State and Time-Dependent Pricing*

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Abstract

There are two main approaches to modelling price stickiness in macroeconomics: time-dependent pricing, where firms adjust prices costlessly at fixed intervals or with fixed probabilities. And state-dependent pricing, where firms respond to events subject to adjustment costs. We present new evidence on how firms set prices using direct questions from a large economy-wide survey of UK firms over the recent high-inflation period. On average, just over half of firms report setting prices in a state-dependent manner, as opposed to changing prices at fixed intervals. Smaller firms, those with a higher share of non-labour costs, and those in the goods sector are more likely to be state-dependent. State-dependent firms experienced a sharper increase in price growth over 2022-2023, and also a faster subsequent decline. Using firm-level local projections, we show how state-dependent firms respond more quickly to exogenous oil supply news shocks and gas supply shocks. Their responses are also larger for bigger shocks, consistent with theoretical predictions.

Keywords: inflation, price-setting, survey data, firms

JEL Codes: C83, D22, D84, E31

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1 Introduction

How do firms set prices? A key assumption in modern macroeconomics is that firm prices adjust with a lag. In other words, prices are 'sticky' or exhibit 'nominal rigidities'. This has important implications in macroeconomic models – for example, price stickiness allows monetary policy to have (short-run) impacts on real activity (Woodford, 2003). In practice, there are two main approaches to modelling price-setting behaviour which exhibit such nominal rigidities. In the first class of models, firms are able to change their prices in each period with a fixed probability (Calvo, 1983), or they are able to change prices every N periods (Taylor, 1979). This is known as 'time-dependent' pricing. Alternatively, in the second class of 'state-dependent' models (Ball and Mankiw, 1994, 1995), firms are able to change prices every period, but have to pay a cost to do so. In other words, firms will only change prices when the benefit of doing so exceeds the cost. If shocks are small, firms will not adjust prices instantaneously, which again generates stickiness.

The two modelling approaches offer some distinct theoretical predictions around how firms' prices should respond to shocks. On the extensive margin, the frequency of price changes should be constant for time-dependent firms (by construction), whereas it should increase with the magnitude of the shock for state-dependent firms. As a result, the pass-through of shocks is faster for state-dependent firms, particularly when faced with large shocks. Crucially, the two approaches give similar predictions when economic conditions are stable, but diverge in times of high inflation or when the economy is faced with large shocks (Alvarez et al., 2017; Auclert et al., 2024).

In this paper, we use new survey questions from the Decision Maker Panel (DMP) that directly ask firms how they set prices. We study which types of firms set prices in different ways and how the prices of these different groups respond to shocks. The DMP is a large, economy-wide monthly survey of UK firms established in late 2016. It regularly asks firms about their realisations and year-ahead expectations for output prices, sales, employment, and investment. We combine these regular series with a newly introduced question on how firms set prices. This question asks firms whether they normally set prices at regular intervals ('time-dependent') or in response to events ('state-dependent'). These questions have been asked multiple

times since 2023, with observations from over 3,500 unique firms as of 2025. In addition, questions on the frequency of price changes have also been asked in the survey.

We present four key findings. First, we find that both time-dependent and state-dependent price-setting are common across UK firms. On average between 2023 and 2025, 54% of firms reported setting prices in response to events, whereas 46% set prices at fixed intervals. The share of state-dependent firms was the highest in 2023, at close to 60%. By 2025, this share had fallen to 50%, with corresponding increases in the share of time-dependent firms.

Second, we find evidence of substantial heterogeneity in state versus time-dependent pricing behaviour across firms. Firms that produce or sell goods (e.g. manufacturing, wholesale & retail sectors) and firms with higher non-labour cost shares are more likely to be state-dependent. This could be consistent with these firms facing more volatile input costs, particularly over the last three years. Conversely, service firms, whose costs may be more stable, are more likely to be time-dependent price-setters. Finally, we find a significant relationship with firm size, where smaller firms are more likely to be state-dependent in their price setting.

Third, we find that state-dependent firms experienced a much larger increase in price growth over 2022/2023 (and also a sharper decline over 2024-2025) than time-dependent firms. This is consistent with theory, where large shocks pass through faster to prices in state-dependent models (Cavallo et al., 2024). We also find that relative to 2019, state-dependent firms experienced a greater increase in the frequency of price changes. This is again in line with the theory, which suggests that the frequency of price changes for time-dependent firms should remain relatively stable.

Fourth, we study the pass-through of cost shocks to firms' prices using firm-level local projections. For cost shocks, we use data on oil supply news shocks from Känzig (2021) and gas supply shocks from Alessandri and Gazzani (2025). We find that both these shocks have a strong effect on firm price growth, and that the dynamics of this response depend on the price-setting behaviour of firms. State-dependent firms exhibit stronger price growth in the first six quarters following a shock. Following oil supply shocks, state-dependent firms exhibit stronger price growth during the first six quarters, whereas time-dependent firms dominate in the following six. For

gas supply shocks, state-dependent firms respond more strongly over the first seven quarters, with time-dependent firms showing a stronger response in the subsequent five. These results are robust to the inclusion of firm and time fixed effects. Finally, we also show that the difference between state- and time-dependent pricing increases more than proportionately for larger shocks, consistent with the theoretical predictions from these models.

The results have several implications for modelling price-setting behaviour. First, they emphasise that both state- and time-dependent price setters are present in the economy in roughly equal proportions. In the presence of large shocks, accurately modelling the pass-through to prices should take this into account. As we show in this paper, the differential pass-through between state- and time-dependent firms is present even after controlling for the average frequency of price change. Second, we show substantial evidence of heterogeneity in price-setting behaviour across sectors, with firms in the goods sector being much more likely to be state-dependent. Thus, the pass-through of sectoral shocks should also take into account whether these shocks fall on more state- or time-dependent sectors.

Related Literature This project relates to two main strands of the literature. First, it relates to papers which use price microdata to infer whether state-dependent (SD) or time-dependent (TD) pricing models are more well-suited for understanding inflation dynamics. A classic paper is Bils and Klenow (2004), who use US CPI price quota data from the Bureau of Labor Statistics over the period 1995-1997 to study the frequency of price adjustment across product categories. The authors conclude that the evidence is not consistent with time-dependent pricing models. Klenow and Kryvtsov (2008) provide detailed information on price adjustment frequencies, durations, and magnitudes in the US using the CPI Research Database. They argue that neither purely SD nor TD models perfectly fit the stylised facts, and models which incorporate features of both can more closely match the microdata. Nakamura and Steinsson (2008) use the US CPI Research Database and PPI Research Database and provide a detailed analysis of price adjustment frequencies, asymmetries in price adjustment, seasonality effects, and the role of sales and product substitutions. They conclude that some, but not all, of the findings are consistent with a standard menu cost pricing model. Dixon and Grimme (2022) use data from the ifo Business Cycle

Survey and find that firm pricing decisions feature both SD and TD characteristics. In the UK, (Bunn and Ellis, 2012a,b) study PPI and CPI micro-data as well as supermarket prices, and find evidence of significant heterogeneity in pricing behaviour across sectors and product groups. These two papers conclude that conventional price-setting models are not able to fully capture the heterogeneity of price-setting observed in the data. Ascari and Haber (2022) use aggregate US data and find evidence that the transmission of monetary policy shocks exhibits both non-linearities and state-dependence, both of which are consistent with SD pricing models.[1]

A second set of studies in this literature uses evidence from the microdata to calibrate pricing models. Cavallo et al. (2024) argue that state-dependent models are better able to capture pass-through of large shocks, because they generate increases in the *frequency* of price changes. Likewise, Alvarez et al. (2017) show that for small shocks, the difference between SD and TD pricing is minimal, as long as they are appropriately calibrated. Furthermore, Auclert et al. (2024) show that the cost-price pass-through in menu cost SD models can be closely approximated by appropriately calibrated TD models. We contribute to this literature with direct evidence on firm price-setting behaviour from the DMP, an economy-wide firm survey which shows that both SD and TD pricing are common across firms. We also find that the pass-through of cost shocks to firm prices differs depending on price-setting behaviour, with quicker pass-through for SD firms.

Second, we contribute to recent research on cost-price pass-through using micro-data. Gopinath and Itskhoki (2010) show that firms with a higher frequency of price adjustment have stronger pass-through of exchange rate shocks to prices. Amiti et al. (2019) use data from the Belgian manufacturing sector and find evidence that firm prices respond to both own-costs and competitors' prices, consistent with evidence of strategic complementarities. Gagliardone et al. (2024, 2025) use similar Belgian manufacturing data to study cost-price pass-through, and emphasise implications for the estimation of the Phillips curve and aggregate inflation dynamics. Godl-Hanisch

[1]More recently, Montag and Villar (2023) use US CPI micro data and show that the recent inflation period was driven by a higher frequency of price changes (specifically price increases), whereas the absolute value of changes remained stable. In the euro area, Dedola et al. (2023, 2024) use micro-data from the Price-setting Microdata Analysis Network (PRISMA) to study price-setting dynamics and their implications for the Phillips curve and transmission of monetary policy. Morris and de Vincent-Humphreys (2019) also use a survey of euro area firms to study the frequency of price reviews and price changes.

and Menkhoff (2024) use survey data from German firms and survey experiments to study cost pass-through dynamics. They find evidence of both micro real rigidities and nominal rigidities in price-setting. In the UK, Bunn et al. (2024) use data from the Decision Maker Panel and show evidence of significant non-linearities in the pass-through of cost shocks to firm prices. We contribute to this literature by studying the pass-through of exogenous oil supply news shocks (Känzig, 2021) and gas supply shocks (Alessandri and Gazzani, 2025) to firm prices depending on price-setting behaviour.

The rest of the paper is structured as follows. Section 2 describes the Decision Maker Panel survey used for the empirical analysis. Section 3 provides descriptive statistics on state- versus time-dependent price setting. Section 4 examines the implications of different price-setting behaviour for inflation dynamics. Section 5 concludes.

2 The Decision Maker Panel

We use data from the Decision Maker Panel (DMP) survey.[2] The DMP is a monthly online survey of businesses in the UK. It was launched in late 2016 and is organised by the Bank of England, in collaboration with the University of Nottingham and King's College London. On average, it receives responses from around 2,500 firms each month (Figure A1), who account for around 4% of UK employment. The response rate of active panel members is around 50%. The survey is representative with good coverage across industries (see Bunn et al., 2024 for further details on survey representativeness).[3]

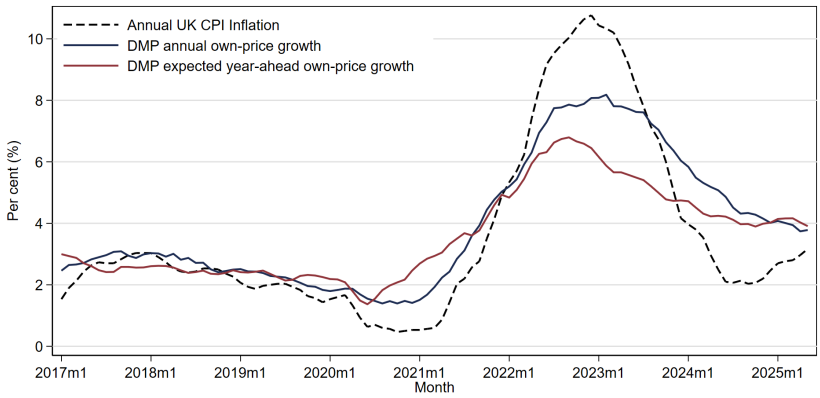
In the DMP, firms are regularly asked about their realised firm performance along a number of dimensions, including sales growth, own output price growth, employment, and capital expenditure. The question of output prices asks firms about changes in the average price that they charge rather than collecting data on the prices of individual goods or services. In addition, firms are asked about their year-ahead

[2]Monthly aggregated statistics on realisations and expectations of outcomes are available on the DMP website: https://decisionmakerpanel.co.uk/

[3]Figure A2 compares the coverage of the DMP survey across industries and by region with data for the universe of UK businesses from the Business Register. Panel A shows that the DMP broadly matches industry shares in the UK. It also matches the regional distribution (Panel B), but with a larger concentration for London.

expectations for these variables. In particular, they are asked to provide a five-point distribution for their expectations and assign probabilities to each of the five scenarios. Figure A3 shows the template for the own-price expectations question. This format allows us to analyse not only the mean expected price growth (as the weighted average of the scenarios), but also construct firm-level measures of uncertainty and skewness over expected future price growth (see Yotzov et al. (2023), for example, who analyse firm-level inflation uncertainty using data from the DMP). Finally, since the DMP is a panel, we can compare firm expectations with their realisations *a year later*. Figure A4 presents this comparison for own-price growth, and shows that there is a very strong positive correlation between own-price expectations and realisations a year later. In other words, expectations are generally a very good guide to how firms' prices will actually evolve.

Figure 1: Firm annual price growth, expected price growth, and annual CPI inflation



Notes: The data on annual own-price growth and expected year-ahead own-price growth are based on data from the Decision Maker Panel. The data on annual CPI inflation is taken from the Office for National Statistics. The series are three-month moving averages.

Figure 1 compares the trends in firm annual own-price growth and expected price growth from the DMP with annual Consumer Price Index (CPI) inflation for the UK. Annual price growth (dark blue line) among DMP firms closely matches the trends in CPI inflation in the pre-pandemic period. Since 2020, firm price growth has continued to track CPI inflation trends, although changes in the CPI inflation have been somewhat larger, both on the downside and the upside. A large portion of this deviation can be explained by energy prices, which have a larger weight in

the CPI basket and contributed to the sharp increase in CPI inflation in 2022-2023.[4] Nevertheless, the trends in CPI and firm-level inflation series are highly correlated.

New questions on state vs. time-dependent pricing In February 2023, new questions were introduced to the DMP survey, which asked firms how they usually set prices. Businesses could choose from two options: 'Mostly change prices in response to specific events (e.g. changes in costs or demand)' or 'Mostly change prices at fixed intervals (e.g. once a year or once a quarter, etc.)'. Figure A5 is a screenshot of the question in the survey platform. We interpret the first option as corresponding to state-dependent pricing behaviour, and the second option as time-dependent pricing behaviour in our analysis. These questions have been asked in four blocks since 2023: February-April 2023, February-April 2024, August-October 2024, February-April 2025.[5] By 2025, the survey has received over 6,500 responses to this question, from over 3,500 unique firms.

New questions on frequency of price change In addition to the questions on how firms set prices, questions have also been included since 2023 asking firms about the typical frequency of their price changes. These ask firms about their current frequency, as well as retrospectively about their frequencies in the past. Figure A6 presents a screenshot of this question in the survey platform, as asked in February 2025. In this vintage, firms are able to select one of six options – 'Daily'; 'Weekly'; 'Monthly', 'Quarterly'; 'Half-yearly'; 'Annually' – for 2019, 2024, and 2025. Over the past three years, we have collected data on the frequency of price changes in 2019 as well as for each year over 2022-2025.

In the empirical analysis, we convert these responses to the approximate percentage of price changes in each month. For firms which select annual price changes, this corresponds to approximately 1/12th of prices changing each month; for half-yearly, it is 1/6th; and so on. This approach allows for more straightforward analysis of how the frequency of price changes has evolved over time and for different cross-sections of firms.

