

Original Research Article

Price Setting Behavior in Vietnam: Evidence from a Survey

ABSTRACT

The paper aims to investigate the price setting behavior of Vietnamese firms, by analyzing the results of a price survey. We find that it is costly and difficult for firms to discover their competitors' prices, because of differentiation. The majority of firms review and change their prices both at regular intervals and in response to specific events, mainly taking into account current market developments. We also reveal that the customer relations and the existence of contracts are the two most important reasons for price rigidity. Lastly, firms seem to respond asymmetrically to positive and negative shocks.

Keywords: price setting behavior, rigidity, survey data

1. INTRODUCTION

Understanding the price setting behavior of firms is a very important task for central banks when they are designing and implementing monetary policy. When prices are sticky – which means that they respond slowly to changing economic conditions – will allow changes in monetary policy can have a real impact on output, at least in the short run. In contrast, if prices are flexible – which means that they frequently and rapidly respond to changes in monetary policy – then the policy will lead only to either inflation or deflation and there will be almost no change in output.

The key idea of this research is to examine the price setting behavior of Vietnamese firms, through an enterprise survey and a descriptive analysis. The use of surveys to analyze the price setting behavior of firms was pioneered in the United States by Blinder (1991, 1994) and Blinder et al. (1998). Subsequently, the methodology has become increasingly popular and has been used by a number of central banks in advanced countries, including the Bank of England (Hall, Walsh and Yates 1997; Greenslade and Parker, 2012), the Bank of Japan (Nakagawa, Hattori and Takagawa, 2000), the Bank of Sweden (Apel, Friberg and Hallsten, 2005), the Bank of Canada (Amirault, Kwan and Wilkinson, 2005), the Bank of Australia (Park, Rayner and D'Arcy, 2010), the Bank of Ireland (Keeney, Lawless and Murphy, 2010), and the European Central Bank, for nine Euro area economies (Fabiani et al., 2006).¹ These surveys have tried to document and assess important aspects of price setting practices, the information set used in the price-adjustment process, the reasons for price stickiness, and asymmetries in pricing behavior. Based on the evidence of the surveys, the authors are then able to determine the transmission mechanism and provide recommendations for how monetary policy can achieve low and stable inflation.

¹ The nine countries are Austria, Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Portugal and Spain.

The micro-based approach above is considered as an important complementary method to aggregate time series analysis in investigating price stickiness or nominal rigidity. As argued by Amirault, Kwan, and Wilkinson (2005), one of the main reasons for this is that rigid prices can best be understood at the micro level where pricing decisions are actually made. Although price setting behavior might vary significantly across countries/sectors and over time, the overall results of these studies indicate that costs and demand are the two most important determinants. In addition, most surveys, except for that for Japan, support the use of the mark-up over costs form of pricing, suggesting that firms have some form of market power and can set their prices above their marginal costs.

In general, firms take two steps when deciding whether to change their prices. First, they review their prices to check whether or not the prices are optimal for profit maximization. If the prices are not optimal, they decide whether to change them, by looking at the costs and benefits of doing so. In the reviewing stage of the price setting process, firms seem to apply both time- and state-dependent rules. For example, in the Euro area, around one third of firms follow time-dependent pricing rules, while the remaining two thirds employ state-dependent rules using both past and expected information (Fabiani et al., 2006). Meanwhile, in Australia about half of the surveyed firms reviewed their prices at regular intervals (Park, Rayner and D'Arcy, 2010).

Moreover, there are considerable differences in the frequency of reviewing and changing prices. Firms review prices more frequently than they actually change them. For example, in the Euro area, on average, firms review their prices between once and three times per year, while they change their prices only about once per year (Fabiani et al., 2006). This result is similar to that reported in Greenslade and Parker (2012) for the UK, but lower than that reported in Blinder et al. (1998), of about 1.4 times per year, for the US. However, in all the countries in the surveys mentioned above, firms quoted cost pressure as the most important driver for raising their prices, whereas demand shocks were more important for firms during periods when they were lowering prices. Greenslade and Parker (2012) also found that nearly half of the UK firms changed their prices within a quarter in response to an increase in costs or a fall in demand.

In addition, the frequency with which firms adjust their prices varies across sectors. In the Euro area, services firms review and change their prices less often than other firms (Dhyne et al., 2005; Fabiani et al., 2006; Lünemann and Mathä, 2005). A similar result has been found in Canada, where services firms set their prices only annually based on wage settlements. In contrast, wholesalers and retailers are more likely to have flexibility in their prices, with about seven changes every year. Other factors that are important to the frequency of price changes include the size of the firm, international market sales, the number of competitors and the intensity of competition. In most countries, there is evidence that firms in highly competitive markets are more likely to respond to changes in cost and demand than firms facing low competition.

