Why Do Supply Disruptions Lead to Inflation (While Demand Booms Do Not)? Survey Evidence from the COVID Pandemic*

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Abstract

Firms tend to justify price increases as necessary to cover rising costs. Changes in consumer spending, instead, cannot serve as justification for price increases. We analyze how this asymmetry affects the decomposition of inflation into supply and demand factors. We base our analysis on a model that explains shock-dependent pricing, and extend it by deriving a sufficient statistic for relative inflation contributions. Novel survey data on the price-setting of German firms at the reopening of the economy post-COVID provides direct evidence for calibrating the model. We find that supply shocks are responsible for most of the upward adjustment of prices.

Keywords: Inflation bursts, optimal strategies, price stickiness, price gouging.
JEL codes: D82, E31.

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1 Introduction

The 2021-2022 global burst of inflation took macroeconomics by surprise. Inflation had been a non-story for decades, but the end of the pandemic brought back a familiar macroeconomic foe. As a result, a vigorous debate has emerged as to whether increased demand, or instead whether supply bottlenecks of various types, should be judged as the culprit. At a basic level, it should be obvious that both factors were at play, and most vigorously so, given the unprecedented economic impact of the pandemic, and the exceptional government efforts undertaken to combat it. Yet, as we will argue, a proper understanding of the post-COVID dynamics of inflation cannot be obtained by simply cataloging the shocks that buffeted economies at their reopening.

The reason is that prices are set by firms, so inflation is ultimately determined by firms' decisions to adjust prices. It is therefore crucial to focus on firms' *incentives* when adjusting prices, and whether these incentives justify an increase in prices, or not, *conditional* on a given shock. Indeed, a priori, it is not clear which shocks are likely to generate a price change. In this paper, we answer the following question: What is the relative contribution of various shocks to aggregate inflation once we take into account that firms' incentives to adjust prices may depend on the type of the shock?

We build our analysis on the conceptual framework of L'Huillier (2020), which allows for an informational superiority of firms over consumers when it comes to assessing changes in aggregate demand and supply conditions. The single information friction induces strategic behavior between the firm and the customers, which results in different pricing behavior in response to changes in aggregate demand or supply. We present a novel approach within this existing framework to estimate the relative contribution of demand and supply to inflation. We find that, when firms are heterogeneous with respect to the informedness of their customer base, the share of firms that adjust their prices *to demand* is a sufficient statistic for calculating the relative contributions.

We then demonstrate the application of this theory by using novel evidence from a survey of German firms conducted at the onset of the reopening of the economy after the COVID pandemic, when firms were subject both to high costs and high demand. We directly ask firm managers about their reasons for a price increase, and use the answers to calibrate our

model. By surveying firms at a time when both demand and supply pressures are high, we obtain a measurement of the fraction of firms that adjust prices to demand that is directly relevant for answering our research question: what share of the heightened demand pressure is responsible for the overall price increase?

In Section 2, we illustrate the mechanism through which the information friction generates shock-dependent pricing. As in L'Huillier and Phelan (2025), firms' incentives based on asymmetric information about the state of the economy imply that supply shocks are much more likely to generate inflation than demand shocks. When firms' costs increase for supply-driven reasons—such as disruptions to production networks or increases in the prices of energy or intermediate goods—then firms' prices equal prices in the frictionless benchmark. There is no price rigidity. In contrast, when aggregate demand increases—implying both higher demand at a given price together with higher production costs for endogenous reasons—firms are reluctant to change their prices and may not respond to changes in demand at all. Intuitively, a firm's reaction to aggregate demand is not incentive compatible, as the firm would like to signal high demand also in the low-demand state, inducing customers to spend more. We will henceforth call the model "incentive-based", in contrast to standard pricing models without this strategic friction.

In Section 3, we describe the microevidence based on a survey of German firms. The timing of the survey is crucial, delivered immediately after the post-COVID reopening of the economy in March 2021. In our survey, we target an industry embodying the classic example of the non-tradable sector, hairdressing businesses. This methodological choice narrows our scope down towards an industry that is typically characterized by highly sticky prices[1], and allows us to go in depth into the reasons for price increases. Importantly, the identification of different shocks is straightforward in this setting, as pandemic-related restrictions on firms in close-contact service industries induced (exogenous) cost increases, while raised demand for haircuts after a months-long lockdown was equally apparent.[2] By directly asking firm

[1]See the discussion in Bils and Klenow (2004), p. 948.

[2]Identifying an *industry-wide* instead of *firm-specific* demand shocks is crucial for investigating the impact of an aggregate demand shock, as our measurement is not confounded with changes in the competitive environment of a specific firm that raise the firm's market power, which is conceptually very different. This sets our survey apart from much of the literature that surveys firms on their pricing decisions. See the discussion in the Related Literature-Section.

managers about these factors during this episode, we sidestep the need to structurally identify the shocks based on an estimated DSGE model or multivariate regression.

The survey provides micro-level evidence that firms change prices in response to exogenous cost increases but not in response to changes in demand. About two thirds of the firms in our survey increased their price for a male haircut after the second COVID lockdown, which started in December 2020 and lasted through February 2021. Despite the presence of both shocks, firms that increased their price did so overwhelmingly because of higher costs: 68% of firms attribute a big role to higher costs for increasing their prices, whereas 63% of firms attribute *no role* to higher demand for their decision to increase prices. In fact, only 11% of firms attribute a big role to demand. We thus find a clear asymmetry between higher costs versus higher demand considerations for price setting. Interestingly, firms that increased their price by more, above and beyond the reaction to costs, were less likely to expand their opening hours, showing an expansionary effect of pent-up demand. This shows that the inability to increase prices due to higher demand, as reported by the firms, is reflected in the firms' actions, and has "real" consequences.

Our firm survey is unusually detailed, when compared to other firm surveys in the literature, thanks to our reliance on the head of industry guilds to distribute the survey. We leverage this to provide further corrobarating evidence for our theory, which relies on the importance of customer markets and information asymmetry. We find that firms are more likely (by 26pp) to change their prices when customers are expected to understand the reasons behind the price change, an expectation which we elicit in the survey. Remarkably, despite our survey being quite detailed in terms of firm's perceptions and characteristics, no other survey answer (including to questions about expectations and uncertainty about future business conditions) predicts a price increase. In line with this, the main reason why firms did *not* increase their price—besides having already passed through the higher costs in the recent past—is that they feared to lose regular customers. The plausibility of the customer-understanding channel is confirmed by anecdotal evidence from a head of a hairdresser guild, who told us that customers usually ask for the reasons behind a price increase, and that a cost-based explanation is a credible answer to provide clients with. Higher demand, instead, is not a reason the clients would understand. This is in line with the incentive-based model.

In Section 4, we calibrate the incentive-based model for the purpose of quantifying how the underlying shocks hitting the economy translate into aggregate inflation. When setting up and calibrating the model, we innovate compared to L'Huillier and Phelan (2025) on several accounts. Most importantly, we allow for the information friction to vary across firms, in order to reflect the observed heterogeneity of firms in their ability to pass on demand shocks. Following this, we derive approximate closed-form formulas for the relative inflationary contributions of demand and supply, and find that the fraction of firms in the economy that adjust their price to demand is, given the aggregate shock sizes, a sufficient statistic. This share can be directly read out from our survey data. We also improve the robustness of the underlying theory, by making explicit and numerically checking the bounds within which the incentive-compatibility constraints hold. We find that the Perfect Bayesian Equilibrium we solve for exists in the model for a wide range of shock sizes, so that the model accommodates annual inflation of up to about 10% in our baseline calibration, where prices are fairly sticky to demand.