[4]This is not the only difference between the DMP series and CPI inflation. The DMP is a sample of firms across the whole economy, whereas CPI inflation covers only consumer-facing firms. Furthermore, the CPI is constructed by weighting price changes by their shares in a representative consumer basket. In contrast, price growth in the DMP is weighted by industry and employment shares.

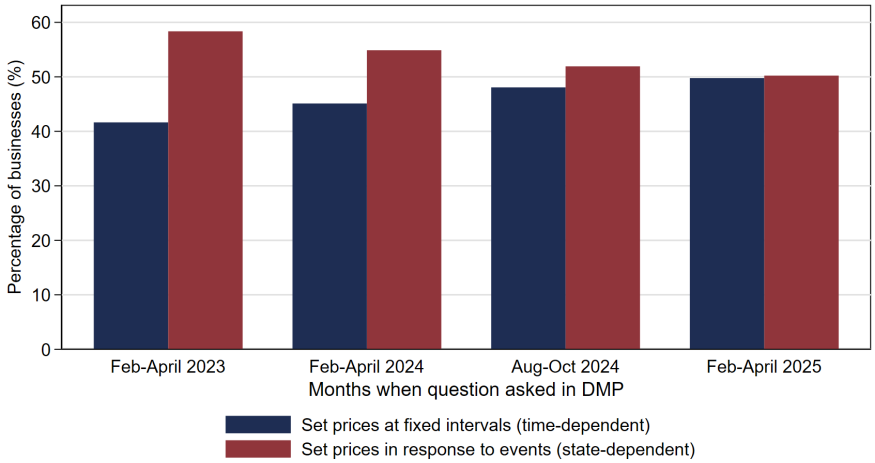
[5]The survey has a rotating panel structure, and these questions are included in one panel. Over three months, all firms in the panel are able to answer the question.

3 Characteristics of state- vs. time-dependent pricing

In this section, we analyse the characteristics of state- and time-dependent firms, based on survey answers over the past three years. Figure 2 shows the average proportion in each of the four periods when these questions were asked. In February-April 2023, 58% of firms reported setting prices in a state-dependent manner, whereas 42% reported setting prices in a time-dependent manner. During these months, firm price growth was near its peak rate (see Figure 1), at 7.7% on average. In subsequent periods, the share of firms that reported setting prices in a state-dependent way gradually declined. At the same time, output price inflation has also fallen. By the three months to April 2025, 50% reported setting prices in a state-dependent manner. Overall, the figure suggests that both types of price-setting behaviour have been present in UK businesses over the past years.

The declining share of state-dependent firms in Figure 2 reflects both new firms answering the question and some firms changing their responses over time. Across all responses, we find that around 80% have always responded in the same way, and around 20% have changed from either state- to time-dependent pricing, or vice versa. Table A1 shows that regardless of the number of times firms had responded to the price-setting question, firms that never switched price-setting behaviour remained the largest group, typically accounting for over 60% of each subsample. Among those that do switch, most do so only once, while multiple switches are relatively rare.

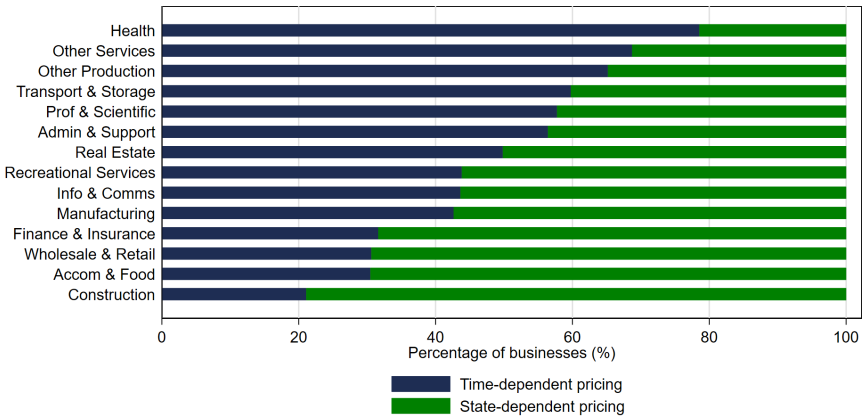
Figure 2: Share of time-dependent and state-dependent price-setters over survey waves



Notes: The data are based on responses to the question: 'Which of the following best describes how your business usually sets prices?'. Respondents were asked to choose one of the following options: (i) Mostly change prices in response to specific events (eg changes in costs or demand), (ii) Mostly change prices at fixed intervals (eg once a year or once a quarter, etc).

Beyond the aggregate shares, we find substantial differences in price-setting behaviour across sectors and industries of the economy. Existing research has documented significant heterogeneity in the frequency of price changes across sectors (e.g. Bunn and Ellis, 2012a,b; Davies, 2021), but not on state- versus time-dependent behaviour. State-dependent pricing is more common among firms in the goods sector than in the services sector, where firms are more likely to be time-dependent. Figure 3 shows the split by price-setting behaviour for broad industry groups. State-dependent pricing was reported to be most common in the construction industry, with 76% of firms setting prices in response to events, followed closely by 71% of firms in the wholesale & retail and accommodation & food industries. The industries with the highest share of time-dependent firms were health (79%) and transport & storage (70%). Overall, no industry is fully time-dependent or fully state-dependent, highlighting the heterogeneities in price-setting both across sectors and within them. We next analyse how price-setting behaviour varies across a number of firm-level characteristics.

Figure 3: State- vs. time-dependent price setting by industry

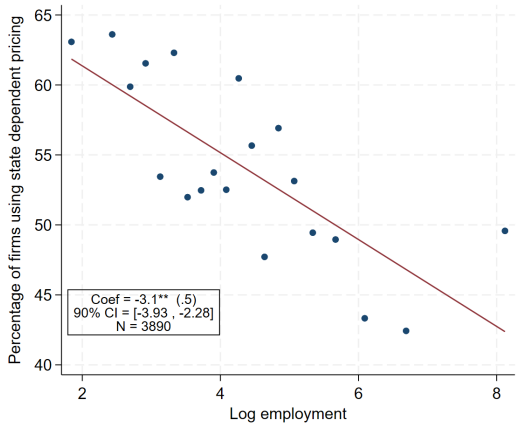


Notes: This figure compares the use of state- and time-dependent pricing across industries. The average is based on data collected over four response periods: Feb-Apr 2023, Feb-Apr 2024, Aug-Oct 2024, and Feb-Apr 2025.

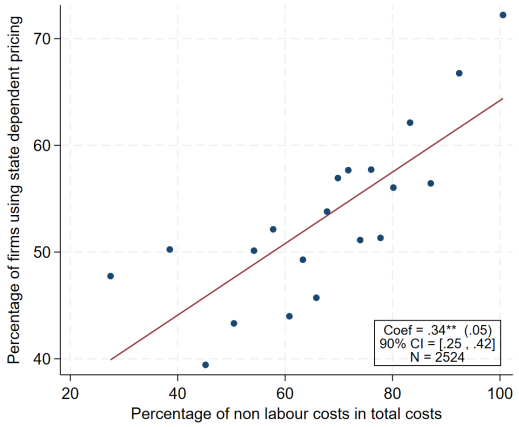
In Figure 4, we present binned scatter plots on the relationship between firm price-setting behaviour and different firm characteristics. Panel A shows that smaller firms are more likely to use state-dependent pricing. 60% of firms with 10-49 employees reported setting prices in a state-dependent manner, falling to 51% for firms with 250 or more employees. In Panel B, we look at the correlation with firm non-labour cost shares. These are calculated as the share of non-labour costs as a percentage of total costs using firm accounts data. The figure suggests that firms for whom non-labour costs are more important are more likely to be state-dependent price-setters. Conversely, firms that have relatively higher labour costs are more likely to be time-dependent. Labour costs are likely to be less volatile and more predictable than non-labour costs and may therefore be more suitable for a time-dependent pricing strategy. This finding is also consistent with the industrial breakdowns, as good producers have higher non-labour cost shares on average and higher shares of state-dependent firms.

Figure 4: Key correlates of price-setting behaviour

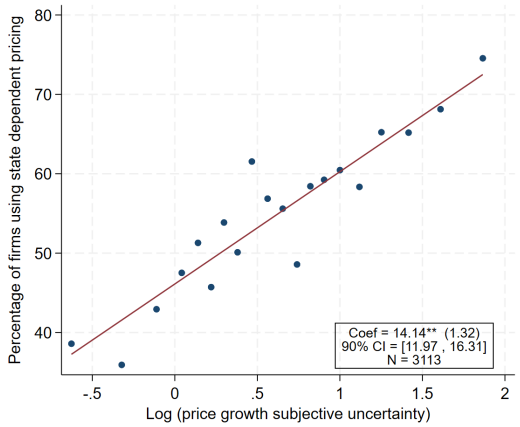
Panel A: Firm employment



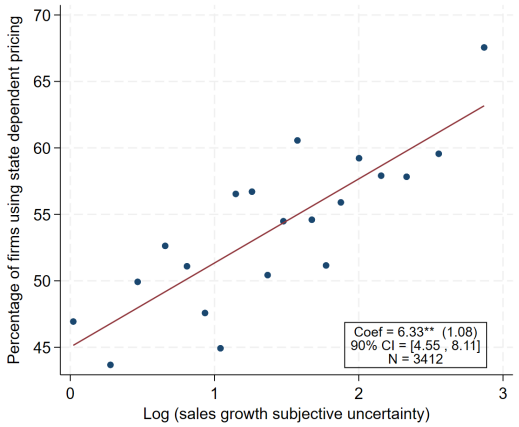
Panel B: Non-labour cost shares



Panel C: Inflation uncertainty



Panel D: Sales uncertainty



Notes: Results are based on data collected over four response periods: Feb-Apr 2023, Feb-Apr 2024, Aug-Oct 2024, and Feb-Apr 2025.

One reason why firms may set prices in response to events is that economic conditions are more uncertain. In this case, firms may need to be more responsive to changing circumstances. We can measure firm-level uncertainty as the standard deviation of expectations for price growth or sales growth, using the five-point distributions firms are asked to provide. Panels C and D examine the relationship between price-setting behaviour and firm-level inflation uncertainty and sales growth uncertainty, respectively. In both cases, we find a strong positive relationship, suggesting that higher uncertainty is associated with a higher likelihood of state-dependent pricing. Higher uncertainty could also be one reason why smaller firms are more likely to be state-dependent: as shown in Yotzov et al. (2023), smaller firms have higher firm-level

inflation uncertainty on average. However, the causality of this relationship between price uncertainty and how firms set prices is not clear-cut. Firms that only set prices at fixed intervals, and particularly on an annual basis, may be less uncertain about their future prices because they choose to set prices in this way.

In Table 1, we test the relationship between these characteristics and firm price-setting behaviour. The dependent variable pools all the individual survey responses from firms over time and is a dummy equal to one for firms which reported setting prices in response to events and zero for firms that reported setting prices at fixed intervals. Multiple factors are individually correlated with price-setting, including firm size (Column 1), non-labour cost share (Column 2), import cost share (Column 5), industry energy costs (Column 6), and subjective uncertainty around prices and sales (Columns 7-8). Once all these variables are included together, along with industry and time fixed effects, the variables most strongly correlated with how firms set prices remain firm size and non-labour cost share (Column 11).

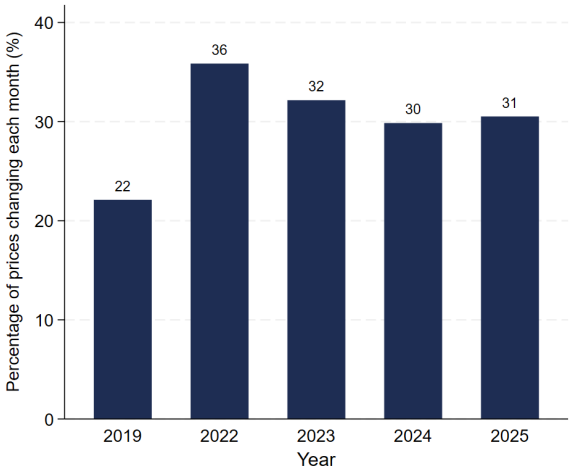
3.1 Frequency of price changes

In addition to the questions on how firms usually set prices, firms in the DMP have also been asked about the frequency of their price changes. These data are available for 2019 as well as over 2022-2025. As described in Section 2, we convert the categorical responses to the approximate percentage of prices which change each month for the empirical analysis.

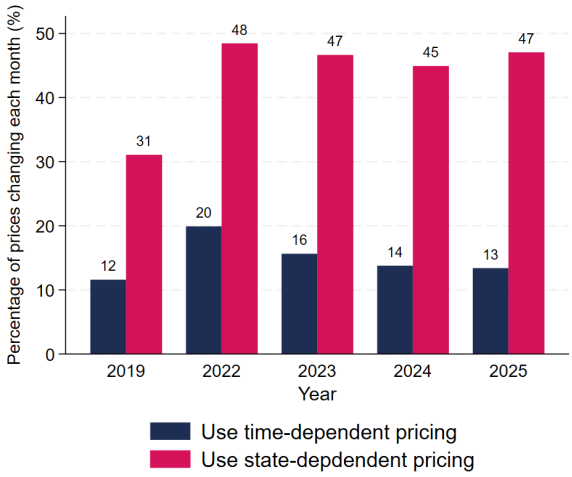
Figure 5, Panel A presents the results over the full sample. In 2019, we estimate that 22% of prices change every month. This increases sharply to 36% in 2022, when inflation rates in the UK were rising rapidly. Over 2023-2025, the frequency has declined from this peak, but remains above the 2019 levels. In 2025, approximately 31% of prices change each month.

Figure 5: Frequency of price change over time

Panel A: Full Sample



Panel B: By Price-Setting Behaviour



Panel B of Figure 5 shows that there is a significant difference in the frequency of price changes across state-dependent and time-dependent firms. State-dependent firms have a higher average frequency across all years. State-dependent firms also saw a much larger increase in the frequency at which they changed prices after 2019, consistent with the predictions of theory. There was still some increase in the frequency of price changes for time-dependent firms, indicating that the horizon at which firms update prices can still change in exceptional circumstances. However, this share quickly returned back towards normal, whereas the frequency of price changes for state-dependent firms remained well above 2019 levels. Thus, the higher aggregate frequency of price changes in 2025 from Panel A is almost entirely driven by state-dependent firms.

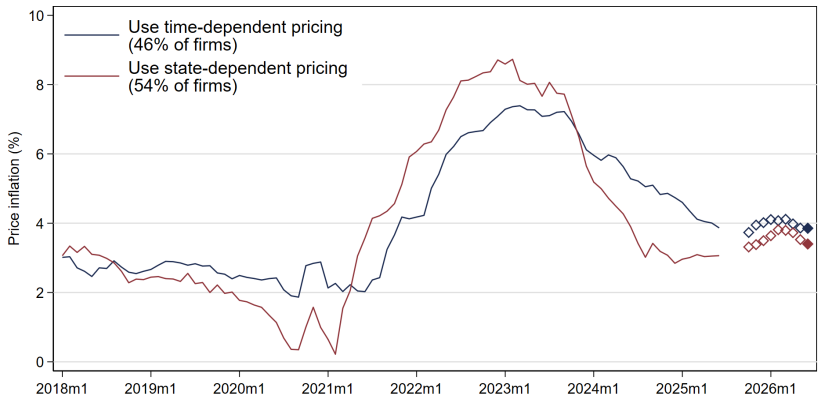
Overall, this section documents that firm price-setting behaviour exhibits significant heterogeneity, both across sectors and along a number of firm-level characteristics. It also shows that there are large differences in the frequency of price adjustment for these two sets of firms. In the next subsection, we link state- versus time-dependent price-setting behaviour to data on firm price growth to study its implications for inflation dynamics.

