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Income Multiples and Mortgage Repossession in the UK

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Abstract

This paper presents the findings of the study that examines how income multiples for mortgage loan associates with home repossession using the data of the Council of Mortgage Lenders (CML). It employs a statistical measure for improving regression efficiency with conditioning information in the form of lagged instrument to unravel the pattern of association evident from the data. Based on the data, the study investigates what level of income multiples is optimum – that is the income multiple that minimises home repossession. A sensitivity analysis was undertaken to show how home repossession responds to changes in income multiples. For each of the analytical tasks, the study compares the aggregate market, first-time-buyers, and home movers.

Keywords: Mortgage; Repossession; Affordability; Income Multiples; Lagged Instrument

Backgrounds

The income multiples of a mortgage loan determines the potential size of the loan, as well as the ratio of household income devoted to paying the mortgage. Mclaverty and Yip (1994) examine the potential of council tenants in England to become owner-occupiers. The study shows that the income multiples applied for prospective mortgage borrowers have a significant impact on the ability of different groups of people to gain a mortgage. They compare the effects of different income multiples on the ability to buy using income data contained in the UK General Household Survey. Littlewood (1986) devised two forms of mortgage potential called average and marginal. Average mortgage potential refers to the ability of council tenants to gain mortgage loans so that they can purchase a house or an apartment at the average price paid by first-time buyers in their region in a particular year; while marginal mortgage potential refers to the ability of tenants to gain a mortgage so that they can purchase a house or an apartment in the lowest quartile of prices paid by first-time buyers in their region in a particular year. McLaverty and Yip (pp.1373) shows that an increase in the income multiple from 2.5 to 3.5 enables almost three times the proportion of households to gain marginal mortgage potential in London; and in other regions where average house prices are lower, the impact is much higher.

During the housing finance boom, people tend to take on commitments which they have subsequently found difficult to maintain; this has lead to an upsurge of home repossessions. In a sharp reversal of the boom, and subsequent fall in house prices, those who have borrowed on the strength of equity in their homes have found themselves in a state of negative equity; and with the economic downturn that has thrown markets all over the world into a slump, many people are losing their jobs, as companies are going out of business or downsizing. Even those that are not in danger of losing their jobs are finding it harder to manage their finances because of rising costs. The Financial Services Authority (FSA) show that for the three months period up to September 2008, there were about 14,000 homes repossessed. Also, the CML reported that its members were involved in the repossession of 11,300 homes during the third quarter of 2008; an increase of 12% over the same time in 2007. The CML also reported that the number of borrowers who found themselves in arrears on their mortgage during the same period increased by 8%.

This study examines how income multiple for mortgage loan associates with home repossessions using the CML data. By employing appropriate statistical tools, the study unravels the pattern of association evident from the data – including the effects of lags. Also based on the data, the study investigates what is the optimum income multiple, i.e. the income multiple that minimizes repossession; making comparison between the aggregate market, first-time-buyer, and home movers. A sensitivity analysis is conducted to show how home repossession in each section of the market responds to changes in income multiples. The next section focuses on repossession procedures in the UK; this is followed by a discussion of mortgage repossession and income multiples data; then the presentation of the model and the analysis of data, including sensitivity analysis. The last section is the conclusion.

Repossession Procedures

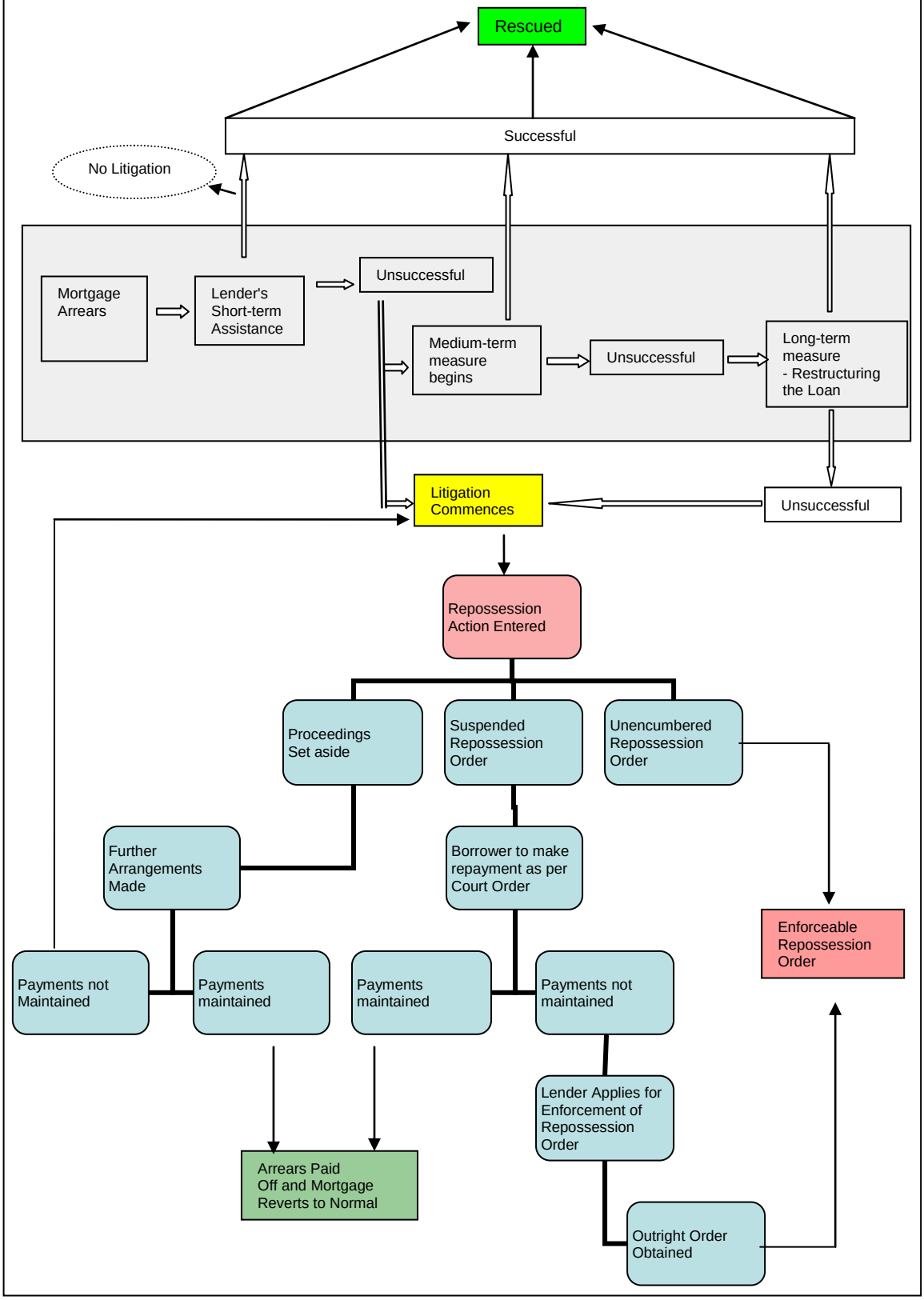
The FSA's Mortgage Code of Business (MCOB) outlines the options opened to a lender when dealing with mortgage arrears, including the details of legal remedies[1]. The code requires lenders to treat mortgage borrowers fairly even when borrowers are in arrears. It is therefore expected that the option to repossess the property could be exercised only when all other reasonable attempts at resolution has failed. As shown in Figure. 1, the assistance by the lender to resolve mortgage arrears can take the form of short-term, medium and long-term measures. The short-term measures are those that are taken before any litigation, usually between one and three months of the account being in arrears. The medium measures are embarked upon when the short-term assistance has failed and litigation has commenced. This may apply to cases that are up to twelve months in arrears. While the long-term measures involve attempts to re-structure or reschedule the loan over a longer period.

