Originate-to-Distribute Model and UK Financial Institutions

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The subprime mortgage crisis has brought attention to the business model, (namely the originate to distribute (OTD) model), that a vast majority of banks have adopted. In the OTD model the originator of a loan sells it to third parties through a securitisation process. The OTD model can be an efficient risk sharing tool for financial institutions to diversify their portfolio. However, the conflict of interest between different parties and potential incentive problem has eroded the original intention of the model. Furthermore, the financial contagion effect evolving from the OTD model of lending, contributes towards a significant proportion of the credit crisis in 2008. Because of data limitation we choose to examine the OTD business model of Lloyds Banks and Northern Rock. We adopt Purnanandam's (2008) approach using the difference-to-difference method to analyse the participation of UK OTD mortgage market pre-subprime crisis and post-subprime crisis periods. We show the difference of two UK commercial banks' participation in mortgage market prior to the credit crisis and post-disruption period. We find that the ability of the transfer of credit risk through the OTD model encouraged the origination of inferior quality loans by the banks. We also find that the OTD model affects banks' attitude towards risk from risk aversion to risk taking investment behaviour. We conclude that the OTD model is a positive financial innovation. However the screening incentive needs to be revised and monitored.

Keywords: Originate- to-Distribute, subprime crisis, incentive problem

1. Introduction

The resilience of UK financial system has been severely challenged in 2008. The collapse of US subprime mortgage market has sent a shock wave into the global financial system. The severity of this financial crisis is substantial. Reputable financial institutions have been bankrupted (Lehman Brother), nationalised

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(Northern Rock) or acquired (Merrill Lynch) by others. Fund managers were forced to liquidate their position to meet the clients' demand as investors tried to rush out of the capital market. Public criticisms and academic debates are focused on the greediness of banks. However, the question reminds unanswered as how can a collapse of single domestic market leads to a global financial chaos. Ashcraft - Schuermann (2008) provide an overview of subprime mortgage securitisation process and several key informational frictions that arise.

Financial innovation enables financial institutions to shift its investment behaviour from originate-to-hold to originate-to-distribute (OTD), where the originator of a loan sells it to various third parties. In the past, banks receive funds from depositors and make loans to borrowers. The function of intermediary based on different liquidity preferences allows the flow of funds smoothly within the banking system. However, in recent years, because of the ability of transferring credit risk through the originate-to-distribute business model, banks are encouraged to originate excessive loans without appropriate monitoring and screening process. Purnanandam (2008) found that lack of screening incentive created by the separation of origination from the ultimate bearer of the default risk has been one of the major contributing factors to the US subprime mortgage crisis. However, the originate-to-distribute model of lending has its own strength. Diversification of banks' portfolio through originate-to-distribute model allows banks to reach optimal risk-sharing and therefore enhance the resilience to possible financial shock and reduce regulatory capital requirement by moving its positions to off-balance sheet. It is however, the incentive structure of the originate-to-distribute model causes irresponsible investment behaviour.

Banks possess an unique function in the economy, they acts as an intermediary upon various liquidity preferences. Banks are able to assess borrowers' credibility shall they require a loan. It is banks' responsibility to conduct appropriate due diligence before approval any loans. It is also a standard procedure in terms of risk assessment for banks to perform screening and monitoring functions. However, sometimes they might not fully use these functions. With the application of Originate-to-Distribute business model, financial institutions are able to transfer credit risk to third parties while maintaining their profits. The incentive of performing due diligence and other risk assessments has been reduced significantly. The quality of mortgage originated by the financial institutions who widely adopt OTD model deteriorated as screening function is poorly performed.

This business model works well from 2001 to 2006 as the market was enjoying an explosive growth. Assets value rose significantly, in particular the property price has gone up dramatically since then. Mortgagors were able to roll over the loan based on the appreciation of their property value. However, the sign of market reversal first appears in the end of 2005 as loan quality had been worsening for five years in a row at that point. (Demyanyk - Van Hemert 2008) the cost of

excessive lending is severe as the world economy is suffering the worst economy downturn since the Great Depression. It is clear that banks were unable to understand the true risks of these loans that they originated. The flowchart provided below is a simplified OTD model and there are a number of conflicts involved in different stage. Subprime lenders are willing to provide mortgage to subprime borrowers as they can generate fee without bearing the risk of default through the OTD business model. Investment bank securities subprime mortgage and sell it to pension fund and asset management. Arguably, if the credit rating agencies performed its function correctly, the severity of this financial crisis might not be as damaging as it is now. It is difficult to assess the risk of a structured product due to its complexity and lack of information, that is why investors and fund managers are heavily reply on credit rating agencies, unfortunately, because of the nature of its fee structure, the credit rating agencies were unable to provide independent credit assessment as they are being paid by investment banks who securities subprime mortgages.