Although many studies have been carried out to study price setting behavior, especially in developed countries, none has been carried out in Vietnam. With technical support from the General Statistics Office (GSO), a survey was implemented in 2014 with the aim of shedding light on how firms set prices. Given the particular features of the structure of an emerging economy, such as its degree of openness, its market structure, its dependence on imported materials and production tools, and its environment as regards inflation and monetary policy, this first attempt is expected to provide useful information about price rigidity that will be essential for a better monetary policy in the future.

In this paper, we attempt to provide a comprehensive view of the price setting behavior of Vietnamese firms, through investigating the results of a price survey. Our main findings are that it is costly and difficult for firms to discover their competitors' prices, because most of them have some kind of price differentiation. The majority of firms said that they reviewed and changed their prices both at regular intervals and in response to specific events, mainly taking into account information about current market conditions. In addition, we discover that the antagonism of customers and the existence of contracts are the two most important reasons why firms do not change their prices, while menu costs and coordination failure play a less important role. Lastly, the responses of prices seem to be asymmetric to the direction of

shocks. Firms raise their prices faster in response to positive shocks (increases in costs or demand) than they reduce their prices in reaction to negative shocks (declines in costs or demand).

The remainder of the paper is organized as follows. Section 2 describes some background details of the survey and the main characteristics of the firms that responded. Section 3 deals with the price reviewing process, and provides evidence on the time- or state-dependent nature of firms' pricing policies, the information set used and the frequency of price reviews. Sections 4, 5 and 6 report on the frequency of price changes, the factors influencing price changes, and how prices react to significant changes in demand and costs, respectively. Finally, Section 7 concludes and provides some policy implications.

2. THE SURVEY

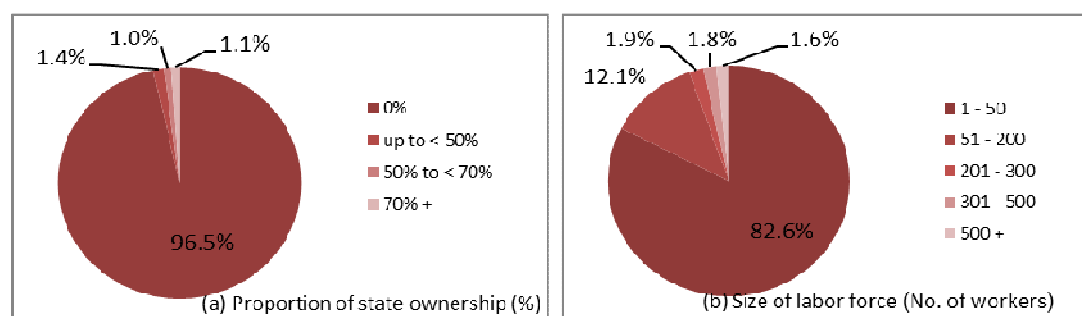
The survey was designed in a very similar way to that in Greenslade and Parker (2012). It was conducted with technical support from the GSO of Vietnam, and covered a selection of businesses located in the three largest cities of the country in 2014Q2, Ha Noi in the north, Da Nang in the center and Ho Chi Minh City in the south. Questionnaires were sent to over 2,000 firms operating in different industries. The proportion of firms in each city and industry was consistent with what is chosen in the annual national enterprise surveys. To obtain a high response rate, firms were selected randomly from those who had a good record of responding to previous surveys by the GSO. The firms were first asked, directly or indirectly through email or phone, about how they set prices. In the end, we obtained a total number of 1,579 respondents. The survey respondents by industry are presented in Table 1.

Table 1: Survey respondents by industry

	Number of responses				%
	Ha Noi	Da Nang	HCM City	Total	
1 Manufacturing	142	70	160	372	23.6
2 Trade	191	101	180	472	29.9
3 Hotels and restaurants	95	62	90	247	15.6
4 Transport	60	61	80	201	12.7
5 Agr., forestry & fisheries	32	11	35	78	4.9
6 Elec., gas & water supply	11	3	8	22	1.4
7 Construction	50	30	55	135	8.5
8 Real estate and renting	20	7	25	52	3.3
Total	601	345	633	1579	100

Most of the firms, accounting for about ninety-six percent of the respondents, are privately owned. The rest are firms with different proportions of state ownership. Regarding firm size, nearly eighty-three percent of the respondents employ fewer than 50 workers, and over twelve percent employ between 51 and 200 workers. Around eighty-two percent of the respondents have a share capital of less than VND50 billion (equivalent to around US\$2.4 million), and almost none of them have a share capital of over VND1,000 billion. This means that the survey mostly covers privately owned small and medium size firms.