The spectrum of options opened to a lender include: arranging with the borrower to pay off the arrears over a given period; a full or partial suspension of monthly payments, the borrower will be expected to settle the backlog after the end of the concessionary period; mortgage and debt consolidation; and accepting interest-only payments for hitherto capital and interest mortgage. Other options include extending the term of the mortgage; capitalising the arrears; and borrower trading down to cheaper property. The range of options a lender is prepared to consider is usually influenced by the lender's perceptions about the financial circumstances of the borrower and the risk of the loan. For instance where the loan-to-value ratio is low, there is less threat to the lender's security; hence, a wider range of options for resolution can be afforded.

Apart from the arrangements between the lender and the borrower, there exists the assistance from the state through the Income Support for Mortgage Interest (ISMI) scheme. This scheme operates a strict eligibility criteria relating to: (i) how much of the loan would qualify for ISMI assistance – this is £100,000 before April 2009 and £175,000 after April 2009; (ii) the maximum saving the borrower can have – this shouldn't be more than £8,000; (iii) the exclusion period that depends on whether the mortgage meets the classification as 'new' or 'existing' housing cost – except for those over the age of 60 years, borrowers with new housing cost (i.e. new mortgage loan after 1 Oct 1995) can not receive ISMI assistance during the first 39 weeks of a claim; borrowers with existing housing cost (i.e. those with mortgage before 2 Oct 1995) would not receive ISMI assistance during the first 8 weeks of the claim, and during the following 18 weeks only 50% of the entitlement is paid; (iv) the arrears that accumulate during exclusion period – ISMI assistance is not payable on this; (v)the applicable mortgage interest rate – ISMI mortgage interest payments are calculated using a standard rate of interest.

[1] See CML (2008), Industry guidance on arrears and repossessions to help lenders comply with MCOB 13 and TCF Principles, CML London October 2008

Figure 1: Mortgage Repossession Procedures



If all avenues for resolution and rescue have failed the unpleasant consequence is for the lender to seek legal remedy through litigation – a process that may lead to repossession. As illustrated in Figure 1, the common approach In England and Wales is for the legal representatives of the lender to petition the county court for a repossession order. Before considering granting a repossession order, the court has to be satisfies that every other option has been explored and that repossession is being pursued as the last resort. After a repossession action has been entered in the county court, three outcomes are possible – (i) action set aside, (ii) repossession order suspended, or (iii) unencumbered repossession order obtained. An unencumbered repossession order has the full authority of the court for its enforcement but a suspended repossession order does not (MoJ 2009).

If a suspended repossession order is obtained, the borrower must make repayments of the accrued arrears as ordered by the court. If payments are maintained, the arrears would be settled over time and the mortgage reverts to normal. If the borrower fails to maintain repayments the lender will apply to the court to obtain an outright repossession order that is enforceable. Once this is obtained the borrower must give up possession by specific date – usually 28 days. If action is set aside the lender and borrower will return to making further arrangements at resolving the arrears. If this works out, arrears would be paid off and the mortgage is back to normal; if further arrangements did not resolve the problem, the lender may embark on a new round of litigation to obtain an enforceable repossession order.

Mortgage Repossession Data

The three major producers of data on mortgage repossession in the UK are Council of Mortgage Lenders (CML); Ministry of Justice (MoJ); and the Financial Services Authority (FSA). Each of these organisations publishes quarterly figures; although their reporting populations differ. The differences relate to regional coverage, loan coverage and repossession coverage. The full details can be found in a technical note of the Ministry of Justice published in 2009[2] – which is summarised below.

In terms of regional coverage, the MoJ data relates to England and Wales, while the CML and FSA figures cover the entire UK. However, CML covers only the first charge mortgages from its members' business books which accounts for around 98% of residential mortgage balances (MoJ 2009 pp.3). The FSA data includes repossessions resulting from first and second charge mortgages, but the figures are only for FSA regulated firms. This means that lenders that are not regulated by FSA, and only carry out unregulated mortgage activities, e.g. second charge, commercial mortgage, and the unregulated buy-to-let, are not reported. The FSA data also differ from CML data in that it reports on total number of distinct loan accounts, while the CML amalgamates multiple loan accounts that relate to the same first charge mortgage