4 Implications of price-setting behaviour for inflation dynamics

4.1 Aggregate trends in price growth

We begin by analysing average firm output price growth since 2018, split by whether firms set prices in a state-dependent or time-dependent manner. This is shown in Figure 6. We create time-invariant indicators for price-setting behaviour at the firm level, based on each firm's most recent response to this question (as of April 2025). Over 2018-2019, there was little difference between these two groups - output price growth was 2.7% for time-dependent firms and 2.5% for state-dependent firms, on average. The trends started to diverge in 2020. State-dependent firms experienced a more pronounced slowdown in price growth in the first year of the Covid pandemic. But subsequently, price growth for state-dependent firms increased more quickly and reached a higher peak of 8.6% in the three months to December 2022, before falling rapidly over 2024. Price growth for time-dependent also increased over 2021-2023. But it peaked lower and later at 7.4% in the three months to August 2023. The decline in price growth among time-dependent firms was also more gradual over 2024. In the three months to June 2025, annual price growth for time-dependent firms was 3.9%, whereas it has declined to 3.1% for state-dependent firms.[6]

Figure 6: Firm output price growth by price-setting behaviour



[6]The difference in price growth by price-setting behaviour is particularly pronounced between time-dependent firms who change prices annually, and both state-dependent firms and time-dependent firms who change prices more than once a year. This is shown in Figure A7 and highlights the importance of the frequency of price change in inflation dynamics.

The trends in firm price growth since 2020 by price-setting behaviour are visually consistent with the theoretical predictions of state- and time-dependent models in the face of large shocks. As we showed previously, state-dependent firms experienced a sharp and sustained increase in the frequency of price changes (see Figure 5). They also experienced a sharper increase and quicker decline in price growth. However, this analysis does not account for other factors, such as differences in costs, that could also have affected these pricing dynamics. Therefore, to more formally test the predictions of these models using our survey data, in the next subsection, we use firm-level local projections to analyse the pass-through of oil supply news shocks and gas supply shocks to price growth.

4.2 Firm-level local projections: Methodology

To analyse how exogenous cost shocks pass through to firm prices, we estimate local projections (Jordà, 2005) at the firm-quarter frequency. Specifically, for firm i, quarter t and year y, we estimate the following specification over a period of up to 12 quarters:[7]

$$\begin{aligned}\pi_{i,t+h} =& \alpha_{i,h} + \sum_{l=0}^{p} \delta'_{l,h} X_{t-l} + \omega \pi_{i,t-1} + \lambda_y \\ &+ \theta SupplyShock_t + \varepsilon_{i,t+h},\ h \in [0, 12]\end{aligned} \tag{1}$$

The dependent variable is annual (quarter-on-year) own-price growth, $\pi_{i,t+h}$, at horizon $t+h$ based on firm survey responses. On the right hand side, we use either the oil supply news shocks from Känzig (2021) or the gas supply shocks from Alessandri and Gazzani (2025) as the main treatment variables, aggregated to the quarterly frequency.[8] Panel A of Figure A8 presents the time series of the Känzig (2021) oil supply news shocks until 2024Q4, while Panel B of Figure A8 shows the Alessandri and Gazzani (2025) gas supply shocks up to 2023Q4, with major events labelled in both figures. We include firm-horizon fixed effects in our specification,

[7] The estimated local projections use data drawn from the 2017Q1 to 2025Q2 period. However, the Känzig (2021) oil supply news shock series extends only to 2024Q4, while the Alessandri and Gazzani (2025) gas supply shock series ends in 2023Q4.

[8] In a robustness check (Figure A17), we find similar results using oil supply shocks from Baumeister and Hamilton (2019).

$\alpha_{i,h}$, calendar year fixed effects λ_y, and lagged firm own-price growth. We also include contemporaneous and lagged macro series as additional controls: these include seasonally adjusted CPI inflation, the unemployment rate, the FTSE all-shares index, and the Bank of England's Bank Rate. Additionally, we control for contemporaneous and lagged prices of alternative energy-related commodity prices: UK NBP natural gas prices in the oil supply news shocks model, and Brent crude oil prices in the gas shocks model. The standard errors are clustered at the firm level.

Since we are interested in how these oil supply news shocks and gas supply shocks pass through to firm prices depending on their price-setting behaviour, we augment Equation 1 with the coefficients θ_1 and θ_2 for time-dependent and state-dependent firms, respectively, and estimate Equation 2 with the same methodology as detailed above:

$$\begin{aligned}\pi_{i,t+h} =& \alpha_{i,h} + \sum_{l=0}^{p} \delta'_{l,h} X_{t-l} + \omega \pi_{i,t-1} + \lambda_y \\ &+ \theta_1 SupplyShock_t \times Time\text{-}dependent_i \\ &+ \theta_2 SupplyShock_t \times State\text{-}dependent_i + \varepsilon_{i,t+h},\ h \in [0, 12]\end{aligned} \tag{2}$$

As we are seeking to deeply understand the difference in pass-through for state- and time-dependent firms, we also estimate a specification with calendar quarter fixed effects, as in Equation 3:

$$\begin{aligned}\pi_{i,t+h} =& \alpha_{i,h} + \lambda_t + \omega \pi_{i,t-1} \\ &+ \theta SupplyShock_t \times State\text{-}dependent_i + \varepsilon_{i,t+h},\ h \in [0, 12]\end{aligned} \tag{3}$$

In this specification, all the additional macro controls are absorbed, since they only vary at the quarterly frequency. The key coefficient of interest is θ, which captures the *additional* effect of supply shocks on firm price growth for state-dependent firms, relative to time-dependent firms. We next present the main results.

4.3 Firm-level local projections: Main Results

In this subsection, we present four main results using the firm-level local projections.

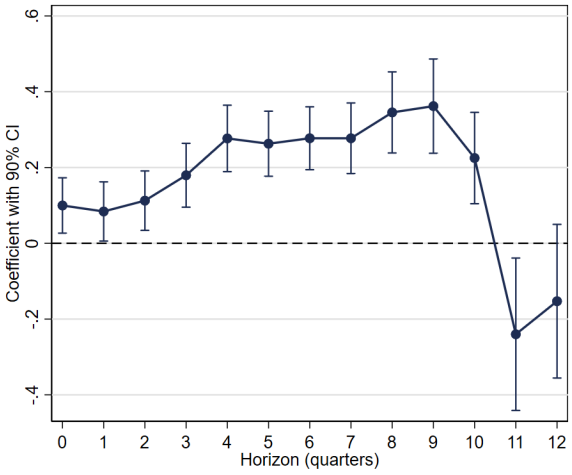
Result 1: Firm price growth increases significantly in response to positive oil supply news shocks and gas supply shocks.

In Figure 7, we begin by showing the average response of firm output price growth to oil supply news shocks and gas supply shocks across the full sample, based on the specification in Equation 1. Firms' price growth responds immediately following the shocks, and is strongest nine quarters following the oil supply news shock, and seven quarters after the gas supply shock. Table A2 presents the coefficients in Panel A of Figure 7, and reports all control variables in the specification as well. The ninth quarter coefficient suggests that a one standard deviation oil supply news shock leads to a peak impact on annual price growth of 0.36 percentage points. After the ninth quarter, the effect of the oil supply shock begins to decline, becoming negative by the eleventh quarter. Similarly, Table A3 shows the coefficients in Panel B of Figure 7. The seventh quarter gas supply shock coefficient indicates that a one standard deviation gas supply shock leads to a peak impact on annual price growth of 0.28 percentage points. Following the seventh quarter, the effect of the gas supply shock begins to fall and also turns negative in the eleventh quarter.

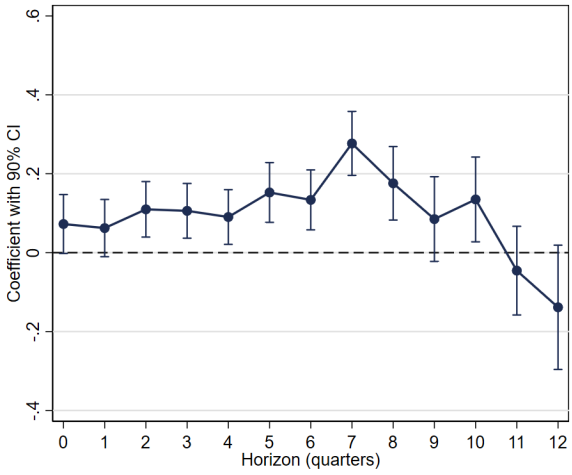
Overall, oil supply shocks and gas supply shocks seem to have a significant and persistent effect on firm prices. As we will show next, the profile of these effects differs significantly for state-dependent and time-dependent firms.

Figure 7: Response of firm price growth to supply shocks (full sample)

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks



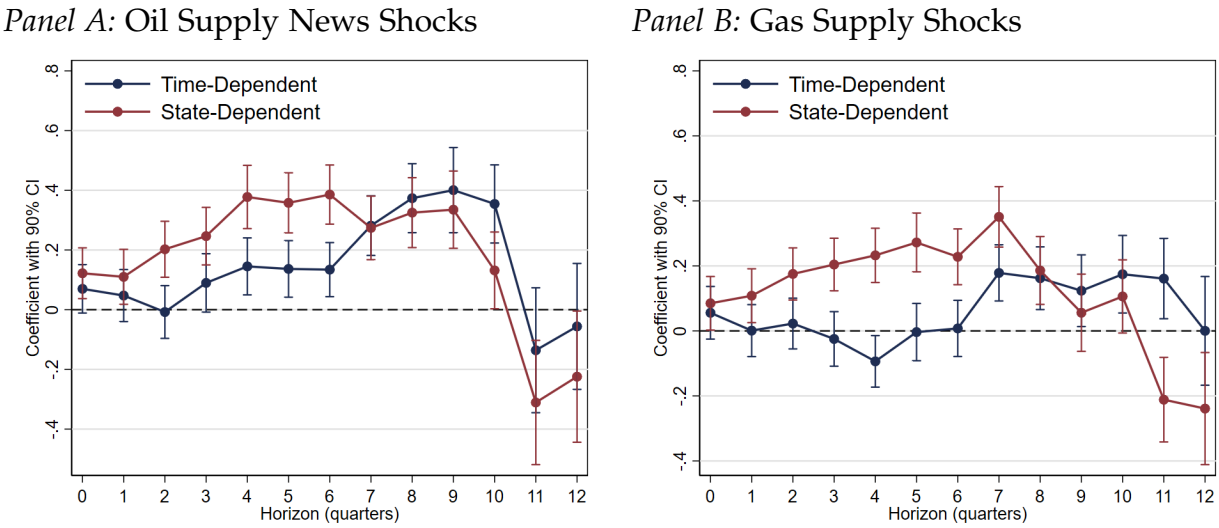
Notes: This figure presents the response of firm own-price growth to oil supply news shocks (Känzig, 2021) and gas supply shocks (Alessandri and Gazzani, 2025) across the full sample based on the methodology in Equation 2. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level.

Result 2: Price growth of state-dependent firms responds more quickly in response to oil supply news shocks and gas supply shocks.

In Figure 8, we estimate the specification in Equation 2 to analyse how oil supply news shocks and gas supply shocks pass through to firms' price growth depending on their price-setting behaviour. In this specification, we keep only firms which have not changed their response to the question on how they set their prices over time. As the figure shows, state-dependent firms react strongly to these shocks, similar to the aggregate response in Figure 7. The peak response for state-dependent firms comes in the sixth quarter after the oil supply news shock, and the seventh quarter after the gas supply shock, but the effect is close to the peak within a year for both shocks. The coefficient estimates for the oil supply new shock are reported in Table A4, and the gas supply shocks in Table A5. At peak, annual own-price growth is around 0.39 percentage points higher for a one standard deviation oil supply shock, and 0.35 percentage points higher for a one standard deviation gas supply shock. The profile of responses to these shocks for time-dependent firms is very different. The response of firms, which usually set prices at fixed intervals, is mostly insignificant

for the first year after the oil supply shock, and for the first year and a half following gas supply shocks. During the second year, the estimates become more positive and statistically significant for both shocks, and past the eighth quarter, the estimated magnitude is higher than for state-dependent firms. Overall, the results from Figure 8 are consistent with a slower pass-through of oil supply shocks and gas supply shocks to firm prices for time-dependent firms.

Figure 8: Response of firm price growth to supply shocks by price-setting behaviour



Notes: This figure presents the response of firm own-price growth to supply shocks by price-setting behaviour based on the methodology in Equation 2. Panel A uses oil supply news shocks from Känzig (2021). Panel B uses gas supply shocks from Alessandri and Gazzani (2025). The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level.

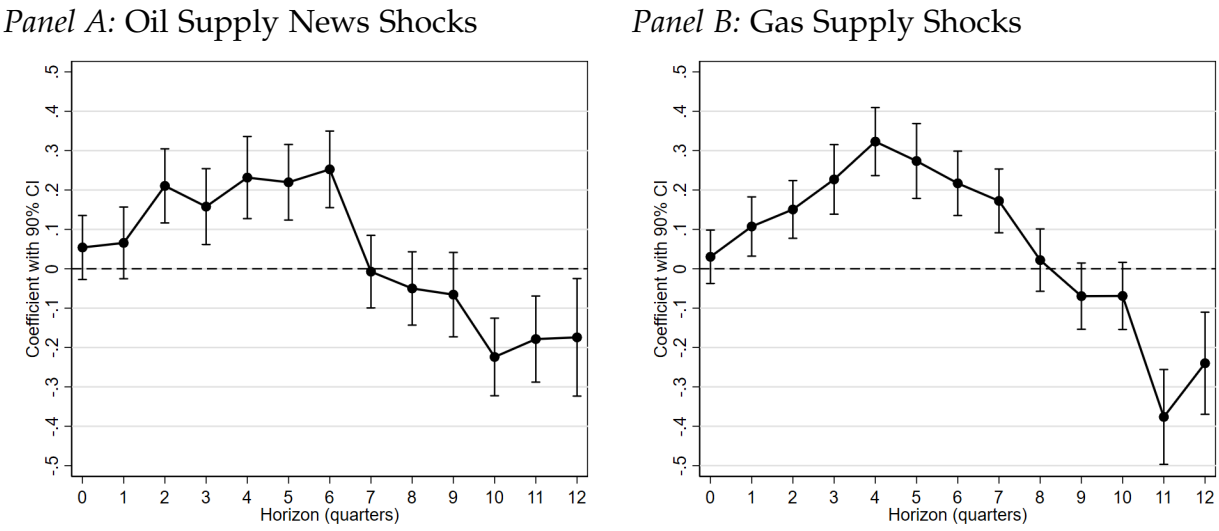
Result 3: The difference between price responses of state- and time-dependent price-setters is highly significant for both oil supply news shocks and gas supply shocks.