Figure 1: Survey respondents by ownership and size of labor force



The market for the main products of the firms is domestic and relatively competitive. In particular, around ninety-six percent of the respondents target the home market, and nearly ninety percent of them reported that they face competition at either a high or a medium level. Similarly, the majority of the respondents perceive themselves to have a market share of less than 5%, over ten percent of them report a market share between 5% and 10%, and only about seven percent of them said they have a market share of over 10%. Therefore, it is clear that most of the surveyed firms face a high or medium level of competition in the domestic market.

3. PRICE REVIEWS

Firms do not adjust their prices instantaneously in response to shocks, because it is costly for them to do so. In order to make a decision on price adjustments, firms normally go through two stages. In the first stage, firms evaluate whether their current prices are optimal or not. If they are not, then, in the second stage, price changes may be made, taking into account all the relevant costs and benefits. In this section, we will document the main features of the first stage of price reviews.

One of the most important pieces of information needed for a price review is the firm's competitors' prices. Figure 2 shows that over two fifths of the respondents stated that they could easily discover their competitors' prices. However, a larger proportion of the firms (around three fifths in total) find it either difficult or impossible to observe their competitors' prices. The ability to discover competitors' prices differs across sectors. Those firms finding it easy are more likely to belong to the service sectors, including transportation (51.7%) and hotels and restaurants (49.0%), where prices are often set publicly. In contrast, those firms finding it difficult or impossible are more likely to belong to the agriculture, forestry and fisheries (71.8%), manufacturing (64.0%), construction (60.0%), and real estate and renting (57.7%) sectors. It is likely that sale contracts in these sectors are not published by either of the contract parties. In addition, the majority of the respondents said that they apply some kind of price differentiation, with around two fifths of them doing so according to the quantity sold and over half of them deciding case by case. The complexity of price differentiation makes it difficult for firms to detect their competitors' prices.

Figure 2: Ease of finding out competitors' prices and price differentiation

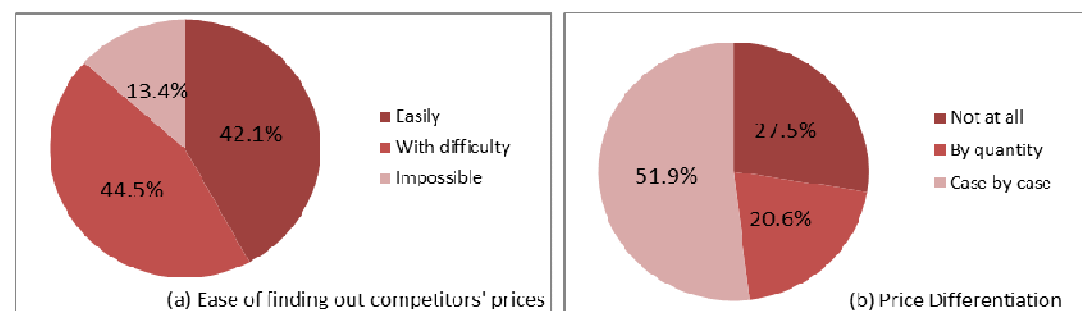
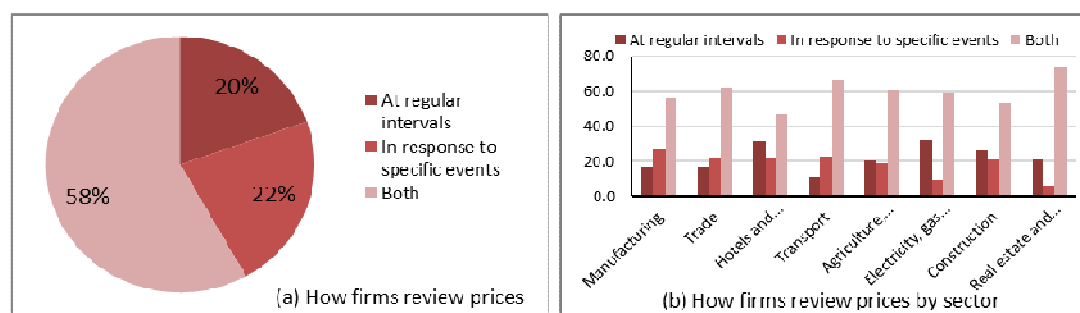


Figure 3: How firms review their prices



Price rigidity is one of the crucial ingredients of the modern dynamic stochastic general equilibrium (DSGE) models that are widely used for policy analysis by central banks. These models can be classified as either time-dependent, where the probability of price adjustment remains constant over time, or state-dependent, where firms decide to change prices in response to market conditions. To extract this information, firms were asked whether they review their prices at regular intervals or in response to specific events.

