector.

Aalbers (2008) has suggested that capital market funding can increase house price inflation, and in the case of the UK, the expansion of securitisation over the past decade has coincided with substantial house price increases. Between 1997 and 2007 the average price of a UK house rose by 193 per cent as the UK's mortgage industry and consumers alike had become financialised⁵⁸. Consumers enjoyed the substantial growth in house prices, becoming real estate speculators, selling their homes to buy a larger house as an investment, or by unlocking capital by releasing equity from their homes (Langley 2008), while the management of the UK's retail and investment banks received large cash and stock bonuses, with institutional investors enjoying the high-dividends from UK banks.

The effects of the credit crunch unravelled rapidly within the UK with disastrous repercussions for the banks, prior to the contagions that spread throughout the economy, affecting large industrial producers through to small family businesses and high-street consumers, a consequence of the enhanced exposure of the UK's financial institutions to the volatility of the international financial system. This

⁵⁷ <http://news.bbc.co.uk/1/hi/business/6292266.stm> (Accessed: 14/04/2009).

⁵⁸ <http://www.communities.gov.uk/housing/housingresearch/housingstatistics/housingstatisticsby/housingmarket/livetables/> (Accessed 14/04/09)

exposure – repositioned through securitisation and interbank lending - had been steadily growing as a response to series of events, beginning with financial deregulation in the 1970s and 1980s. This deregulation indirectly stimulated the spread of new financial technologies from the US, including securitisation, and business models such as centralised lenders. The implementation of these new ideas and knowledges began to integrate the UK's financial institutions, in particular mortgage lenders, into the international financial system through its reliance on international capital to fund the UK mortgage market. This fundamental shift was to have serious implications for the UK economy, which regulators failed to acknowledge and plan for. This final chapter will now summarise the key empirical findings of innovations, developments and geographies that supported the growth of the UK mortgage market; how the findings from the research can be used to inform the theories and philosophies which this thesis has drawn upon; and the contributions of the thesis to the wider debates ongoing within economic geography.

8.2. Empirical contributions of the research

The empirical contributions offered by the thesis concern the fluid geographies of UK mortgage production, that are shaped through the production of credit scoring technologies and the securitisation of mortgage assets into RMBS bonds, central to understanding how contemporary mortgage production is performed and financed. Chapter 5 highlighted how deregulation in the 1980s witnessed the emergence of new types of mortgage providers, instigated through financial restructuring that was stimulated by The Financial services Act (1986) and The Building Societies Act (1986). These two Acts allowed building societies to transfer their mutual status to that of a bank, an option mainly exercised during the 1990s, allowing them to access interbank money markets, and later securitisation,

allowing mortgage banks to expand their mortgage portfolios and increase their profits. In addition, the deregulation made it legal for banks to issue residential mortgages, while centralised lenders began to enter the residential mortgage market. The thesis discussed how the geographies of mortgage funding became spatially reconfigured, and in so doing addressed the second and third research questions which concerned the geography of mortgage production and how this geography has become transformed. In particular, the research has illustrated how the localised circuits of mortgage funding became integrated with the international capital markets as different types of mortgage lenders accessed their mortgage funding through the interbank and international capital markets.

Since The Financial Services Act and The Building Societies Act were both passed, the UK mortgage market has undergone a series of dramatic transformations. The introduction of new technological infrastructure, such as credit scoring, discussed in Chapter 6, restructured the geographies of mortgage production, as the importance of branch networks declined. The thesis discussed, in Chapter 5, how mortgages were traditionally underwritten by the branch manager of a building society, and later bank managers as banks entered this market, but credit scoring technologies initiated a redistribution of financial power as the decision-making procedures were automated and moved to specialised centralised, processing centres. Subsequently, a geography of centralised processing centres emerged, which arguably exercise the power to financially include or exclude UK consumers from housing credit. This geography is dispersed across the UK, a pattern that was explained through the particular geographies and histories of the three different types of mortgage lenders: building societies, centralised lenders and retail banks. Building society processing centres are located close to the building society headquarters in order to exercise control over the centre, but also as there is no clear advantage to locating further away from