To underline the role of shock-dependent adjustment, we compare the results of the incentive-based model with those of a standard (Calvo) pricing friction that treats demand and supply shocks symmetrically. In our baseline calibration, about 92% of inflation during this time period can be attributed to supply-driven disturbances, while the Calvo model-prediction is close to a 50-50 split. The view that prices are more flexible to supply than to demand shocks is consistent with broader findings in the literature that the slope of the Phillips curve is quite flat (Hazell, Herreño, Nakamura, and Steinsson 2022; Del Negro, Lenza, Primiceri, and Tambalotti 2020), while cost-push shocks generate inflation fluctuations (Smets and Wouters 2007). This is also consistent with a recent point by Bernanke and Blanchard (2025), that it is difficult to detect non-linearities in the Phillips curve when one conditions on cost-push disturbances. Our calibrated model predicts a Phillips curve that is flat up to fairly large demand shocks. The model can accommodate somewhat steeper (non-linear) Phillips curves, by calibrating a higher share of firms adjusting to demand (which reflects the underlying distribution of informed consumers in the economy). Still, as long as the share of firms adjusting their prices to supply is significantly larger than that of firms adjusting to demand—as the evidence suggests—large aggregate cost shocks cause most of the

observed inflation, even in the presence of large demand shocks. Our analysis additionally reveals that monetary policy becomes *more effective* in times of large adverse cost shocks than in normal times. This is the case because the model-implied Phillips curve is very convex, and even bends backwards, when demand increases above some threshold, which falls in the size of the cost shock.

We thus answer the title question of our paper by saying, supply disruptions lead to inflation because firms have strong incentives to change prices in response to supply-driven changes in costs.

Related Literature. Previous literature discusses the notion that the firm-customer relation limits price adjustment, suggesting that nominal price-setting frictions are determined by how consumers' demand reacts to price changes (Hall and Hitch 1939; Kahneman, Knetsch, and Thaler 1986; Greenwald and Stiglitz 1989; Blinder 1991). Blinder, Canetti, Lebow, and Rudd (1998) provide survey evidence that when asked to explain their reluctance to increase prices after an increase in costs, firms' managers usually answer that "price increases cause difficulties with customers." The asymmetry between supply and (aggregate) demand was tested by Bils and Chang (2000), who provide evidence going back to the 1950s that firms are more likely to react to changes in cost factors than to changes in demand factors in their pricing. Our own survey results resonate with the results in this earlier literature: firms are more likely to adjust prices in response to costs *and* when customers can understand the justification for the price change.

The survey evidence summarized in Fabiani, Druant, Hernando, Kwapil, Landau, Loupias, Martins, Mathä, Sabbatini, Stahl, and Stokman (2006) consistently finds that firms are more likely to increase prices in response to cost shocks than in response to demand shocks. As this literature typically investigates the asymmetry of pass through of demand versus supply shocks through the lense of the "fair pricing"-hypothesis, however, it does not explicitly discriminate between aggregate and firm-specific demand shocks (see also below). This may explain why the share of firms adjusting their prices to changes in demand differs widely across surveys that pose the questions differently: In Loupias and Ricart (2004), 78.1% of French firms report that they would change prices in response to "increased demand

or lower competition", while in Kwapil, Baumgartner, and Scharler (2005), only 37% of Austrian firms report that they would change prices "if demand for [their] main product rises markedly". In our survey, which specifically targets firms in an industry that experiences a positive demand shock, the share of firms attributing a big role to demand for their price increase is even lower (only 11%). This suggests that higher demand due to *higher market power* of individual firms has potentially different (larger) effects on firm prices than higher industry-wide (or aggregate) demand.[3]

A number of papers argue that behavioral features constitute the basis for price rigidity in the survey evidence cited above (Rotemberg 2005; Rotemberg 2011; Eyster, Madarasz, and Michaillat 2021). The "fair-pricing" hypothesis states that consumers specifically dislike when firms "exploit" favorable demand conditions for their product. Hence, as in our model, firms mostly stick to "justifiable" price-adjustments, i.e. responding to changes in costs. In our model, however, it makes a difference whether the demand-increase is firm-specific, with little relevance for the consumer's overall consumption choices, or whether it is an aggregate phenomenon. We assume that consumers and firms behave rationally, and find that by adding incomplete information about the aggregate state of the economy, firm pricing becomes strategic and shock-dependent. Related work that models the way firms set prices in line with survey evidence, which points towards strategic considerations, customer retention concerns, and coordination failures, among other channels, includes Nakamura and Steinsson (2011), Gilchrist, Schoenle, Sim, and Zakrajšek (2017), Gaballo and Paciello (2025) and Dupraz (2024), although none of these can accommodate shock-dependent pricing as we emphasize.

There is a recent literature started by Shapiro (2025) that decomposes inflation into supply- and demand-driven components based on the correlation of quantity and price changes. Using this decomposition, Shapiro (2025) ascribes roughly half of the post-COVID inflation to demand and half of it to supply pressures, though the earliest part of the post-

[3]In the more recently run Decision Maker Panel survey, firm managers in the UK are asked hypothetical questions about sales volume shocks, as a proxy for demand shocks (Bunn, Anayi, Barnes, Bloom, Mizen, Thwaites, and Yotzov 2024). This survey design shares with the earlier survey literature the problem (for our purpose) of not discriminating between firm-specific and aggregate demand shocks. Indeed, Bunn et al. account for their findings (an asymmetry in price responses to negative versus positive demand shocks) using a model that features only firm-specific demand shocks.

COVID inflation is predominantly driven by supply. Within this literature, Firat and Hao (2023) estimate PCs separately for demand- and supply-driven inflation. They find that these PCs are not identical. The demand-driven PC is quite flat, with measures of output gaps having a negligible impact on demand-driven inflation, comparable to estimates for the aggregate PC. In contrast, measures of costs (such as energy) have a one-to-one impact on supply-driven inflation with almost no impact on demand-driven inflation. Giannone and Primiceri (2024) examine post-COVID inflation in both the United States and the Euro Area, concluding that unexpectedly strong demand forces were the primary drivers of inflation, while adverse supply shocks played a lesser role. In a related study, Bernanke and Blanchard (2025) find that, contrary to early concerns about overheated labor markets, most of the inflation surge that began in 2021 resulted from shocks to prices given wages, including sharp increases in commodity prices and sectoral price spikes due to changes in demand and supply constraints.

There is a literature that attempts to reconcile the New Keynesian framework with the data. The first major challenge is explaining (or reinterpreting) the so-called missing disinflation during the Great Recession, as it constitutes an anomaly within the standard paradigm. Several factors have been considered to explain (or reinterpret) these phenomena, such as inflation expectations (Jorgensen and Lansing 2019), online retail (Cavallo 2018), and globalization (Forbes 2019). See L'Huillier and Schoenle (2023) for related evidence of the link between the frequency of price adjustment and the inflation target.

Relatedly, Gitti (2024) and Cerrato and Gitti (2022) analyze U.S. metropolitan areas and find that the PC's slope increased multiple times post-pandemic. Complementing this, Benigno and Eggertsson (2023) introduced a nonlinear New Keynesian PC model. This strand of research indicates that the recent inflation surge was predominantly due to an exceptionally tight labor market, implying that an appropriate monetary policy could reduce inflation without triggering a substantial recession. In important work, Blanco, Boar, Jones, and Midrigan (2024b), Blanco, Boar, Jones, and Midrigan (2024a) and Karadi, Nakov, Nuño, Pastén, and Thaler (2024) also explore nonlinear inflation dynamics in the presence of large shocks. See also Cavallo, Lippi, and Miyahara (2024). Our story that prices are more flexible to cost increases provides a complementary account of the rise in inflation.

