How firms decide their goods and services prices plays an important role in both developments in the general price level and transmission of monetary policy; therefore, it is important that central banks understand the drivers of the decisions. In summer 2008, the Central Bank of Iceland conducted a survey of domestic firms' pricing decisions (Ólafsson *et al.*, 2011). At that time, inflation measured 12.4% and had averaged just over 5% since the inflation target was adopted in 2001. Inflation has subsided markedly in recent years, however, averaging close to the 2.5% target since the beginning of 2012. The Bank therefore decided to repeat the survey, which was conducted by Gallup during the period from 18 March through 20 April 2019. The sample included 279 businesses with four or more employees (Gudlaugsdóttir *et al.*, 2020). As before, the objective of the survey was to gain a fuller understanding of the factors that affect Icelandic firms' pricing decisions, the frequency of price changes, the effects of exchange rate movements and wage costs on pricing, and whether these factors have changed in the past decade.

Box 2

Firms' pricing decisions

Price change frequency has fallen

Before a price change is made, a firm will examine whether it is profitable to make the change, as there can be direct costs involved, such as the cost of changing price tags. Furthermore, price changes can affect both demand and the firm's reputation, thereby affecting sales and market share. If a company considers it profitable to change prices, it does so following such an examination. According to the survey, just under 40% of firms review their prices on a regular basis, and nearly half usually review their prices regularly but also following specific events (Chart 1). These results are similar to those from the 2008 survey, which is interesting because the Icelandic economy has been more stable in recent years than before the crisis, and inflation has been much lower and less volatile. Because of these factors, it could have been expected that a larger share of firms would review their prices only at regular intervals, as there are fewer specific events calling for a review of prices. However, this may reflect the fact that at the time the 2019 survey was taken, inflation had spiked to about 3% following the depreciation of the króna the previous autumn, owing to concerns about the status of airline WOW Air and pessimism about upcoming wage negotiations and the overall economic outlook (see Chapter III). The rise in inflation and inflation expectations following the depreciation of the króna, together with uncertainty about the overall outlook, could therefore have affected the survey results to a degree; however, this may be offset somewhat by the relatively favourable outcome of the wage settlements negotiated around the same time.

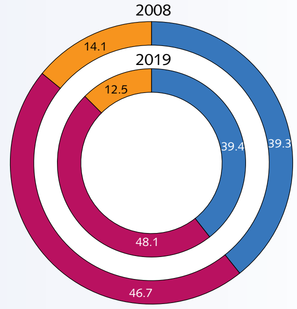
Another noteworthy point is the decline between surveys in the share of firms that consider prospects for the future a more important factor in pricing decisions than the assessment of the current situation and recent developments. Apparently, future prospects weigh heavier in the decisions of large companies, which presumably are better able to assess the outlook than their smaller counterparts, including by tasking some of their employees with financial planning.[1] There are also signs that firms whose imported inputs account for a large share of total production costs give closer consideration to the current situation and past developments when setting prices – an understandable tendency in view of such firms' sensitivity to exchange rate movements, which are difficult to predict.

The survey results show that, in the twelve months preceding the survey, firms had examined less often whether there were

1. This is well documented in international research; see, for instance, Ball (2000) and Kumar *et al.* (2015).

Chart 1

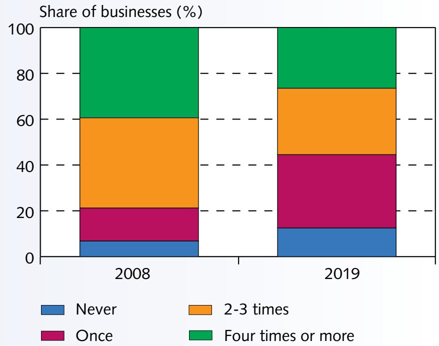
Is the price of the main product reviewed on a regular basis?



Sources: Gallup, Central Bank of Iceland.