The results suggest that there is a slight difference between the number of firms using time-dependent rules and the number using state-dependent rules. In particular, about one fifth of the respondents either review prices at regular intervals or do so in response to specific events, for example following a large increase in costs. However, most of the respondents, approximately three fifths, use a combination of the two. Despite the differences, the number of firms using both rules is dominant across all sectors. The result is much higher than that found by Fabiani et al. (2006) for the Euro area (46%) and Greenslade and Parker (2012) for the UK (44%).

Table 2: Frequency of price reviews

		Daily	Weekly	Monthly	Quarterly	Half year	Yearly	> 1 year	Irregularly
1	No. of firms	30	47	179	119	58	71	23	1,052
2	Percentage	1.9%	3.0%	11.3%	7.5%	3.7%	4.5%	1.5%	66.6%

Regarding the frequency of price reviews, it is unclear how often firms review their prices since the majority of the respondents do it at irregular intervals. In particular, two thirds of the respondents reported that they review their prices at irregular intervals, while fewer than a quarter of them do so at least quarterly. The result is not surprising since a state-dependent price setting rule is widely chosen by firms in the highly volatile economy of Vietnam.

4. PRICE CHANGES

In the second stage of price adjustment, if its prices are not at an optimal level, a firm will decide to change them. In the survey, firms were asked about the frequency of changes and about the information used in their decision making. In addition, the asymmetry of price changes was also investigated.

4.1 The frequency of price changes

Table 3 illustrates that, on average, fewer than one fifth of the respondents change their prices at least quarterly, although nearly a quarter of them review their prices in the same period. This implies that firms review their prices more often than they actually change them. Notably, over two thirds of the respondents change their prices at irregular intervals. These results are not surprising, as the majority of firms set their prices according to market conditions. Furthermore, firm size, measured by the number of

employees, share capital or domestic market share, has almost no impact on how often firms reset prices. However, the degree of competitive pressure faced by the firm matters for the frequency of price reviews as well as for price changes. In particular, about two fifths of firms operating in markets with a high or medium level of competition adjust their prices at least quarterly, while the fraction of firms doing so in markets with low or no competition is only half that.

Table 3: Frequency of price change by sector

		Daily	Weekly	Monthly	Quarterly	Half year	Yearly	> 1 year	Irregularly
1	Manufacturing	1.3%	6.5%	12.1%	5.1%	2.4%	5.1%	1.3%	66.1%
2	Trade	0.8%	0.4%	3.6%	5.1%	3.8%	6.8%	1.7%	77.8%
3	Hotels and restaurants	0.0%	1.6%	23.5%	4.5%	5.3%	5.3%	2.4%	57.5%
4	Transport	0.5%	0.0%	9.0%	5.5%	2.0%	2.0%	0.5%	80.6%
5	Agriculture, forestry and fisheries	0.0%	1.3%	1.3%	6.4%	0.0%	3.8%	2.6%	84.6%
6	Electricity, gas and water supply	18.2%	9.1%	0.0%	0.0%	0.0%	0.0%	4.5%	68.2%
7	Construction	0.7%	0.0%	5.9%	13.3%	4.4%	2.2%	0.7%	72.6%
8	Real estate and renting	11.5%	9.6%	5.8%	3.8%	9.6%	0.0%	0.0%	59.6%
Total		1.3%	2.4%	9.5%	5.7%	3.5%	4.7%	1.5%	71.4%

Firms in some sectors change their prices more frequently than firms in others. For example, over a quarter of the firms that change their prices at least quarterly can be seen in real estate and renting (30.8%), hotels and restaurants (29.6%), electricity, gas and water supply (27.3%), and manufacturing (25.0%). Note that the small number of firms in our survey in the electricity, gas and water supply sector may make its result biased. Most of the firms in this sector review and change their prices daily, weekly or at irregular intervals, as they face daily changes in world prices.