2 The Model

In this section, we present a microfoundation for price stickiness that builds on the conceptual framework of L'Huillier (2020). The model aims to capture a realistic interaction between firms and consumers: firms are concerned about consumer reactions to price changes, particularly because consumers have less information than firms. Consumers, wary of being misled or exploited, respond strategically to price adjustments. We use standard game theory tools to analyze this interaction.

2.1 Stripped-Down Version

To zoom into the intuition, we start with a stripped-down version of the model. To simplify the exposition, this Subsection proceeds by making an extreme assumption on consumer information, which we generalize later on. The main results for the full model are presented in Subsection 2.2, while we relegate the complete model description to the Appendix A.

Consider a representative consumer with the following demand function:

$$c(p, \zeta) = 1 - p\frac{1}{\zeta} \tag{1}$$

where c is the demand for the good, p is the nominal price of the good, and ζ is a random variable. In this stripped-down version, it will be useful to directly interpret ζ as embodying the aggregate price level. The idea is that the consumer's demand depends on the real price p/ζ. (In the full model we will use a discount factor shock, but the resulting expressions will be identical.)

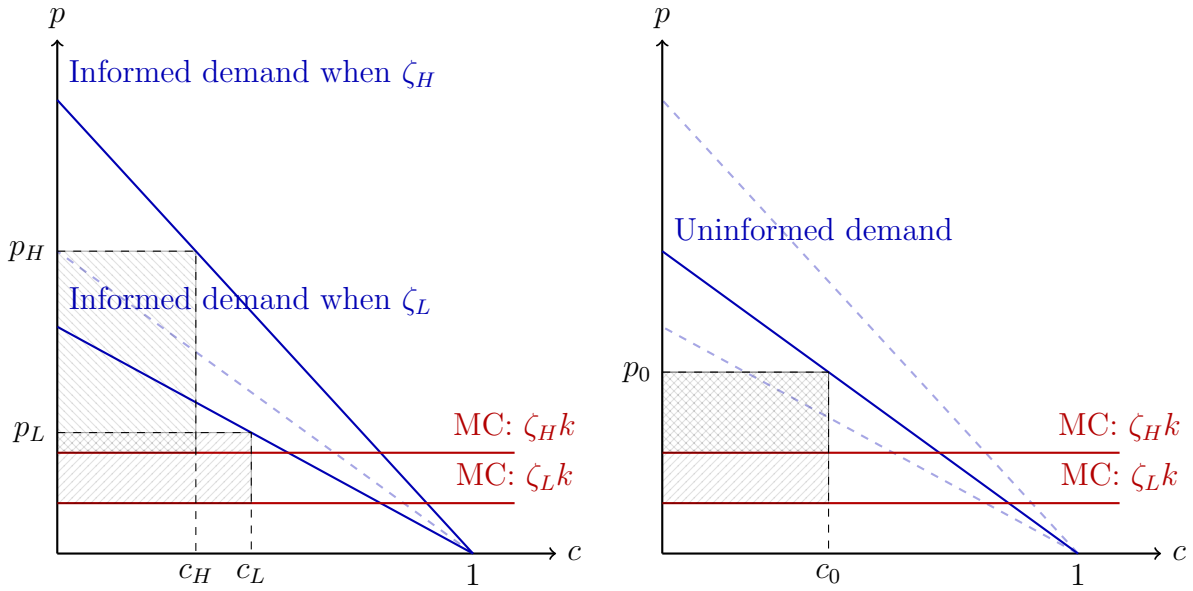
A monopolist supplies the good at nominal marginal costs ζk. k is the *real* marginal cost of the firm. The monopolist's profits are thus

$$(p - \zeta k)c(p, \zeta) \tag{2}$$

As can be checked quite easily, the profit-maximizing price of the firm is proportional to ζ.

We add an information friction to this simple setting. For the sake of illustration of the mechanism, we consider an extreme case. Mainly, we assume that the consumer does not

Figure 1: Separating and Pooling Strategy with respect to State of Demand



(a) Separating strategy: The firm chooses a different price in each demand state.

(b) Pooling strategy: The firm sets the same price irrespective of the demand state.

know the state of variable ζ, which influences her demand. At the same time, the firm is informed about ζ. The idea here is that an aggregate demand shock has shifted the price level. Firms, either being more sophisticated or having more resources to gather information, have superior observation of this aggregate shock. In the short-run, *some* consumers will be slow to learn the realization of the shock and adjust their spending, while other consumers will learn as fast as the firm.

In this stripped-down version of the model, we focus exclusively on the implications of the presence of uninformed consumers for the pricing strategy of the firm. As those consumers are aware that the firm knows ζ, the firm's posted nominal price p becomes a potentially informative signal. The uninformed consumer's demand is, then,

$$c(p) = 1 - pE\left[\frac{1}{\zeta} \mid p\right] \tag{3}$$

where $E[\cdot \mid p]$ denotes the expectation conditional on observation p. We assume that the variable ζ can be either high or low: $\zeta_H > \zeta_L$. If known by the consumer, ζ can be interpreted as the state of demand: For a given price, the demand for the good is higher in the high state, ζ_H, than in the low state, ζ_L.

Figure 1 illustrates the two pricing strategies the firm can follow in this environment: a *separating strategy*, where the firm sets the price $p(\zeta)$ that depends on the realization of ζ (left panel of Figure 1); or a *pooling strategy*, where the firm sets the same price irrespective of the demand state (right panel). In the following, we denote the pooling price by p_0.

Crucially, the information available to the consumer differs across the two cases: If the firm plays the separating strategy, the consumer is perfectly informed, as $E\left[\frac{1}{\zeta} \mid p(\zeta)\right] = 1/\zeta$, and her demand curve thus varies with the state. In contrast, if the firm follows the pooling strategy, the firm's price is uninformative about ζ, and the consumer will instead compute her demand function in line with the unconditional expectation of $1/\zeta$.

Analyzing the incentives of the firm, we find that the separating strategy is *never* an equilibrium strategy (Proposition 4 in Appendix B generalizes this result for the full model). The incentive compatibility constraint of the firm when the state of demand is low, that is, $\zeta = \zeta_L$, shows that the firm can profitably deviate: By setting the price corresponding to the high state of demand, $p_H = p(\zeta_H)$, instead of the truthful $p_L = p(\zeta_L)$, the firm fools the consumer into buying more. Anticipating being fooled, however, consumers do not consider the firm's price as an informative signal of the state of demand. As we show in Appendix B, this prohibits the firm from conditioning its price on the demand state; only the pooling strategy is consistent with equilibrium behavior. In that sense, information asymmetry microfounds price stickiness: As the pooling price p_0 does not react to changes in the state of demand, it is "sticky" with respect to demand shocks.[4]

We contrast this with the pricing response to cost shocks. Again, we assume that there are two possible states of real marginal costs: $k_H > k_L$. Consumers are initially unaware of the state of costs, while firms are informed. As the firm's real marginal costs do not directly enter the consumer's problem, her demand curve is the same for either pricing strategy. The firm chooses the optimal price by moving along a constant demand curve.

We find that firms will always play the separating strategy with respect to real cost changes. As the demand is fixed, firms have no incentive to misrepresent the state of real

[4]One can interpret our mechanism of price stickiness with respect to demand shocks as a commitment problem. Firms prefer to be able to condition their price on the state of demand. This is not credible, however: In the low demand state, the firm will deviate by setting the high price, attempting to fool uninformed consumers into thinking it was a good time to buy. As a consequence, those consumers ignore what the firm signals about the demand state. See also L'Huillier and Zame (2022).

costs in their price. Absent any incentive compatibility problem, firms always prefer to set prices that flexibly react to the state. As a consequence of the separating strategy obtaining in equilibrium, the consumer perfectly learns the state of real marginal costs—precisely because she has no stake in knowing it. Prices are flexible with respect to cost shocks.