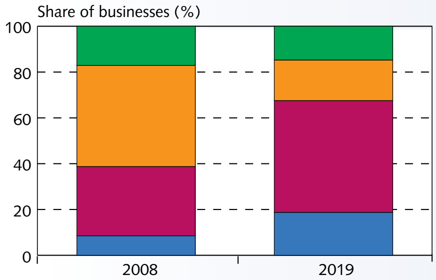
Chart 2

In the past 12 months, how often has your company examined whether there were reasons to change the price of its main product?



Sources: Gallup, Central Bank of Iceland.

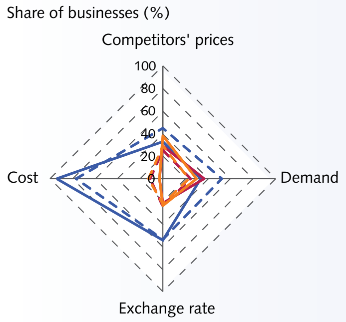
Chart 3
In the past 12 months, how often has your company actually changed the price of its main product?



Never
Once
2-3 times
Four times or more

Sources: Gallup, Central Bank of Iceland.

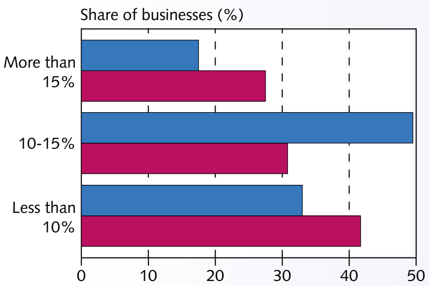
Chart 4
How important are the following factors in a decision to change the price of your company's main product?



Very important for increase
Irrelevant for increase
Unimportant for increase
Very important for decrease
Irrelevant for decrease
Unimportant for decrease

Sources: Gallup, Central Bank of Iceland.

Chart 5
How much must the króna depreciate in one quarter in order for your company to raise the price of its main product?



2008
2019

Sources: Gallup, Central Bank of Iceland.

reasons to change the price of their main product (without having changed it) than in the 2008 survey (Chart 2). This is in line with the past few years' decline in inflation and inflation volatility. However, a larger drop between surveys could have been expected because, according to the median response, firms reviewed their prices 2.5 times over a twelve-month period, as opposed to 3 times in the last survey.

Studying how often firms changed the price of their main product over a twelve-month period reveals, however, that price changes occur less often now than they did a decade ago. This is also in line with expectations. About half of respondent firms had changed their prices once in the twelve months preceding the survey, and just under a third had changed their prices two or more times (Chart 3). In the previous survey, about 30% of firms reported having changed their prices once during the preceding twelve months, and a full 60% had changed them two or more times.

Exchange rate pass-through to prices appears more symmetric than suggested by the previous survey

Survey participants considered their costs to be the most important factor underlying both upward and downward price changes (Chart 4). Just over half of firms considered movements in the exchange rate of the króna an important factor in decisions either to raise prices or to lower them. Therefore, exchange rate movements appear to have a more symmetric impact on pricing decisions now than they did just over a decade ago, when a much larger number of firms considered exchange rate movements a factor in price hikes more often than in price cuts.

That said, the survey results are not unambiguous as regards the impact of the exchange rate on the price level. When firms were asked how much the króna would have to depreciate in a single quarter before they would raise prices, nearly 42% responded that a depreciation of less than 10% would suffice, up from one-third of respondents in 2008 (Chart 5). On the other hand, nearly 28% of firms specified that the króna would have to depreciate by more than 15% in a single quarter, up from just under 18% of firms in the last survey.

When respondents were asked how much the króna would have to appreciate in a single quarter before they would lower their prices, the results were similar to the responses to the corresponding question about a depreciation (Chart 6). This is another indication that the impact of exchange rate movements on pricing decisions is more symmetric now than it was a decade ago. Just under 40% of respondents answered that the króna would have to rise by less than 10% in a given quarter, as opposed to one-third in 2008. In addition, the share that considered an appreciation of more than 15% necessary was about 30%, broadly the same as in the previous survey. It seems, then, that firms are more inclined to pass a currency appreciation through to the price level by lowering their prices than they were a decade ago.