their headquarters and their regional market, a geography that is reinforced by the historical locations of building society headquarters that are distributed around the country. The location of retail bank processing centres are more widely distributed which can be explained by the national scale on which they operate, compared to building societies that have a tendency to be regionally concentrated, so are more likely to locate their processing centres in areas that have low operational costs, or because they have inherited a processing centre from another financial services provider which they have acquired. Centralised lender processing centres are distributed throughout the UK to benefit from low operational costs, while their locate headquarters are more often than not located in London as it provides them with access to the capital markets, law firms and investment banks as they are reliant on securitisation. The contemporary geography of mortgage processing is dynamic and will continue to change in response to regulatory transitions and technological innovations. It is also likely that the current credit crunch may initiate a new phase of restructuring, as Santander, the owner of Abbey, begins to streamline its processing operations following its purchase of Alliance & Leicester and the branch network of Bradford & Bingley. The Lloyds Group may seek to reduce the number of HBOS's processing centres, which will reshape these geographies – an area of potential further research.

Mortgage lenders were only able to centralise their operations through the adoption of credit scoring, a decision-making technology imported from the US to the UK. The development of credit scoring, and its adoption within the UK, was explored in Chapter 6, which sought to explore the internal workings of credit scoring. In doing so, this thesis identified how scorecards develop and exercise their power through the alignment of heterogeneous materials and human relations to develop power asymmetries. The scorecard becomes an obligatory passage point that provides access to credit, for those who desire it, through the practice of surveillance and

the encoded performance of epistemic knowledges through software operated through the centralised processing centres. The research also identified how proponents of ANT have a tendency to fixate on a network's attempt to enrol actors. However, credit scoring, as an actor-network, actively seeks to exclude specific actors that bear particular, undesirable attributes that are judged to represent a consumer who is a 'bad' credit risk from joining the network of the financially included.

Chapter 6 sought to examine the processes used to develop scorecards, in order to highlight and acknowledge how human expertise, embedded within epistemic communities is responsible for developing the codes used by credit scoring software. This revealed that although credit scoring is automated and its construction is primarily derived from quantitative epistemologies, it is fundamentally reliant on social judgements, knowledges and the experience of credit analysts. It was also uncovered how the spaces of financial inclusion and exclusion are fluid and vary temporally as the capability of scorecards to accurately discriminate consumers into the categories of 'good' and 'bad' consumers varies overtime, as scorecards become outdated. As such, the predictive ability of scorecards to identify 'good' and 'bad' consumers fluctuates, which reshapes the spaces of financial inclusion and exclusion before the scorecards are adjusted or replaced.

I also highlighted the geographies of credit data in Chapter 6, which emphasises how credit data is subject to varying combinations of self-regulation by consumer credit lenders and the specific legislation of particular nation-states in which they reside. The range of available consumer data attributes and the richness of this information is also governed by the history and development of a country's consumer credit market which generates the credit data that can be used in credit

scoring. Countries, whose consumer credit markets are established, enable the financial services industry to amass substantial longitudinal databases of consumer data, and analysts argue that these larger, historical datasets assist them in producing more predictive scorecards. This thesis' examination of credit scoring, and the consumer data used in underwriting, was used to view how credit data was misused in the US context of subprime lending, which illustrates how the data used in credit scoring and underwriting are open to abuse. While the research focussed on the development of scorecards prior to the crunch, this raises new questions as to how new credit scoring products and technologies may be utilised to aid mortgage lenders in identifying consumers that are likely to default during the credit crunch. This also raises additional questions as to how the credit crunch will affect the credit records of individuals, with increases in missed payments and defaults. It is likely that an increase in adverse credit data will result in increased application rejections within the prime mortgage industry, which may signal an increase in demand for subprime products from previously prime customers, providing there is a subprime market with enough capacity to meet demand, an important area of potential future research.

Detailed empirical research that has focussed on securitisation in the UK has been limited to the work of Pryke and Whitehead (1994) who viewed securitisation as a mechanism to invest capital into the built environment, and of Langley (2008), who examined how consumers have become embedded into high-finance through securitisation. In contrast, this thesis embarked on a detailed examination to understand how individual mortgages are converted, through securitisation, into bonds, with a focus on the roles performed by different epistemic elites who reengineer the income streams from mortgages to produce bonds and succeed in reducing the exposure of the transactions to taxation. The initiation of securitisation, despite being coordinated by mortgage lenders, occurs on the

boundaries of the lender, where it interfaces with the epistemic elites of investment banks, corporate service providers and law firms.

