Price-setting Behaviour – Insights from Australian Firms

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Since 2004, the RBA has been conducting a survey of how firms set prices, how frequently they review and change prices, and what factors influence these decisions. The results show that firms employ a range of approaches to price setting, with around half reviewing their prices at a regular interval. Early in the survey period, costs were the most important factor in price setting, though demand considerations became more important when economic conditions softened.

Introduction

The way firms set prices can be a key determinant of the dynamics of the inflation process. Given this, over recent years a number of central banks, including the Reserve Bank of Australia (RBA), have conducted surveys of how firms set prices, how frequently they review and change their prices, and what factors influence these decisions.[1] This article discusses the results of an ongoing survey that has been conducted by the RBA since 2004.

The main findings can be summarised as follows:

- the surveyed firms employed a range of approaches to price setting, with slightly more setting prices as a mark-up on costs rather than in response to various demand factors;
- broadly the same number of surveyed firms reviewed prices at regular intervals (most commonly annually) as reviewed prices with each transaction or in response to external factors, although behaviour differs across sectors; and
- costs were the most important driver of price adjustment over the first part of the sample period, with demand considerations becoming more important when economic conditions softened in late 2008.

The Survey

The RBA has been surveying firms about the way they set prices since 2004. The survey has been conducted in two parts. The first was undertaken over an 18-month period from late 2004, with around 700 firms responding to a detailed set of specific questions about their pricing strategies, the timing of price reviews and adjustments, and the reasons for these adjustments. Questions about the factors influencing pricing decisions have been continued into the second part of the survey, which has run on an ongoing basis, involving around 60 firms each quarter. The survey has covered both 'large' firms (with more than 200 employees) and 'small to medium' firms (with less than 200 employees) across a wide range of industries (Table 1).

In the survey conducted from 2004–2006, firms were asked to identify the most significant influence on their price setting. In a similar fashion to surveys conducted by other central banks, firms were

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1 Following the initial study in the United States (Blinder *et al* 1998), price-setting surveys have been conducted by the central banks of Canada, England, Japan, Sweden and New Zealand, as well as a number of euro area central banks.

Table 1: Characteristics of Firms

	Per cent of firms surveyed	Share of gross value added in GDP
Industry sector[(a)]		
Agriculture	2	3
Construction	13	8
Manufacturing	28	14
Mining	4	3
Utilities	2	3
Wholesale & retail trade	17	13
Transport & storage	7	6
Business services	21	27
Household services	3	20
Tourism	3	4
Firm size[(b)]		
Small to medium	34	49
Large	66	51

(a) Industry shares are calculated using a five-year average of the ratio of industry gross value added to GDP(P), from June 2001 to June 2006.
(b) Firm size shares are calculated using gross value added data from 2001. Large firms have more than 200 employees.
Sources: ABS, RBA

categorised into six broad groups, in particular firms that:

- predominantly used a cost plus fixed percentage mark-up;
- predominantly used a cost plus a variable percentage mark-up;
- set prices based on 'general market conditions';
- reported that 'competitors' prices' were the most important influence;
- reported that 'the level of demand' was the most important influence; and
- reported that the customer sets the price.

Firms were also asked how frequently prices were reviewed, in particular whether price reviews were conducted at a set frequency ('time-dependent') or whether prices were fixed until there was a sufficiently large change in market conditions ('state-dependent'). In order to assess the frequency of price changes, the survey asked how many times the firm adjusted prices in the previous 12 months. Further, to explore the reasons for price changes, the survey asked firms to identify the relative significance of a list of factors in driving price changes. These included: *costs, demand, competitor price movements, exchange rate movements and regular adjustments*. (This question has been continued beyond 2006, which enables an assessment of how pricing behaviour has adjusted to changes in economic conditions as outlined in the final section of this article.) In addition, firms were asked if they offer 'regular discounts', such as a routine percentage reduction for larger customers, or if they offer 'discounts that vary with market conditions'. Finally, the structural characteristics of each firm were also recorded, as well as their exposure to domestic and external competition.

Survey Results

How are prices determined?

When asked to describe how prices are set, one-half of the firms surveyed during the 2004–2006 period indicated that internal cost considerations were the most significant factor, while almost as many indicated that pricing decisions were driven primarily by demand factors. Of the firms that predominantly focused on cost factors, around half reported that they set prices as a fixed mark-up over costs, while the rest reported they set prices based on costs plus a margin that varies in line with demand conditions (Table 2).