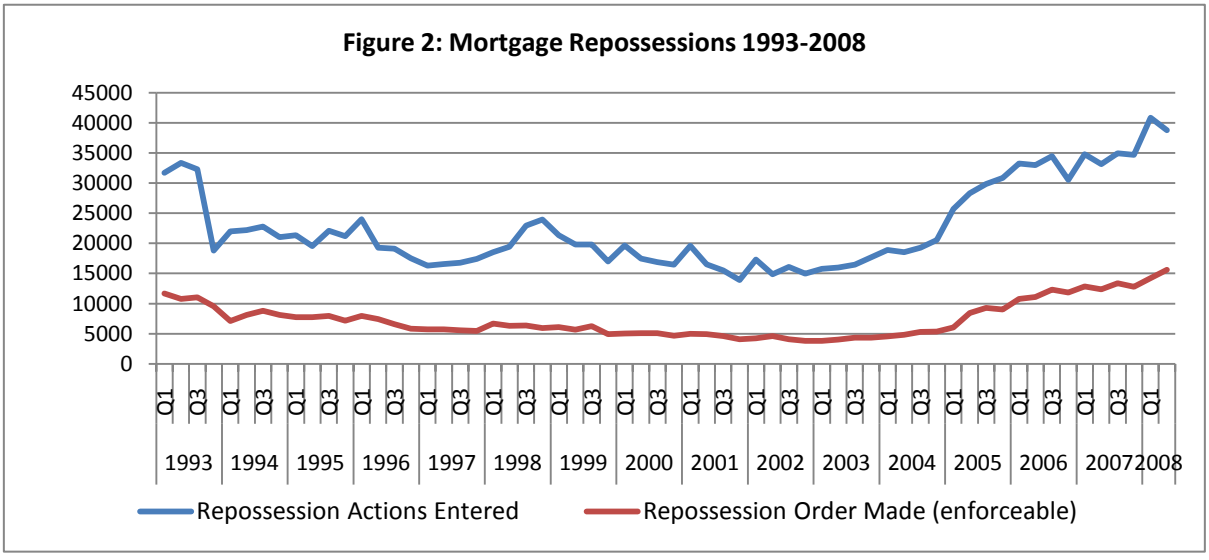
[2] MoJ (2009), Mortgage Lending: Comparison of Published data sources on mortgage possessions and mortgage arrears, Ministry of Justice Technical Note, January 2009

on a property. The implication can be illustrated using the example where part of a mortgage is on a capital-plus-interest loan and another part is on an interest-only basis; the FSA will treat this as two loan accounts while the CML will report it as only one mortgage.

The MoJ reporting is based on county court repossession actions rather than loans. It covers repossession actions entered and repossession orders made. The latter encompasses both the outright or unencumbered orders that entitle the claimant (lender) to apply for a warrant to have the debtor(s) evicted; suspended order is where repossession is granted but the operation of the order by the claimant is suspended and cannot be enforced if the debtor(s) complies with the terms of suspended order. Since it is based on county court processes, the MoJ figures cannot account for voluntary repossession, abandonments, and other cases where the lender has obtained repossession without recourse to the court. For instance, in the third quarter of 2009, about one-quarter of home repossessions took place without a court order[3]. Since the CML and the MoJ data are synchronised, the quarterly releases are very reliable. The analyses in this study are based on the two comparable measures – (i) repossession actions entered, and (ii) outright or unencumbered repossession orders made.

As shown in Figure 2 from a high figure of 33,371 repossession actions in the second quarter of 1993, the number declined by more than 50% to 16,298 in the first quarter of 1997. It rose again until it reached 23,932 in the last quarter of 1998; thereafter fluctuating on a downward trend for about four years up to the last quarter of 2002 when the trend changes, subsequently leading to a dramatic upsurge from the first quarter of 2005. By the first quarter of 2008 the number of repossession actions reaches 40,860.

Figure 2: Mortgage Repossessions 1993-2008



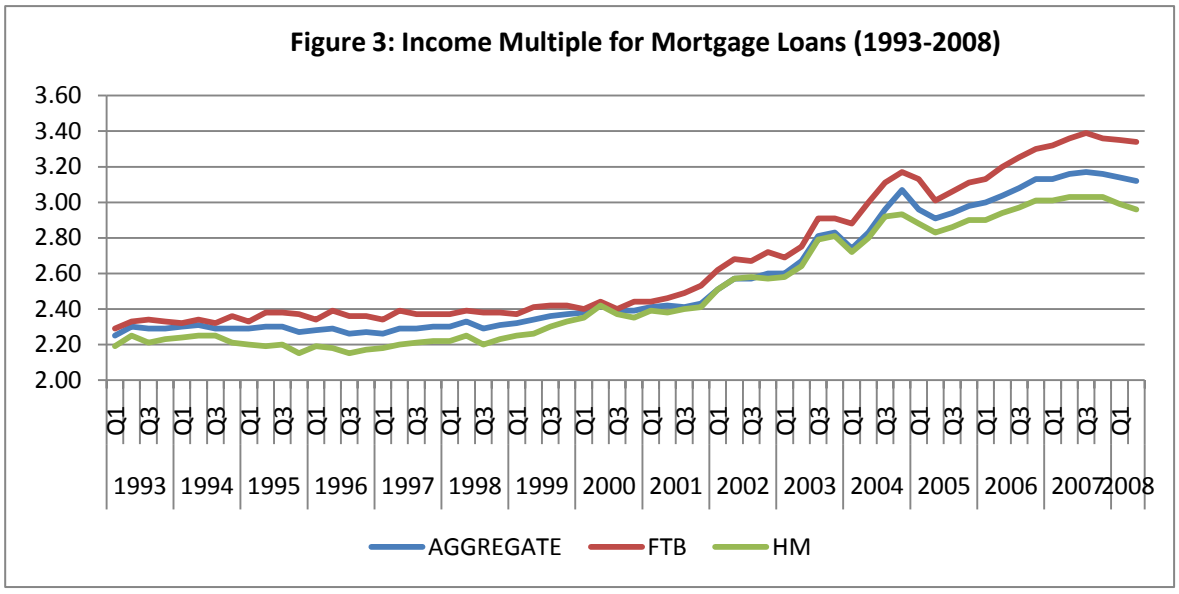
[3] See CML Release of 12 November 2009 online at http://www.cml.org.uk/cml/media/press/2456 (accessed on 08 February 2010)

The number of enforceable repossession orders also started from an initial high level of 11,664 in the first quarter of 1993, the number of orders then fell, reaching a minimum level of 3,788 (approximately one-third of the of 1993 figure), in the last quarter of 2002. It rose gradually afterwards until the end of 2004. In the second quarter of 2005 repossession orders almost doubled. The acceleration continues; and by the second quarter of 2008, the number or repossession orders, 15,603 was again almost double the 2005 figure and about four times the 1993 figure.