We next explicitly test whether the *difference* in price responses for state-dependent and time-dependent firms is statistically significant. The theory on price-setting behaviour would predict a faster pass-through for state-dependent firms. To test this, we estimate the specification in Equation 3, by including time (calendar quarter) fixed effects in our regressions. The coefficient estimate, θ, gives the *additional* price effect for state-dependent firms, over and above the effect on time-dependent firms. These time fixed effects also control for any macro trends during the sample period, mean-

ing our additional controls are absorbed in these regressions.

As expected, Figure 9 shows that state-dependent firms have a significantly larger price response. This difference is statistically significant between the second and sixth quarters after the oil supply news shock (Panel A) and between the first and seventh quarters following the gas supply shock (Panel B). Table A6 and Table A7 present the full set of coefficient estimates for the impact of oil supply news shocks and gas shocks, respectively. These findings are consistent with the profiles of responses from Figure 8. They are also consistent with the trends in annual own-price growth presented in Figure 6, which showed that state-dependent firms experienced a stronger increase in price growth, particularly over 2021-2022.

Figure 9: Difference between state- and time-dependent pricing responses to supply shocks



Notes: This figure presents the difference between state-dependent and time-dependent price responses to oil supply news shocks (Känzig, 2021) and gas supply shocks (Alessandri and Gazzani, 2025) based on the methodology in Equation 3. A positive coefficient means that the price response of state-dependent firms is greater than time-dependent firms. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level.

Result 4: The difference between state- and time-dependent firms' price growth response is larger for bigger shocks.

Finally, a key prediction from the models on price-setting is that the difference between state- and time-dependent price-setting is greater when firms are hit by a larger shock. We test for this type of non-linearity by adding a quadratic supply

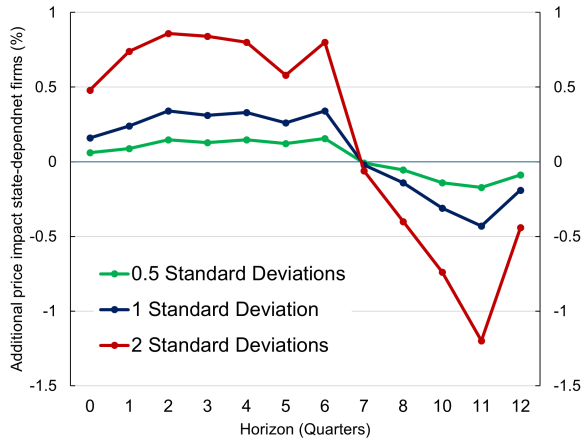
shock term to Equation 3. This tests precisely whether the difference increases with the size of the shock.

As shown in Table A8 and Table A9, we indeed find evidence of such a non-linearity for both oil supply shocks and gas supply shocks, respectively. In the first five quarters, the coefficients on the quadratic term are positive and statistically significant for both shocks, suggesting that bigger shocks lead to larger annual own-price growth differences between state- and time-dependent price-setters. The nonlinearity then has a period of insignificance for both shocks before turning negative in the third year of the local projections.

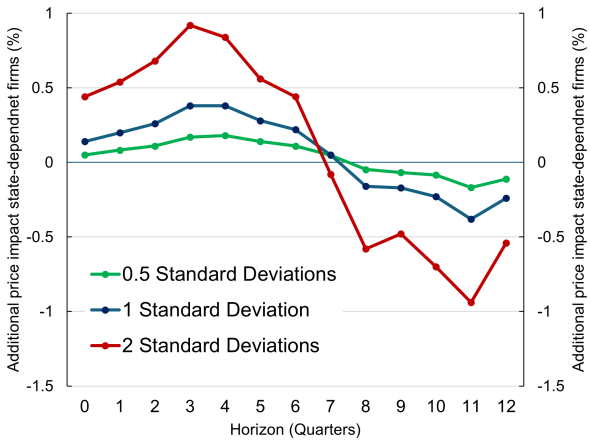
In Panel A of Figure 10, we visualise the results from Table A8, and in Panel B of Figure 10, we illustrate the results from Table A9. In order to plot the profiles of the estimated shock impacts, we input three different shock magnitudes into our estimates: 0.5 standard deviations, one standard deviation, and two standard deviations. Crucially, the differences between state- and time-dependent price-setters more than double for a doubling in the shock size. For example, in the second quarter, a 0.5 standard deviation oil supply shock raises firms' price growth by 0.06 percentage points, while a gas supply shock of the same size results in a 0.05 percentage point increase. The corresponding higher price growth estimates for a one (two) standard deviation(s) shock are 0.16 (0.48) percentage points for oil supply shocks, and 0.14 (0.44) percentage points for gas supply shocks. Thus, our empirical estimates are consistent with the theoretical prediction that the prices of state-dependent firms respond more to large shocks.

Figure 10: Difference between price responses for large versus small supply shocks

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks



Notes: This figure presents the difference between state-dependent and time-dependent price responses to oil supply news shocks (Känzig, 2021) and gas supply shocks (Alessandri and Gazzani, 2025) based on the methodology in Equation 3. A positive coefficient means that the price response of state-dependent firms is greater than time-dependent firms. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level.

In the next sub-section, we present several additional results and robustness checks for our main analysis.

4.4 Firm-level local projections: Additional Results and Robustness

Positive versus negative shocks We examine the differences in price responses between state- and time-dependent firms for positive versus negative oil supply news shocks and gas supply shocks. Figure A9 shows that state-dependent firms' price growth responses are larger for contractionary shocks (which raise oil/gas prices). Smaller differences for positive supply shocks (which lower oil/gas prices) could be linked to non-linearities in cost-price pass-through. As shown by Bunn et al. (2024), firm prices respond more strongly to positive than negative unit cost shocks.

Differences in 2017-2020 versus 2021-2025 The UK experienced a large energy price shock in 2022 following the Russian invasion of Ukraine. To test whether this period is driving our results, we examine the differences in the price responses between state- and time-dependent firms over 2017-2020 and 2021-2025 for both oil supply news shocks and gas supply shocks. Panel A of Figure A10 shows that for oil supply shocks, state-dependent firms' price growth response was larger in 2020-

25 for the first three quarters following the shock before falling below the 2017-2019 response. Conversely, Panel B of Figure A10 shows that the profile of the difference between state- and time-dependent firms' price growth response to gas supply shocks is similar in both the 2017-19 and 2020-25 periods. Overall, we conclude that our results are not exclusively driven by the recent period, although the profile of price responses may differ, particularly for oil supply shocks.

Effect on own-price expectations We also consider the differences between state- and time-dependent firms' expected year-ahead own-price growth responses. This is shown in Figure A11. State-dependent firms report stronger expected future price inflation, particularly over the first three quarters after both the oil supply news shock and the gas supply shock. By the sixth quarter, this reverses, and time-dependent firms report stronger expectations, especially in response to gas supply shocks.

Effect on CPI inflation expectations In addition to the results on own-price expectations, we can also test the effects of oil supply news shocks and gas supply shocks on firms' CPI inflation expectations, which are also collected in the DMP survey. Firms have been asked about one-year and three-year ahead CPI inflation expectations since May 2022. We present the results using the same methodology in Figures A12 and A13. For both one-year and three-year CPI inflation expectations, we do not find evidence of significant differences between state-dependent and time-dependent firms. Thus, even though state-dependent firms increase their prices and price expectations by more in the first year following the shock, they do not extrapolate from this to higher aggregate inflation expectations.

Effect on additional outcome variables In addition to the impacts on own-price growth and own-price expectations, we also analyse the effects of oil supply news shocks and gas supply shocks on additional outcome variables: cost growth (Figure A14), wage growth (Figure A15), and employment growth (Figure A16). We find that price-setting behaviour makes little difference to the response of these additional outcome variables.

Alternative oil supply shocks We find similar results using an alternative oil supply shock series from Baumeister and Hamilton (2019). These are shown in Figure A17.

Controlling for frequency of price change We next test whether the differences

between state- and time-dependent price-setting are also robust to controlling for the frequency of price changes at the point of the shock. In Table A10, in addition to the interaction between oil supply news shocks and the dummy for state/time-dependent price-setting, we add additional interactions for different frequencies of price changes. The interaction with state-dependent price-setting remains robust across multiple horizons, and Panel A of Figure A18 plots these results. The gas supply shock results are similarly robust, as we show in Table A11 and Panel B of A18. Our results emphasise that the differences between state- and time-dependent firms cannot be explained only by differences in price adjustment frequencies.

Placebo: Randomly assigning state/time dependent pricing Finally, we test whether we could replicate our results by randomly assigning state- and time-dependent pricing to firms in our sample. To do this, we randomly assign price-setting indicators to firms and estimate our main specification with firm and time fixed effects. We do this 1000 times for both oil supply news shocks and gas supply shocks, and then plot the distribution of these estimates along with our actual estimates. This is shown in Figure A19. The placebo distributions are centred around zero, suggesting we are not able to recreate our main results by chance.

5 Conclusion

We study firm price-setting behaviour using new survey questions on state vs. time-dependent price-setting and the frequency of price changes. On average, 55% of firms reported setting prices in a state-dependent manner, and this share has been gradually decreasing over 2023-2025. Furthermore, we document substantial heterogeneity across sectors and by firm characteristics. Firms in the goods sector are more likely to be state-dependent, whereas service providers are more likely to be time-dependent. Smaller firms and those with higher non-labour cost shares are also more likely to set prices in response to events. State-dependent firms have also experienced a larger and more persistent increase in the frequency of price changes since 2019. Finally, we use firm-level local projections to study the pass-through of exogenous oil supply shocks and gas supply shocks to firm prices by their price-setting behaviour. Consistent with the theory, we find that state-dependent firms react more quickly to these supply shocks, and that the responses are larger for bigger shocks. Overall, our

paper contributes to the literature on firm price-setting and highlights the importance of considering differences in price-setting, especially when shocks are large.

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6 Tables

Table 1: Determinants of state- vs. time-dependent price setting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dependent variable:	= 1 State-Dependent Price Setting										
Sample period:	2023-2025										
Estimation:	OLS										
ln(Employment)	-0.033***								-0.018***	-0.028***	-0.020***
	(0.005)								(0.006)	(0.006)	(0.006)
% of non-labour costs in total costs		0.005***							0.002***	0.002***	0.002***
		(0.000)							(0.000)	(0.001)	(0.001)
ln(Firm Age)			0.017						0.011	0.003	0.008
			(0.012)						(0.012)	(0.013)	(0.013)
ln(Labour Productivity)				0.007					-0.025**	-0.025**	-0.022*
				(0.012)					(0.012)	(0.013)	(0.012)
Import cost share in total costs					0.002***				0.001	0.000	0.001
					(0.000)				(0.000)	(0.000)	(0.000)
Industry energy cost share (2022)						0.014***			0.007		
						(0.003)			(0.004)		
ln(Subjective Price Uncertainty)							0.153***		0.116***		0.115***
							(0.012)		(0.014)		(0.014)
ln(Subjective Sales Uncertainty)								0.072***	0.008		0.004
								(0.011)	(0.012)		(0.012)
Broad industry fixed effects	No	No	No	No	No	No	No	No	Yes	No	No
SIC2 industry fixed effects	No	No	No	No	No	No	No	No	No	Yes	Yes
Time fixed effects	No	No	No	No	No	No	No	No	No	Yes	Yes
R^2	0.011	0.035	0.001	0.000	0.008	0.005	0.035	0.011	0.124	0.139	0.158
Observations	3,894	3,894	3,894	3,894	3,894	3,886	3,894	3,894	3,886	3,888	3,888

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

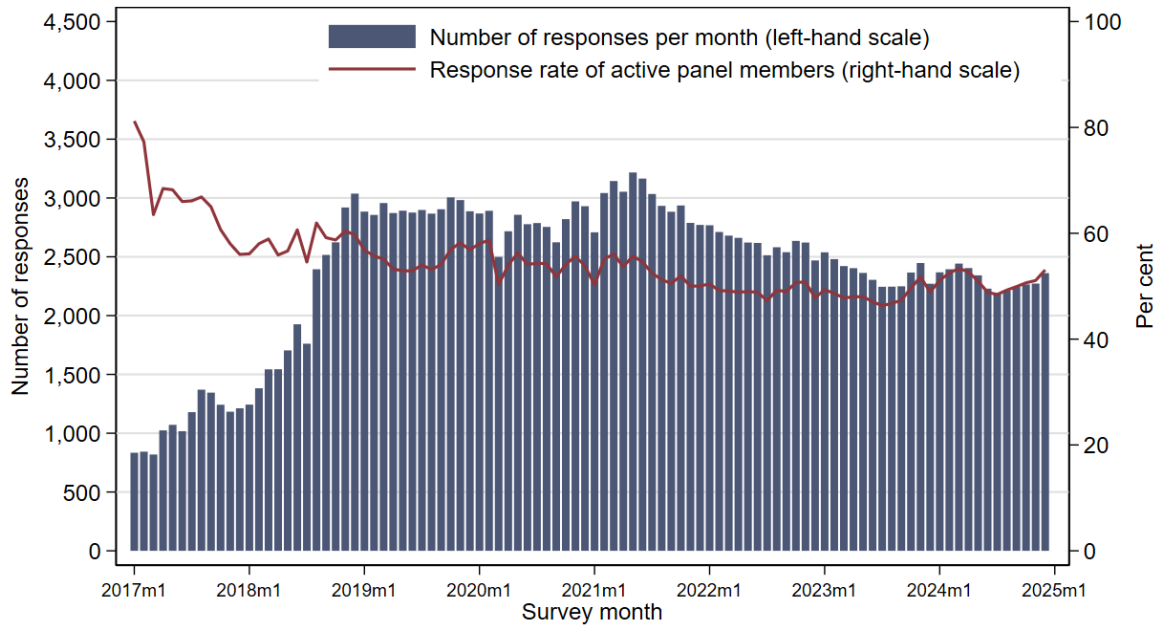
Online Appendix
State and Time-Dependent Pricing

For Online Publication

July 17, 2025

A Figures

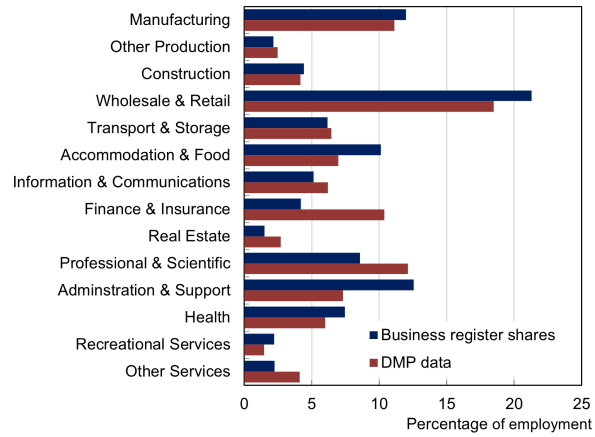
Figure A1: DMP response rate



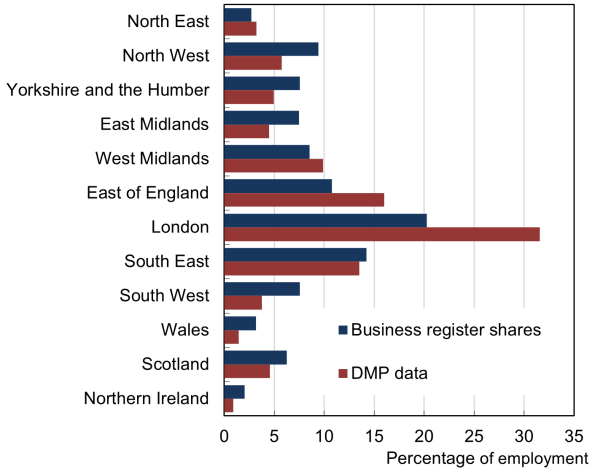
Notes: This figure presents the number of monthly responses to the DMP. The solid line shows the *active* response rate, referring to the response rate among firms which have responses at least once over the past 12 months.