The research identified the two main ways in which the financial service providers necessary for the production of RMBS were chosen by mortgage lenders. First, lenders chose the companies that they had successfully used on previous securitisation transactions. Second, the lenders would draw upon the broader experience of service providers that have been involved in successful securitisations with other lenders. The thesis investigated how deregulation and the 'Big Bang' led to the transference of securitisation from the US to the UK, through investment banks, which imported the idea of securitisation into the City and introduced and nurtured the formation of new epistemic elites who began to perform securitisation in the UK for mortgage lenders. The role of London's prominent law firms in securitisation was also highlighted, in addition to the importance of their clustering within London, which has fostered the development of legal epistemic elites, who interpret alterations to UK legislation that has proven instrumental in the adaption and performance of securitisation within the UK.

One of the key findings of the research was the identification of the role of SPVs that insulate mortgage lenders from credit risk, reduce the regulatory capital reserves of mortgage lenders, as well as reducing the effect of tax liabilities on the revenue streams involved in the transaction to ensure that RMBS bond holders are repaid in full. This finding drew attention to the use of financial structures - used in the performance of a securitisation - that are constructed by law firms and managed by corporate service providers. Chapter 7 illustrated how the legal status of charitable trusts are mobilised by law firms to minimise the tax liabilities that affect securitisations reducing the likelihood that changes in taxation rates will reduce the repayments in RMBS investors. In turn, this has produced a

concentrated geography of RMBS SPVs. A synthesis of the variations between different political economies and their particular tax regimes has developed an enclave of UK mortgage assets in London, where billions of pounds of residential are associated with companies registered at a few select addresses, at the offices of corporate service providers.

The thesis sought to replicate the sociological analysis used by academics that investigate the performance of financial markets (for example, Knorr-Cetina and Bruegger, 2002; Maurer, 2001; and Pryke and Allen, 2000) to develop an understanding of how consumer income streams are restructured in the performance of securitisation. The structuring of RMBS transactions has spatial implications, and the spatial attributes of mortgage assets are encoded into waterfall structure models. This is to attempt to protect the investors of RMBS from disproportionate concentrations of credit risk from consumers concentrated in particular regions. During the research it was also discovered that while bond-rating agencies provide financial governance through the production of risk metrics, the use of their bond-rating methodologies by RMBS structurers to perform securitisation, has embedded the knowledges of bond-rating agencies indirectly into the waterfall structures of RMBS production, which has extended their role from governor to structurer, which raises questions surrounding the independence of their metrics. Bond-rating agencies have received substantial criticism from the financial media since the credit crunch, and this thesis suggests that new modes of governance may emerge to supplement the role of the three main bond-rating agencies, an area for further research to understand new modes of governance that may emerge from the crisis.

8.3. Contributions to political economic theory

The thesis engaged with the diverse and contested narratives written on money and its value(s), discussed in Chapter 2, to explore the origins and intellectual traditions that seek to understand money and credit, in order to contextualise the theorisations that can be used to comprehend the role of RMBS notes in the economy. The thesis examined Marx's early work, drawing on that of Smith (1976 [1776]) and Ricardo (1951), to develop an extensive understanding of monetary theory, where the value of money is derived from the human labour embedded in material objects based on the labour theory of value. Marx provided early theorisations of credit, later expanded upon by Harvey (1982), to explain how the value of credit money reflects the, perceived, future value of labour, not yet exploited by capitalists. This is important for understanding RMBS notes as a form of credit money, as illustrated in Chapter 7, which is used by retail banks and centralised lenders to allow them to continue their mortgage lending and to accumulate additional profits. However, instead of using the capital to buy fresh means of production, mortgage lenders use the money exchanged from their credit notes to produce new mortgage assets. This theorisation of RMBS complements Marx's, and Harvey's, arguments on understanding the role of credit money in contributing to financial crises, when mortgage lenders develop fictitious capital through the issuance of RMBS notes. When these notes are overproduced by unscrupulous issuers, such as US subprime lenders, where there is little chance of the notes being repaid, the value of the notes is reduced as they are shunned by investors, as witnessed during the credit crunch. This leads to the notes becoming devalued, creating a crisis of trust for credit money in general as investors return to assets bearing less risk (Harvey 1982).

