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Economic Research note

A model of RBA behavior: another rate rise in late 2007

- **We have developed a model to capture the probability of RBA policy moves in a given month**
- **The model accurately predicted 73 of the last 75 policy decisions—a 97% success rate**
- **The model predicts a 25bp policy rate rise at the end of 2007, but a 25bp rate cut for late 2008**

A study this year by JPMorgan's global macro team ("Central bank communication hits diminishing marginal returns," *Global Issues*, May 11 2007) found that the RBA is an inferior communicator relative to the ECB, the Fed, and the Bank of Japan. This implies that market participants' job of predicting RBA policy moves is more difficult than would be the case if, like other central banks, the RBA released more regular commentary and detailed statements when policy is left unchanged (the RBA releases a statement only when policy is changed).

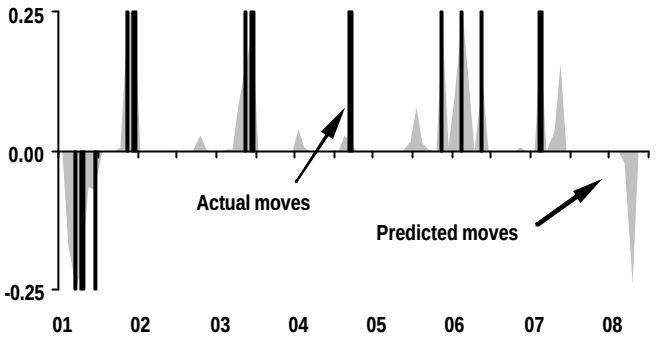
To aid the process of predicting RBA moves, we have developed a model to estimate the probability, measured in basis points relative to a 25bp tightening or 25bp ease, in any given month. Back-testing over the last six years (the model is estimated only from 2001 because some of the input data was first released then) shows that the model correctly predicts RBA decisions on 73 of the 75 occasions covered; that is, 97% of the time. This is vastly superior to the interbank (IB) futures market, which predicted two rate rises that didn't materialize, and only three of the seven hikes since 2003, when the IB contract was launched.

Model predicts a rate hike in November

The model accurately predicted eight of the nine rate hikes since 2001 and two of the three eases; the two moves the model failed to predict were the 25bp cut in December 2001 and the 25bp hike in March 2005. On both occasions, though, the model was accumulating basis point probabilities in favor of the move.

The model correctly predicted all 63 times the RBA left policy unchanged, including in April this year when the futures market wrongly priced a high chance of a hike. The model predicts a 25bp rate hike for November 2007—even with our expectation of 25bp eases by the Fed at the September and October FOMC meetings—but forecasts that the RBA will cut the cash rate at the end of 2008.

Actual vs fitted moves in policy rate using tool



RBA policy decisions since 2001 - probit model

	Estimated	Actual
-25 basis points	2	3
No change	63	63
25 basis points	8	9
Total	73	75

Background: RBA independence in 1996

The newly elected Howard government gave the RBA formal independence in 1996, agreeing to the objective that the RBA should keep inflation between 2% and 3%, on average, over the cycle. The RBA has for the most part achieved its inflation objective, while simultaneously helping to steer Australia through the longest uninterrupted period of economic expansion in measured history.

This track record of success in part is because RBA officials have allowed periodic deviations of inflation from the agreed target. RBA officials' tolerance of temporary breaches of the inflation target helps to explain why the RBA has adjusted policy just 26 times—that is, less than three times per year on average—since it gained formal independence more than a decade ago. To be fair, though, a sustained house price boom and, more recently, a once-in-a-generation terms of trade bonanza (supported by a healthy global economy and China's insatiable demand for raw materials) also played significant roles in delivering Australia's impressive economic performance.