Price changes are less frequent among firms with relatively high wage costs

It is noteworthy that the ratio of wage costs to total production costs has risen markedly in the past decade. In 59% of respondent firms, wage costs account for more than 40% of total expenses, up from 42% of firms in the last survey (Chart 7). To some degree, this reflects the large pay raises implemented in recent years, but it is probably affected as well by the boom in tourism, a labour-intensive sector. The survey shows that wage costs weigh heaviest in services sectors. It appears that firms with significant wage costs change their prices less often than other firms do. This is probably because wages are less flexible than, for instance, imported input prices. About ¾ of firms whose wage costs account for a large share of their total expenses changed their prices once or not at all during the twelve-month period covered by the survey (Chart 8), compared to about 40% in the 2008 survey.

Firms whose wage costs account for a large share of their total expenses are also more likely to base their pricing decisions on developments in the consumer price index. This could make price increases more persistent. Firms that rely heavily on imported inputs, for example, are likely to raise prices in the wake of a currency depreciation. The general price level then rises, and because firms with proportionally high wage costs are likelier to change their prices to accord with the general price level, they will also raise prices even though their largest expense item has not changed. This could also be seen in the last survey. In that survey, about one-third of firms with significant wage costs reported that developments in the general price level affected their pricing decisions most strongly. That share has fallen to 17% in the current survey. Overall, the number of firms that set the price of their main product in response to the general price level has fallen (Chart 9). To some extent, this decline in the number of firms that align prices with the general price level (regardless of developments in their own costs or developments in demand) probably reflects greater price stability and more firmly anchored inflation expectations.

Do firms think competition has increased?

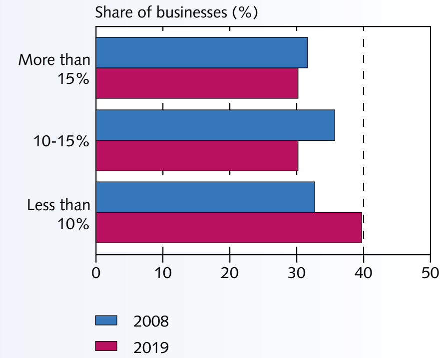
There are signs that competition has increased in recent years: ¾ of survey participants were of the view that it has, and the share of firms reporting that there are few competitors in the market has declined (Chart 10). Interestingly, firms that are of the view that competition has not stiffened also use a simpler pricing rule – for instance, they follow the general price level or rely on a fixed markup on their costs – whereas firms that consider themselves engaged in stronger competition are more likely to consider competitors' prices or rely on a variable markup. The share of firms that rely largely on competitors' prices when setting their own prices has risen, which indicates growing competition (Chart 9).

The impact of e-commerce and digital technology on pricing

Adoption of digital technology has had wide-ranging effects on the economy in recent years, including on pricing. It is unclear what impact digital technology has on inflation (see, for example, Cavallo, 2017, and Sveriges Riksbank, 2015). First of all, it can be expected that the rise of e-commerce has lowered goods and services prices. Increased online shopping boosts competition and transparency, potentially forcing companies to reduce their markups. Just over a third of firms have already set up an online sales platform or plan to do so. Among these companies, about half are engaged in retail and wholesale trade and in hotel-, restaurant-, or transport-related operations. However, a large majority of firms report that e-commerce has little or no impact on their goods and services prices, while about 20% of retailers and wholesalers consider online shopping to have led to moderate or large price reductions. Second, digital technology can result in lower prices if firms' operating expenses fall and efficiency is enhanced. On the other hand, since it can be quite expensive to adopt digital technology, the overall effect on prices is unclear. About a third of firms report that adopting digital technology has reduced their operating expenses. The signs of this are clearest among companies in services (other than hotels, restau-

Chart 6

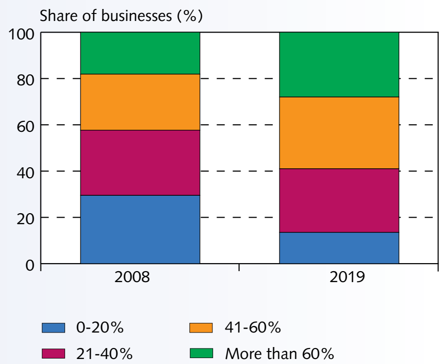
How much must the króna appreciate in one quarter in order for your company to lower the price of its main product?