Criticisms by Simmel (2003[1907]) and Weber (1968) have sought to undermine Marx's labour theory of value, instead pointing to other ways in which money derives its value, where people value an object based on the quantity of money they believe is necessary to exchange for an object. The thesis sought to determine the particular sociological origins of 'value' that exist beyond the materiality of money's form, which can be used to understand the value behind RMBS notes, as the labour theory of value is not compatible with the development of RMBS notes as no material labour is exerted on an underlying commodity. Instead, the thesis contributes to debates on how the production of value is achieved through calculative practices performed by epistemic elites to understand how money and credit can be conceptualised. Social scientists have focussed on the assemblages of elites, knowledges, objects and technology which highlight the importance of the relationships between human and non-human actors (Pryke and du Gay 2007) in the production of money and credit. This thesis provided insight into how money can be considered to be a symbolic cultural artefact that is culturally formed through conventions and social interactions (Maurer 2006) through the use of computers, knowledges and bond-rating manuals used to develop waterfall structures and RMBS notes that circulate amongst investors as money. The research demonstrated how value can be produced through trust and calculative technologies developed, contributing towards theories of money within economic geography and the wider social sciences.

The thesis has also contributed to the ongoing work on financialisation that has begun to gain momentum within the wider social sciences but also within economic geography. In drawing attention to financialisation's contested past, the review in Chapter 2 outlined how financialisation comprises of a series of different discourses which operate in a multitude of different spaces. This thesis has contributed to the debates surrounding financialisation by outlining some additional

spaces where financialisation is active, but also how specific actors modify particular spaces so that they become compatible with the politics of financialisation. Financialisation's politics have come to focus broadly on the spectre of shareholder value (Froud et al. 2000), in particular, the increased pressure of institutional investors on companies, including banks and mortgage lenders, to increase their profits through modifying the corporate behaviour of managers.

This thesis argues that the politics of financialisation contributed to the transformation of the UK mortgage industry to increase its profitability. Chapter 5 outlined the strategies used by mortgage lenders which have included bank mergers, centralisation, credit scoring and the development of programmes that would enable them to access the interbank markets through securitisation. The deregulation of the UK mortgage market combined with demutualisation, the entrance of publically owned mortgage lenders that were owned by shareholders in the 1990s witnessed the financialisation of the UK mortgage market, as building societies - that redistributed their profits to their members – lost their monopoly on the mortgage market to retail banks and centralised lenders who passed their profits to their shareholders. In this sense, the distinctive non-capitalist segment of consumer lending which used regional circuits of capital became assimilated within the international circuits of capitalist accumulation.

Chapter 6 examines the development of consumer subjectivities through credit scoring that expands on the work of Langley (2006; 2007) who has explored how the government is attempting to equip consumers with the ability to regulate their bodies and thoughts through financial literacy. The aim is to produce responsible investors that are able to protect themselves as the welfare state is withdrawn, by investing their own financial resources into pension funds and unit trusts. The

research in Chapter 6 on credit referencing agencies draws attention to the way in which credit referencing agencies produce and store consumer subjectivities, which act as private disciplinary technologies that govern the behaviour of consumers. This has emerged as consumers are able to check their credit records and are increasingly made aware, through the media, as to how their credit data will affect their future ability to access credit, which contributes to the performance of self discipline, prudence and planning by consumers.

