

The contribution of firm profits to the recent rise in inflation

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Introduction

Recently, inflation in Canada and worldwide has risen to levels not seen since the 1980s. Discussion about the reasons for this and what role firms have played is growing. In particular, the notion that firms exploited their market power to raise prices by more than their costs increased has been at the centre of this discussion (e.g., Glover, Mustre-del-Rio and Von Ende-Becker 2022; Hansen, Toscani and Zhou 2023). In this note, we examine this hypothesis by documenting the recent changes in Canada in both inflation and markups—the ratio of firms’ prices to costs. We show that, counter to what we would expect if firms were using their market power to raise prices, increases in the markups of Canadian firms do not coincide with the high inflation in 2021 and 2022. Rather, the data suggest that the contribution of changes in markups to inflation was limited.

In the pursuit of profits, firms set prices above their marginal costs of production. In other words, they set a price that is the product of their marginal costs and their markup. Importantly, this implies that changes in firms’ prices—that is, inflation—can be broken down into the changes in their costs and changes in their markups. Hence, both increases in costs and increases in markups may be passed through to consumers in the form of higher prices and, thus, inflation. This relationship allows us to understand the dynamics of firms’ prices by looking at changes in their markups. And it is precisely this relationship that forms the basis of our analysis and helps us determine the role that markups played in the recent episode of high inflation.

Market competition and the responsiveness of demand to prices determine the market power that firms wield and the extent to which they can mark up the prices of their goods and services. The more market power a firm has, the more it can mark up its prices and increase its profits. Several factors can prompt changes in markups. If consumer demand becomes less sensitive to prices, or a less competitive market increases the market power of firms, then firms could set higher prices and obtain greater markups. Alternatively, changes in current costs can affect the markups firms receive. In this case, the changes in markups will depend on how firms’ price-setting behaviour responds to the changes in costs. If firms reduce their prices following a decline in costs, then markups may either remain unchanged or increase, depending on how much of the cost savings firms pass through to consumers. Conversely, when costs rise, firms may increase their prices but not necessarily their markups. Even without a change in market power, forward-looking firms may not always pass cost savings along to consumers if they anticipate an increase in competitors’ prices or in their own costs in the near future. Firms’ expectations motivate them to smooth out price increases over time rather than having to change prices abruptly when higher prices or costs are realized. As a result of this price smoothing, markups may increase as current costs decline. Firms’ expectations can play a significant role in the dynamics of markups and will help us understand the patterns in markups and inflation that we have observed recently.

To determine how much the growth in markups contributed to recent inflation, we use firm-level data provided by Statistics Canada to measure markups. We compare the average growth rate of markups for private non-financial firms with consumer price index (CPI) inflation for the period from the beginning of 2018 to the end of 2022. Furthermore, we decompose the changes in our measured markups to determine whether markup growth was driven by demand or cost pressures.

We find that firms' measured markups did grow after the onset of the COVID-19 pandemic. However, our results do not indicate that this markup growth was inflationary. Most of the growth in markups occurred during 2020, a year characterized by low inflation. Moreover, markup growth began to decline in 2021 as inflation started to increase, suggesting that the contribution of changes in markups was mild and decreasing. Specifically, our estimates suggest that markup growth accounted for less than one-tenth of inflation in 2021. Furthermore, by 2022, when inflation reached its highest levels in recent history, growth in markups was near zero or negative. The fact that markup growth was not aligned with the dynamics of inflation indicates that the recent rise in inflation was driven primarily by changes in costs rather than by firms leveraging their market power to increase prices.

Why did this increase in markups not contribute significantly to inflation? We show that markup growth reached its highest level because of a contraction in firms' costs. More specifically, the declines in firms' costs outpaced the declines in their sales, and markup growth peaked during the pandemic-related public health interventions. We observe a mild contribution of markup growth to inflation in 2021, partially explained by demand rebounding faster than costs. However, the fact that markup growth fell to zero the following year indicates that firms were likely smoothing out their price increases in anticipation of high demand and rising costs rather than leveraging increases in market power. This evolution of markups, inflation and costs is consistent with economic theories in which firms set prices in anticipation of future increases in costs.

In this note, we first discuss our data and the methodology we use to measure the growth in markups. We also document the dynamics of inflation and markup growth and examine the misalignment between them. We then decompose the changes in our measured markups into their components—changes in sales and costs—and investigate the drivers of the changes in markups and the rapid increase in inflation that started in 2021. Lastly, we provide an explanation, supported by economic theory, that helps us better understand the observed patterns of markups and inflation.