Figure A2: Coverage of DMP survey by industry and region

Panel A: Industry



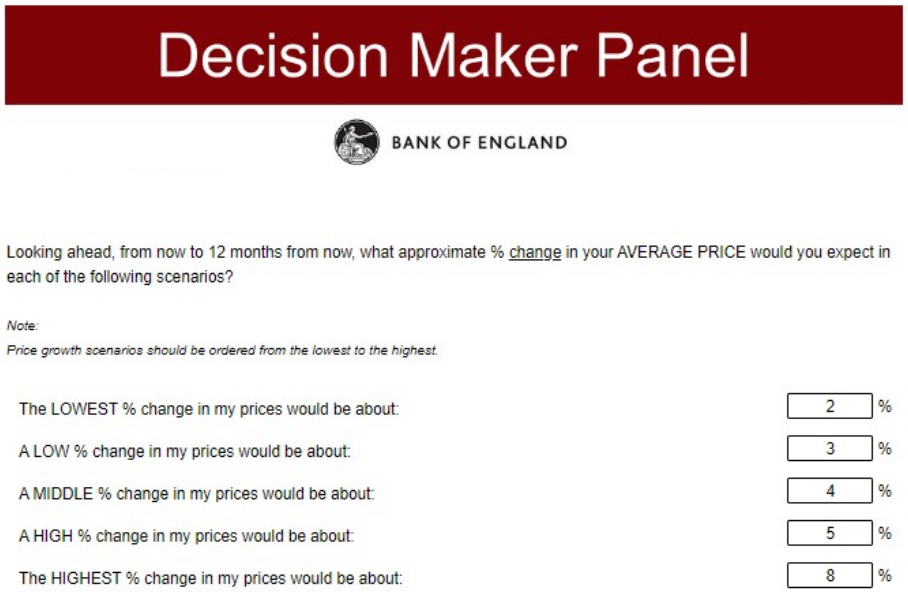
Panel B: Regions



Notes: This figure compares the coverage of the DMP survey across industries (Panel A) and by region (Panel B), based on data over 2017-2023.

Figure A3: Format of question on expected own-price growth

Panel A: Scenarios



Decision Maker Panel

BANK OF ENGLAND

Looking ahead, from now to 12 months from now, what approximate % change in your AVERAGE PRICE would you expect in each of the following scenarios?

Note:
Price growth scenarios should be ordered from the lowest to the highest.

The LOWEST % change in my prices would be about:	2 %
A LOW % change in my prices would be about:	3 %
A MIDDLE % change in my prices would be about:	4 %
A HIGH % change in my prices would be about:	5 %
The HIGHEST % change in my prices would be about:	8 %

Panel B: Probabilities



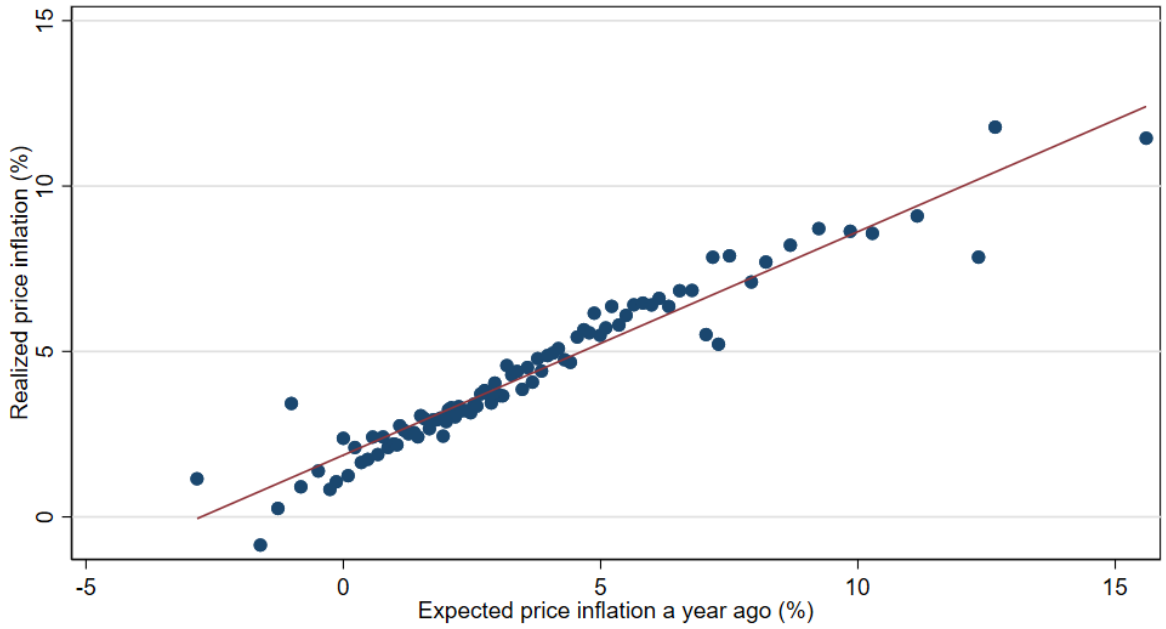
Decision Maker Panel

BANK OF ENGLAND

Please assign a percentage likelihood (probability) to the % changes in your AVERAGE PRICES you entered (values should sum to 100%).

LOWEST: The likelihood of realising about **2%** would be:	5 %
LOW: The likelihood of realising about **3%** would be:	15 %
MIDDLE: The likelihood of realising about **4%** would be:	25 %
HIGH: The likelihood of realising about **5%** would be:	20 %
HIGHEST: The likelihood of realising about **8%** would be:	35 %
Total	100 %

Figure A4: Expected and realised firm own-price growth



Notes: This figure presents a binned scatterplot of the relationship between expected year-ahead own-price growth and realised own-price growth *a year later* for the same firms. Each dot represents approximately 1% of the sample of firms. The figure is based on data from November 2017 to December 2024.

Figure A5: Format of question on state vs. time-dependent pricing



Figure A6: Format of question on frequency of price change in 2019, 2024, 2025

Decision Maker Panel

BANK OF ENGLAND

Approximately, how often did you change/do you expect to change your prices in each of the following years?

Notes:
(a) Where possible, please consider the average across all products and services. If that is not possible, please answer for your main product/service.

	2019	2024	2025
Daily	○	○	○
Weekly	○	○	○
Monthly	○	○	○
Quarterly	○	○	○
Half-yearly	○	○	○
Annually	○	○	○
Prices did not change/not expected to change	○	○	○

Figure A7: Firm output price growth for state-dependent, annual time-dependent firms, and time-dependent firms with more than annual frequency of price setting

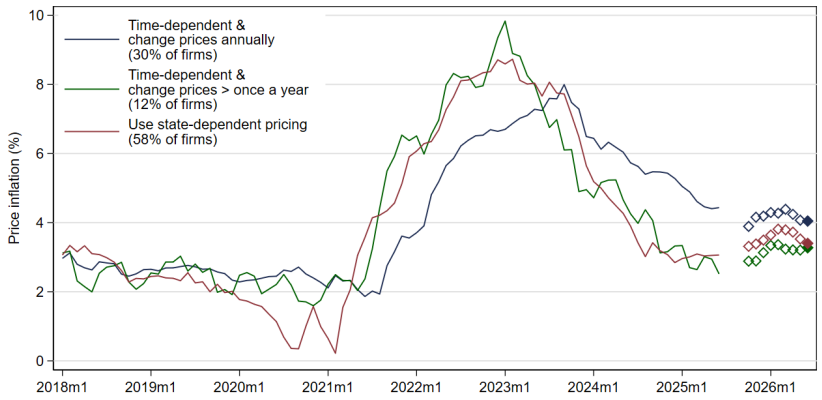
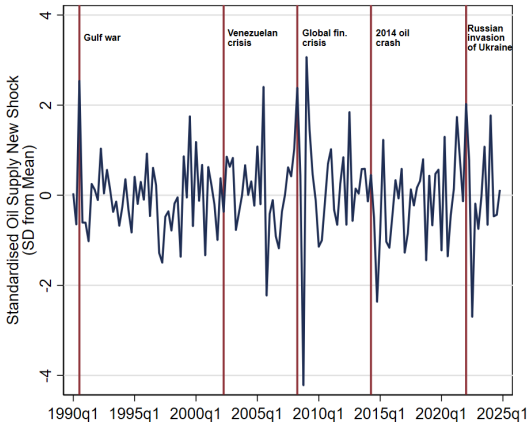
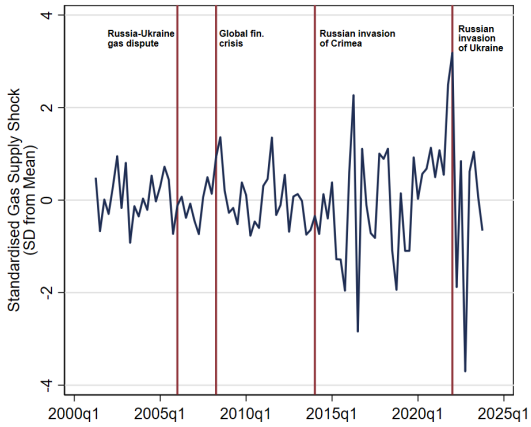


Figure A8: Time series of normalised supply shocks at the quarterly frequency

Panel A: Oil Supply News Shocks



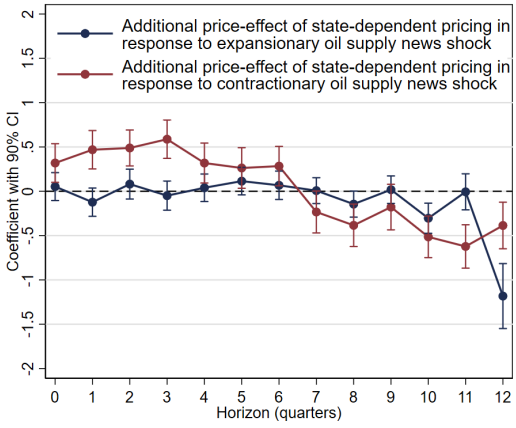
Panel B: Gas Supply Shocks



Notes: Panel A plots the time series of the normalised Känzig (2021) oil supply news shocks at the quarterly frequency. Panel B plots the time series of the normalised Alessandri and Gazzani (2025) gas supply shocks at the quarterly frequency.

Figure A9: Difference between state- and time-dependent price responses for positive vs. negative shocks

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks

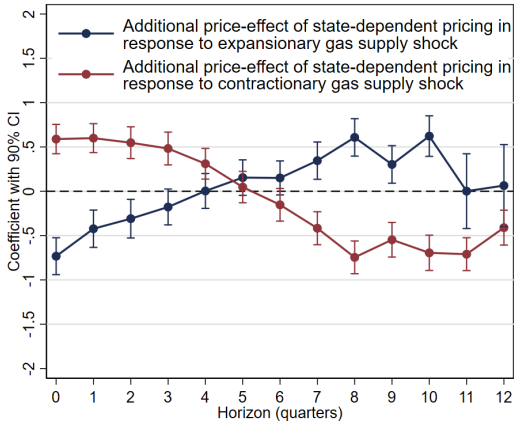
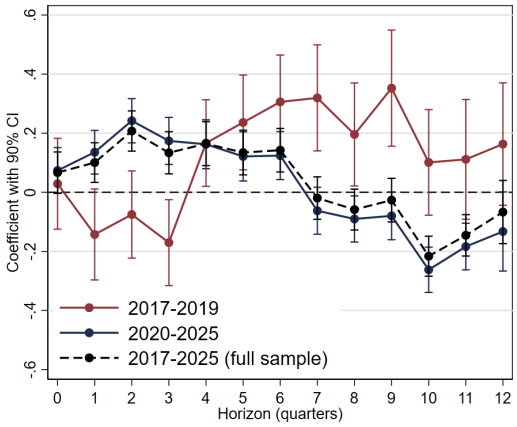
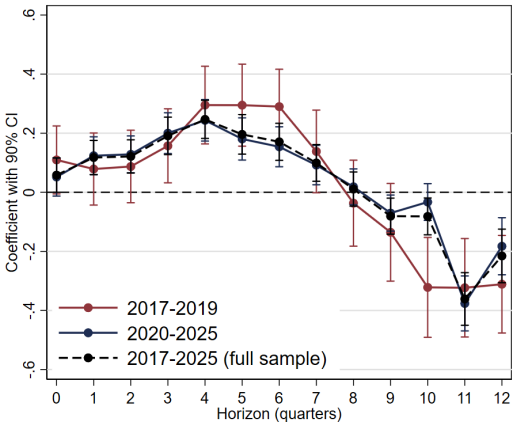


Figure A10: Difference between state- and time-dependent firms' price growth responses in 2017-2020 vs. 2021-2025

Panel A: Oil Supply News Shocks



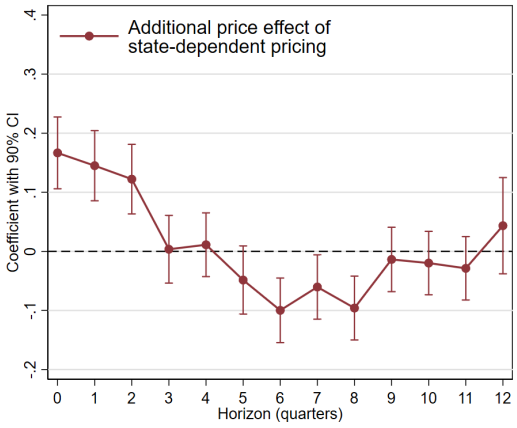
Panel B: Gas Supply Shocks



Notes: Local projections are estimated over the full sample period from 2017Q1 to 2025Q2. However, the Känzig (2021) oil supply news shock series extends only to 2024Q4, while the Alessandri and Gazzani (2025) gas supply shock series ends in 2023Q4.