8.4. Contributions to economic geography

Finally, the research has focussed on the role of financial centres, central to the circulation of international financial capital. London's reputation as an international financial centre was damaged after the second world war, but its prestige returned as a result of the burgeoning euro money markets but also as sweeping regulatory changes in the 1970s which witnessed an expansion of the operations of resident US investment banks in the City while UK merchants banks moved into investment banking (Plender 1986). Epistemic elites has become increasingly more important to economic geographers as they have begun to study the role of elites and the uneven geographies that they produce (Schoenberger 1991). This research has argued that the historical legacies of London have contributed to the embedding of securitisation in the City, by nurturing the development of new epistemic elites, working practices and education (Hallsworth and Skinner 2008) that not only displaced the old 'gentlemanly capitalism', but introduced new financial knowledges and products. In this thesis I have also drawn attention to the importance of proximity between mortgage lenders, lawyers and investment bankers, in order to initiate securitisation transactions. Geographical proximity is necessary to draw upon the different skills and knowledges required to perform

securitisation, but also to circulate new ideas amongst these elites as they continue to develop new innovations.

The research has also expanded on geographical research and the role of financial centres at the regional level. While there has been a tendency to focus on global financial cities (Amin and Graham 1997; Robinson 2006) this thesis has acknowledged research that has been conducted on smaller regional centres that act as processing spaces for financial data (Leyshon *et al.* 1989; Richardson and Marshall 1999; Bailey and French 2005). However, this thesis has attempted to highlight the role of what it argues are powerful, regional financial centres, that are linked to London and the international financial markets through securitisation. The research in Chapter 5 argues how these centres of underwriting exercise financial power through scorecards, which in turn are determined by financial elites that financially include and exclude particular consumers based on their personal characteristics. The thesis outlines a geography of regional financial centres, and suggests that the power of these centres has, until now been understated, and that although these centres are not as dynamic as London, the credit risk decision-making performed in these centres, underpins the credit quality of mortgages and RMBS notes, which are later circulated through the international capital markets. In addition, the analysts that produce scorecards are frequently based in these regional financial centres which highlight how financial elites that wield financial power are not strictly limited to financial institutions within London, as these elites encode their knowledges into scorecards which determine which consumers are able to purchase a house with a mortgage and which assets are later restructured to form RMBS notes.

8.5. Research limitations

One limitation of the research is that the findings are not definitive and that the research should be considered as one thread situated amongst a wider web of discourses that can be used to raise new questions regarding credit scoring and securitisation. Subsequently, the thesis should be viewed as a partial reading of economic geography, securitisation, credit scoring and mortgage production, as a complete review of the UK mortgage and securitisation markets, situated against a historical background were beyond the means of the thesis. The findings were also limited by the following issues. Framing the research was complicated as the research began at the end of a decade of substantial growth within the housing markets, when securitisation was a celebrated financial tool for providing housing finance and asset growth for consumers and investment opportunities and increased profits for the financial sector. Subsequently, the financial sector's view of itself changed throughout the research process and some of the celebrated actors addressed in the research, such as securitisation and financial analysts had their reputations downgraded by their peers. As such, the responses of interviewees to certain questions changed over time as the industry began to re-evaluate securitisation and centralised lender business models, making it difficult to reconcile different views by different research participants over time.

An additional impact of the credit crunch on the research was the difficulty in accessing research subjects as the crisis deepened, which reduced the number of respondents willing to participate in the research. Although the recession provided some new opportunities for the research, criticism of the financial sector by the media made research access more complicated, especially as the visibility of market participants began to fade as the capital markets closed. For example, it became more difficult and time consuming to identify and contact UK RMBS investors, at a

time when investors wanted to keep their exposures to RMBS investments secret, a problem which was exacerbated by the time limits placed on the project⁵⁹. As such, research into the consumption of RMBS notes by investors was withdrawn from the project.

If I was to undertake the research again, there are several changes that could be implemented. As attempts to contact investors were time consuming and returned few interviewees willing to participate in the research, this time could have been used differently to expand on the following three areas of research. First, it would have been useful to gain greater access to investment bank structuring departments in order to determine if there were any differences in the development of securitisation structures by investment banks based on their different geographical origins. For example, did US investment banks have more experience in underwriting higher risk UK transactions than their European counterparts based on their experiences in US subprime securitisation, or did these investment banks use different features in their securitisation structures depending on their attitudes to the risks inherent in securitisation? It was challenging to enrol research respondents from structuring departments and it would have been useful to have attempted to contact structurers that had been made redundant during the recession, in order to potentially gain a more critical review of the development of waterfall structures and any problems that were recognised by these actors, but that were not acted on by executives. Second, it would be useful to have explored other funding mechanisms in more detail, such as medium-term notes and covered bonds, to situate the importance of securitisation amongst other external funding techniques and to understand how reliant UK mortgage lenders were on capital market funding. The final change would seek to explore the development and implementation around