2.2 Results for the Full Model

The full model is a modified version of the model in L'Huillier and Phelan (2025). Extending the simplified version of the model presented above, we consider heterogeneously informed consumers, which has implications for the firm's incentives, and the simultaneous presence of demand and supply shocks. Our main result states that firms find it optimal to keep prices sticky with respect to demand shocks when information asymmetry is severe. Different from L'Huillier and Phelan (2025), here we model firms as heterogeneous with respect to the informedness of their customer base. This will yield heterogeneous pass-through of the demand shock. In Section 4, we present a quantitative analysis of the model.

In the following, we describe the components of the model important for understanding the firm's optimal pricing decision, and refer to Appendix A for the complete description of the model. In the short-run, the economy is subdivided into a unit mass of islands, each of which is populated by a unit mass of consumers, and a firm. We model orthogonal binary states for both future marginal utility, which impacts demand for the homogenous good c that is consumed in the short-run on each island, and cost k realizations, which is the real marginal cost of each firm. The state of aggregate demand, denoted by ζ, is determined by changes to future marginal utility, by the future price level, and by monetary policy.[5] We assume that the firms' *nominal* marginal costs are flexible and proportional to nominal aggregate demand ζ.[6] Denoting by $\{H, L\}$ (High, Low) the realizations of the news about future marginal utility, resulting in demand states $\zeta_H > \zeta_L$, and by $\{H, L\}$ (High, Low) the realizations of the cost shock, $k_H > k_L$, then we have 4 possible realizations, each with equal

[5]We can microfound the changes in future marginal utility as generated by a news shock about future endowment, similar to the work by Lorenzoni (2009), under the assumption that future utility has curvature. We follow this microfoundation of the future marginal utility when calibrating the aggregate demand shock in Section 4 using expectation data about future output growth and long-run inflation.

[6]Specifically, the assumption is that production costs (wages or intermediate goods) are paid at the end of the first period, and therefore the production cost is the discounted value of the price level in the future.

probability. We index a variable to denote the state of aggregate demand by $s = \{H, L\}$ and to denote the state of aggregate supply by $\varsigma = \{H, L\}$. For instance, below we use $p_{s,\varsigma}$ for the price when demand is s and supply is ς.

There are two types of consumers: Insiders (informed consumers) and Outsiders (uninformed consumers). Insiders are perfectly informed about the aggregate state; Outsiders are uninformed about the aggregate state. Outsiders know the probability distribution of the aggregate state, and draw inferences from the price set by the firm with which they trade. The fraction $\alpha \in [\alpha_0, \alpha_1] \subset [0, 1]$ of Insiders on a particular island varies across islands. We use this source of heterogeneity to allow for distinct patterns of price adjustment across islands. When information is perfect ($\alpha = 1$), the firm's problem boils down to a standard price-setting monopolist problem. We will see that in that case, prices are fully flexible. However, if information is not perfect and consumers and firms behave strategically, this is not necessarily an equilibrium; we must also ask whether the optimal monopoly price is consistent with equilibrium in the implicit game between the firm and the consumers. First, Outsiders must be behaving rationally, making consumption decisions based on utility maximization and beliefs about aggregate states upon observation of the price offered by the firm. This includes correctly understanding firm incentives. Second, the firm must be exploiting all opportunities to increase profits, including opportunities to misrepresent the information the firm possesses.

Definition 1 (PBE) *A Perfect Bayesian Equilibrium (PBE) of the game between a firm and consumers is given by a price, beliefs of Outsiders, and consumption decisions, such that*

1. *There is no profitable deviation from posting the price, given consumers' strategy,*
2. *Outsiders' beliefs, upon observation of the price, are formed using Bayes' rule on the equilibrium path,*
3. *Consumption decisions solve the consumer problem given consumers' beliefs.*

Island Equilibria. We now derive a short-run equilibrium for a given island when both demand and supply shocks are active. The following result characterizes equilibrium prices. It characterizes the consequences of shock dependence when both shocks hit the economy.

Before stating the result, we need to introduce some notation: $\Delta \equiv \zeta_H/\zeta_L$ is the spread of the possible states of demand. $\zeta_0 \equiv 1/E[1/\zeta]$ is the harmonic mean of the states of demand. $\kappa \equiv k_H/k_L$ is the spread of the possible cost states.

Proposition 1 (Equilibrium) *Let $\Delta > 1$ and $\kappa > 1$. There exist thresholds $\bar{k}_H(\Delta) \in (0,1)$ and $\underline{\kappa}(\Delta) > 1$ such that, for all $k_H < \bar{k}_H(\Delta)$, $\kappa > \underline{\kappa}(\Delta)$, the following pricing strategies are part of a PBE:*

Case A (low information islands). If $\alpha < \alpha_H^* \equiv \frac{1-k_H}{\Delta(1+k_H)-2k_H}$,

Prices are sticky in demand but flexible in cost:

$$p_{0,\varsigma} = \zeta_0 \frac{1+k_\varsigma}{2}, \qquad \varsigma \in \{L, H\}.$$

Case B (high information islands). If $\alpha \geq \alpha_H^*$,

Prices are fully flexible:

$$p_{s,\varsigma} = \zeta_s \frac{1+k_\varsigma}{2}, \qquad (s,\varsigma) \in \{L, H\}^2.$$

See Appendix B for the proof. The result shows that in our shock-dependent model, in the admissible parameter range, equilibrium prices can be sticky with respect to the demand shock (in which case firms do *not* condition their prices on it), but equilibrium prices are always flexible with respect to the supply shock (and therefore firms condition their prices on it). Stickiness with respect to demand is evident in the lack of dependence of $p_{0,\varsigma}$ on ζ_s. Flexibility with respect to supply is evident in the dependence of $p_{0,\varsigma}$ on the k_ς term. In the simpler model above, we have already noted that firms have no strategic incentive to misrepresent the realization of k_ς. The demand shock adds a complication, as the state of demand influences the firm's marginal costs. Still, the result that the firm can convey information about the shock k_ς without conveying information about the demand shock ζ obtains for a wide range of parameters, which we quantify in Section 4.

To build intuition for the result, first note that $p_{s,\varsigma}$ obtains as the optimal price under

the benchmark of flexible prices without information frictions, $\alpha = 1$:

$$p_{s,\varsigma} = \arg\max \left(p_{s,\varsigma} - \zeta_s k_\varsigma\right)\left(1 - \frac{p_{s,\varsigma}}{\zeta_s}\right)$$

It can be seen that these prices are proportional to the state of aggregate demand, ζ_s, and hence the state of nominal demand is neutral.

The firm still sets flexible prices if the share of Insiders α is sufficiently high (determined by threshold α_H^* in Proposition 1). The reason is that the existence of Insiders alleviates the firm's incentive compatibility problem with the separating strategy. The Insiders know the demand state and cannot be fooled into buying more. Therefore, by posting the high price in the low demand state, the firm loses profit on the Insiders: The high price is not the correct frictionless monopoly price that would maximize profit from the Insiders. The higher the share of Insiders, the more weight this has for the firm's overall profit. Beyond threshold α_H^*, the separating strategy becomes incentive compatible, and the firm sets flexible prices.

If a firm with a large share of Outsiders adjusts its price, it must be due to cost shocks, as passing on cost shocks is equilibrium behavior. Such behavior may also be considered "acceptable". When such a firm instead increases its price in response to higher demand, it inevitably *signals* higher demand. Such a price-setting is at odds with equilibrium behavior; consumers may find such a reason for a price increase therefore "unacceptable".[7] In Section 3, we provide evidence that the reason behind a price increase, as understood by the customers, is of central importance for firm price setting.