Based on 2008 housing market forecasts, the CML anticipated 75,000 repossessions in 2009; however, the estimate was later cut down to 48,000[4]. The cut was in recognition of three important factors that are helping borrowers facing difficulty to keep their homes – these are (i) lenders' forbearance policies, (ii) government measures, and (iii) the beneficial effects of continuing low interest rates. Based on this factors remaining in place, the estimated number of repossessions in 2010 is still more than 50,000.

Income Multiples

The measure for income multiples is the median income multiples for mortgage borrowers published by the CML. Income multiples ranges between the minimum value of 2.15 for home movers in the third quarter of 1995 and 1996 and the highest 3.39 for first time buyers obtained around the third quarter of 2007. The first-time-buyers category clearly maintains higher income multiples throughout the period covered, except the second quarter of 2000 when median income multiples were almost at par for both categories with first–time-buyers having 2.44 while home movers had 2.42.



[4] See CML Release 12 Nov 2009, ibid

It is important to note that although the median income multiple has its highest value at 3.39, but in real practice, mortgage loans of 6, 7, and even 8 times the borrowers annual income exist. Very high levels of income multiples have generated reactions, but opinions differ. For instance in an interview with Mortgage Strategy in 2007, the Shadow Chancellor for the Liberal Democrats Vince Cable MP, said lenders were irresponsible to offer loans to consumers at 7 or 8 times income[5]. However, a mortgage specialist says income multiples are a means to an end. Once a buyer falls in love with their dream home they will try and get it by all means. A readers' poll shows a majority, 57%, in support of high multiples even at 6-times income[6]; while 63% against 37% of mortgage brokers are not worried about high multiples, of 5-times income[7].

The Model

It is anticipated that mortgage defaults and repossessions would exhibit some form of association with the income multiples of mortgage loan. Nevertheless, it is acknowledged that other characteristics of borrowers; such as income, age, household type, employment status, etc; as well as market factors, including prices, and loan features; coupled with regional factors may also influence mortgage default and repossession.

The initial investigation reveals a quadratic relationship between income multiples and mortgage repossession (See figure 5). Hence, if X^R represents the number of mortgage repossession and Y^M represents income multiples of mortgage loan; it can be hypothesised that:

$$X^R{}_T = \beta_1 (Y^M{}_T)^2 + \beta_2 Y^M{}_T + C \quad \ldots\ldots\ldots (1)$$

Within a specified model such as (1) above, a variable y is a multi-lag predictor of variable *X*, if the estimated coefficient of *Y* is statistically significant at more than one order of lag. In order words, $\beta_i \neq 0$ statistically in expression (2) as *n* takes different values of lag length.

$$X^R{}_T = \beta_1 (Y^M{}_{T-n})^2 + \beta_2 Y^M{}_{T-n} + C \ldots\ldots\ldots (2)$$

[5] Mortgage Strategy 2 July 2007 pp. 16

[6] Mortgage Strategy 23 April 2007 pp. 8

[7] Mortgage Strategy 13 November 2006 pp.8

The data reveals a statistically significant relationship at various lengths of lag. Thus Income multiple of mortgage loan is a multi-lag predictor of the number of repossessions. This study therefore develops a measure for improving regression efficiency with conditioning information in the form of a lagged instrument. The aim is to identify the appropriate model that should exhibit the best mean-square-error efficiency with respect to the conditioning information. For instance, in an attempt to provide a framework for refining the test of portfolio efficiency, Ferson and Siegel (2009 pp.2735) affirm that the optimal use of the lagged variable(s) is economically important. The basic assumption here is that an incorrect time lag will mislead, distort, and cause a reduced efficiency of the relationship. Therefore a time lag that maximises the efficiency can be considered the correct or the optimum time lag.

Figure 4A:

Repossession Actions and Income Multiples

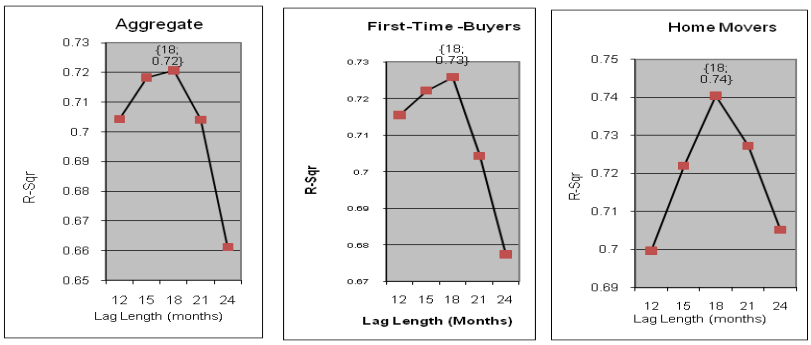


Figure 4B:

Enforceable Repossession Orders and Income Multiples

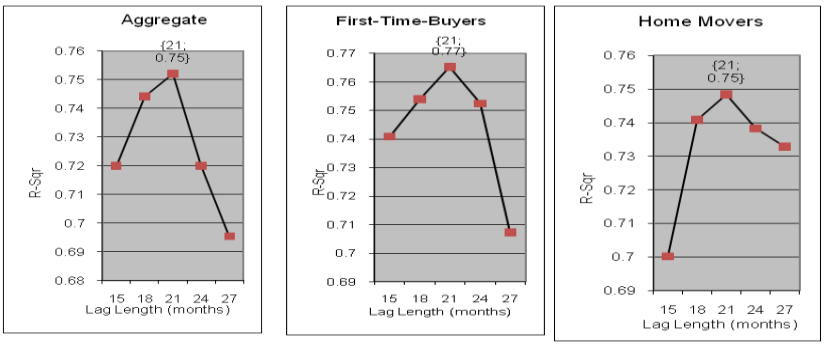
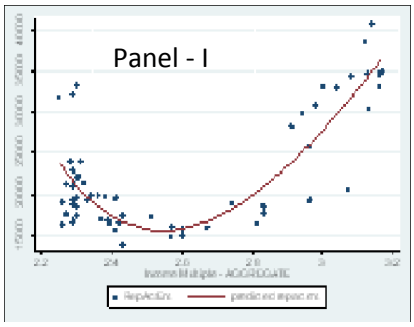
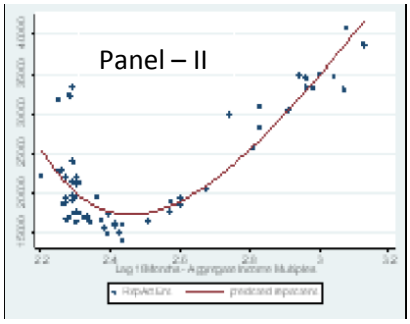
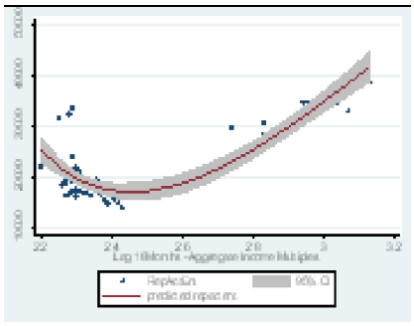


Figure 5: Repossession Actions and Income Multiples (Aggregate)





Panel – III



Yang, Everitt and Bradford (2002, pp.1738-1739) observed that a time lag smaller or larger than the optimum will lower the correlation. They states that the relationship between the correlation co-efficient or the co-efficient of determination (r^2) and the time lag takes the shape of a parabola opening downward, or a bell. Therefore the time lag that corresponds to the maximum co-efficient of determination should be the optimum time lag. Bahmani-Oskooee and Brooks (2003) introduce goodness of fit, derived through r^2, to select the optimum time lag; they found results that are sensitive to the lag order.

Figure 4A shows R-Squares of the relationships of mortgage repossession and income multiple at various lag orders. The R-Square associated with the number of repossession actions reaches the highest point in the three market categories when the lag length is 18months. The highest R-square in the case of enforceable repossession orders was obtained when the lag length is 21months (See Figure 4B). Hence for income multiple to show the best effect on the number of repossession actions and the number of enforceable repossession orders the optimum time lag is 18 months and 21 months respectively. Using the optimum time lag helped to transform the relationship of repossession actions and the aggregate income multiples depicted in Panel – I of Figure 5 into a more refined association shown in Panel – II; with a resultant effect of capturing the observation points at a high confidence level of 95% as shown in the gray colour around the curve in Panel – III.

Analysis of Results

In a quadratic model, the ratio of the linear and quadratic coefficients is critical to interpreting the equation. Where the linear coefficient is negative while the quadratic term is positive, as in the estimated equations(See Tables 1A&B), a U-shaped curve results and the interpretation is that repossession is at the minimum when the lagged median income multiple equals half of the ratio of linear to quadratic coefficient. This income multiple that minimizes the number of mortgage repossession is termed the optimum income multiple. An alternative approach is the method of differential calculus; here the income multiple obtained by equating the first derivative of the estimated regression equation to zero is the optimum. Both methods should produce the same results as presented in Tables 1A&B.

Based on the aggregate market, the income multiple that minimises repossession action is 2.473 when the number of actions is 18,320. On the other hand, looking at market categories, repossession actions are minimised when income multiples for first-time-buyers and home-movers are 2.55 and 2.42; with minimum actions being 18,373 and 17,301 respectively. All income multiples are median values with 18-months of time lag. Similarly, the income multiple that minimises the number of enforceable repossession orders from an estimate based on the aggregate market is 2.515, with the number of orders being 4,874. While the first-time-buyer and home mover categories produces the minimum repossession orders of 4, 776 and 4,570, when the 21 months lag of median income multiples are 2.60 and 2.44 respectively.

	Table 1A: Regression Result – Repossession Actions Entered					
A.1 - Aggregate Market	Repossession Actions Entered	Co-efficient (β)	Std Error	t-value		
	Lag-18Months of Median Income Multiples	-286561	48650.59	-5.89		
	Square Lag-18Months of Median Income Multiples	57932.99	9229.364	6.28	Optimum Income Multiple	Minimum Repn. Actions
	Constant	372682.9	63284.75	5.89	2.473211	18320.01
A.2 – First Time Buyers	Repossession Actions Entered	Co-efficient (β)	Std Error	t-value		
	Lag-18Months of Median Income Multiples	-233702	40455.86	-5.78		
	Square Lag-18Months of Median Income Multiples	45827.02	7393.329	6.2	Optimum Income Multiple	Minimum Repn. Actions
	Constant	316322.4	54508.15	5.8	2.549823	18373.52
A.3 - Home Movers	Repossession Actions Entered	Co-efficient (β)	Std Error	t-value		
	Lag-18Months of Median Income Multiples	-343863	46478.3	-7.4		
	Square Lag-18Months of Median Income Multiples	71086.28	9137.89	7.78	Optimum Income Multiple	Minimum Repn. Actions
	Constant	433139.4	58347.26	7.42	2.418628	17301.71

	Table 1B: Regression Result – Enforceable Repossession Orders					
B.1 - Aggregate Market	Repossession Orders Made (Enforceable)	Co-efficient (β)	Std Error	t-value		
	Lag-21Months of Median Income Multiples	-177821	21268.27	-8.36		
	Square Lag-21Months of Median Income Multiples	35357.21	4054.076	8.72	Optimum Income Multiple	Minimum Repn. Orders
	Constant	228451.6	27551.68	8.29	2.514637	4873.837
B.2 – First Time Buyers	Repossession Actions Entered	Co-efficient (β)	Std Error	t-value		
	Lag-21Months of Median Income Multiples	-152729	17516.97	-8.72		
	Square Lag-21Months of Median Income Multiples	29342.5	3219.942	9.11	Optimum Income Multiple	Minimum Repn. Orders
	Constant	203517	23482.61	8.67	2.602525	4776.193
B.3 - Home Movers	Repossession Actions Entered	Co-efficient (β)	Std Error	t-value		
	Lag-21Months of Median Income Multiples	-191168	20929.75	-9.13		
	Square Lag-18Months of Median Income Multiples	39103.36	4130.151	9.43	Optimum Income Multiple	Minimum Repn. Orders
	Constant	238214.4	26190.85	9.1	2.44439	4570.223