Table 2: Firm Pricing 'Models'
Which of the following is most significant for the firm's price setting?

	Per cent of firms
More cost-focused	**49**
Cost plus fixed mark-up	23
Cost plus variable mark-up	26
More demand-focused	**45**
Market conditions	25
Competitors' prices	11
Level of demand	4
Customer sets price	5
Other	**6**

Source: RBA

Table 3: Dominant Pricing Strategy by Firm Characteristic
Per cent of firms

	Cost-focused[a]	Demand-focused[b]	Other
Total sample	**49**	**45**	**6**
Industry[c]			
Agriculture	18	82	0
Construction	71	27	2
Manufacturing	47	46	6
Mining	18	71	11
Utilities	18	27	55
Wholesale & retail	44	50	7
Transport & storage	57	30	13
Business services	55	44	1
Household services	35	30	35
Tourism	20	80	0
Firm size[c]			
Small to medium	56	42	2
Large	46	45	9
Import competition[c]			
Significant	33	62	4
Moderate	54	39	7
Minor	50	41	8

(a) Sum of 'direct cost-plus fixed mark-up' and 'direct cost-plus variable mark-up' categories.
(b) Sum of 'market conditions', 'competitors' prices', 'level of demand' and 'customer sets the price' categories.
(c) Chi-squared tests of independence were conducted for each heading group. The null hypothesis of no relationship was rejected at the 5 per cent level of significance.
Source: RBA

The survey results suggest that pricing strategies differed significantly across industries (Table 3). Cost-focused strategies were dominant for the construction and transport & storage industries. This is not surprising given that during the first part of the survey period the construction industry was operating close to full capacity, so increases in costs were swiftly passed into prices. In contrast, pricing was more demand-focused in the commodity-producing agriculture and resource industries. In these industries, global demand factors were particularly important in determining prices. Similarly, demand-focused pricing dominated in the tourism industry; for example, accommodation prices and airfares were often quick to respond to changes in demand. A relatively high proportion of firms in the utilities and household services industries reported 'other' pricing strategies, consistent with the significance of price regulation in these sectors.

In terms of the structural characteristics of the surveyed firms, those exposed to a larger degree of import competition tended to use more demand-focused approaches to price setting. In terms of size, cost-focused approaches were more common among smaller firms; this may be because it is costly to gather the information required to review prices, encouraging smaller firms to use a simple cost-plus mark-up approach.[2]

In response to the questions about discounting, around 40 per cent of firms said they undertook some type of significant discounting, with around one-quarter of all firms using discounting to manage fluctuations in market conditions. Larger firms were a little more likely to discount and had a higher tendency to vary discounts as market conditions change (Table 4). Discounting was also more prevalent among firms exposed to a higher degree of import competition, and among firms that used demand-focused pricing strategies.

Table 4: Dominant Discounting Strategy by Characteristic
Per cent of firms

	Standard discounts	Discounts on market conditions	No significant discounts
Firm size[(a)]			
Small to medium	16	22	62
Large	13	31	57
Import competition[(a)]			
Significant	21	40	38
Moderate	17	22	60
Minor	12	24	64
Pricing strategy[(a)]			
Cost-focused	13	24	63
Demand-focused	16	34	50

(a) A chi-squared test of independence between the firm characteristic (rows) and pricing behaviour (columns) was conducted. The null hypothesis of no relationship was rejected at the 5 per cent level of significance.
Source: RBA

2 These two findings are consistent with the euro area central banks' survey results presented in Fabiani *et al* (2006), that find the lower the level of competition, or the smaller the firm, the more likely mark-up pricing is used.

How often are prices reviewed?

Around half of the surveyed firms reviewed prices at a set frequency ('time-dependent') (Table 5). This is lower than the shares reported in international pricing studies.[3] The most commonly reported frequency was annual, while less than 15 per cent of firms conducted reviews monthly or weekly. This result suggests that for many firms the cost of conducting frequent reviews is greater than the expected benefit, particularly during a period of relatively stable demand and inflation.

Around one-quarter of firms reviewed prices for each transaction, with the large majority of these firms in the business services and construction industries. Of those firms, the most common trigger for a review was a change in costs (cited by nearly 30 per cent of firms), consistent with the dominance of cost-focused pricing models in these industries.