Figure A11: Difference between state- and time-dependent firms' own-price growth expectation responses

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks

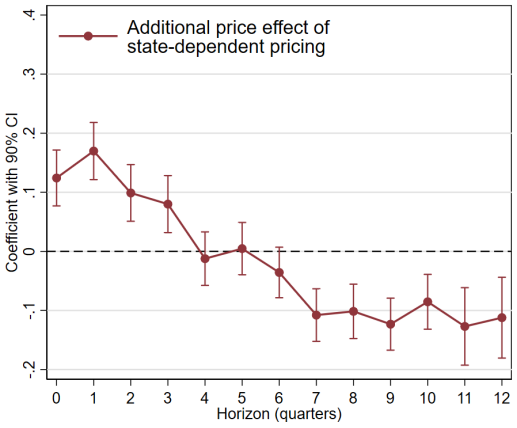
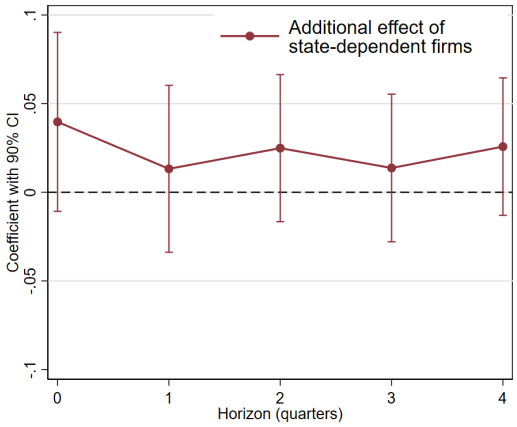


Figure A12: Difference between state- and time-dependent firms' 1yr CPI inflation expectation responses

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks

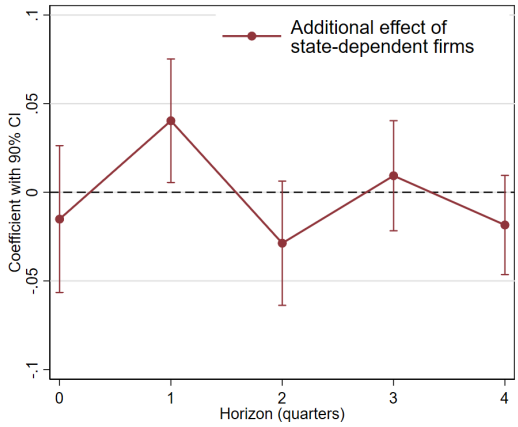
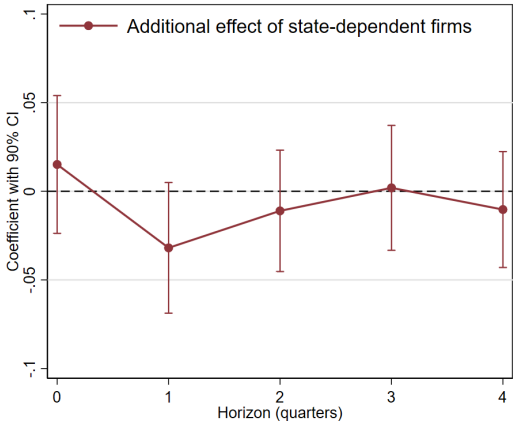


Figure A13: Difference between state- and time-dependent firms' 3yr CPI inflation expectation responses

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks

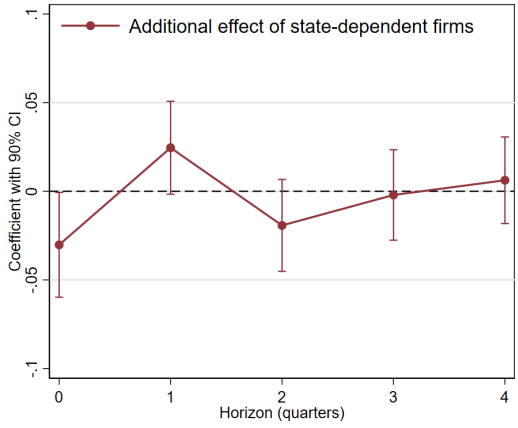
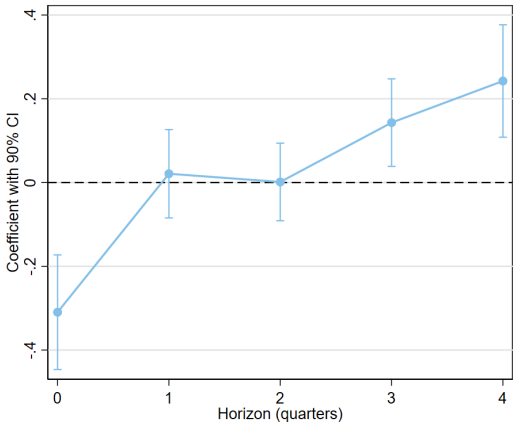


Figure A14: Difference between state- and time-dependent firms' cost growth responses

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks

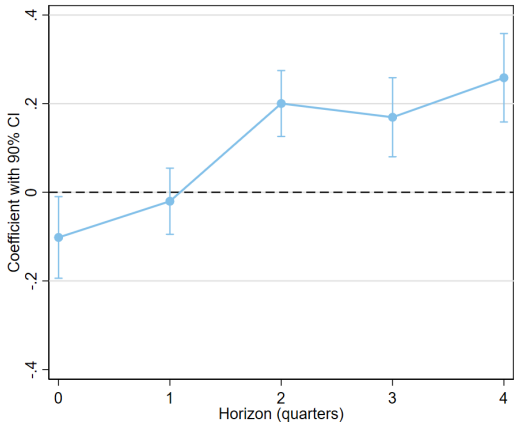
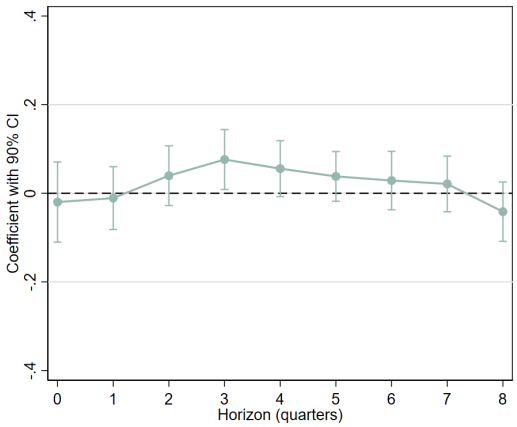


Figure A15: Difference between state- and time-dependent firms' wage growth responses

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks

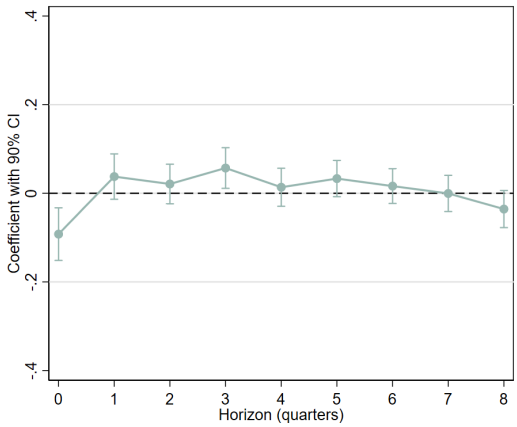
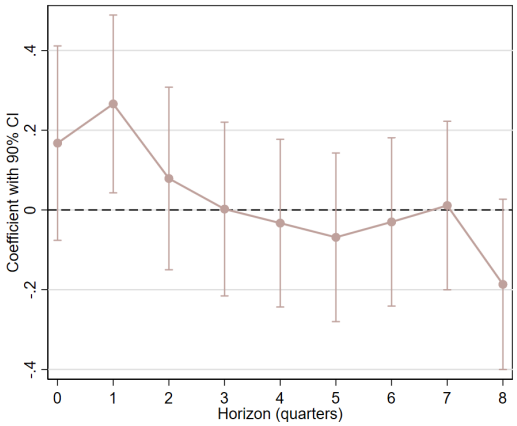


Figure A16: Difference between state- and time-dependent firms' employment growth responses

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks

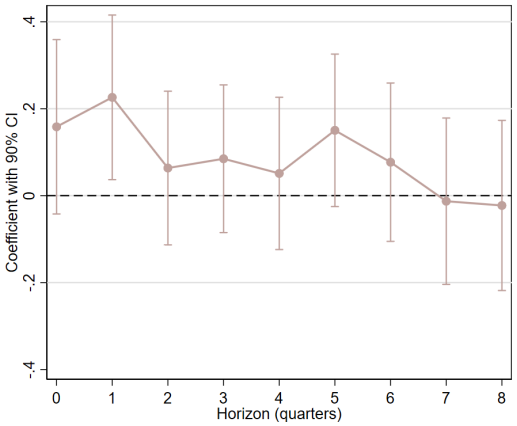


Figure A17: Difference between state- and time-dependent price responses: Using oil supply shocks from Baumeister and Hamilton (2019)

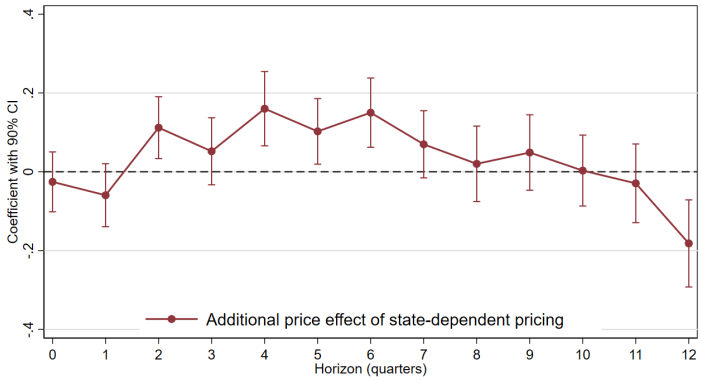
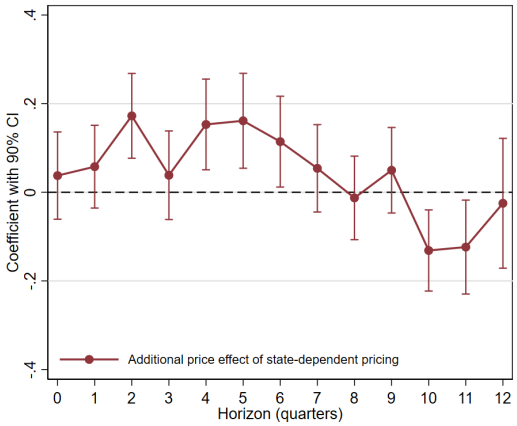


Figure A18: Difference between state- and time-dependent price responses: Controlling for frequency of price change

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks

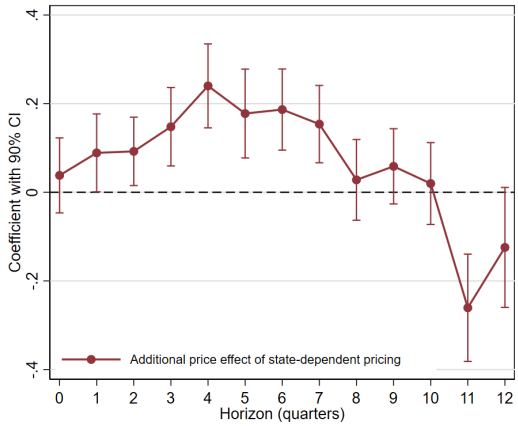
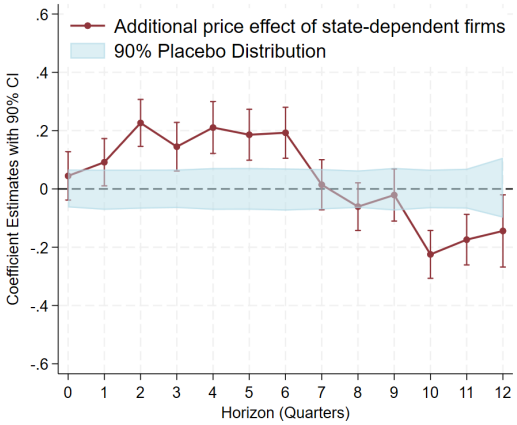
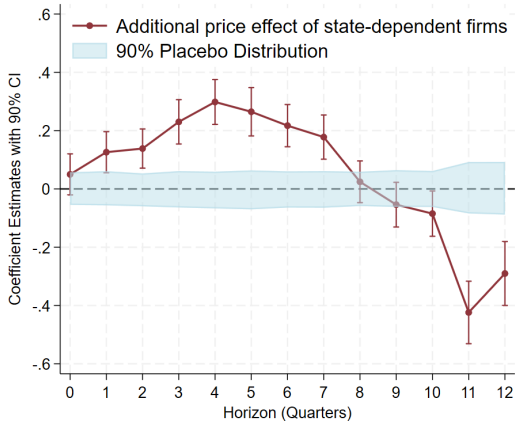


Figure A19: Placebo test: Randomly assigning state/time dependent pricing indicators

Panel A: Oil Supply News Shocks



Panel B: Gas Supply Shocks



B Tables

Table A1: Share of firms switching price-setting behaviour split by the number of times they have responded to the question

Percentage of Businesses (%)	**No. of times firms switched price-setting behaviour**			
No. of times firms responded to the price-setting behaviour question	**0**	**1**	**2**	**3**
1 (41% of firms)	100	0	0	0
2 (25% of firms)	78	22	0	0
3 (17% of firms)	65	23	12	0
4 (17% of firms)	64	17	15	4