Moreover, in the survey, firms were questioned about whether their frequency of price adjustment had changed in the last 5 years (2010-2014). The results indicate that more than two fifths of the respondents changed their prices more frequently as the period went on, while more than one tenth changed their prices less frequently, and the rest had not changed the frequency or were not sure about the tendency of their price adjustment. The increasing frequency of price changes may be the result of the increasing uncertainty of the Vietnamese macro-economy during the period.²

4.2 The information set and price setting rules

To determine whether inflation should be modelled primarily as a backward-looking variable, as in the so-called traditional expectations-augmented Phillips curve, or as a forward-looking variable, as in the New Keynesian Phillips Curve (NKPC), the firms were asked directly about the information they take into account when adjusting prices. In the traditional Phillips curve, inflation depends on its own lags and some cyclical measures. By contrast, the NKPC focuses on the forward-looking nature of inflation, which helps monetary authorities to try to avoid significant costs in terms of employment and output as they attempt to reduce inflation.

The results show that over two thirds of the respondents use information about the current conditions, and that fewer than a quarter of them simply adopt a rule-of-thumb approach based, for example, on the consumer price index, to decide whether to change prices. Meanwhile, a very small proportion of the respondents change their prices by looking at either past or future economic developments. The high

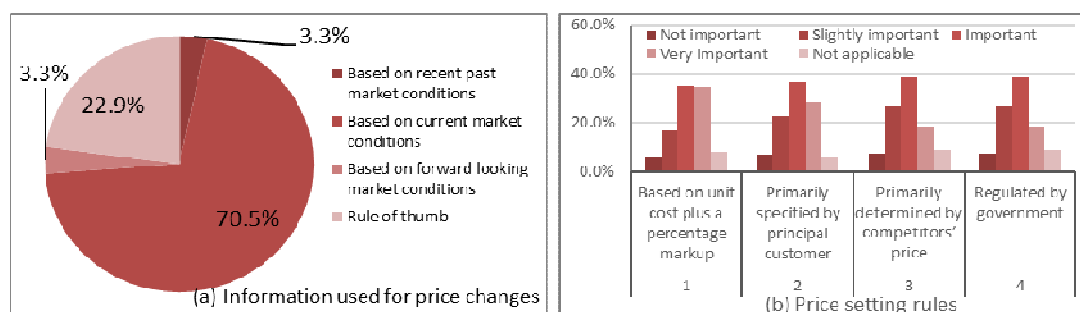
² Data from the GSO shows that, on average, the mean and standard deviation of the year-on-year inflation rate for the period 2008M1-2013M12 in Vietnam were 12.3% and 7.3%, respectively.

proportion of firms using current information in making decisions on prices is again attributable to the unstable condition of the Vietnamese economy during the years before the survey, as uncertainty makes the future unpredictable and the past useless in firms' price setting. These results are very different from those obtained in developed countries such as the UK where over one third of firms were found to set their prices primarily by looking forward into the near future (Greenslade and Parker, 2012). This implies that the estimation of hybrid versions of the NKPC as proposed by Galí and Gertler (1999) may be more suitable for the Vietnamese economy.

In addition, the results indicate that firms that change their prices more frequently are more backward looking in their price setting. In particular, over one tenth of those respondents who change their prices at least quarterly use information on past conditions, and almost three quarters of them use information on current conditions, while the corresponding figures for firms that change their prices at most semi-annually are almost zero and three fifths. In contrast, firms that change their prices less frequently, at most semi-annually, tend to use more rule-of-thumb in their price setting, with nearly one third of the respondents using this rule. Meanwhile, the corresponding number for firms that change their prices at least quarterly is just above one tenth.

Looking at how prices are determined, we find that there is only a slight difference in the degree of importance among four possible price setting rules: the price is made up of the direct unit cost plus a fixed percentage mark-up; the price is primarily specified by the principal customer; the price is primarily determined by the competitors' prices and; the price is primarily regulated by the government. Between about three fifths and more than two thirds of the respondents stated that all the rules were important or very important, and fewer than one tenth said that they were not important.

Figure 4: The information set and price setting rules



Furthermore, there is a very small difference among firms of different sizes as to the price setting rules that are applied. Large firms, with over 50 workers, are slightly more likely than small firms to set their prices based on the direct unit cost plus a fixed percentage mark-up. In more detail, nearly three quarters of the large respondents find this rule to be important or very important, while over two thirds of small firms think so. Similarly, the proportion of large firms that may make their decisions with reference to competitors' prices or following government regulations barely exceeds the corresponding figures for small firms. Meanwhile, the prices for both small and large firms seem to be equally influenced by their principal customers, with around two thirds of each group finding this important or very important. The results therefore do not reveal any significant role of firm size, in terms of the number of employees, in the price setting rule used by the firm.