While the OTD model being on the centre of debate, this financial innovation delivered numerous benefits to the financial system. This paper will focus on its incentive structure and the participation of OTD market within UK financial system. The paper is structured as follows: chapter 2 presents an overview of OTD model, in particular, the conflict of interest between different parties. It must be noted that the availability of data are lower in UK compare to US. Chapter 3 describes the data and summary statistics. In chapter 4 we present the empirical evidence for the participation of OTD market and chapter 5 conclude the paper.

2. Overview of the OTD model

Financial innovation evolves in response to capital constraint. Over the last decade, bank credit has shifted from traditional originate to hold to originate to distribute business model, where banks originate loans and sell it to third parties through securitisation process. There are six major players in the model and each of them possesses different key role. They are borrowers, originators, arrangers, distributors, investors and credit rating agencies. The relationship between each party is illustrated in figure 1 below. First thing to note from the chart was that the model is a bottom-up approach, start from borrowers and move up to investors. Each party is only interest in its next party. This next nearest phenomenon creates potential incentive problem which prohibit each party from performing its origin screening and due diligence functions.

2.1. Conflict of interest between Borrowers & Originators

Banks are able to act as financial intermediary base on individual's different liquidity preference. Borrowers are people who needs mortgage to finance their home purchase or refinance their existing mortgage. Borrowers might not be financially sophisticated. They might not be able to act for their best interest because of lack of financial knowledge. If mortgage originators do not provide appropriate financial advisory, borrowers might have a financial product which is not suitable for their financial situation.

Borrowers' credit history will normally be assessed by mortgage originators to determine whether the mortgage should be approved. However, In the case of the subprime mortgage crisis, borrowers' credit history has not been fully assessed because mortgage originators were able to sell their pool of mortgage funds to third party. The incentive for screening procedure on mortgages quality has been significantly reduced because of this credit risk transition.

2.2. Conflict of interest between Originators & Arrangers

Arrangers are usually investment banks or large commercial banks with investment or asset management division. Arrangers are in the centre of the securitisation process. When arrangers buy pool of mortgage loans from originators, the first responsibility is to perform due diligence on originators. This includes review on financial statement of originators and underwriting guidelines. However, arrangers might not fully perform its screening function as they are able to pass it to its next party. Moreover, as originators have superior information on the quality of the mortgages over arrangers, it is difficult for arrangers to fully assess and understand the true risks behind the pool of mortgage loans.