Table A2: The impact of oil supply news shocks (OSNS) on firm price growth: Full Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	Annual Own-Price Growth (%)												
Horizon (Quarter):	0	1	2	3	4	5	6	7	8	9	10	11	12
$OSNS_t$	0.100**	0.084*	0.113**	0.179***	0.277***	0.263***	0.277***	0.277***	0.345***	0.362***	0.225***	-0.240**	-0.153
	(0.044)	(0.047)	(0.048)	(0.051)	(0.053)	(0.052)	(0.050)	(0.057)	(0.065)	(0.076)	(0.073)	(0.122)	(0.123)
π_{it-1}	0.427***	0.280***	0.121***	-0.010	-0.110***	-0.198***	-0.267***	-0.261***	-0.244***	-0.204***	-0.153***	-0.099***	-0.028
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.019)	(0.022)	(0.022)	(0.024)	(0.026)	(0.027)	(0.027)
CPI_t	0.393***	0.163	0.136	0.180*	0.010	0.219**	-0.071	-0.133	0.265*	0.101	0.448***	0.545**	0.089
	(0.117)	(0.100)	(0.109)	(0.103)	(0.104)	(0.106)	(0.105)	(0.112)	(0.152)	(0.178)	(0.173)	(0.232)	(0.237)
CPI_{t-1}	0.011	0.151	0.119	0.163	0.421***	0.010	0.172	0.197*	-0.363*	-0.737***	-1.033***	-1.256***	-0.729***
	(0.116)	(0.103)	(0.115)	(0.108)	(0.110)	(0.111)	(0.113)	(0.106)	(0.205)	(0.205)	(0.211)	(0.276)	(0.278)
$UnRate_t$	0.233	0.627**	0.530**	0.707***	1.184***	0.957***	1.111***	0.625**	-0.581*	-0.165	-0.525	-1.822**	1.288
	(0.267)	(0.255)	(0.259)	(0.269)	(0.266)	(0.276)	(0.269)	(0.277)	(0.344)	(0.810)	(0.777)	(0.926)	(1.019)
$UnRate_{t-1}$	0.552*	0.078	0.428	0.949***	1.353***	1.265***	1.041***	0.651**	2.067***	1.812***	1.028**	0.786*	-1.347***
	(0.298)	(0.292)	(0.289)	(0.289)	(0.286)	(0.297)	(0.289)	(0.298)	(0.384)	(0.468)	(0.475)	(0.476)	(0.486)
$BankRate_t$	-0.363	-0.490	-0.434	-0.165	-0.719**	-0.582	-0.223	0.679*	1.533***	1.581*	1.217	-1.458	-2.261**
	(0.369)	(0.350)	(0.370)	(0.359)	(0.338)	(0.365)	(0.348)	(0.399)	(0.479)	(0.908)	(0.848)	(0.987)	(0.959)
$BankRate_{t-1}$	0.512	0.051	0.052	0.027	0.576	0.361	0.138	-1.088**	-0.274	1.584	1.370	1.614	6.040***
	(0.422)	(0.414)	(0.442)	(0.431)	(0.406)	(0.438)	(0.430)	(0.496)	(0.506)	(1.581)	(1.456)	(1.560)	(1.783)
$OSNS_{t-1}$	0.151**	0.280***	0.193***	0.365***	0.490***	0.297***	0.304***	0.132*	0.210***	0.282**	0.000	0.099	0.021
	(0.067)	(0.063)	(0.065)	(0.063)	(0.063)	(0.067)	(0.067)	(0.070)	(0.077)	(0.113)	(0.114)	(0.120)	(0.136)
$OSNS_{t-2}$	0.135**	0.284***	0.135**	0.175***	0.053	0.034	-0.025	-0.064	-0.348***	-0.296***	-0.415***	0.010	0.085
	(0.062)	(0.061)	(0.062)	(0.067)	(0.062)	(0.061)	(0.064)	(0.068)	(0.081)	(0.104)	(0.099)	(0.119)	(0.119)
$GasPrice_t$	0.000	-0.001	0.005***	0.005***	0.007***	0.006***	0.006***	0.006***	0.008***	0.012***	0.011***	0.002	0.015***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.005)
$GasPrice_{t-1}$	-0.002	0.006***	0.007***	0.008***	0.006***	0.003**	0.005***	-0.004**	-0.008***	-0.011***	-0.015***	-0.025***	-0.038***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.006)	(0.011)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.625	0.574	0.534	0.520	0.508	0.514	0.516	0.509	0.497	0.492	0.480	0.474	0.480
Observations	10,172	10,056	9,953	9,900	9,840	9,801	9,752	9,262	8,593	8,015	7,385	6,774	6,163

Notes: This table presents the response of firm own-price growth to oil supply news shocks (Känzig, 2021) across the full sample based on the methodology in Equation 2. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A3: The impact of gas supply shocks on firm price growth: Full Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	Annual Own-Price Growth (%)												
Horizon (Quarter):	0	1	2	3	4	5	6	7	8	9	10	11	12
Gas Shock$_t$	0.073	0.062	0.110**	0.106**	0.090**	0.153***	0.134***	0.277***	0.176***	0.085	0.135**	-0.046	-0.139
	(0.045)	(0.044)	(0.043)	(0.042)	(0.042)	(0.046)	(0.046)	(0.049)	(0.057)	(0.065)	(0.065)	(0.068)	(0.096)
π_{it-1}	0.427***	0.281***	0.123***	-0.008	-0.108***	-0.197***	-0.266***	-0.260***	-0.244***	-0.204***	-0.153***	-0.099***	-0.029
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.019)	(0.022)	(0.022)	(0.023)	(0.026)	(0.027)	(0.027)
CPI$_t$	0.217	0.452***	0.772***	0.610***	0.365***	0.608***	0.457***	0.027	0.029	-0.298*	-0.074	-0.042	0.087
	(0.137)	(0.122)	(0.136)	(0.129)	(0.125)	(0.137)	(0.131)	(0.139)	(0.137)	(0.152)	(0.134)	(0.200)	(0.217)
CPI$_{t-1}$	0.221	-0.103	-0.424***	-0.216	-0.011	-0.423***	-0.410***	-0.172	-0.345*	-0.421**	-0.664***	-0.581***	-1.271***
	(0.161)	(0.140)	(0.148)	(0.137)	(0.146)	(0.146)	(0.153)	(0.147)	(0.182)	(0.189)	(0.174)	(0.214)	(0.307)
UnRate$_t$	0.303	0.648**	0.259	0.531*	1.003***	0.883***	0.871***	1.078***	-0.505	-1.676**	-1.949***	-3.529***	-3.713***
	(0.306)	(0.284)	(0.286)	(0.296)	(0.287)	(0.290)	(0.293)	(0.323)	(0.415)	(0.661)	(0.678)	(0.754)	(1.093)
UnRate$_{t-1}$	0.312	0.036	0.745***	0.687**	0.645**	0.711**	0.403	-0.383	0.281	0.470	0.201	0.564	0.265
	(0.272)	(0.298)	(0.287)	(0.289)	(0.279)	(0.276)	(0.294)	(0.292)	(0.327)	(0.394)	(0.422)	(0.448)	(0.569)
BankRate$_t$	-0.463	-1.159***	-1.302***	-0.922**	-1.434***	-0.952**	-0.464	1.377***	2.615***	4.458***	4.376***	7.094***	3.392**
	(0.387)	(0.394)	(0.411)	(0.394)	(0.362)	(0.402)	(0.385)	(0.454)	(0.597)	(0.886)	(0.877)	(1.349)	(1.317)
BankRate$_{t-1}$	0.603	0.795*	1.226**	0.826*	1.123***	0.800*	0.346	-1.817***	-1.333**	-3.651***	-1.869	-5.551***	-3.291*
	(0.440)	(0.458)	(0.487)	(0.460)	(0.421)	(0.479)	(0.458)	(0.553)	(0.588)	(1.202)	(1.158)	(1.501)	(1.699)
Gas Shock$_{t-1}$	0.144**	0.092	-0.128**	-0.010	-0.040	0.021	0.064	0.252***	0.250***	0.095	0.128	0.298**	0.066
	(0.063)	(0.068)	(0.065)	(0.063)	(0.066)	(0.063)	(0.061)	(0.083)	(0.088)	(0.100)	(0.094)	(0.132)	(0.130)
Gas Shock$_{t-2}$	0.100**	-0.051	-0.141***	-0.025	-0.024	0.052	0.041	0.175***	0.463***	0.431***	0.670***	0.473***	0.363***
	(0.044)	(0.045)	(0.043)	(0.044)	(0.044)	(0.043)	(0.041)	(0.053)	(0.082)	(0.087)	(0.087)	(0.093)	(0.099)
OilPrice$_t$	0.009	0.005	0.011	0.017	0.028**	-0.004	-0.018	-0.058***	-0.028*	-0.029*	-0.006	-0.069**	0.006
	(0.013)	(0.013)	(0.014)	(0.013)	(0.012)	(0.013)	(0.015)	(0.014)	(0.016)	(0.015)	(0.016)	(0.030)	(0.031)
OilPrice$_{t-1}$	0.006	0.015	0.002	0.007	0.002	0.002	-0.002	0.027**	-0.023*	-0.014	-0.051***	-0.037**	-0.026*
	(0.010)	(0.010)	(0.011)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)	(0.013)	(0.013)	(0.014)	(0.015)	(0.015)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.624	0.573	0.532	0.517	0.505	0.512	0.514	0.509	0.497	0.492	0.483	0.476	0.480
Observations	10,172	10,056	9,953	9,900	9,840	9,801	9,752	9,262	8,593	8,015	7,385	6,774	6,163

Notes: This table presents the response of firm own-price growth to gas supply shocks (Alessandri and Gazzani, 2025) across the full sample based on the methodology in Equation 2. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A4: The impact of oil supply news shocks (OSNS) on firm price growth by price-setting behaviour

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	Annual Own-Price Growth (%)												
Horizon (Quarter):	0	1	2	3	4	5	6	7	8	9	10	11	12
$OSNS_t \times$ Time-Dependent$_i$	0.070	0.047	-0.008	0.090	0.145**	0.137**	0.134**	0.282***	0.374***	0.401***	0.354***	-0.136	-0.056
	(0.049)	(0.053)	(0.054)	(0.059)	(0.058)	(0.058)	(0.055)	(0.061)	(0.070)	(0.087)	(0.079)	(0.127)	(0.128)
$OSNS_t \times$ State-Dependent$_i$	0.122**	0.110**	0.202***	0.246***	0.378***	0.358***	0.386***	0.274***	0.325***	0.335***	0.132*	-0.311**	-0.224*
	(0.052)	(0.056)	(0.057)	(0.059)	(0.064)	(0.061)	(0.060)	(0.065)	(0.071)	(0.079)	(0.078)	(0.126)	(0.133)
π_{it-1}	0.427***	0.280***	0.121***	-0.010	-0.110***	-0.198***	-0.267***	-0.261***	-0.244***	-0.204***	-0.153***	-0.099***	-0.027
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.019)	(0.022)	(0.022)	(0.024)	(0.026)	(0.027)	(0.027)
CPI_t	0.393***	0.165*	0.140	0.184*	0.016	0.223**	-0.067	-0.133	0.265*	0.101	0.449***	0.542**	0.090
	(0.117)	(0.100)	(0.109)	(0.103)	(0.104)	(0.106)	(0.105)	(0.112)	(0.152)	(0.178)	(0.173)	(0.232)	(0.237)
CPI_{t-1}	0.010	0.149	0.113	0.159	0.417***	0.004	0.166	0.197*	-0.363*	-0.737***	-1.034***	-1.253***	-0.729***
	(0.116)	(0.103)	(0.115)	(0.108)	(0.110)	(0.111)	(0.112)	(0.106)	(0.205)	(0.205)	(0.211)	(0.276)	(0.278)
$UnRate_t$	0.233	0.627**	0.528**	0.706***	1.190***	0.955***	1.109***	0.625**	-0.582*	-0.160	-0.531	-1.803*	1.280
	(0.267)	(0.255)	(0.259)	(0.269)	(0.267)	(0.276)	(0.269)	(0.277)	(0.344)	(0.811)	(0.777)	(0.927)	(1.020)
$UnRate_{t-1}$	0.551*	0.076	0.423	0.946***	1.355***	1.260***	1.036***	0.651**	2.069***	1.813***	1.035**	0.786*	-1.347***
	(0.298)	(0.293)	(0.289)	(0.288)	(0.287)	(0.297)	(0.289)	(0.298)	(0.385)	(0.468)	(0.475)	(0.476)	(0.486)
$BankRate_t$	-0.358	-0.486	-0.415	-0.158	-0.712**	-0.560	-0.203	0.679*	1.532***	1.575*	1.213	-1.474	-2.261**
	(0.369)	(0.350)	(0.370)	(0.358)	(0.339)	(0.366)	(0.348)	(0.400)	(0.479)	(0.909)	(0.850)	(0.987)	(0.960)
$BankRate_{t-1}$	0.506	0.046	0.031	0.019	0.570	0.338	0.117	-1.088**	-0.271	1.597	1.387	1.660	6.037***
	(0.422)	(0.414)	(0.442)	(0.430)	(0.406)	(0.438)	(0.430)	(0.496)	(0.506)	(1.583)	(1.459)	(1.561)	(1.784)
$OSNS_{t-1}$	0.151**	0.279***	0.192***	0.362***	0.490***	0.296***	0.302***	0.132*	0.210***	0.283**	-0.000	0.102	0.019
	(0.067)	(0.063)	(0.065)	(0.063)	(0.063)	(0.067)	(0.067)	(0.070)	(0.077)	(0.113)	(0.114)	(0.120)	(0.136)
$OSNS_{t-2}$	0.136**	0.285***	0.138**	0.176***	0.053	0.036	-0.024	-0.064	-0.349***	-0.296***	-0.417***	0.010	0.085
	(0.062)	(0.061)	(0.062)	(0.067)	(0.062)	(0.061)	(0.064)	(0.068)	(0.081)	(0.104)	(0.099)	(0.119)	(0.119)
$GasPrice_t$	0.000	-0.001	0.005***	0.005***	0.007***	0.006***	0.006***	0.006***	0.008***	0.012***	0.011***	0.002	0.015***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.005)
$GasPrice_{t-1}$	-0.002	0.006***	0.007***	0.007***	0.006***	0.003*	0.005***	-0.004**	-0.008***	-0.011***	-0.015***	-0.025***	-0.039***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.006)	(0.011)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.625	0.574	0.534	0.520	0.509	0.514	0.517	0.509	0.497	0.492	0.481	0.475	0.480
Observations	10,172	10,056	9,953	9,900	9,840	9,801	9,752	9,262	8,593	8,015	7,385	6,774	6,163
Test state/time dependent coefficients equal (p-value)	0.290	0.257	0.000	0.007	0.000	0.000	0.000	0.892	0.392	0.313	0.000	0.008	0.063

Notes: This table presents the response of firm own-price growth to oil supply news shocks from Känzig (2021) by price-setting behaviour based on the methodology in Equation 2. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A5: The impact of gas supply shocks on firm price growth by price-setting behaviour