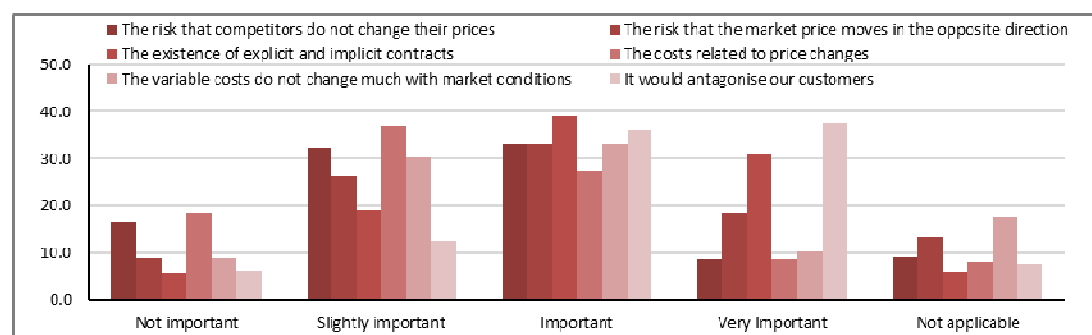
4.3 Why might prices be sticky?

There could be many reasons why firms do not change their prices in response to every change in supply and demand. For example, firms may not adjust their prices because of the costs associated with gathering information and reprinting price lists (menu costs), or because they do not want to trigger a price war with competitors (coordination failure), or because they have an official or unofficial agreement with their customers to supply a certain product at a specific price (explicit and implicit contracts), or

because they want to build up long-term customer relationships and to try to avoid antagonizing customers (customer relations). Note that some of these factors, such as the wish not to antagonize customers, are less relevant for price decreases than they are for increases.

By asking firms to assess how important these factors are in deciding not to change their prices, the survey shows that a desire not to antagonize customers, and explicit and implicit contracts, are the two most important factors, with over two thirds of the respondents rating them as important or very important. By contrast, menu costs and coordination failures are the least recognized, as they are reported to be not important or to be only slightly important by around half of the respondents. The results are consistent with the findings in many other surveys such as Greenslade and Parker (2012) for the UK, Fabiani et al. (2006) for the Euro area, Apel, Friberg and Hallsten (2005) for Sweden, and Amirault, Kwan and Wilkinson (2005) for Canada.

Figure 5: Reasons for not changing prices



5. FACTORS DRIVING PRICE CHANGES

In this section, we investigate the factors that cause prices to change and whether these factors have asymmetric effects. In the survey, firms were asked about the degree of importance of various factors when making price changes; these factors included costs (fuel, material and labor costs), market conditions (demand, competitors' prices, world prices), government regulations, and others. The question was posed separately for price increases and decreases to take into account the possible asymmetry.

Table 4 shows that, in general, firms' price responses are relatively symmetric. That is, firms are equally strongly prompted to change their prices in response to shocks that drive prices upward and shocks that drive prices downward. In addition, changes in costs, including fuel, material or input costs, and product quality emerge as the two most important factors that lead to price adjustments. Meanwhile, changes in labor costs and demand are also crucial determinants of price changes, as more than three fifths of the respondents considered them important or very important. In contrast, world prices and government regulations are considered less important, because only a small proportion of our sample are firms that are state owned, that are affected by international prices or that sell products to overseas markets.

Table 4: Most important factors leading to a rise or fall in price

Rise	Rank	Fall	Rank
Increase in the prices of fuel, materials or input	1 (86.1%)	Decrease in the prices of fuel, materials or input	1 (77.4%)
Increase in the quality of products	2 (75.7%)	Decrease in the quality of products	2 (70.7%)
Increase in labor costs	3 (69.4%)	Decrease in demand	3 (60.6%)
Increase in demand	4 (64.8%)	Decrease in labor costs	4 (59.7%)
Increase in competitors' prices	5 (53.3%)	Decrease in competitors' prices	5 (54.2%)

Increase in inflation	6 (52.6%)	Decrease in market share	6 (50.0%)
Increase in market share	7 (50.1%)	Decrease in inflation	7 (48.4%)
Permitted by government	8 (42.4%)	Required by government	8 (47.1%)
Routine at regular intervals	9 (41.5%)	Routine at regular intervals	9 (46.9%)
Increase in world prices	10 (36.9%)	Decrease in world prices	10 (35.7%)