Aggregation. Aggregation of island equilibria is straightforward, as we assume that in the long-run, markets are complete. Therefore, for each consumer j in a given island, for a given choice of short-run consumption c_j^*, consumption of the long-run good is set to satisfy the budget constraint. Short-run aggregate allocations are obtained as follows. By market clearing, a given island's output $y(\alpha) = c(p(\alpha))$, and aggregate output y is obtained by

[7] In the equilibrium we solve for, consumers "punish" off-equilibrium strategies by choosing consumption according to the low demand state, ζ_L. One could think of more complicated setups where customers have the option to "leave" their customary firm and consume somewhere else, representing even more severe "punishment".

integration over islands:

$$y = \int y(\alpha) dF(\alpha)$$

The natural level of output is computed as output under no information frictions: $y^n = (1-k)/2$. The output gap, x, is the percentage deviation of aggregate output from the natural level:

$$x = \frac{y - y^n}{y^n}$$

In order to compute inflation, we first compute the benchmark frictionless price when demand equals $1/E[1/\zeta]$, which is $p_0 = (1+k_0)/2$ when k_0 is the real marginal costs[8] and when normalizing $E[1/\zeta] = 1$.[9] Inflation is given by the percentage deviation of the price level away from this benchmark:

$$\pi = \frac{\int p(\alpha) dF(\alpha) - p_0}{p_0}$$

3 Micro Evidence on Firms' Motives for Increasing Prices

The previous section presented a model where firms' prices are more flexible to supply than demand shocks. In this section we present evidence that this prediction is realistic, based on a survey of German firms, launched during the reopening of the German economy after the COVID pandemic. We purposely target a particular industry: hairdressing businesses. This provides two advantages: First, our survey is detailed compared to other firm surveys available. Second, we have precise within-survey and external information about demand and supply factors at the time of the survey.

Data. We conducted our survey of German hairdressers on the online platform *SoSci Survey* from Monday, March 08, 2021, to Friday, April 16, 2021. The questionnaire consists

[8] We define k_0 as the harmonic mean of the states of supply, since then the average markup we calibrate in Section 4 obtains as p_0/k_0. We assume that the economy starts at the long-run average, akin to evaluating shock responses in a DSGE model around its ergodic mean. Since harmonic and arithmetic means differ, p_0 only approximates the long-run average frictionless price level, but since the difference is numerically small for our calibration, we use it as a baseline for simplicity.

[9] This normalization restricts the calibration of the state of demand to one dimension. Therefore, in Section 4, we will calibrate the spread of the two demand states, $\Delta = \zeta_H/\zeta_L$.

of three main parts: First, we ask firm managers to submit the prices at which they offered a male haircut, at different times before and after the lockdown. Depending on whether or not they increased their price, we then present them with a list of reasons why they increased their price, or the reasons why they did not increase their price. We ask them to rate each reason on a Likert scale. Third, we ask them general questions about the characteristics of their firm and their assessment of their business during the pandemic. The complete questionnaire used is in Appendix D (both the original German version, and an English translation).

Everybody in possession of the link to the survey (URL) could participate. We recruited participants in two ways. First, on March 08, 2021, we contacted all local Chambers of Handicrafts (*Handwerkskammern*), since membership is mandatory for German hairdressing firms. However, the response rate was low. Thus, second, we contacted the heads (*Obermeister*) of all local hairdressing guilds (*Friseur-Innungen*)[10] in Germany on March 15, 2021, and asked them to participate and to forward our e-mail to the other members of their guild. On April 1, we sent a reminder to the heads of the local hairdressing guilds. After cleaning the data from incomplete or self-contradictory entries, we retained 208 responses.[11]

We complement our survey with micro data from the German Consumer Price Index, for the years 2020 and 2021. It allows us to observe prices for the specific service in the survey, male haircuts.[12] This corroborates that the frequency of price changes for the service in question was large during the pandemic in Germany, especially right after the lockdowns, and at the time of a temporary decrease in VAT in Germany in July of 2020 (see Figure 2).

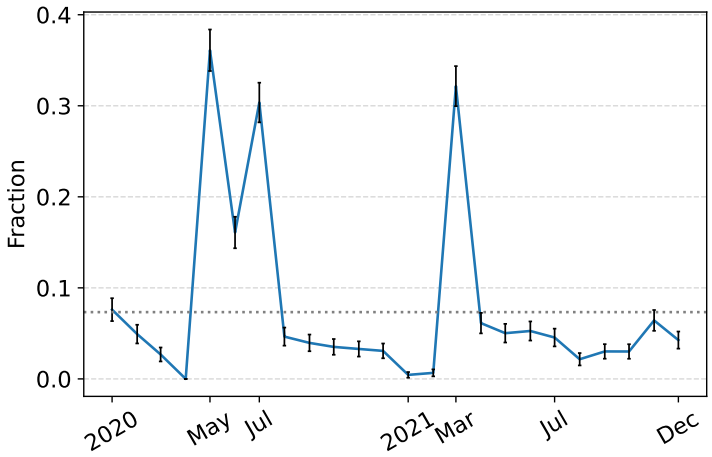
The COVID-19 pandemic and the associated lockdowns hit German hairdressers with common aggregate shocks. Notably, the second lockdown in Germany, during which it was forbidden to offer close-contact services like haircuts, ended on February 28, 2021, right

[10]Guilds are lobby groups with voluntary membership. Local hairdressing guilds are organized on a county-level or slightly larger. As of 2022, there are 247 of them in total.

[11]For comparison, in 2020, 77.166 hairdressing firms were registered in Germany (Zentralverband des Deutschen Friseurhandwerks 2021, p. 12).

[12]We only consider entries that carry the attributes "haircut" (as opposed to shaving) and "wet cut" (hairwashing before cutting became mandatory after the first lockdown, so we delete dry cut-services for all months for consistency). We use the price series "PreisBearbeitet", since it is smoother and has less missing values. Our results are robust to using the series "PreisErhoben" instead. Results are available upon request. We delete sales prices and observations where the quality changed over time. For each month, between 445 and 465 observations remain.

Figure 2: Fraction of Price Changes



Notes: Ratio of hairdressers that changed their price for a man's haircut, monthly, from January 2020 to December 2021. Dotted horizontal line shows the average monthly price change frequency for the median firm, 7.3%. Whiskers depict 68%-confidence intervals. Source: German CPI micro-level data, N=445-465.

before we started our survey. In what follows, we present evidence of both increases in demand and increases in costs for the firms in our survey, caused by common circumstances.

3.1 Large Demand and Supply Shocks

Aggregate Demand Shock. During the course of the COVID-19 pandemic, the German government imposed two lockdowns at the Federal level, during which the consumption of "close-contact services," like getting a professional haircut, was forbidden. The first lockdown lasted from March 22 to May 4, 2020, and the second lockdown lasted from December 13, 2020, to February 28, 2021.

Pent-up demand for a professional haircut after the second lockdown was very high. *Treatwell*, an online booking platform for hair and beauty salons, reported a record high number of bookings in March 2021, which eclipsed the number of bookings after the first lockdown in May 2020, which had already been record high, by 36 percent. The average waiting time to get an appointment for a haircut on the platform was more than two weeks. The platform reported a slightly higher demand for male than for female haircuts.

Our survey of German hairdressers, which we conducted directly after the second lock-

down, confirms that hairdressing businesses experienced higher demand than usual. 71% of hairdressers in our survey expanded their opening hours in response to the higher demand. When they had to ration their services, hairdressers report allocating appointments for the most part according to the following rules: honor appointments that were scheduled before the lockdown (63%), prefer regular customers (59%), or apply the first-come-first-serve principle (51%). Only 3% of the respondents did none of the above.