How often are prices changed?

Around 40 per cent of firms reported that they had changed prices once over the previous 12 months (Graph 1).[4] Just 15 per cent of firms did not change prices at all. At the other end of the spectrum, about 25 per cent of firms reported changing prices more than once a month in the previous year.

Price changes were most frequent in the goods sector, with a median of two price changes in a 12-month period (Table 6). The median frequency of price changes was similar for both small and large firms, although a higher proportion of large firms changed their prices more than once a week. This is consistent with the administrative and management costs associated with the price-setting process being particularly high for small firms, resulting in fewer price reviews and price changes.

3 For example, for the United States and the United Kingdom, Blinder *et al* (1998) and Hall, Walsh and Yates (2000) find that 60 per cent and 79 per cent of firms followed time-dependent rules. For the euro area economies Fabiani *et al* (2006) ask a slightly different question, and find that most firms follow both time-dependent and state-dependent rules.

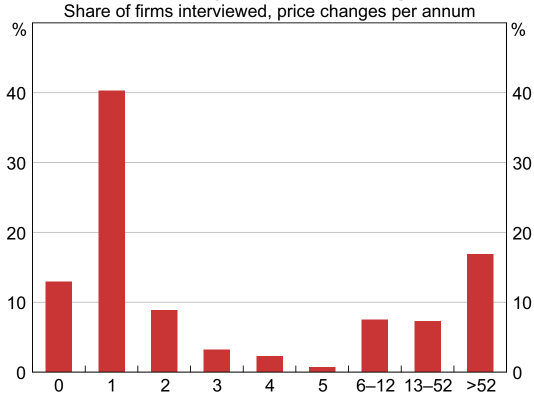
4 For questions on the frequency of price reviews and changes where the firm has multiple product lines, the survey asked the firm to focus on their major product category.

Table 5: Price Reviews
How frequently are prices reviewed for the firm's major product category?

	Per cent of firms
State-dependent	**29**
For each transaction	**25**
Time-dependent	**46**
Annually	23
Semi-annually	6
Quarterly	6
Monthly	7
Weekly	4

Source: RBA

Graph 1
Frequency of Price Changes
Share of firms interviewed, price changes per annum



Source: RBA

The nature of firms' costs also appeared to influence the frequency of price changes. Firms with imported input costs accounting for a high share of total costs reported more frequent price changes and reviews than those with a lower share. A similar pattern was apparent for material costs. The share of labour costs had the opposite effect on the frequency of price adjustments and reviews, consistent with material costs and imported costs being more volatile than labour costs.

Table 6: The Influence of Firm Characteristics on Price Change Frequency[(a)]
Price adjustments per annum

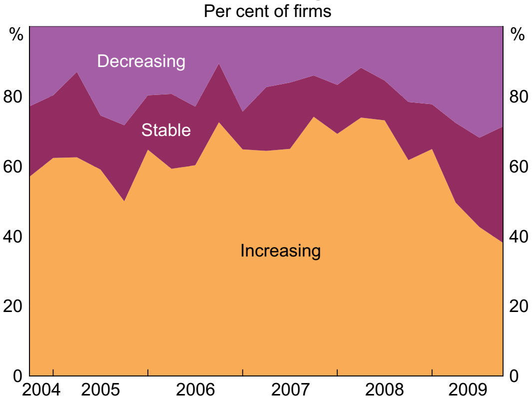
	Median		Median
Sectors*		**Firm size**	
Goods production	2	Small to medium	1
Goods distribution	2	Large	1
Services	1		
Market share*		**Labour costs***	
Less than 20 per cent	2	Less than 20 per cent	3
20–40 per cent	2	20–50 per cent	2
Greater than 40 per cent	1	Greater than 50 per cent	1
Domestic competition*		**Material costs***	
Significant	2	Less than 20 per cent	1
Moderate	1	20–50 per cent	2
Minor	1	Greater than 50 per cent	3
Import competition		**Imported costs****	
Significant	2	Less than 20 per cent	1
Moderate	2	20–50 per cent	2
Minor	1	Greater than 50 per cent	3

(a) A Kruskal-Wallis rank sum test of the equality of medians was conducted. * and ** indicate rejection of the null hypothesis at the 10 and 5 per cent levels, respectively.
Source: RBA

How Do Pricing Decisions Vary with Economic Conditions?