Sources: Gallup, Central Bank of Iceland.

Chart 7

What percentage of the total production cost of your company's main product is due to wage costs?

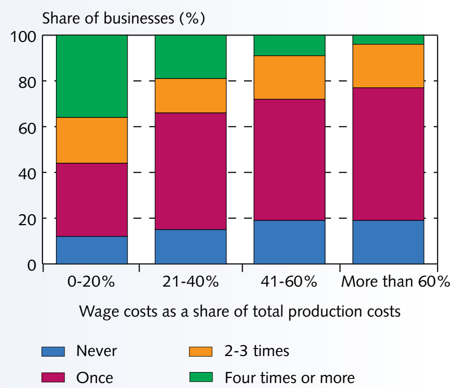


Sources: Gallup, Central Bank of Iceland.

Chart 8

In the past 12 months, how often has your company actually changed the price of its main product?

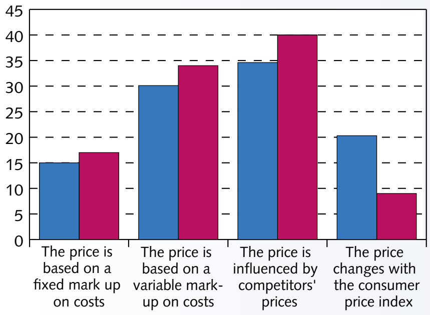
Sorted by the share of wage costs



Sources: Gallup, Central Bank of Iceland.

Chart 9

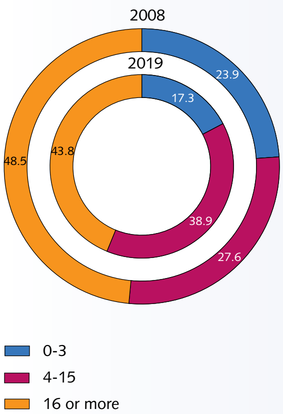
Which of the following statements best applies to the price setting method your company uses for its main product?



Sources: Gallup, Central Bank of Iceland.

Chart 10

How many competitors are there in the domestic market for your company's main product?



Sources: Gallup, Central Bank of Iceland.

rants, and transport). In those sectors, about half of firms report that digital technology has led to lower operating expenses.

Summary

Many of the survey responses indicate clearly that economic conditions have improved since the previous survey was carried out. Inflation has declined and is more stable than before, the króna has been relatively stable, the relative weight of economic sectors has changed, and competition has increased. Firms now appear both to review and to change prices less often than they did a decade ago, probably reflecting to some extent the improvement in monetary policy conduct.

Developments in costs are of paramount importance in firms' pricing decisions, and there are signs that the impact of exchange rate movements on pricing decisions is now more symmetric than before. Firms are now likelier to lower their prices following a currency appreciation, and a larger share of them report that a sizeable depreciation would be needed to prompt them to raise prices. These factors have doubtless played a part in the disinflation of the past few years. Given how steeply inflation and inflation expectations have fallen in recent years, it is interesting that 58% of firms – a larger share than in the last survey – consider it unlikely that inflation will be close to target in five years' time. To some extent, this may reflect the increase in inflation and uncertainty around the time the survey was taken, owing to then-recent difficulties in airline operations, labour disputes, and a depreciation of the króna.

Overall, the survey suggests that firms' price-setting behaviour is now more consistent with low and stable inflation than it was a decade ago. What also appears clear, however, is the importance of continuing to strengthen the credibility of monetary policy and of anchoring inflation expectations even more firmly. In international comparison, Iceland's episode of price stability is a relatively brief one; therefore, it could take more time for firms to believe inflation will remain at target in the long run than it would otherwise.

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