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	Annual Own-Price Growth (%)												
Horizon (Quarter):	0	1	2	3	4	5	6	7	8	9	10	11	12
Gas Shock$_t$ × Time-Dependent$_i$	0.056	0.001	0.023	-0.025	-0.094*	-0.004	0.008	0.179***	0.162***	0.124*	0.174**	0.161**	0.000
	(0.049)	(0.049)	(0.047)	(0.051)	(0.048)	(0.054)	(0.052)	(0.052)	(0.059)	(0.067)	(0.072)	(0.075)	(0.102)
Gas Shock$_t$ × State-Dependent$_i$	0.085*	0.108**	0.175***	0.204***	0.232***	0.272***	0.228***	0.351***	0.186***	0.056	0.106	-0.212***	-0.239**
	(0.050)	(0.050)	(0.049)	(0.049)	(0.051)	(0.055)	(0.052)	(0.056)	(0.063)	(0.072)	(0.068)	(0.079)	(0.105)
π_{it-1}	0.427***	0.280***	0.123***	-0.008	-0.108***	-0.197***	-0.266***	-0.260***	-0.244***	-0.204***	-0.153***	-0.096***	-0.027
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.019)	(0.022)	(0.022)	(0.023)	(0.026)	(0.027)	(0.027)
CPI$_t$	0.217	0.453***	0.771***	0.611***	0.362***	0.606***	0.455***	0.028	0.029	-0.298**	-0.074	-0.044	0.075
	(0.137)	(0.122)	(0.136)	(0.129)	(0.125)	(0.136)	(0.131)	(0.139)	(0.137)	(0.152)	(0.134)	(0.200)	(0.218)
CPI$_{t-1}$	0.221	-0.103	-0.424***	-0.214	-0.007	-0.422***	-0.406***	-0.175	-0.345*	-0.421**	-0.665***	-0.577***	-1.257***
	(0.161)	(0.140)	(0.148)	(0.138)	(0.147)	(0.146)	(0.153)	(0.147)	(0.182)	(0.189)	(0.174)	(0.215)	(0.307)
UnRate$_t$	0.303	0.652**	0.264	0.536*	1.020***	0.892***	0.870***	1.082***	-0.504	-1.681**	-1.948***	-3.572***	-3.701***
	(0.306)	(0.284)	(0.287)	(0.297)	(0.287)	(0.290)	(0.293)	(0.323)	(0.415)	(0.660)	(0.678)	(0.754)	(1.096)
UnRate$_{t-1}$	0.312	0.035	0.739**	0.684**	0.628**	0.700**	0.402	-0.383	0.281	0.472	0.201	0.602	0.259
	(0.272)	(0.298)	(0.287)	(0.289)	(0.279)	(0.276)	(0.293)	(0.292)	(0.327)	(0.394)	(0.422)	(0.447)	(0.569)
BankRate$_t$	-0.464	-1.162***	-1.303***	-0.934**	-1.434***	-0.962**	-0.473	1.361***	2.612***	4.468***	4.382***	7.092***	3.415***
	(0.387)	(0.394)	(0.411)	(0.395)	(0.362)	(0.402)	(0.385)	(0.454)	(0.597)	(0.886)	(0.876)	(1.352)	(1.318)
BankRate$_{t-1}$	0.602	0.795*	1.220**	0.832*	1.112***	0.800*	0.347	-1.800***	-1.330**	-3.664***	-1.872	-5.552***	-3.288*
	(0.440)	(0.457)	(0.487)	(0.461)	(0.421)	(0.478)	(0.458)	(0.553)	(0.588)	(1.202)	(1.157)	(1.502)	(1.704)
Gas Shock$_{t-1}$	0.144**	0.093	-0.126*	-0.009	-0.033	0.023	0.065	0.250***	0.250***	0.095	0.129	0.293**	0.066
	(0.063)	(0.068)	(0.065)	(0.062)	(0.066)	(0.063)	(0.061)	(0.083)	(0.088)	(0.100)	(0.094)	(0.133)	(0.129)
Gas Shock$_{t-2}$	0.100**	-0.050	-0.140***	-0.024	-0.020	0.053	0.042	0.174***	0.463***	0.431***	0.670***	0.476***	0.369***
	(0.044)	(0.045)	(0.043)	(0.044)	(0.044)	(0.043)	(0.041)	(0.053)	(0.082)	(0.087)	(0.087)	(0.093)	(0.099)
OilPrice$_t$	0.009	0.005	0.010	0.017	0.027**	-0.004	-0.018	-0.058***	-0.028*	-0.029*	-0.006	-0.068**	0.006
	(0.013)	(0.013)	(0.014)	(0.013)	(0.012)	(0.013)	(0.015)	(0.014)	(0.016)	(0.015)	(0.016)	(0.030)	(0.031)
OilPrice$_{t-1}$	0.006	0.015	0.003	0.007	0.003	0.003	-0.002	0.027**	-0.023*	-0.014	-0.051***	-0.039**	-0.026*
	(0.010)	(0.010)	(0.011)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)	(0.013)	(0.013)	(0.014)	(0.015)	(0.015)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.624	0.573	0.533	0.518	0.507	0.514	0.515	0.510	0.497	0.492	0.483	0.478	0.481
Observations	10,172	10,056	9,953	9,900	9,840	9,801	9,752	9,262	8,593	8,015	7,385	6,774	6,163
Test state/time dependent coefficients equal (p-value)	0.479	0.019	0.001	0.000	0.000	0.000	0.000	0.000	0.621	0.185	0.187	0.000	0.002

Notes: This table presents the response of firm own-price growth to gas supply shocks from Alessandri and Gazzani (2025) by price-setting behaviour based on the methodology in Equation 2. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A6: The impact of oil supply news shocks (OSNS) by firm price-setting behaviour: Including time fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	Annual Own-Price Growth (%)												
Horizon (Quarter):	0	1	2	3	4	5	6	7	8	9	10	11	12
$OSNS_t \times$ State-Dependent$_i$	0.054	0.066	0.211***	0.158***	0.232***	0.220***	0.252***	-0.007	-0.050	-0.066	-0.224***	-0.179***	-0.174*
	(0.049)	(0.055)	(0.057)	(0.059)	(0.063)	(0.058)	(0.059)	(0.056)	(0.057)	(0.065)	(0.060)	(0.066)	(0.091)
π_{it-1}	0.427***	0.280***	0.121***	-0.010	-0.110***	-0.199***	-0.267***	-0.260***	-0.244***	-0.204***	-0.153***	-0.099***	-0.027
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.019)	(0.022)	(0.022)	(0.023)	(0.026)	(0.027)	(0.027)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.625	0.574	0.535	0.521	0.509	0.515	0.518	0.511	0.501	0.496	0.487	0.480	0.482
Observations	10,172	10,056	9,953	9,900	9,840	9,801	9,752	9,262	8,593	8,015	7,385	6,774	6,163

Notes: This table presents the difference between state-dependent and time-dependent price responses to oil supply news shocks (Känzig, 2021) based on the methodology in Equation 3. A positive coefficient means that the price response of state-dependent firms is greater than time-dependent firms. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level.Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A7: The impact of gas supply shocks by firm price-setting behaviour: Including time fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	Annual Own-Price Growth (%)												
Horizon (Quarter):	0	1	2	3	4	5	6	7	8	9	10	11	12
Gas $\text{Shock}_t \times$ State-Dependent$_i$	0.030	0.107**	0.151***	0.227***	0.323***	0.274***	0.217***	0.172***	0.022	-0.070	-0.069	-0.376***	-0.240***
	(0.041)	(0.046)	(0.045)	(0.054)	(0.053)	(0.058)	(0.050)	(0.049)	(0.048)	(0.051)	(0.052)	(0.073)	(0.079)
π_{it-1}	0.427***	0.280***	0.121***	-0.009	-0.110***	-0.199***	-0.267***	-0.260***	-0.244***	-0.204***	-0.154***	-0.096***	-0.027
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.019)	(0.022)	(0.022)	(0.023)	(0.026)	(0.027)	(0.027)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.625	0.575	0.535	0.522	0.511	0.516	0.518	0.512	0.501	0.496	0.487	0.482	0.482
Observations	10,172	10,056	9,953	9,900	9,840	9,801	9,752	9,262	8,593	8,015	7,385	6,774	6,163

Notes: This table presents the difference between state-dependent and time-dependent price responses to gas supply shocks (Alessandri and Gazzani, 2025) based on the methodology in Equation 3. A positive coefficient means that the price response of state-dependent firms is greater than time-dependent firms. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A8: The impact of oil supply news shocks (OSNS) on firm price growth by price-setting behaviour: Testing for non-linear effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	Annual Own-Price Growth (%)												
Horizon (Quarter):	0	1	2	3	4	5	6	7	8	9	10	11	12
$OSNS_t \times$ State-Dependent$_i$	0.083	0.112*	0.245***	0.202***	0.256***	0.233***	0.275***	-0.011	-0.077	-0.090	-0.251***	-0.257***	-0.162*
	(0.051)	(0.059)	(0.060)	(0.062)	(0.067)	(0.063)	(0.062)	(0.060)	(0.062)	(0.071)	(0.065)	(0.073)	(0.093)
$OSNS_t^2 \times$ State-Dependent$_i$	0.076**	0.125***	0.091**	0.112***	0.066*	0.034	0.057	-0.009	-0.064*	-0.060	-0.061	-0.170***	-0.030
	(0.034)	(0.036)	(0.039)	(0.040)	(0.039)	(0.040)	(0.036)	(0.037)	(0.038)	(0.039)	(0.040)	(0.046)	(0.065)
π_{it-1}	0.426***	0.279***	0.120***	-0.011	-0.110***	-0.199***	-0.267***	-0.260***	-0.243***	-0.203***	-0.152***	-0.096***	-0.027
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.019)	(0.022)	(0.022)	(0.023)	(0.026)	(0.027)	(0.027)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.625	0.575	0.535	0.521	0.509	0.515	0.518	0.511	0.501	0.496	0.487	0.481	0.482
Observations	10,172	10,056	9,953	9,900	9,840	9,801	9,752	9,262	8,593	8,015	7,385	6,774	6,163

Notes: This table presents the difference between state-dependent and time-dependent price responses to oil supply news shocks (Känzig, 2021) based on the methodology in Equation 3. A positive coefficient means that the price response of state-dependent firms is greater than time-dependent firms. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level.Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A9: The impact of gas supply shocks on firm price growth by price-setting behaviour: Testing for non-linear effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	Annual Own-Price Growth (%)												
Horizon (Quarter):	0	1	2	3	4	5	6	7	8	9	10	11	12
Gas Shock$_t$ × State-Dependent$_i$	0.057	0.134***	0.178***	0.255***	0.338***	0.275***	0.216***	0.136***	-0.031	-0.097*	-0.108**	-0.292***	-0.212**
	(0.042)	(0.047)	(0.046)	(0.056)	(0.054)	(0.060)	(0.051)	(0.052)	(0.051)	(0.054)	(0.054)	(0.082)	(0.087)
Gas Shock$_t^2$ × State-Dependent$_i$	0.078***	0.074***	0.077***	0.084***	0.040*	0.003	-0.003	-0.086***	-0.128***	-0.072***	-0.119***	-0.094**	-0.032
	(0.018)	(0.022)	(0.026)	(0.026)	(0.024)	(0.022)	(0.024)	(0.024)	(0.024)	(0.026)	(0.029)	(0.040)	(0.045)
π_{it-1}	0.424***	0.277***	0.118***	-0.013	-0.112***	-0.199***	-0.267***	-0.256***	-0.238***	-0.200***	-0.146***	-0.093***	-0.025
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.019)	(0.022)	(0.021)	(0.023)	(0.026)	(0.027)	(0.027)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.626	0.575	0.536	0.523	0.511	0.516	0.518	0.513	0.503	0.497	0.488	0.483	0.482
Observations	10,172	10,056	9,953	9,900	9,840	9,801	9,752	9,262	8,593	8,015	7,385	6,774	6,163

Notes: This table presents the difference between state-dependent and time-dependent price responses to gas supply shocks (Alessandri and Gazzani, 2025) based on the methodology in Equation 3. A positive coefficient means that the price response of state-dependent firms is greater than time-dependent firms. The sample covers firms which are either always state- or time-dependent. It also includes firms with at least seven quarters of price growth data. Standard errors are clustered at the firm level. Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A10: Difference between state- and time-dependent firms' price growth responses to an oil supply news shock: Controlling for frequency of price change

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	Annual Own-Price Growth (%)												
Horizon (Quarter):	0	1	2	3	4	5	6	7	8	9	10	11	12
$OSNS_t \times$ State-Dependent$_i$	0.038	0.058	0.172***	0.038	0.153**	0.161**	0.114*	0.054	-0.013	0.050	-0.131**	-0.124*	-0.025
	(0.060)	(0.057)	(0.058)	(0.061)	(0.062)	(0.065)	(0.062)	(0.060)	(0.057)	(0.059)	(0.056)	(0.064)	(0.089)
$OSNS_t \times$ No Price Change$_i$	-0.037	-0.019	0.019	-0.031	-0.012	-0.020	0.106	0.071	0.105	0.052	0.016	-0.135	-0.113
	(0.084)	(0.077)	(0.080)	(0.097)	(0.091)	(0.090)	(0.092)	(0.081)	(0.079)	(0.087)	(0.073)	(0.084)	(0.133)
$OSNS_t \times$ Half-Yearly Price Change$_i$	-0.025	0.021	0.073	0.026	0.129	0.099	0.101	0.052	-0.059	0.000	-0.107	0.026	-0.176
	(0.078)	(0.089)	(0.084)	(0.072)	(0.083)	(0.088)	(0.088)	(0.078)	(0.081)	(0.082)	(0.087)	(0.083)	(0.127)
$OSNS_t \times$ Quarterly$_i$	0.129	0.099	0.155*	0.252**	0.065	0.040	0.111	-0.011	-0.163	-0.184*	-0.118	-0.184*	-0.337**
	(0.093)	(0.083)	(0.092)	(0.103)	(0.101)	(0.105)	(0.100)	(0.117)	(0.106)	(0.106)	(0.108)	(0.095)	(0.153)
$OSNS_t \times$ Monthly+ Price Change$_i$	0.050	0.109	0.105	0.389***	0.159	0.009	0.119	-0.189*	-0.182*	-0.236**	-0.288***	-0.048	-0.308**
	(0.111)	(0.107)	(0.111)	(0.105)	(0.117)	(0.107)	(0.104)	(0.103)	(0.105)	(0.110)	(0.101)	(0.102)	(0.142)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.540	0.534	0.519	0.508	0.499	0.485	0.478	0.474	0.478	0.476	0.479	0.474	0.473
Observations	12,565	12,976	12,944	12,926	12,952	12,845	12,765	12,160	11,443	10,709	9,942	9,135	8,357

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A11: Difference between state- and time-dependent firms' price growth responses to a gas supply shock: Controlling for frequency of price change

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	Annual Own-Price Growth (%)												
Horizon (Quarter):	0	1	2	3	4	5	6	7	8	9	10	11	12
Gas Shock$_t$ × State-Dependent$_i$	0.038	0.089*	0.092**	0.148***	0.240***	0.178***	0.187***	0.154***	0.028	0.059	0.020	-0.261***	-0.124
	(0.051)	(0.053)	(0.047)	(0.054)	(0.058)	(0.061)	(0.056)	(0.053)	(0.055)	(0.052)	(0.056)	(0.074)	(0.082)
Gas Shock$_t$ × No Price Change$_i$	-0.085	-0.046	-0.135*	-0.062	-0.123	0.037	0.019	0.133	0.135*	-0.059	0.023	-0.008	-0.094
	(0.075)	(0.079)	(0.074)	(0.082)	(0.086)	(0.096)	(0.089)	(0.094)	(0.080)	(0.070)	(0.077)	(0.101)	(0.111)
Gas Shock$_t$ × Half-Yearly Price Change$_i$	-0.024	0.013	0.017	0.153**	0.045	0.211***	0.153**	0.195**	0.036	-0.104	-0.024	-0.224**	-0.134
	(0.072)	(0.069)	(0.073)	(0.077)	(0.074)	(0.080)	(0.072)	(0.076)	(0.082)	(0.081)	(0.079)	(0.113)	(0.115)
Gas Shock$_t$ × Quarterly$_i$	0.129	0.175**	0.169*	0.222**	0.104	0.263***	0.046	0.066	-0.028	-0.292***	-0.368***	-0.467***	-0.505***
	(0.081)	(0.088)	(0.089)	(0.088)	(0.102)	(0.101)	(0.095)	(0.094)	(0.089)	(0.099)	(0.099)	(0.143)	(0.129)
Gas Shock$_t$ × Monthly+ Price Change$_i$	0.025	0.132	0.171*	0.202**	0.233**	0.143	0.041	-0.066	-0.049	-0.284***	-0.237**	-0.374***	-0.369**
	(0.099)	(0.099)	(0.092)	(0.096)	(0.105)	(0.103)	(0.091)	(0.086)	(0.084)	(0.099)	(0.102)	(0.136)	(0.146)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.540	0.535	0.519	0.509	0.501	0.487	0.479	0.476	0.478	0.476	0.479	0.479	0.475
Observations	12,565	12,976	12,944	12,926	12,952	12,845	12,765	12,160	11,443	10,709	9,942	9,135	8,357

Notes: Standard errors are clustered at the firm level and reported in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.