The first part of the pricing survey provided some stylised facts about the price-setting process used by Australian firms. The second part of the survey provides some insights into how pricing behaviour varies with economic conditions.

Graph 2
Price Changes
Per cent of firms



Source: RBA

According to the survey results, the share of firms raising their prices increased gradually through much of the past decade, up until the second half of 2008, when firms started to report a moderation in inflationary pressures (Graph 2). Reflecting this change, in both 2008 and 2009 the share of firms cutting prices was significantly higher than in previous years.

As part of the ongoing survey, firms were asked why they changed their prices, and to indicate the importance of five factors – demand, costs, competitors' price moves, exchange rate movements and regular price adjustments – on a scale from unimportant (a score of 1) to very important (a score of 4). The relative importance of each of the five factors was different for firms raising prices and firms lowering prices (Graph 3). Cost changes were significantly more important for firms increasing prices. On the other hand, competitors' price changes and exchange rate movements were relatively more important in explaining price decreases than price increases. The importance of demand conditions was broadly balanced for firms increasing or decreasing prices.

The relative importance of factors explaining price changes has varied over time: from late 2004 until mid 2007, the share of respondents reporting cost pressures and strong demand growth as important factors explaining price changes gradually increased, though cost pressures remained the dominant factor (Graph 4). While the share of firms citing cost pressures continued to drift higher into 2008, demand growth became a less important factor. But from early 2009 when the slowdown in economic growth resulted in a moderation in inflationary pressures, an increasing number of firms cited demand factors as a reason to lower prices. The exchange rate also became a more important consideration in late 2008, in line with the large depreciation of the Australian dollar, and the subsequent appreciation in 2009.

Conclusion

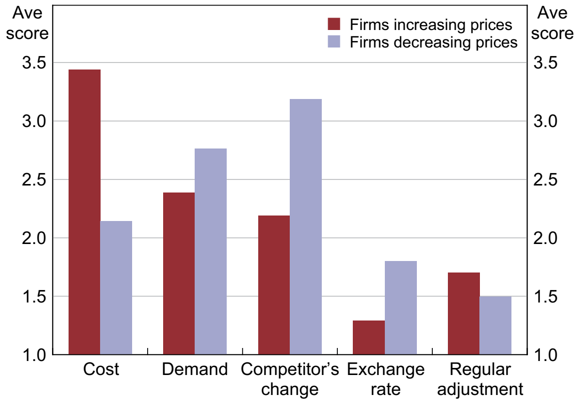
The results of the Reserve Bank's pricing survey suggest that the key drivers of price changes vary both amongst different types of firms and over time. In general, around half of the surveyed firms use a cost-plus mark-up approach to price setting while the other half reported that they respond more to market conditions. Many firms also appear to review prices at a regular interval, typically on an annual basis. Price reviews and changes tend to be more frequent for those firms in the goods sector. These results are broadly consistent with the findings of similar studies in other countries.

The RBA survey also indicated that firms' price-setting behaviour changed somewhat during the recent economic slowdown, with demand factors becoming a more important determinant of price-setting decisions. Through 2009, the share of firms highlighting the importance of demand factors when setting prices increased significantly, whereas the share of firms citing the importance of cost factors fell by one-third. In general, cost pressures were found to be relatively more important for firms raising prices, whereas demand conditions, competitors' price decreases and exchange rate movements were relatively more important for firms during periods in which they were lowering prices. ✠

Graph 3

Factors Explaining Price Changes*

Significance of factors on decision to change prices



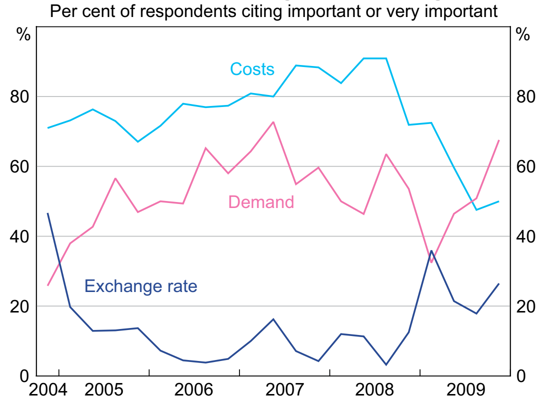
* November 2004 to December 2009

Source: RBA

Graph 4

Factors Explaining Price Changes

Per cent of respondents citing important or very important



Source: RBA

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