⁵⁹ After the collapse of Bear Stearns and Lehman Brothers, investors did not want to advertise that they were RMBS investors, as other financial institutions would be concerned as to whether they were about to collapse from their exposure to US RMBS investments.

credit rationing in the wake of the recession and the socio-technical engineering involved to develop an understanding as to how credit scoring is altered and monitored in relation to mortgage lender liquidity.

Finally, to draw the conclusion to a close, this research has sought to provide insight into the wider processes of capitalism and financialisation, though the dissemination and transplantation of business models, ideas and epistemic communities that circulate within specific spaces of financialisation. Marx may have forecasted the collapse of capitalism from its internal contradictions, but it was Braudel who provided the nuanced suggestion that capitalism will always be sick, but will never die (Froud *et al.* 2007:339). Perhaps what is important to understand about capitalism, and the disproportionate power wielded by economic elites, is their ability to create new financial products and technologies that are useful in reengineering capitalism, as investment banks, law firms and mortgage lenders have used credit scoring and securitisation to increase corporate returns. I have little doubt that old financial technologies and products will be modified, while new products and technologies will be devised to supplant the failure of the financial strategies that contributed to the credit crunch.

This research has attempted to historicise and highlight how the geographies of financial knowledges and their adoption is spatially uneven, determined by the compatibility of these knowledges and devices with particular political economies, and the politics of the actors that circulate these financial knowledges and technologies. The thesis has aimed to offer a modest contribution towards understanding financialisation and the production of consumer mortgages, that has sought to provided a narrative as to how the technologies of securitisation and credit scoring have reshaped the geographies of retail finance, and how the

enhanced integration of the UK mortgage market into the international financial markets has exposed it to external shocks and systemic risks.

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Appendix 1

1. Treasury Director

Interview in December 2007. This individual was employed by a large UK retail bank and had extensive experience in different retail banking roles, in other UK retail and clearing banks, and oversaw the running of the treasury department.

2. Securitisation Manager

Interview in December 2007. This manager was employed by a large UK retail bank and previously worked as an accountant and was responsible for managing new and existing securitisations.

3. Director of Fixed Income

Interview in August 2007. This director worked for a large global institutional investor. Key responsibilities involved managing funds that invest in corporate, sovereign and RMBS bonds.

4. Securitisation Manager

Interview in September 2007. This individual was responsible for managing the issue of securitisations for a UK retail bank.

5. Director of Risk Management

Interview in February 2007. This individual was responsible for managing the different types of risk across a large UK retail bank. This employee had extensive experience in developing scorecards and risk policies.

6. Director of Securitisation Research

Interview in April 2007. This director was head of the research team for securitisation in an investment bank. He had previously worked in securitisation for a different investment bank.

7. Director of Trade Body

Interview in January 2007. This individual worked for a trade body that represents part of the UK financial sector. This employee has experience working in the UK retail banking and building society sectors.

8. Electoral Services Manager

Interview in October 2006. This manager was responsible for managing a council's electoral roll. Their responsibilities included the registration and compilation of electoral information.

9. Trade Body Spokesperson

Interview in January 2007. This employee was the spokesperson for an industry trade body that represented the UK's financial services sector, and was responsible for briefing the media.

10. Director of Risk

Interview in November 2007. This director was responsible for running a credit referencing agency. They had previously worked in the UK's financial services industry.

11. Risk Manager

Interview in December 2007. This employee developed new products for a credit referencing agency.

12. Trade Body Spokesperson

Interview in February 2007. This employee was the spokesperson for an industry trade body that represented the UK's financial services sector, and was responsible for briefing the media.

13. Securitisation Research Analyst

Interview in April 2007. This analyst worked for an investment bank and was responsible for compiling research and reports for use by the investment bank and its clients.

