

### The Consumer Implications of Interest Rate Pass-Through in Retail Mortgages

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The mortgage market is one of Australia’s most important retail financial markets. As of June 2013, more than two-thirds of Australian households possessed residential property (either owned outright or mortgaged), with a third of households bearing a home loan, with a mean debt value of \$329 thousand dollars for mortgage-holding households and gearing (the ratio of home loan debt to assets) of 29.4% (Reserve Bank of Australia [RBA], 2013). Consequently, Australian households are among the most indebted in the world, with ongoing historically high levels of debt gearing (148.1%) and service (interest payments on debt-to-income) (9.3%) and continuingly unaffordable housing markets (Worthington, 2012).

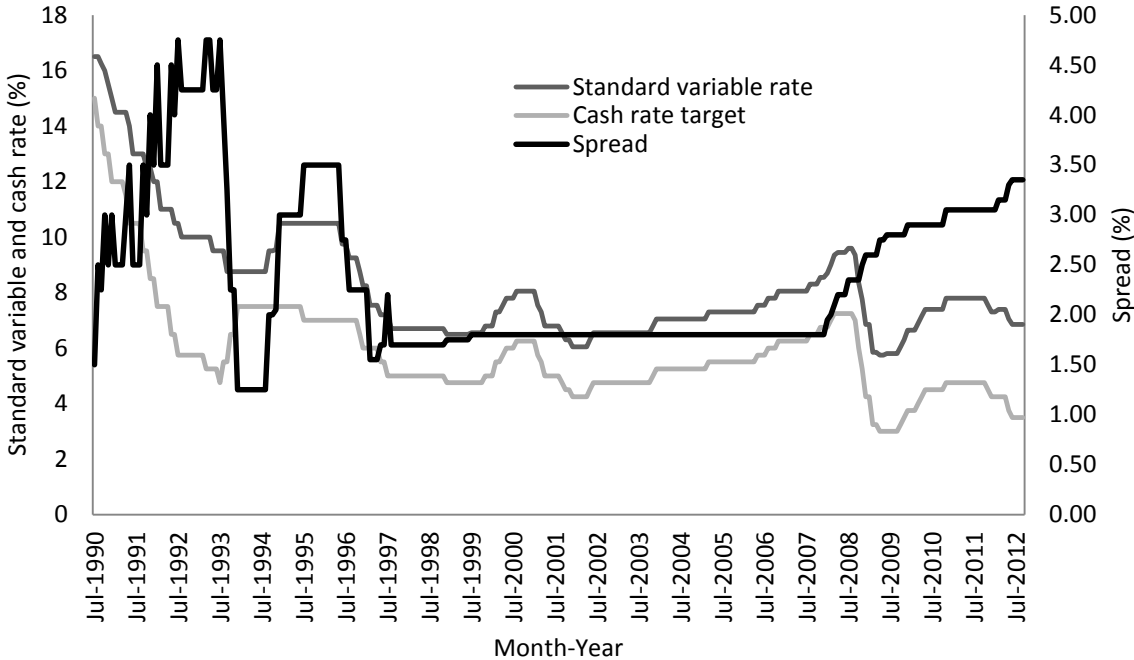


Figure 1. Australian monthly mortgage and cash rates.

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Similarly, from the lender perspective, several hundred lenders offering literally thousands of products have ever-increasingly competed for a share of the \$1.2 trillion mortgage market with net interest margins (the difference between lending rates and funding costs) becoming progressively narrower and financially savvy households increasingly attuned to the different attributes of the many competing products offered. Finally, residential mortgages are an important part of the monetary policy transmission mechanism. This is because as the majority of home loans in Australia are variable (adjustable) rate mortgages (in contrast to the dominance of fixed rate mortgages in the US), moves by the Reserve Bank of Australia (RBA) in setting short-term interest rates exert a powerful impact on household disposable income and consumption.

There is, of course, a link here in that while many factors affect mortgage rates—including the cost of funding, credit and liquidity risk, and marketing strategies—efforts made by the RBA in the pursuit of monetary policy are a primary determinant of the level of funding costs and hence the level of lending rates. Since 1990, the RBA has targeted the desired interest rate on overnight loans in the money market. This policy instrument, referred to as the cash rate, is the equivalent of the federal funds rate in the US.