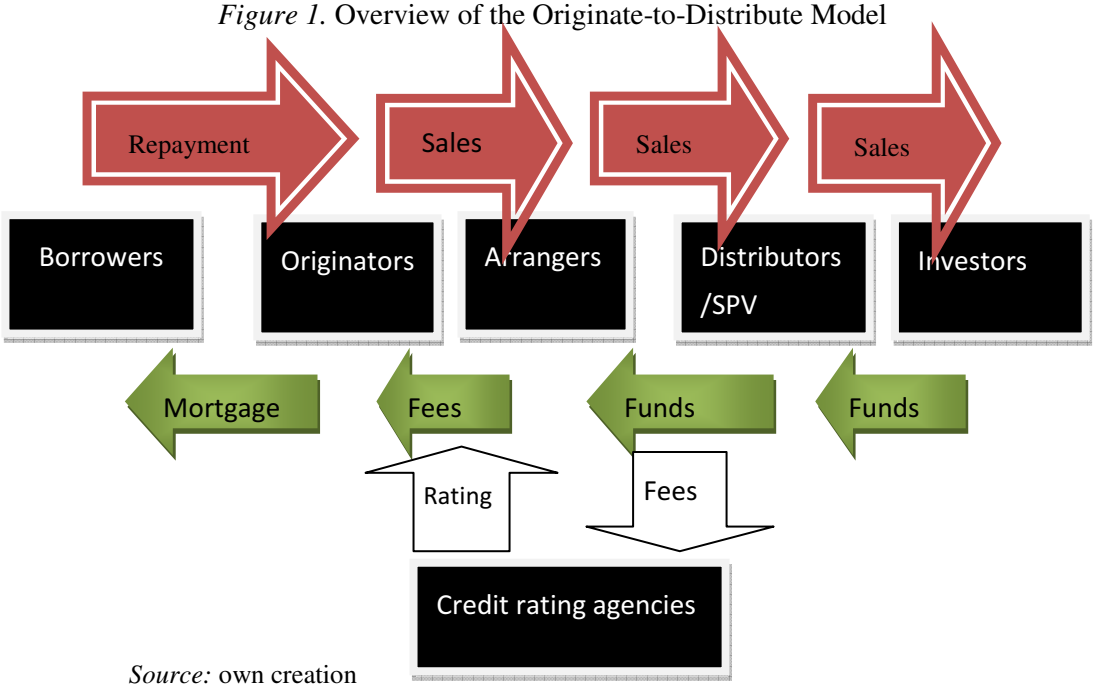
Arrangers then repackage pool of mortgage loans into different debt securities such as collateral debt obligation (CDO). Arrangers assign risk and return accordingly to each CDO and obtain credit rating from the rating agencies for a fee. The nature of this fee structure between the rating agencies and arrangers creates potential conflict of interest. The credit rating agencies were unable to conduct independent credit assessment because they are being paid by arrangers. It is clear that if the credit rating agencies issue unfavourable credit report to the arrangers, the credit rating agencies might risking lose business. The arranger creates a bankruptcy-remote entity to purchase these debt securities in order to protect it from default risk. This special purpose vehicle (SPV) is designed to finance the purchase of pool of mortgage loans without putting the entire firm at risk.

Investors here refer to institutional investors such as mutual funds, hedge funds, pension funds and insurance companies. Investors are heavily relying on

credit rating agencies' opinions to make investment decision. This is because it is difficult for investors to estimate the underlying credit risk of a structured product due to the nature of its complexity. However, as mention above, credit rating agencies were unable to issue objective opinion due to the conflict of interest created by issuer-paid fees model. The structured finance deal contributed a significant proportion of rating agencies' revenue. The information asymmetry between investors and the credit rating agencies has exposed investors to the risk of dishonest of the rating agencies.

There are different degrees of conflict of interest in different stage of the OTD model. The incentive of screening on loan quality and perform due diligence on originators are crucial. Moreover, disclosure of rating and downgrade criteria can be helpful for public to observe.

Figure 1. Overview of the Originate-to-Distribute Model



Source: own creation

3. Methodology and Empirical result

UK banking system is constituted by a small number of large financial conglomerates. The big four banks are accounted for 80% of the market share. The remaining 20% of market shares are accomplished by local banks and building societies. We use Lloyds TSB and Northern Rock for this study. We obtain data from the bank annual report between 2005 to 2008, this includes bank's balance

sheet, income statement and off-balance sheet activities. We define 2005 to 2006 as pre-crisis period and 2007-2008 as post-crisis, use Purnanandam (2008)'s difference-in-difference methodology.

We extract several key information from balance sheet, income statement and off-balance sheet activities. We obtain information on bank's total assets, mortgage loans, total deposit, demand deposit and other variable from annual report. We use the loan subject to securities as the measure of a bank's involvement in the OTD market and loan lost provision as the measure of mortgage lost. We measure bank's liquidity as the ratio of demand deposit over total deposit. This is to analyses bank's attitude towards the OTD market under capital constraint. We use available for sale debt securities on balance sheet to measure the result of involving in the OTD market. Our interest is in creating a meaning proxy measurement of the credit risk transfer that a bank engages in. Our hypothesis is that banks have the incentive to issue inferior mortgage loans because they are able to generate profit without bearing the credit risk of borrowers through the OTD business model. This is preliminary study as UK data is difficult to obtain compare to the US.