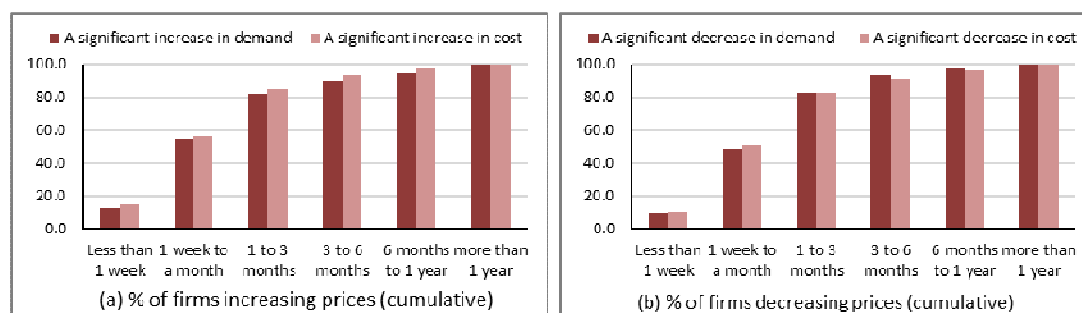
Note: Figures in brackets are the percentage of firms responding 'very important' or 'important'

6. HOW DO PRICES ADJUST FOLLOWING A DEMAND OR COST SHOCK?

The survey then asked firms how long it takes them to adjust their prices following demand and cost shocks. Figure 6 illustrates the cumulative responses. First, it shows that firms' reactions to shocks are relatively fast, as over half of the respondents raise or reduce their prices within a month, and over four fifths of them do so within a quarter; these figures are much higher than the corresponding figures in developed countries. For example, in response to either demand or cost shocks, less than half of the firms in the UK (Greenslade and Parker, 2012) and between one and two thirds of the firms in different countries in the Euro area (Fabiani et al., 2006) adjust their prices within a quarter. The results can be attributed to the higher average and more volatile inflation in Vietnam, which causes more frequent wage and price adjustments, as argued by Ball, Mankiw and Romer (1988).

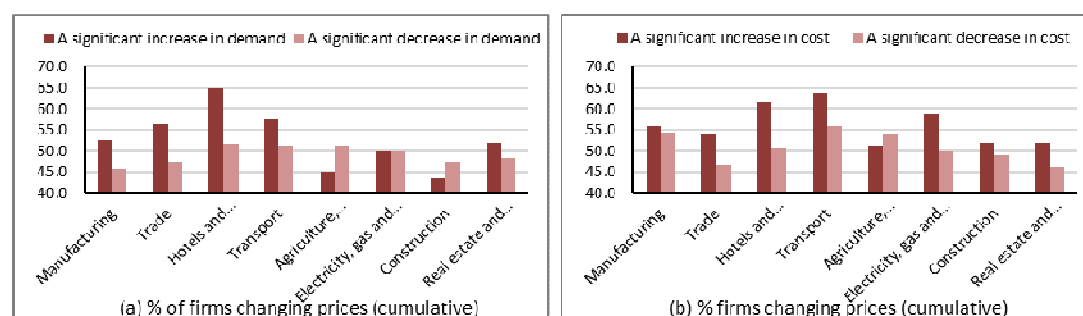
In addition, Figure 6 indicates that there is only a little asymmetry in the responses by firms to different types of shocks (demand and cost). In particular, positive cost shocks seem to induce firms to adjust their prices slightly faster than positive demand shocks, while the opposite is not really true for negative shocks. This means that firms are slightly more strongly prompted to change their prices in response to shocks that lead to profit losses (rising costs) than in response to shocks leading to profit gains (increasing demand). The results hold across all sectors.

Figure 6: Percentage of firms responding within different periods to demand and cost shocks



Furthermore, the asymmetry appears more obviously in the responses of firms to the sign of the shock. For demand shocks, higher demand tends to cause firms to change their prices faster than lower demand. For example, Figure 6 also illustrates that, within a month, about fifty-five percent of the respondents would have increased their prices when facing a positive demand shock, as compared to forty-eight percent that would have reduced their prices when coping with a negative shock. Interpreting monetary policy shocks as demand shocks, these results imply that a monetary contraction probably has a lower effect on prices, and then a higher effect on output, than a monetary expansion. Similarly, prices also respond more quickly to increasing costs than to decreasing costs. Within a month, nearly fifty-seven percent of the respondents would have increased their prices in reaction to a positive cost shock, while fewer than fifty-one percent of them would have cut their prices in response to a negative one. The results hold across almost all the sectors, and suggest that firms are more flexible and willing to raise their prices rather than to reduce them.