Analysing the behaviour of banks in response to changes in the cash rate is then one of the more topical issues with tangible implications for borrowers. In particular, relative mortgage rates affect decisions by consumers on switching loans from one lender to another, while the speed and accuracy with which rate cuts and increases are passed on to borrowers, especially highly indebted households, affects their financial well-being.

### Literature Review

Numerous studies demonstrate that the transmission mechanism of monetary policy does not lead to an immediate and complete pass-through of the official rates to the retail rates. Among those studies, the pass-through of official interest rates to mortgage rates has attracted increasing attention over the period of time (e.g., Liu, Margaritis, & Tourani-Rad, 2008; Mansson, Shukur, & Sjolander 2013; Valadkhani & Anwar, 2012). The major concern is how fast financial institutions pass through changes in the official interest rates to mortgage rates, and whether or not there is an asymmetry in pass-through.

For the most part, studies on the asymmetric pass-through of official interest rates to mortgage rates are mostly concerned about upward asymmetry where financial institutions intend to pass on interest rate increases faster than interest rate cuts. With respect to the explanations of upward asymmetries, the bank concentration hypothesis suggests that banks are less likely to decrease lending rates in fear of disrupting collusive arrangements established between banks. In evidence, Toolsema and Jacobs (2007) find that Dutch banks tend to increase interest rates instantly when costs rise, while waiting to lower the rates when costs drop.

Before this, Hofmann and Mizen (2004) find that the adjustment speed in the UK mortgage rates depend on whether the perceived gap between retail and base rates is widening or narrowing. That is, banks tend to increase the adjustment speeds of retail rates to base rates quite dramatically when the gap is widening but slowdown the adjustment when base rates are moving in a direction that will automatically close the gap. Recently, Becker, Osborn, and Yildirim (2012) suggest that adjustment speeds are significantly greater when clear monetary policy signals motivate interest rate movements.

In a similar vein, the consumer behavior hypothesis states that the high proportion of unsophisticated consumers, along with search and switching costs, dispose banks to have greater market power in the adjustment of interest rates to their advantage. In the US, Payne (2006) finds that fixed mortgage rates adjust asymmetrically to changes in the federal fund rate in the long run; only about 0.08 percent of the adjustment in the fixed mortgage rate is completed within one month after the change in the federal rate over the period 1987-2005. Xu, Han, and Yang (2012) also find that mortgage rates have stronger responses to the positive surprises caused by monetary policy.

A recent study by Mansson et al. (2013) found Swedish banks have a higher propensity to increase rapidly their mortgage interest rates for customers following an increase in their borrowing costs, compared with the propensity for the banks to decrease their customers' mortgage rates subsequent to a corresponding borrowing cost decrease. Finally, in Canada, Allen and McVanel (2009) suggest that pass-through is incomplete in the short run, and that the dominant banks tend to have the lowest pass-through

and highest mark-ups. In summary, the tacit collusion or, more generally, market power on the market may lead to upward asymmetries; highly competitive pressure can give rise to downward asymmetries. Therefore, an investigation into the direction of pass-through asymmetry is closely associated with prevailing market conditions and is, therefore, of great importance to consumers in these markets.

### Method

We use official weekly cash rate data from the RBA (2013) and weekly standard variable mortgage rates for Australia's Big-4 banks from [www.canstar.com.au](http://www.canstar.com.au). The Big-4 banks, comprising the ANZ Bank (ANZ), Commonwealth Bank of Australia (CBA), National Australia Bank (NAB), and Westpac Banking Corporation (WBC), collectively account for nearly 80 percent of the Australian residential mortgage market. As shown in Figure 2, the mortgage rates of the individual banks typically track each other—and the cash rate. However, Figure 3 illustrates significant differences in the speed and magnitude of the adaption to changes in the cash rates in terms of the cash rate-mortgage rate spread.

We use the unrestricted autoregressive distributive lag (ARDL) dynamic heterogeneous panel methodology. Our long-period and weekly data set for the Big-4 Australian banks from 1992 to 2012 allows for an accurate analysis of the pass-through of the official interest rates to mortgage rates in housing markets. We also employ Hansen's threshold test for sun-sampling periods to identify any different pass-through coefficients.