The inputs: global economy crucial

The model uses five independent variables, three for the domestic economy and two for the global economy. Interestingly, the fit of the model was inferior when only domestic variables were used. This highlights the extent to which the RBA's decision making depends on developments offshore, and why the assessment of conditions in the global economy gets such prominence in RBA commentary. The *domestic* independent variables are:

- The rate of **capacity utilization** from the NAB business survey, which captures the extent to which resources are stretched and approximates the gap between actual and potential output. We assume that usage rates ease back to 82% in 2008, from north of 83% now;

- Annual growth in the **trimmed mean CPI**. We assume that core inflation will be 3.0% to June 2008, and 2.75% thereafter, in line with RBA forecasts; and

- Annual growth in **credit to the private sector**, which approximates the demand for money. We assume credit growth easing to 13%oya by the end of 2008.

The *overseas* independent variables were:

- JPMorgan's measure of the **global policy rate,** which reflects global inflation pressure and any gap between actual and potential output. We assume a lower policy rate in coming months as the Fed eases, but a rising policy rate from early 2008; and

- JPMorgan's **global manufacturing PMI**, which captures by proxy the strength of demand for Australian raw materials and, by extension, the degree to which domestic resources may be stretched. We assume that global manufacturing activity continues to grow in 2008, albeit at a weaker pace than in recent months.

The model's mechanics

We used an ordered probit model, estimated within a Taylor rule framework. It uses a conventional Taylor rule estimation and adds an adjustment mechanism to predict the likely change in the cash rate towards a long-run equilibrium rate. That is, the model estimates what the nominal policy rate should be given contemporaneous readings for Australian resource usage rates, core inflation and credit growth, and global policy rates and manufacturing activity. There is a reference in the model to the lagged cash rate to capture the policy rate's distance from the long-run equilibrium rate.

The probit component works by accumulating over a four-month period the basis point equivalent of a probable 25bp move (the model does not predict moves of greater than 25bp) to form a discreet probability of a policy rate change for each month. As a rule, when the accumulated probability of a rate change exceeds 19bp (i.e., at least a 76% chance of a 25bp move), the model predicts a rate change for that month. The four-month accumulation period accounts for the fact that RBA behavior changes quickly in response to changes in the macro environment. In contrast, the ECB model uses a 12-month accumulation period.

RBA probit model: central view

	Estimated move in basis points	Implied rate move	Implied nominal policy rate
Aug 07	18	+25	6.5
Sep 07	0	0	6.5
Oct 07	4	0	6.5
Nov 07	16	+25	6.75
Dec 07	0	0	6.75
Jan 08	0	0	6.75
Feb 08	0	0	6.75
Mar 08	0	0	6.75
Apr 08	0	0	6.75
May 08	0	0	6.75
Jun 08	0	0	6.75
Jul 08	0	0	6.75
Aug 08	0	0	6.75
Sep 08	-2	0	6.75
Oct 08	-24	-25	6.5
Nov 08	0	0	6.5
Dec 08	0	0	6.5

The model's fit is good, with a pseudo-R^2 of 0.76. The derived coefficients for each variable hint that the most powerful driver for predicting RBA behavior is the global policy rate, followed by the trimmed mean CPI, the rate of domestic capacity utilization, private credit growth, and the global manufacturing PMI. The model implies that, in the past, the behavior of RBA Board members was more influenced by the actions of other central banks than the direction of domestic core inflation.

The model's limitations

One limitation is that the model takes only indirect account of influences on RBA behavior other than those demonstrated by contemporaneous economic data. For example, the RBA could ease policy if the market contagion from the US subprime mess were unexpectedly large, or if markets ceased functioning. Such a move would be consistent with one of the RBA's mandates of maintaining stability in the financial system, but would not be captured by the model, unless global policy rates plunged. Also, the model predicts an RBA rate rise in November 2007, but the rise may come in December owing to the proximity of the federal election and the intense political sensitivity of changes in interest rates.

This model was adapted for the RBA from the work that Malcolm Barr, JPMorgan's UK economist, did for predicting the Bank of England's behavior. We also are indebted to David Mackie and Raphael Brun-Aguerre from the European Economics team, who developed Malcolm's initial work for the ECB. Raphael constructed the RBA model and is in the process of building a similar model for the RBNZ.