Our sample consists of Lloydss TSB bank and Northern Rock with available data in mortgage issuance activity from 2005 to 2008. We define 2005 and 2006 and pre crisis period and 2007 and 2008 as post crisis period. We start our investigation with loan lost on banks' balance sheet. We are interested in relating the loan lost to a bank's involvement in the OTD market before the subprime mortgage crisis. We initial our test by fit the following regression model with four years data from 2005 to 2008.

$$\boldsymbol{loanlost_{it}= \beta_0+\beta_1 preotd_i+\beta_2 dummyaftert+\beta_3 available+\varepsilon_{it}}$$

The dependant variable is loan lost on banks' balance sheet from year of 2005. $preotd_i$ is banks' loan subject to securitises, which measures the extend of bank i 's participation in the OTD market prior to the subprime mortgage crisis. The coefficient of this variable measures the average quality of loans issued by such banks. *Dummyafter* is a dummy variable that equals one for post crisis period and zero for pre-crisis period. This allows us to capture the severity of the subprime mortgage crisis and banks' damage according to different level of the OTD market involvement. *Available* is the available for sale debt securities. This variable measures banks' involvement in the OTD market.

The results of the OLS are provided in appendix. We regress loan lost with *preotd, dummyaftr and available*. We find *preotd* is negative and insignificant. This suggests that there is no evidence that the sample banks are heavily participate in the OTD market. This result matches the conclusion of European Central Bank's working paper 2008 December volume which was that European banks are less involved in the OTD market, however, they have been seriously damaged by the

subprime mortgage crisis because they bought large amount of financial derivative originated from the US market. We find positive and significant coefficient on the *dummyafter* variable. This indicates that on average, the loan lost increased significantly after 2006 compare to before. This result confirms the large write-offs in late 2007 because of the subprime mortgage crisis. The coefficient on *available* variable is positive and significant. This suggests that banks with large available for sale debt securities have suffered from larger loan lost.

4. Conclusion

While the public and media blamed the OTD model as the source of the subprime mortgage crisis, this business model helps financial institutions to achieve better risk sharing and managing banks' portfolio. It is more important to introduce appropriate screening system within the model rather than completely give up this financial innovation. In this paper we focus on UK banks' participation in the OTD market. We show that UK banks were not heavily involved in the OTD market. However, the loan lost on banks' balance sheet was still severe. This is because the majority of UK banks are in the last of the OTD model chain as investors. They invest significant in financial products that were originated from UK mortgage market. This investment behaviour and attitude towards risk might be driven by low interest rate from 2001 to 2004, as well as the booming of the property market.

Our evidence shows that there are different degrees of conflict of interest within the OTD model, which confirms the public criticism that information asymmetry and lack of screening incentive have been a significant contribution to the subprime mortgage crisis. Each party in the model does not have the incentive to perform its original screening and auditing function. This is one of the main direct causes of the subprime mortgage crisis.

Our findings have important implication for UK financial market and regulators. We show that as the majority of UK financial institutions are the investor in the OTD business model, their investment activity is crucial. The risk exposure to cross boarder countries, in particular, the US market is very much concentrated. These finding can help financial institutions to review the diversification of their portfolio. From the regulator's perspective, enhancing transparency in trading activity and certain degree of public disclosure could improve the OTD mode.

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Appendix

Table 1.

Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
year	8	2006.5	1.195	2005	2008
totalassets	8	2305501	144668	82709	436191
residentmortgage	8	87392	17798	62290	114643
Mortgage/ta	8	.514	.255	.26	.83
customerdeposit	8	50952	33543	11563	96220
totaldeposit	8	85502	70403	11563	172364
Cd/td	8	.77	.246	.53	1
loanlost	8	1091	978	57	2876
liquiditasset	8	52991	50215	1483	113405
liquidity	8	.173	.123	.01	.33
availableforsale	8	12072	8530	1483	26457
preotd	8	34078	14715	10048	49326
dummyafter	8	.5	.5345	0	1

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Table 2.

$$loanlost_{it} = \beta_0 + \beta_1 preotd_i + \beta_2 dummyafter_{t+} \beta_3 available + \varepsilon_{it}$$

Source	SS	df MS	Number of obs	= 8
		F(3, 4)	= 27.97	
Model	6395793	3 2131931	Prob > F	= 0.004
Residual	304855	4 76214	R-squared	= 0.955
		Adj R-squared	= 0.920	
Total	6700647	7 957236	Root MSE	= 276.07

loanlost	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
preotd	-.023	.009	-2.61	0.060	-.0474	.001
dummyafter	802	234	3.43	0.026	153	1451
availableforsale	.085	.013	6.28	0.003	.047	.123
_cons	447	361	1.24	0.283	-554	1449

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