### Findings

We establish a single equation error correction procedure based on ARDL to identify both the long- and short-term relationships between the standard variable mortgage rate and the official cash rate. Under the PMG assumptions, all the banks have a separate short-term relationship. We obtain the long-term equilibrium relation model from the short-term error correction relationships, indicating that the standard variable rates are mean reverting to the long-run equilibrium. Table 1 provides the results. That means that they will adjust upwards when they are below the equilibrium level and downwards when above their equilibrium level. In addition, to examine whether or not there is a common long-term elasticity across the four banks, we apply the Hausman test to the test of hypothesis of slope homogeneity. The results of the Hausman test show that all three models have a common slope for the long-run equations across the banks. Further, in all three models, the null hypothesis cannot be rejected, meaning that all of the banks pass-through changes in the cash rate to the mortgage rate no matter whether the former goes up or down in the long run. In other words, there is no asymmetrical pass-through in the long run for the Big-4 banks.

However, the results of the short-run models in Table 2 (results only for CBA shown, results for other banks available upon request ) indicate that changes in the official cash rate have both an immediate and long-run effect on the standard variable rates for all banks. Among the banks, as the largest lender in the market, CBA is the fastest bank to pass on interest changes to its customers, through either the long-run adjustment rate or the short-run effect. Interestingly, NAB, with the slowest long-run adjustment speed, appears to have the second-largest coefficient of current cash rate changes on variable rates, with a value of 0.503, which is slightly bigger than that of 0.501 for WBC. This is because the cash rate coefficients only have a joint effect with other coefficients, such as the coefficients of lagged variable rates, on variable rate changes. However, the rapid response of bank variable rates to the cash rate changes does not necessarily indicate good news for consumers because of the presence of asymmetry in the pass-through of the interest changes.

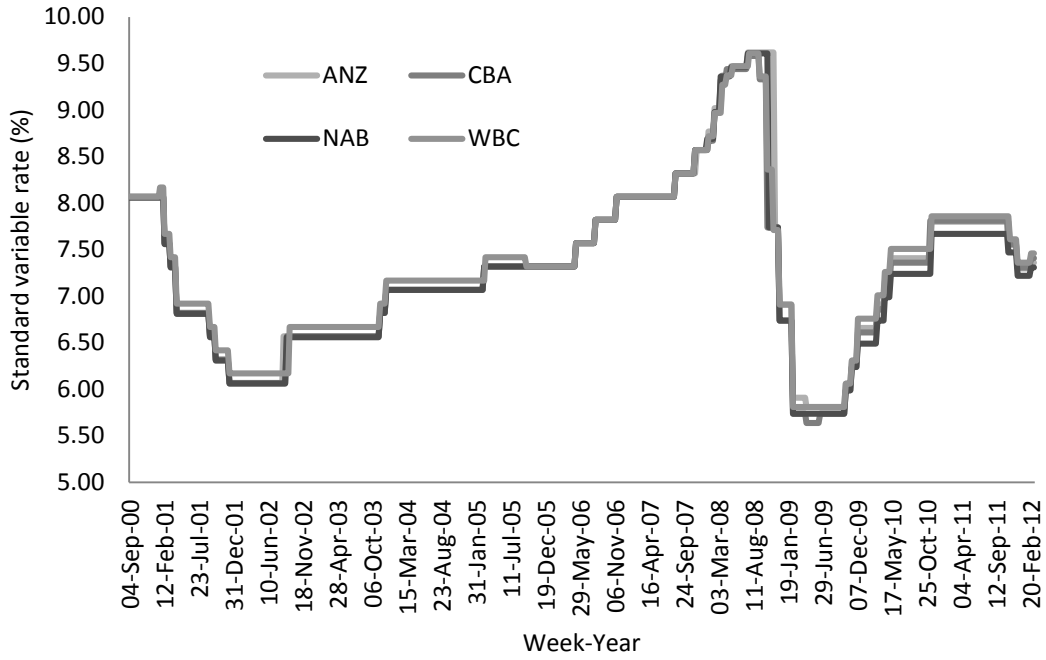


Figure 2. Big-4 bank mortgage rates.