Sensitivity Analysis – Factor Change, Discrete Change and Percentage Change

The factor change in the estimated repossessions can be computed from the original model. Using the optimum lag, Equation (2) can be written as:

$$X^R{}_T = \beta_1 (Y^M{}_{T-18months})^2 + \beta_2 Y^M{}_{T-18months} + C \ldots\ldots\ldots (3)$$

$$henceforth\ Y^M{}_{T-18months}\ will\ be\ written\ as\ Y^M{}_{t18}$$

$$and\ Y^M{}_{T-21months}\ \ will\ be\ written\ as\ Y^M{}_{t21}.$$

If $Y^M{}_{t18}$ changes by δ, the factor change in the estimated repossession action is presented in (4).

$$\frac{\beta_1 (Y^M{}_{t18} + \delta)^2 + \beta_2 (Y^M{}_{t18} + \delta) + C}{\beta_1 (Y^M{}_{t18})^2 + \beta_2 Y^M{}_{t18} + C} \ldots\ldots (4)$$

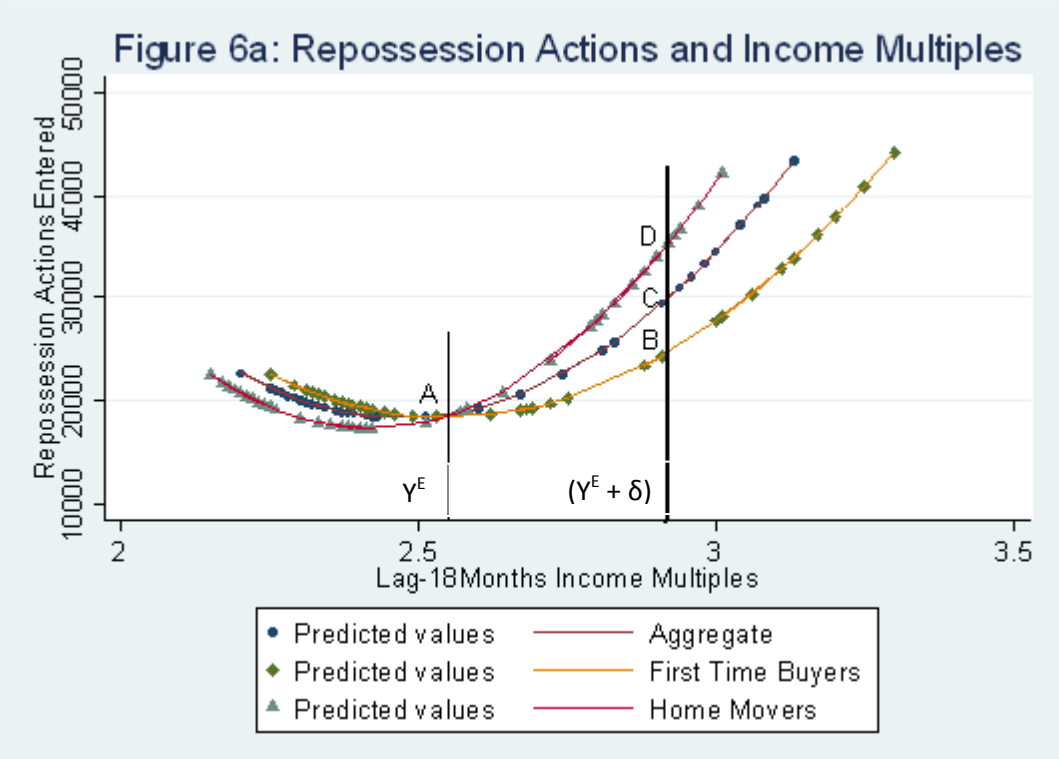
Similarly the factor change in repossession orders can be obtained by changing $t18$ to $t21$ in equation 4, since 21 months is the optimum lag for repossession orders. The factor change can be standardized if δ is equal to the standard deviation of $Y^M{}_t$. If δ is expressed as a percentage of $Y^M{}_t$ then expression (4) will enable us to find the percentage change in repossession actions and repossession orders associated with a δ% change in income multiples. This can be computed as {[eqn. (4) – 1] X 100}.