The contribution of growth in markups to inflation

Measuring the growth rates of firm markups presents two difficulties: First, available firm-level data provide only measures of total costs and not direct measures of marginal costs. Second, firm-level data show only reported total sales; they do not show the prices that firms charge separately from the quantity of goods sold.

These data issues can be addressed by assuming that firms equate their marginal costs to a constant proportion of their observed costs of production. In particular, the observed costs of goods and services sold include variable costs such as labour, intermediate inputs and utilities. This assumption allows us to use the ratio of sales to cost of goods sold as our measure of markups, which provides an observable and useful proxy for firms' actual markups.¹ The growth of markups is then the growth in this ratio.

We compute markup growth using data from Statistics Canada's Quarterly Survey of Financial Statements (QSFS). The QSFS includes data on sales and cost of goods sold for a broad and representative sample of non-financial incorporated businesses in Canada (**Table 1** provides the composition by sales). We measure the economy-wide growth in markups using the sales-weighted average growth in industry-level markups.² **Chart 1** shows the economy's average yearly growth rate of markups plotted against annual CPI inflation from the first quarter of 2018 to the end of 2022.

Table 1: Industry composition by sales, 2018–22

Agriculture	2.2%
Construction	9.2%
Energy	5.8%
Information	3.4%
Manufacturing	22.0%
Retail trade	17.3%
Services	13.1%
Transportation and warehousing	5.6%
Wholesale trade	21.4%

Note: This table provides the industry composition by sales for the private non-financial firms in the Quarterly Survey of Financial Statements, excluding utilities.

Sources: Statistics Canada and Bank of Canada calculations

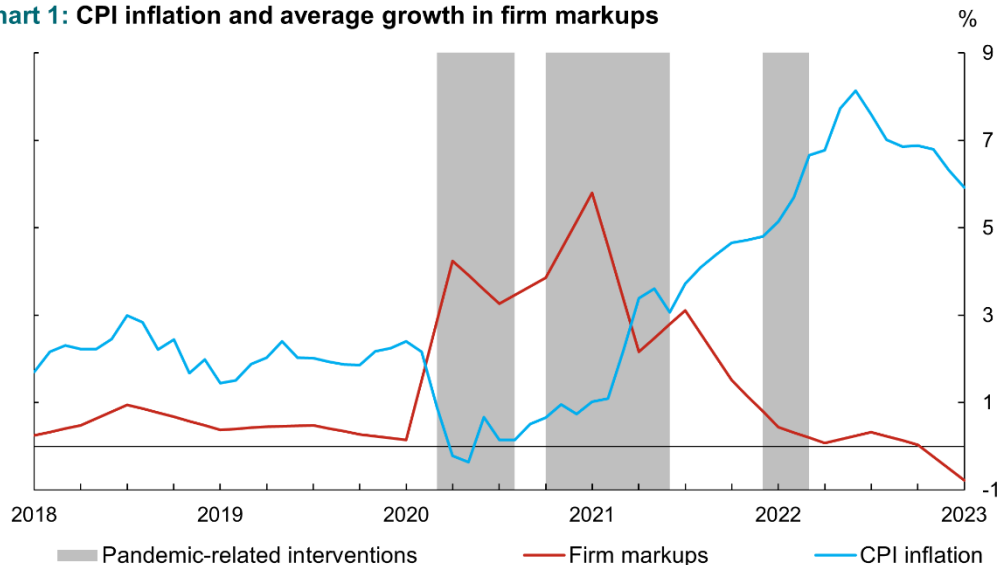
The timing of the growth in markups and inflation stands out and can help us understand the extent to which growth in markups contributed to inflation. The two years preceding the pandemic were characterized by stable inflation and modest growth in markups. The highest growth in markups in our sample years occurred at the beginning of the pandemic and continued through 2020, coinciding with episodes of the most stringent pandemic-related

¹ Using the ratio of sales to cost of goods sold is prevalent in the literature, and we follow this methodology. Specifically, we follow the work by De Loecker, Eeckhout and Unger (2020).

² Publicly available data for the QSFS is aggregated at the industry level. Analysis comparing firm- and industry-level markups using Compustat data shows that most of the variation in markup growth is across industries rather than across firms within industries. Therefore, the dynamics in the economy-wide growth of markups is captured well by the industry-level changes.

restrictions on businesses and households. Furthermore, inflation was low in this period. At the beginning of 2021, as these restrictions were lifted, inflation began to accelerate and continued to rise into 2022. However, markup growth started to decline and was eventually negative. That is, by the end of 2022, markups were shrinking.