While higher demand directly after the lockdown is evident, hairdressers might have expected a long-term decline in demand. Plausible counteracting forces that could have lowered the demand for close-contact services during the pandemic include the fear of infection or a long-lasting change in habits. We ask survey participants about their assessment of a long-term decline in demand due to people's fear of COVID. 71% of hairdressers we ask either think there will not be a permanent decline in demand (54%) or find the situation unclear (17%). We also ask if they think that their customers' willingness to pay for a haircut would decline in the long-term as a result of the pandemic. Again, 76% of the respondents either disagree (40%) or are unsure (36%). Hence, we find that most hairdressers are not particularly pessimistic about the demand for haircuts going forward.[13]

Aggregate Supply Shock. After the first lockdown in spring of 2020, in order to insure a safe conduct of close-contact services, German authorities introduced mandatory hygiene rules. For hairdressing businesses, these included distancing rules: imposing a minimum distance of 1.5 meters between clients, effectively reducing the capacity of their hair salons, mandatory masking, and mandatory hair washing (i.e. no "dry cut" could be offered anymore). After the second lockdown, hygiene rules became even stricter: serving walk-in customers was prohibited, compulsory medical face mask wearing for hairdressers was imposed (with compulsory replacement after each customer), as well as a continuous stream of fresh air in the salon. In some regions with high infection rates, customers had to be tested negatively beforehand. In some states, the hairdresser was allowed to conduct the test. Many of the hygiene rules stayed in place until the end of 2021 and beyond.

[13]Below, we show that the effect of these expectations on price-setting seems to be minor as well: while more pessimistic firms do appear to be less likely to increase their price, the effect is statistically insignificant, and comparatively small.

In sum, these measures severely increased the costs of being in the hairdressing business. First, these firms lost months-worth of profits, paid bills from their savings, and some had to borrow funds to keep their business running. Second, distancing rules effectively increased the average cost of a haircut, since salon space was now less useful, and more time had to be invested in cleaning after a client left. Third, hairdressers had to purchase hand sanitizers and masks. Some hairdressing businesses further invested in prophylactic health measures by buying COVID-19 tests, or by installing an air purifying unit in their salon. Hairdressers expected these cost increases to be long-lasting at the time: 81% of hairdressers in our sample agree with the statement that the hygiene measures will last for years, while 16% are uncertain about it, and 3% disagree.

Other additional factors also increased the costs of a haircut in Germany in 2021. First, the value-added tax-rate was raised back to 19% (for most products and services, including haircuts) in 2021, after it had been temporarily lowered to 16% in July 2020. Second, the legal hourly minimum wage for hairdressers increased in several German states on January 1, 2021, by 15 euro cent, and on July 1, 2021, by 10 euro cent, either due to state-wide binding agreements, or due to the simultaneous increase in the federal minimum wage.[14] What is more, the higher uncertainty and more demanding working conditions had a negative effect on the labor supply of hairdressers (an effect that was generally observed in the service sector during the pandemic). For example, the Guild of Hairdressers in Bavaria reported a 25 percent decline in the number of trainees from 2020 to 2021. These forces further put upward supply-side pressure on the labor costs of a typical hair salon in Germany.

3.2 Firms' Reaction

Roughly two thirds (68%) of firms in our survey increased their male haircut price from December 2020 to March 2021. Among price-increasing firms, the median reported price increase is 7.3%.[15]

[14] In some states, there are binding collective agreements determining the minimum wage in hairdressing. This is the case in Hesse, where the collectively agreed minimum wage increased on January 1, 2021. In some states, there are collective agreements, but employers decide themselves whether to opt in. In the remaining states, located mostly in Eastern Germany, there are no collective agreements on the minimum wage in hairdressing. The Federal minimum wage applies.

[15] This is roughly consistent with the CPI, where the median is at 5.5%. Differences might stem from sampling uncertainty. We use the more representative sample of the CPI microdata, collected by the German

Firms that increased their price did so overwhelmingly because of higher costs. 94% of firms that increased their price report that costs increased. The most important drivers of costs are the stricter hygiene measures (in particular, the cost of masks, disinfectants, and more time per consumer). In contrast, while 83% of firms report higher demand, only a small fraction of them say that it played a big role for their price increase.

To look at this pattern more closely, Figure 3 plots firms' responses to questions regarding the importance of demand or supply factors for their decision to increase prices. The question is: "You have indicated that at least one of your prices was larger in March 2021 than in December 2020. Which role did the following factors play in your increasing the prices?", with subquestions "Increased demand" or "Increased hygiene cost (masks, disinfection, time)" (among others). Firms are given a Likert scale with three options: "No Role", "A Small Role" or "A Big Role". As Figure 3 shows, firms are mostly looking at cost factors when adjusting prices, with 68% of firms attributing a big role to costs (versus 11% of firms attributing a big role to demand). A symmetric pattern is observed for no role, with 63% or firms attributing no role to demand (versus 4% attributing no role to costs). This is a remarkable finding given the prevailing presence of pent-up demand in our sample.[16]

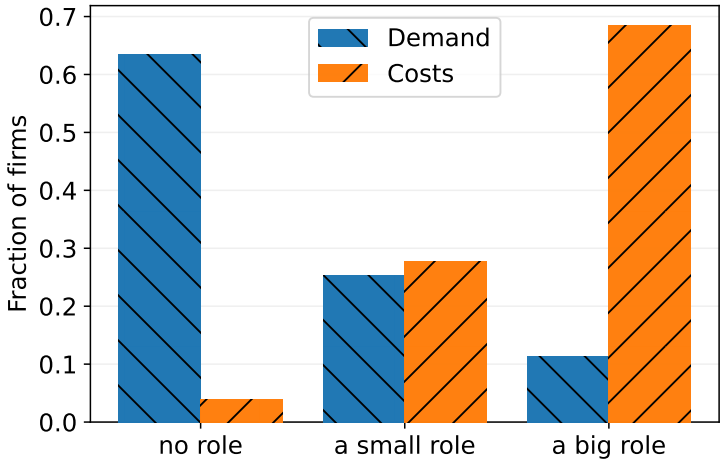
Looking at the correlation between the roles of costs and of demand, we find a similar pattern: 68% of firms that attribute a big role to higher costs attribute no role to higher demand, while exactly 0% of firms that attribute a big role to higher demand attribute no role to higher costs. This is a striking contrast. We thus find a clear asymmetry between the roles of higher costs and of higher demand for price setting: most firms attribute their price increase to higher costs, while only a small fraction attribute it *additionally* to higher demand.[17]

Statistical Office, when calibrating the increase in costs in Section 4.

[16]Other cost factors also rank highly as a reason to increase prices. Lower capacity due to pandemic-related distancing rules applies to 93% of firms. 64% of those firms report it playing a big role in their price increase, while 12% report it playing no role. Higher incidental costs (such as higher electricity or heating costs) apply to 89% of firms. 46% of those firms report it playing a big role in their price increase, while 10% of firms report it playing no role. Endogenously higher costs, such as labor costs, instead, shows a different pattern: while it applies to 88% of firms, only 30% of those firms report it playing a big role in their price increase, while 19% of firms report it playing no role.

[17]The discrepancy between the roles for costs and for demand could come out even starker if survey participants did not have the tendency to select midpoint answers. We find this in our survey as well, as 38% of firm managers who pick the "small role"-answer for the role of higher costs, also pick it for the role of higher demand.

Figure 3: Reason for Increasing Prices: Roles Played by Higher Demand and Higher Costs



Notes: Fraction of firms rating the role that higher demand ($N = 115$), or exogenously higher costs ($N = 130$), play for their price increase. The latter focuses on costs rising due to hygiene measures (masks, disinfectants, time per customer).

What differentiates the small set of firms that attribute a big role to higher demand in their decision to increase prices? To look into this, we run a logit regression of the demand-related answer on Figure 3 on several observables. Most observables are statistically insignificant, with a few exceptions. Firms that did not expand their opening hours are 11pp more likely to attribute a big role to higher demand when increasing prices. In line with the model, firms that increase their price as a reaction to higher demand do not need to expand their supply.[18] Consistent with this observation, the median price increase of firms that state that higher demand played a big role is 10.4%, while the median price increase of firms that state that higher demand played no role is 6.8%.