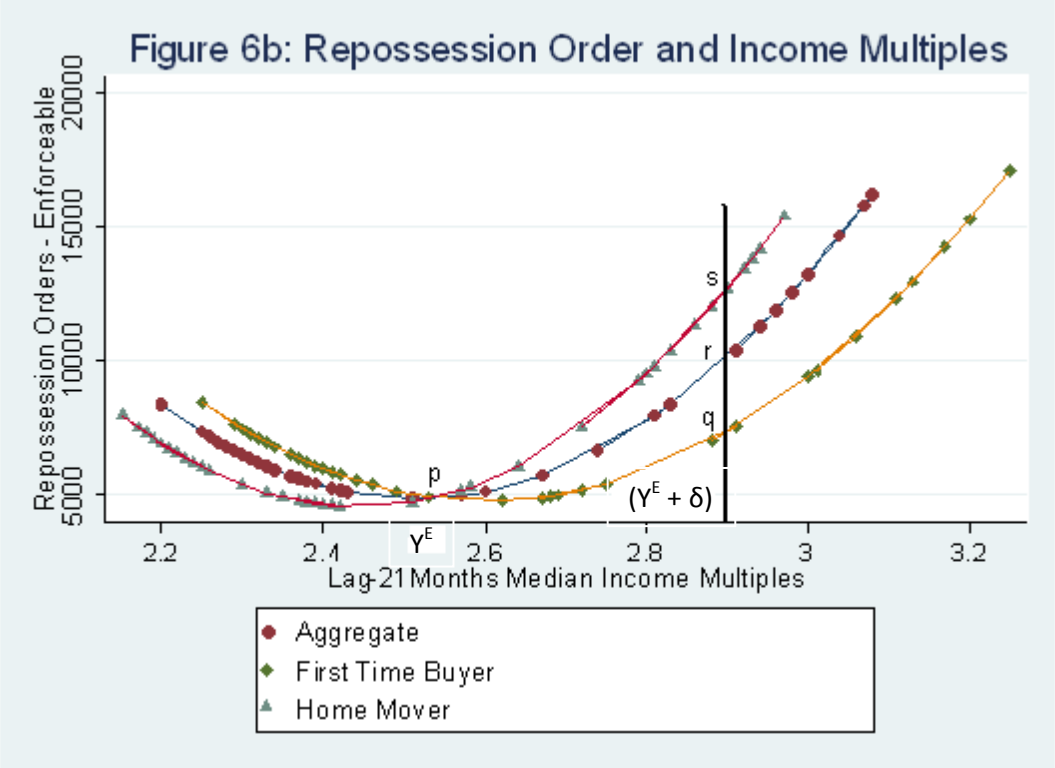
The effect of a change in Income multiples can also be assessed by computing the discrete change in the estimated number of repossessions, denoted by $\Delta X^R{}_T$, for a change in $Y^M{}_t$ starting at $\{Y^M{}_t\}_S$ and ending at $\{Y^M{}_t\}_E$. This can be interpreted as follows: for a change in the lagged median income multiple from $\{Y^M{}_t\}_S$ to $\{Y^M{}_t\}_E$ the estimated number of repossession actions or repossession orders changes by:

$$\Delta X^R{}_T = [X^R{}_T;\ Y^M{}_t = \{Y^M{}_t\}S\ ] - [X^R{}_T;\ Y^M{}_t = \{Y^M{}_t\}E\ ] \ldots\ldots (5)$$

$t = t18$ for repossession action and $t21$for repossession order.

Considering the nature of the model, the calculations of various measures of the effects of changes in income multiple will depend on the point at which the changes were measured. Figures 6A & B show the plot of the estimated regression lines. The figures show that the outcome of measuring a change of income multiples would differ depending on whether the change was measured around Y^E or $(Y^E + \delta)$, since the slopes change values at different points along the curves. In other words, the outcome of measuring the effect of changes would not be the same if the change in repossession actions was measure around Point A, compared to B, C or D in Figure 6A; similarly, the outcome would not be the same if the change in repossession orders was measured around Point p, compared to q, r and s in Figure 6B.





To make comparisons across market categories easier, the changes were measured at four distinct points on the estimated curves – low, medium, high, and higher ranges of income multiples. The low income multiple was set at the point at which a certain income multiple, Y^E produced the same number of repossessions in the two market categories – first time buyers and home movers; the medium is the point where the income multiples is 3.0. When the median income multiples are 3.5 and 4.0 it is treated as 'high' and 'higher' respectively.

Tables 2A, B and C present the factor change, percentage change and discrete change. As shown in Table 2A based on aggregate market data, if income multiples change from low to medium, the number of repossession actions will increase by a factor of 1.85, in other words, 1.85 times the number of repossession actions will be generated after 18 months of the change. However, the equivalent change produces a factor increase of 1.51 and 2.25 if the calculations were based on first-time-buyers and home-movers data respectively. Also, the change from low to medium income multiples will generate a factor change of 2.70, 1.92 and 3.39 times the number of repossession orders after 21 months of the change if measures are based on aggregate, first time buyer and home movers respectively.

As shown in Tables 2B and C, at the lower range, although the aggregate market attracts 10.5% increase in the number of repossession for a 5% increase in the lagged median income multiples, there is only a 3.5% increase if calculations were based on the first time buyers market compared to home movers, a market that has 18.34%, i.e. more than 5 times the increase associated with first time buyers. But if the changes were measured at higher ranges of income multiples, percentage changes are almost the same across market categories.

The magnitude of the change also matters. Still taking the measures at the lower range, the estimated increase in the number of repossession actions for a 10% change in the lagged income multiples for home movers, 49.2% is more than 3-times the estimated increase of 15.1% for first time buyers. The first time buyers have about half of the increase generated if calculations are based on aggregate market figures.

It is also important to note that the gap between factor changes and percentage changes reduces for the market categories when the changes are taking place at higher ranges of income multiples. The order and magnitudes of relative effects also changed in the case of the estimated number of repossession orders. For instance, a 5% increase at the lower range of income multiples causes a 0.35% reduction of repossession orders for first time buyer categories, while the same change attracts a 31.52% increase for home movers, and a 15.67% increase for the aggregate market. But at the medium range, a 5% increase produces an estimate almost at par across the categories – that is, 44.19%, 44.45%, and 45.02% increases in repossession orders for first time buyers, home movers and aggregate markets respectively. Yet, at a higher range, a 5% increase produces 28.31%, 26.11% and 27.05% increases respectively.

Table 2A: Factor Change

	Repossession Action			Repossession Order		
	First Time Buyers	Home Movers	Aggregate	First Time Buyers	Home Movers	Aggregate
From Low to Medium Y^E to Y=3.0	1.505217	2.248938	1.850181	1.91965	3.393329	2.699369
From Medium to High Y=3.0 to Y=3.5	2.160018	2.429988	2.308311	3.018564	2.892978	2.96925
From High to Higher Y=3.5 to Y=4.0	1.920545	1.942394	1.931607	2.18512	2.060447	2.114158

Table 2B: Percentage Change and Discrete Change – Repossession Actions

		Percentage Change (%)			Discrete Change		
		First Time Buyers	Home Movers	Aggregate	First Time Buyers	Home Movers	Aggregate
Low Range	Y^E + 5%	3.506737	18.33812	10.44975	644	3370	1943
Medium Range (Y = 3.0)	Y^M + 5%	26.10261	33.86947	30.40699	7220.186	13997.72	10459.03
High Range (Y = 3.5)	Y^H + 5%	27.85671	28.95795	28.45637	16643.77	29081.77	22593.94
Higher Range (y = 4.0)	Y^{Hr} + 5%	24.76375	24.50865	24.58023	28415.99	47809	37697.9
Low Range	Y^E + 10%	15.06808	49.17026	30.9644	2769	9036	5757
Medium Range (Y = 3.0)	Y^M + 10%	59.6606	75.4791	68.39312	16502.59	31194.32	23525.05
High Range (Y = 3.5)	Y^H + 10%	60.41135	62.25141	61.38183	36094.45	62517.58	48736.27
Higher Range (y = 4.0)	Y^{Hr} + 10%	52.72247	51.93262	52.1824	60498.15	101304.9	80030.45