Chart 1: CPI inflation and average growth in firm markups



Note: This chart plots the yearly sales-weighted average growth rate of firms' markups and the annual CPI inflation rate. The shaded regions denote the periods of significant pandemic-related public health intervention.
Sources: Statistics Canada and Bank of Canada calculations

The growth in markups and inflation raises several points:

- The timing suggests that while changes in markups may have contributed to the initial rise of inflation in 2021, their contribution dissipated by the end of 2021 and growth in marginal costs was the driving force of peak inflation. Comparing the inflation rate with the growth in markups during 2021 (**Chart 1**, the lines at 2022) shows that the contribution of markup growth to inflation was positive but mild—inflation during 2021 was 5.1%, whereas markup growth was only 0.44% over the same period (less than one-tenth the rate of inflation). And when inflation peaked in 2022, growth in markups was near zero and negative.³
- The decline in markup growth in the period after 2021 suggests that the rise and peak in inflation was not fuelled by a steady increase in monopoly power and demand-driven growth in firms' markups.

³ Similar analysis by Glover, Mustre-del-Rio and von Ende-Becker (2022) on markups in the United States finds that growth in markups could account for more than half of 2021 inflation. While growth in markups may have contributed more to inflation in the United States, the analysis finds a similar pattern in which quarterly growth in markups occurred in 2020 and early 2021 but then declined toward the end of 2021.

- The low inflation during the peaks of markup growth meant this markup growth was non-inflationary and primarily cost-driven (we explore the decomposition of measured markups below and find this to be the case).

Our finding that the contribution of growth in markups to recent inflation was limited is consistent with other recent findings for Canada by Bilyk, Grieder and Khan (2023) and Faryaar, Leung and Fortier-Labonte (2023). Bilyk, Grieder and Khan estimate the level of markups using Compustat data and find that markups for a subset of large publicly traded retail and consumer-oriented firms were roughly constant during this episode. While they focus on a small subset of publicly traded firms, our analysis uses a larger and more representative sample of all incorporated non-financial firms (see **Table 1**). Faryaar, Lueng and Fortier-Labonte also use data from the QSFS but adopt a different approach to estimating the change in markups. Although they estimate the level of markups directly rather than the changes in markups, they also conclude that growth in markups does not appear to be the main driver of recent inflation.

Our analysis differs from these analyses by focusing directly on the growth of markups rather than estimating the level of markups. We take this approach for several reasons. First, there are methodological issues: measuring the level of markups requires stronger assumptions and additional data analysis, which can introduce measurement error. Focusing on the growth in markups does not require the stronger assumptions and can alleviate some of the measurement issues; thus, it provides a reliable measure of changes in firms' actual markups. Second, as discussed above, inflation depends directly on the growth in markups, not the level. Therefore, focusing on the changes in markups provides a more direct measure of the contribution to inflation and emphasizes the importance of the timing of growth in markups and inflation. Lastly, growth in markups can be easily decomposed to help us understand the underlying sources of markup growth.

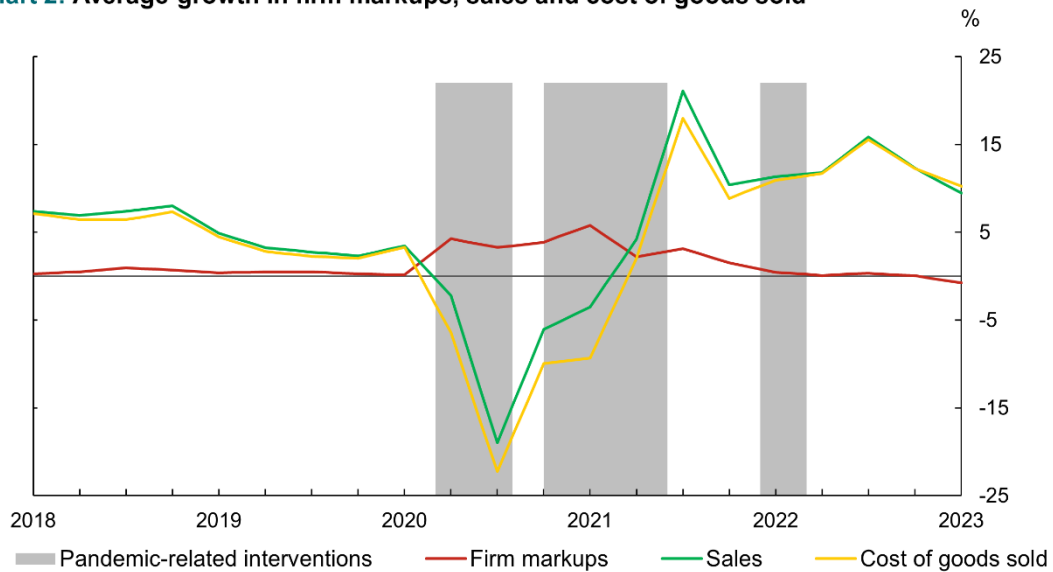
Breaking down the growth in firms' markups