We also find weaker evidence (at the 10% significance level; see Appendix C for the regression tables) that firms that increased their price due to higher demand have a lower share of regular customers, and are more optimistic. One interpretation in line with our theory is that walk-in customers are on average more knowledgeable about the state of the economy, as they observe more prices from other firms. Hairdressers that are located at

[18]This finding alleviates the concern that survey participants might have confused the importance of the change in demand for their price setting—the ranking we report in Figure 3—with the strength of the demand itself.

spots where these clients are more likely to show up—at a train station, say—then are less subject to the pricing friction with respect to demand shocks. The optimism-variable, on the other hand, includes expectations about the future demand for haircuts; the evidence could thus point to firm managers perceiving a particularly high state of demand being more able to pass through the demand shock. This state-dependence is in line with the model, which we will explore further in Section 4. As a robustness check, we investigate the effect of demand uncertainty on price-setting. It could be that firm managers do not act on demand shocks because they are themselves uncertain about the strength of demand. Our survey has two questions that relate to this. While uncertainty about a potential long-term decline in demand due to people's fear of COVID is rather small (14% of price-increasers with high demand are uncertain), the uncertainty about the customers' future willingness to pay is sizeable (46% of price-increasers with high demand are uncertain about this). However, we do not find statistically significantly different uncertainty levels among firms that attribute a big role to higher demand in their price setting (the shares are 8% and 50%, respectively). This is in line with our other finding that firm expectations are not significantly related to the firm's decision whether or not to adjust prices.

Firms that did not increase their price attribute this mainly to two reasons: that they had already increased their price in 2020, after the pandemic started, and that they fear losing regular customers with a price increase. About half of the firms in this group also state that costs did not increase, most of which say this played a role in their decision not to increase their prices. This suggests that some firms do not perceive the stricter hygiene rules that were imposed in 2021 as a significant increase in cost over the hygiene rules that were already in place before, and which they already adjusted to with a price increase.

Why do some firms not increase their price? Apparently, they feared that their customers would not find a price increase acceptable. To investigate this further, we also ask firm managers about whether they think that, in general, the reasons for price increases are understandable for their customers.[19] We find that firms with more understanding customers are more likely to increase their price after the second lockdown. The effect is economically

[19]We also ask two related questions—whether customers express understanding for the firm's prices, and whether some customers accused the firm manager of profiteering—and sum the Likert scale-answers to those questions up to a composite measure, which we call "customer understanding".

significant: the average firm is 26pp more likely to increase its price if it is above the 40%-quantile of customer understanding. The customer understanding variable is the only firm characteristic that significantly predicts the firm's decision to increase their price (other firm characteristics include the size of the firm and the firm manager's business outlook). See Appendix C for the regression tables. These results suggest the importance of information asymmetries between the firm and the consumers for the firm's price setting.

Our model abstracts from firm heterogeneity within islands. In a more complex model, firms are subject to idiosyncratic cost shocks, and customers, which are subject to search or switching costs, face the problem of filtering out the aggregate cost shock from the price signal.[20] Our survey evidence strongly suggests that communication between the customer and the firm can overcome this information asymmetry problem. Heterogeneity in the credibility of this communication might be caused by differences in built-up reputation or relationships to the customers. However, more importantly for the question of this paper, the model predicts that such communication will only be successful to overcome information asymmetry with respect to *cost* shocks, but not with respect to *demand* shocks, as the firm has an incentive to misrepresent demand. A follow-up interview with the head of a hairdresser guild, that we conducted after running the survey, provides us with anecdotal evidence for this: by the expert's account, customers typically ask hairdressers in the weeks after a price increase for reasons to justify it. The expert says that pointing to cost increases, which are evident also to clients (like an increase in energy costs that is also reported in the news), is most effective in justifying the price increase. Conversely, pointing to higher demand would not work as a justification for a price increase. In fact, hairdressers do not even think of bringing it up.

4 Quantitative Exercise

The previous section presented survey evidence on the reasons firms increased prices when the German economy reopened after the pandemic. We find clear evidence that businesses are concerned about passing on exogenous cost increases to consumers. These cost increases

[20] Another possible source of heterogeneity is trembles, meaning that some firms do not play the best response of the PBE.

were caused by several post-pandemic factors, such as hygiene costs and distancing rules. On the other hand, businesses were not concerned about increasing prices due to pent-up demand for their services, even in the presence of rationing or queues.

In this section, we calibrate the incentive-based pricing model developed in Section 2 based on these findings. We also calibrate the size of demand and supply shocks to answer the following question: What was the impact of these shocks on firm pricing decisions? Our main goal is to obtain aggregate implications for inflation, which will answer the question in the title of the paper. In order to transparently show the implications of the strategic pricing friction, we benchmark inflation contributions to those obtained under an exogenous pricing friction (Calvo). In that case, a random subset of firms in the economy are allowed to reoptimize their prices, and (different from the incentive-based model) there is symmetric adjustment to the shocks.

Calibration. The subjective discount rate in equation (5) is determined by consumption growth expectations of the consumer: higher consumption growth expectations imply a higher subjective discount rate. The market discount rate is set by the monetary authority. If monetary policy induces higher inflation expectations, the market discount rate falls. We measure these two components using long-run expectations data from surveys conducted at the time of the reopening of the economy. We use data about the distribution of these expectations to calibrate the two possible realizations of the demand shock that the consumer considers, ζ_H and ζ_L. The model predicts that, the higher the spread between the two possible levels of demand, $\Delta \equiv \zeta_H/\zeta_L$, the more likely it is for firms to set flexible prices. Intuitively, a higher spread between possible states of demand increases the loss firms make when not setting the price that is aligned with the true level of demand, which is understood both by firms and by consumers.[21]

The subjective discount rate is determined by the product of the inverses of the time discount factor β and the news about future marginal utility ϑ. Assuming complete markets

[21]Note that the threshold of the share of Insiders above which firms set flexible prices, in the setting with both demand and supply shocks, is falling in Δ; see the expression for α_H^* in Proposition 1.

and log-consumption preferences in the future, we can measure the news shock as

$$\vartheta_s = E_j \left[\frac{1}{\Xi Y} \mid s \right]$$

where Y is long-run output, Ξ is the fraction of output that is consumed, which is constant across time and states of the world, and $E[\cdot \mid s]$ is the expectation operator conditional on state of the world, or information set, s. For example, $s = H$ stands for news that long-run output will be high, which raises expected future consumption, and thus increases demand. This captures the fact that, at the beginning of the year 2021, there was a large disagreement about the speed and size of the economic recovery, partly due to the uncertainty around the effectiveness of the recently discovered vaccines against the COVID virus. We measure the differences in long-run growth expectations for the Euro zone by taking data from the 2021:Q1 ECB's Survey of Professional Forecasters (SPF). Looking at the cross-section of forecasters, we find that optimistic forecasters—the 75th percentile of forecasts—predicted output growth of 9.4% over 2 years (until the end of year 2022), while pessimistic forecasters—the 25th percentile—predicted 6.9% output growth. Both of these figures are high, reflecting rebound from the depth of the pandemic, but they also show a high dispersion, which is key for our story. We make the assumption that this dispersion is carried forward, along the lines of the news shock literature (Beaudry and Portier 2006; Barsky and Sims 2012; Beaudry and Portier 2014). Therefore, for longer-run expectations, we assume that the difference of 2.5pp in expected output growth over two years measures a disagreement about a persistent component of productivity that persists for 5 years after 2021:Q1.