Table 2C: Percentage Change and Discrete Change – Repossession Orders

		Percentage Change (%)			Discrete Change		
		First Time Buyers	Home Movers	Aggregate	First Time Buyers	Home Movers	Aggregate
Low Range	Y^E + 5%	-0.34911	31.52114	15.69515	-17.1165	1545.858	767.6836
Medium Range (Y = 3.0)	Y^M + 5%	44.18955	44.45319	45.01837	4159.076	7397.695	5943.861
High Range (Y = 3.5)	Y^H + 5%	35.60512	32.49613	33.86606	10115.57	15644.81	13276.7
Higher Range (y = 4.0)	Y^{Hr} + 5%	28.31154	26.1055	27.05226	17575.86	25895.97	22421.6
Low Range	Y^E + 10%	18.55868	88.6984	54.6501	909.9182	4349.941	2673.053
Medium Range (Y = 3.0)	Y^M + 10%	102.4083	99.48022	102.0874	9638.565	16555.04	13478.8
High Range (Y = 3.5)	Y^H + 10%	77.53619	69.96712	73.25618	22028.36	33684.7	28719.04
Higher Range (y = 4.0)	Y^{Hr} + 10%	60.40432	55.36459	57.51727	37499.12	54920.21	47671.79

The discrete change maintained clear differences of the effects of changes for the two measures of repossession across the market categories. Although the percentage changes in repossession orders for a 5% increase in income multiples, at the high range (i.e. $Y^M{}_{t21} = 3.5$) produced 35.61%, 32.5%, and 33.87% increases for first time buyers, home movers, and the aggregate market respectively; however, the discrete change shows that the estimated increases were 10,116, 15,645, and 13,277 respectively. Overall, the discrete changes associated with first time buyers are lesser than those for home movers for the four ranges of values tested.

Conclusion

Income multiple is gaining increasing attention not only from actors in the mortgage industry but from the regulatory body and the government. The Chairman of the Financial Services Authority (FSA) Lord Turner is debating whether to introduce a cap on the loan-to-value ratios and income multiples for mortgage loans as part of regulatory measures. Boulger (2009)[8] described a cap on income multiples as a danger to the "democratisation of home ownership"; while Nadin (2009)[9] raises the alarm that limiting income multiples will see off the mortgage broking industry. Nadin maintains that the plan will only be a reversal of criteria that will see no benefit to anyone nor instil confidence. However, there may be some common sense in the move to regulate income multiples; Lord Turner's proposal can be seen as a response to the fact that the trend in loan to income ratios has risen rapidly since 2000, although this reflects the fact that borrowers require rising income multiples to afford higher house prices, nevertheless affordability consciousness is equally important.

In the light of the findings of this study, we can now re-visit McLaverty and Yip (1994) which shows that an increase in income multiple from 2.5 to 3.5 enables almost three times the proportion of households to gain marginal mortgage potential in London; while the proportions are higher in other regions where average house prices are lower. The addendum now is that such an increase in the income multiple from 2.54 to 3.5 will generate 4.3 times the number of repossession actions that would be entered after 18 months of the increase, if all measures are based on the aggregate figures. However, if the first time buyers and home movers categories are considered separately, there will be 3.3 and 5.5 times the number of repossession actions respectively. A similar increase in the median income multiple will cause 8.0, 5.8 and 9.8 times the number of enforceable repossession orders after 21 months, if measures are based on aggregate, first time buyer, and home movers respectively.

Mortgage default exposes any borrower to the risk of repossession; however, the initial perception of risk and its assessment varies for different segments of borrowers' market. The lenders' popular response is to restrict access to the risky and vulnerable segment, such that, a consumer can only exercise his/her choice amongst mortgage products that are available to the segment of the market s/he belongs[10]. The result is that mortgage loan costs more for borrowers perceived to be in the risky segment. One line of thought is to view the additional premium as a means of compensating or motivating lenders for the higher risk they undertake (See Yongheng and Gabriel 2006, and Ben-Shahar 2008). If the gains or premiums actually serve as a

[8] Mortgage Strategy 23 March 2009 pp.19

[9] Mortgage Strategy 30 March 2009 pp.19

[10] For instance a mortgage search conducted in August 2008 produced 800 mortgage products for a home mover or second time buyer for a loan of £100,000, but only 200 products are available to a first-time buyer. If the loan amount is £250,000, there are 500 products and 40 products available to a home mover and a first-time-buyer respectively. For a loan of £500,000 there are 580 products for a home mover to choose from, while availability to a first-time buyer is zero.

motivating factor, then it is profitable at least in the short-run for lenders to allocate more funds as long as the margins of premium exist. See Getter (2006), and Capozza and Thomson (2006) for a critical appraisal. A contrasting perspective is to consider the imposed risk premium (both the costs and loan terms) as a mechanism that filters the market or screens potential new entrants, to separate the ever increasing want for home ownership from those who are relatively more able to afford the mortgage. If this is the case, the expectation is that the gap between the risks of mortgage repossession across market segments would close up at the end of the process.

A regulatory restriction on income multiples raises the fear that it may results in first-time-buyers being excluded from entering the market. But given existing market practice, empirical analysis based on the market data as revealed in this study, paradoxically contradicts the common *a priori* speculation. The analysis did not show that first time buyers are at higher risk of repossession on the basis of their income multiples of mortgage loans. This is not a generalisation that first time buyers are less risky, but if they are not equally risky generally on loan levels relative to other borrowers, the incremental risk could probably be traced to other factors rather than income multiples. Such factors may include: employment status; household composition, type and size; loan characteristics; regional factors; etc.

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