The growth rate of our measured markups is equal to the difference between the growth rates of both sales and costs. **Chart 2** shows the average growth in markups along with the growth of the ratio's components: sales and cost of goods sold. This decomposition can help determine the underlying source of the observed growth in markups.

Comparing the growth in sales with the growth in costs during 2020, when markup growth was the highest, shows that both sales and costs declined substantially during this period (likely due to the onset of the pandemic and related interventions). The decline in firms' variable costs was greater than the decline in their sales, which indicates that the higher growth in markups was driven primarily by cost-related factors. The reduction in costs (for example, as a result of more remote work, restrictions to the number of workers allowed on site, fewer travel-related expenses and the use of inventories in place of production or purchasing new materials) led to growing markups and potentially greater profit margins.

However, the low inflation in 2020 suggests that firms were not increasing their prices at this time. Concerns about existing overhead costs and uncertainty around the possible length and depth of the pandemic and supply chain issues also meant that firms did not pass along these cost savings in the form of lower prices.

Chart 2: Average growth in firm markups, sales and cost of goods sold



Note: This chart plots the yearly sales-weighted average growth rates of firms' markups, sales and costs of goods sold. The shaded regions denote the periods of significant pandemic-related public health interventions.
Sources: Statistics Canada and Bank of Canada calculations

In 2021, as pandemic-related interventions eased and the economy began to recover, both sales and costs began to grow. The growth in sales outpaced the growth in costs at this time, and growth in measured markups remained positive, although much lower than in 2020. Furthermore, inflation started to rise alongside demand. This means the growth in markups may have been from firms adjusting their prices and could have contributed to the initial acceleration of inflation. However, markup growth declined as increases in costs caught up to sales. By 2022, sales and costs were growing at a similar pace, and the contribution of markup growth to inflation ceased. In fact, by the end of 2022, growth of costs exceeded that of sales, and markups were declining.

The evolution of markups and inflation does not align with the explanation that the recent episode of inflation was fuelled by firms leveraging their market power to raise markups and prices. Rather, the data can be understood in the context of economic theory about firms' expectations and their price-setting behaviour. That is, the dynamics of markups, costs and inflation are consistent with an explanation that firms increased their prices (and, therefore, markups) in anticipation of future increases in both their prices and their marginal costs. This behaviour reflects their desire to smooth price increases over time rather than abruptly

raising prices when higher prices and marginal costs are realized.⁴ As the economy began to reopen in 2021, firms started to increase prices in anticipation of the growing demand and the expected increase in their marginal costs associated with meeting that demand.⁵ This forward-looking behaviour meant that inflation started to rise in 2021 and coincided with markup growth fuelled by firms' raising prices above current costs—a foreshadowing of the subsequent rise in prices and costs.⁶ By 2022, increases in costs caught up to growing demand, and growth in markups declined and became negative once growth in costs surpassed growth in sales. These dynamics in inflation and markups are consistent with the price-setting behaviour of forward-looking firms.

Conclusion

In summary, we show that growth in measured markups contributed modestly to inflation in 2021. The data do not necessarily support the notion that the recent high inflation is a consequence of firms leveraging their market power to increase their prices through higher markups. Using a representative sample of Canadian firms, we find that the observed increase in markups in 2020 was primarily cost-driven. While the subsequent positive but declining markup growth in 2021 could have contributed to inflation, this effect was mild and accounts for less than one-tenth of the sharp increase in inflation. Finally, we discuss how the periods in which we observe positive markup growth paired with increased inflation make sense in the context of the forward-looking behaviour of firms and their desire to smooth out price increases.

⁴ Glover, Mustre-del-Rio and von Ende-Becker (2022) find similar patterns in markups and inflation for the United States. This finding supports the fact that US firms were also adjusting prices in anticipation of higher future costs.

⁵ Supply chain capacity issues and disruptions were known at this time and were expected to continue as demand pressures increased.

⁶ Data on firms' expectations from the Bank of Canada's Business Outlook Survey show that, in 2021, many firms expected large input and output price increases, as well as faster wage growth.

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