14. RMBS Trader

Interview in May 2007. This employee sold securitised products to investors for an investment bank that was tasked with distributing RMBS bonds, by the structuring investment bank and originators.

15. Director of Trustee Services

Interview in April 2007. This individual was a director for a trustee services arm of an investment bank who held RMBS notes on behalf of investors.

16. Director of Risk

Interview in December 2007. This individual was a director of a credit referencing agency and was responsible for overseeing the development of scorecard production and credit referencing products.

17. Bond-rating Analyst

Interview in November 2007. This analyst was responsible for checking RMBS and other securitised products, to ensure that they were eligible for the bond-metrics issued by the company.

18. Partner

Interview in July 2007. This individual worked for an international law firm and was responsible for overseeing the development of the legal frameworks and contracts associated with securitisation transactions.

19 Government Analyst

Interview in June 2007. This employee was responsible for undertaking research on the effect of Basel II capital adequacy changes on the UK financial sector.

20. Risk Manager

Interview in February 2007. This risk manager worked for a large UK retail bank and was responsible for overseeing and developing scorecards for the bank's consumer finance products.

21. Treasury Analyst

Interview in April 2007. This analyst was responsible for preparing the necessary data and documentation for the bank's securitisations before they were structured.

22. Director of Finance

Interview in September 2007. This individual was responsible for coordinating a centralised lenders financial activities and securitisations. He had previously worked in both investment banking and centralised lending.

23. Director of Capital Markets

Interview in April 2007. This investment bank employee was in charge of the arm of an investment bank which raised capital for companies and banks through bond issuances and securitisation.

24. Director of Securitisation Research

Interview in May 2007. This director was in charge of conducting research and developing reports for the investment bank that he worked for and their clients.

25. Securitisation Structurer

Interview in June 2007. This investment bank employee was responsible for designing RMBS waterfall structures and liaising with mortgage lenders during the production of a RMBS transaction.

26. Chief Investment Officer

Interview in August 2007. This individual was responsible for managing the investments of a large institutional investor and developing the investment strategy of the group.

27. Securitisation Manager

Interview in October 2007. This manager was responsible for coordinating the securitisation of mortgage assets for a centralised lender which was the arm of an investment bank.

28. Director of a Corporate Service Provider

Interview in June 2007. This director was responsible for the management of a company that provides corporate services to SPVs used in securitisation.

29. Director of Retail

Interview in February 2007. This director was responsible for managing the retail banking department of a large building society.

30. Electoral Services Manager

Interview in October 2007. This individual was responsible for managing a council's electoral roll. Their responsibilities included the registration and compilation of electoral information.

31. Securitisation Manager

Interview in April 2007. This manager was responsible for managing the issue of securitisations for a large UK retail bank.

32. Director of Finance

Interview in September 2007. This director managed the financial affairs of a centralised lender and was heavily involved in managing the company's securitisation programme.

33. Bond-rating Analyst

Interview in April 2007. This bond-rating agency employee checked RMBS deals and securitised products, to ensure that they were eligible for the bond-metrics issued by the company.

34. Product Manager

Interview in August 2007. This manager worked for a large institutional investor and designed new financial products. They had been involved in the purchase and management of RMBS funds in the past.

35. Ex-commercial Bank Director

Interview in July 2007. This director began his career in a commercial bank and was involved in some of the UK's first securitisation transactions.

36. Partner

Interview in June 2007. This partner works for an international law firm and oversees the development of the legal frameworks and contracts associated with securitisation transactions.

37. Director of Investments

Interview in July 2007. This director works for an institutional investor, specialising in fixed income investments and was responsible for conducting analysis and recommending which assets, including RMBS should be purchased by fund managers.

38. Director of Investments

Interview in July 2007. This director worked for a structured investment vehicle managed from London and was responsible for deciding which investments to make, which frequently included RMBS assets.

39. Treasury Manager

Interview in November 2007. This employee worked in the treasury department of a building society and was involved in the society's interbank money market activities and covered bond programme.

40. Director of Commercial Lending

Interview in November 2007. This employee worked for a building society's commercial lending department and used capital market funding to fund the commercial loans.