Figure 7: Percentage of firms responding to shocks within a month, by sector



Lastly, we investigate the reaction of firms to exchange rate movements. In the survey, importers were asked how great a depreciation in the exchange rate (VND/USD) would be needed before they adjusted their prices in the domestic market. Table 5 shows that the percentage of the 339 importing firms that would increase their prices in the domestic market is about three fifths, if the depreciation was less than 2%, and nine tenths, when the depreciation was as much as 5%. However, among those firms that can adjust their prices, only a very small fraction confirmed that they find it easy to do so, while the rest find it difficult or very difficult or are not sure. The results suggest that domestic prices are relatively sensitive to exchange rate developments. One of the reasons may be that Vietnam is a highly open economy with a large share of imported production inputs.³ Therefore, a rise in the cost of imported goods caused by a depreciation would have a significant impact on domestic prices. However, because of frictions, firms do not find it easy to increase prices in response to an exchange rate shock.

Table 5: Exchange rate depreciation needed before importers raise their prices in Vietnam

	VND/USD depreciation	No. of firms raising prices	Percentage	Ease/Difficulty in raising prices (%)			
				Easy	Difficult	Very Difficult	NA
1	< 2%	200	59.0	1.5	21.1	25.6	51.8
2	2% to < 5%	102	30.1	5.9	52.9	22.5	18.6
3	5 to < 10%	24	7.1	0.0	54.2	20.8	25.0
4	10% +	13	3.8	23.1	30.8	30.8	15.4
	Total	339	100.0				

7. CONCLUSIONS

Understanding how firms set prices is of very great importance to central banks' monetary policy decisions. Following many similar empirical works, this paper attempts to reach this understanding, through investigating the price setting behavior of a representative sample of Vietnamese firms, using survey results. In general, the survey has several interesting findings. First, it shows that firms seem to be equally likely to review their prices at regular intervals or in response to specific events. However, the majority of firms use a combination of the two.

In addition, firms do not adjust their prices continuously, with fewer than a quarter of them reviewing, and about one fifth changing, their prices at least once every three months. Difficulty in observing competitors' prices has an influential impact on how often firms reset their prices, but firm size does not. We also find that firms operating in markets with severe competition review and adjust their prices more frequently. However, a very large proportion of firms, over two thirds, review or change their prices at irregular

³ According to the GSO, for the period 2010-2014, Vietnam's total import value accounts for 81.0% GDP on average, of which production equipment, materials and other inputs account for 90.1%.

intervals. The result is consistent with the fact that a state-dependent price setting rule is widely utilized by Vietnamese firms.

Firms in some sectors change their prices more frequently than firms in others. Moreover, a substantial proportion of firms have, in the last few years, increased the frequency at which they change prices. This may be the result of the high uncertainty of the Vietnamese economic environment that has led to more frequent as well as state-dependent price adjustments during the period.

We find evidence that hybrid versions of the New Keynesian Phillips Curve explain inflation developments, since a large fraction of firms make their price decisions based on information about current market conditions. Furthermore, even though price differentiation is a common practice, firms seem to give equal weight to different price setting rules, and the choices made by firms are likely to be independent of their size. We also discover that customers' antagonism and contracts are the two most important factors influencing price stickiness. In contrast, menu costs and coordination failures are the least recognized. The results are consistent with the findings of many other surveys in developed countries.

Regarding the factors driving price changes, the survey reveals that firms are equally likely to be prompted to change their prices in response to shocks that drive prices upward as they are to shocks that drive prices downward. In addition, the costs of inputs and product quality are the two most important drivers of price changes.

In reaction to cost and demand shocks, firms in Vietnam adjust their prices relatively fast compared to those in developed countries. In addition, there is only a small degree of asymmetry in the responses of firms to different types of shocks (demand and cost). The asymmetry appears more obviously in the responses of firms to the sign of each type of shock. Regarding demand shocks, higher demand tends to cause firms to change their prices faster than lower demand. Interpreting monetary policy shocks as demand shocks, these results imply that a monetary contraction probably has a lower effect on prices, and then a higher effect on output, than a monetary expansion. Similarly, prices also respond more quickly to increasing than to decreasing costs. The results hold across almost all sectors and suggest that firms are more flexible and willing to raise than they are to reduce their prices.

Finally, the survey provides evidence that domestic prices are relatively sensitive to exchange rate developments, because of the very high openness of the Vietnamese economy. Therefore, an exchange rate depreciation is likely to have a significant pass through effect on domestic prices. However, as a result of frictions, most firms do not find it easy to raise prices in response to exchange rate shocks.

CONSENT (WHERE EVER APPLICABLE)

Not applicable

ETHICAL APPROVAL (WHERE EVER APPLICABLE)

Not applicable

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