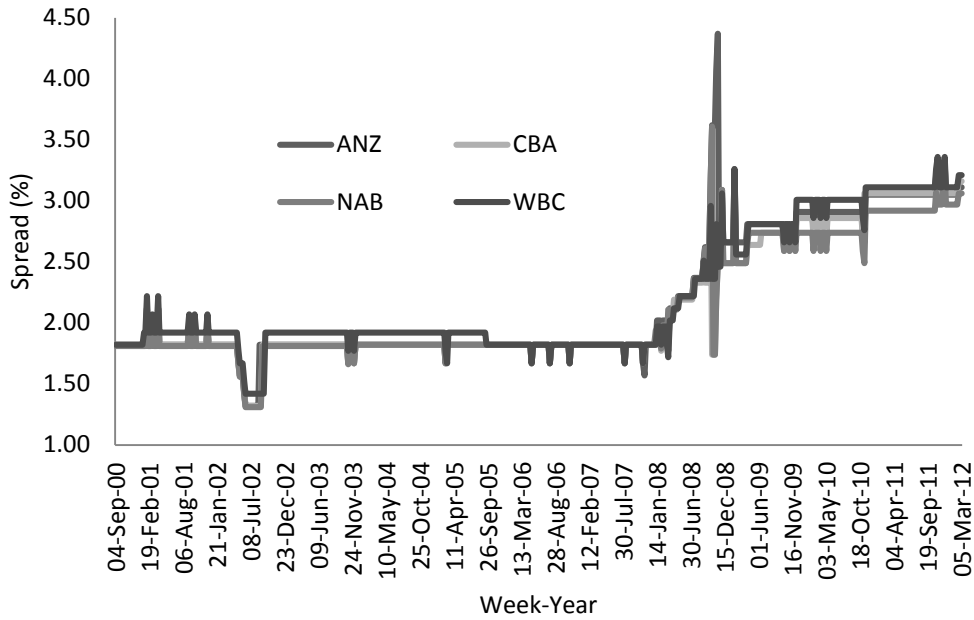


Figure 3. Big-4 bank cash rate-mortgage rate spread.

Table 1

*Long-Term Relationship and Degree of Pass-Through*

	Model A (all pass-through)			Model B (increase pass-through)			Model C (decrease pass-through)		
	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p
Constant	0.872***	0.132	0.000	0.888***	0.100	0.000	0.915***	0.149	0.000
Hausman test	0.040		0.842	0.004		0.951	0.100		0.754
Wald test	0.930		0.335	1.230		0.267	0.320		0.571
ANZ	0.026**	0.013	0.043	0.025**	0.012	0.034	0.018	0.012	0.154
CBA	0.056***	0.020	0.004	0.073***	0.019	0.000	0.048**	0.019	0.015
WBC	0.042**	0.018	0.019	0.053***	0.017	0.003	0.032*	0.016	0.053
NAB	0.019*	0.011	0.086	0.028***	0.010	0.007	0.009	0.010	0.384

Table 2

*Short-term Relationship and the Degree of Pass-Through in the Long Term*

	Model A (all pass-through)			Model B (increase pass-through)			Model C (decrease pass-through)		
	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p
Constant	-0.019***	0.005	0.000	-0.024***	0.005	0.000	-0.017***	0.005	0.000
Std. var.	16.590***		0.000	28.790***		0.000	13.940***		0.000
One-week std. var.	-0.048*	0.029	0.100	-0.038	0.028	0.177	-0.047*	0.029	0.100
Two-week std. var.	-0.186***	0.029	0.000	-0.185***	0.028	0.000	-0.186***	0.028	0.000
Change cash	0.594***	0.037	0.000	0.610***	0.061	0.000	0.584***	0.045	0.000
One-week cash	0.135***	0.041	0.001	0.126***	0.039	0.001	0.134***	0.040	0.001
Two-week cash	-0.043	0.041	0.295	-0.047	0.039	0.230	-0.043	0.041	0.284

### Implications

Knowledge of pass-through in mortgage rates is important for consumers, not least because it has important implications for their choice of mortgage products, and thereby the impact of mortgage debt on net wealth. This is particularly pertinent in the Australian context where just four large banks dominate the market. Over the period 1992 to 2013, we find the standard variable rates of the Big-4 have an error correction relationship with the official cash rate, though not all are cointegrated with the cash rate. However, the short-term pass-on is found to be asymmetric, which indicates that the Big-4 tend to pass on interest increases faster than interest cuts. This means that consumers will more quickly and thoroughly bear interest rate increases associated with the implementation of monetary policy. Among the Big-4, CBA, as the largest lender, appears to pass interest rises to its customers at a speed of 0.024 per week, and interest cuts at a slower speed of 0.017. Following behind, WBC and NAB had pass-on speeds on interest rises at 0.017 and 0.010, and pass-on speeds on interest cuts at 0.011 and 0.004, respectively. By contrast, ANZ apparently did not have a significantly asymmetric pass-through of interest rates.

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