The market discount rate is given by the relative price of the goods (current and future), P/p, and the nominal price of the bond, Q. Since the price of the bond is the same across states, it will drop out from the calibration. We need however to calibrate the expected inflation rate. We measure disagreements over expected long-run inflation by combining short-run consumer inflation forecasts from the ECB Consumer Expectations Survey with long-run inflation forecasts from the ECB's SPF survey. In 2021:Q1, consumers in Germany expected annual inflation in 2021 to range between 2.4% (25th percentile) and 3.6% (75th percentile). While the interquartile range of longer-run consumer expectations is not available, professional forecasters predicted annual inflation in the year 2025 to lie between 1.5%

and 1.8%. We estimate the percentiles for the years in between by linearly interpolating between these two datapoints.

We combine the estimates of the subjective discount rate and of the market discount rate into the spread Δ as follows:

$$\begin{aligned}\Delta &= \frac{P_H/(\beta\vartheta_H)}{P_L/(\beta\vartheta_L)} = \frac{(P_H/p)(Y/Y_L)}{(P_L/p)(Y/Y_H)} \\ &= \frac{(1+\pi_H)(1+g_H)}{(1+\pi_L)(1+g_L)} \approx \frac{1+\pi_H+g_H}{1+\pi_L+g_L}\end{aligned}$$

where π_s and g_s are the net rates of long-run inflation and long-run output growth in state s, respectively. This yields $\Delta = 1.085$.

The share of flexible price firms is determined by the size of the demand shock, and, importantly, by the share of informed consumers—Insiders—at each firm. By assumption, firms are heterogeneous with respect to the share of Insiders, with cdf F. Firms with a share of Insiders above threshold α_H^* will set the flexible price, which reacts to the high demand. We utilize the survey of German hairdressers to directly measure the share of firms that set a higher price in response to the demand shock. Having direct evidence on this metric, which is crucial for our model's prediction on aggregate inflation (see λ_D below), is a crucial advantage of our survey evidence. Our calibration sample is given by firms that report experiencing both higher costs and a higher demand (80% among firms that increased their price). Among these, only 11% state that the higher demand played a big role in their price increase. Hence, we calibrate that $1 - F(\alpha_H^*) = 0.11$. We assume that F is uniformly distributed. Under this assumption, we choose the support $[\alpha_0, \alpha_1] \subset [0, 1]$ to be the largest that is consistent with the survey evidence.[22]

As outlined in Section 2, all firms adjust their prices to higher costs, regardless of the information level of consumers. As we have argued in Section 3, all firms in the hairdressing sector were subject to "high" costs, k_H in our model, at the time of the survey, mainly due the stringent hygiene rules described above, which in effect increased the cost per client. We estimate the cost increase indirectly, using the observed price increase of the median hairdresser in the CPI microdata in March 2021, directly after the second lockdown was

[22] If $\alpha_H^* \geq F(\alpha_H^*)$, we set $\alpha_1 = 1$ and $\alpha_0 = \frac{\alpha_H^* - F(\alpha_H^*)}{1 - F(\alpha_H^*)}$. Otherwise, we set $\alpha_0 = 0$ and $\alpha_1 = \frac{\alpha_H^*}{F(\alpha_H^*)}$.

lifted. The median price increase at that time was 5.5%. We use the model to back out the cost shock, k_H, that rationalizes this observed price increase. Our main identifying assumption is that hairdressers in Germany increasing their price at that time at the median level did not adjust their prices in response to higher demand, but just in response to higher real costs. This assumption is supported by our survey of German hairdressers at that time, where only 11% of price-increasers increased their prices due to demand (and therefore tended to increase their prices by more).[23] Additionally, we assume an average markup of 12.5% over cost, denoted by $\mu = 1.125$, which is a standard value (Galí 2015). The optimal cost pass-through of firms in the model then implies a cost shock of

$$k_H = 1.055 \cdot \frac{2\mu}{2\mu - 1} - 1$$

which is $k_H = 0.9$.

4.1 Results

Contributions to the Rise in Inflation. Table 1 presents the results. We report the frequency of price adjustment, predicted inflation, and the relative contributions to inflation, all distinguished by demand and supply (and totals). The first column reports these figures for the case of the Calvo model (exogenous friction). We calibrate this exogenous price-stickiness to the yearly price adjustment probability pre-pandemic of the relevant service sector, which we measure using the German CPI micro-data to a yearly price adjustment frequency of 59%. The second column reports these numbers for the incentive-based friction model presented in Section 2 (endogenous friction).

In the Calvo model, the fraction of adjusters to demand and supply is identical. This is because once a firm is allowed to adjust, it is optimal to adjust to all factors. The main novelty brought by the incentive-based (or strategic) friction in terms of price adjustment is that the fraction of adjusters differs by factor. All firms adjust to supply (and hence the total

[23]The calibration of 5.5% higher unit costs is also in line with the evidence in Bunn, Anayi, Barnes, Bloom, Mizen, Thwaites, and Yotzov (2024). They ask UK firms in the Decision Maker Panel during the COVID-pandemic about "the impact of measures to contain coronavirus (social distancing, hand washing, masks and other measures) on the average unit costs of your business". Between 2020:Q2 and 2022:Q1, firms report a 4 to 6% increase in unit costs.

Table 1: Main Results: Inflation, Calvo Vs. Incentive-Based Friction

	Friction: Exogenous (Calvo)	Friction: Endogenous (Incentive Based)
FRACTION OF ADJUSTERS (%)		
To Demand	59.0*	11.0*
To Supply	59.0*	100.0
To Both	59.0*	11.0
CONTRIBUTION TO INFLATION (%)		
Demand	43.5	7.8
Supply	56.5	92.2
Total	100.0	100.0
PREDICTED INFLATION (%)		
By Demand	2.5	0.5
By Supply	3.2	5.5
Total	5.9	6.0

Notes: * denotes calibrated values. We use exact formulas for inflation, and therefore factor-inflation figures do not necessarily add up to total inflation, due to a multiplicative term. We split the multiplicative term according to the relative sizes of demand and supply factors when calculating their relative contributions to inflation.

fraction of adjusters is 1). However, a small fraction of firms (11%) adjust to the demand shock.

Turning to the price level inflation predicted by the models, and the relative contribution of demand and supply factors, we notice that, according to the Calvo model, both factors had an important contribution to inflation, with a demand-supply split of 43.5% vs. 56.5%. In the Calvo model, firms that update their price adjust to both shocks (which is in contradiction to the evidence we provided in Section 3). As we will explain below with the aid of formulas, the proportions are therefore simply given by the relative size of the shocks. According to our shock size calibration, this calibration points to a somewhat bigger supply than demand shock at the onset of the reopening of the economy.

The incentive-based, strategic, friction provides a different picture than the Calvo friction to the contributions of demand vs. supply to inflation. Looking at the fourth row, second column, of Table 1, notice that demand contributes only to 7.8% of the rise in inflation,

whereas supply contributes the lion's share, to 92.2%. According to the calibrated model, almost all of the inflation was caused by the supply factor. The reason is that, consistent with our data set, only a small fraction of firms adjust prices taking the demand factor into consideration, and at the same time all firms pass on exogenous cost increases to the consumer.

Importantly, the different predictions in terms of relative contributions for the two models are not based on different predictions of the total rise in inflation. Both models predict roughly the same total price level inflation, of 6% post-covid. For comparison, annual inflation in the European Union was 5.6% in January of 2022, before the further rise in energy prices due to the Russian invasion in Ukraine.[24]

Predicted Output Gaps. Another point of comparison between the models is regarding their prediction for the output gap. Table 2 reports these gaps for the model that preserves the information friction among households, but uses a Calvo fairy to generate the nominal friction (instead of the incentive-based friction), and for the incentive-based friction model.

Table 2: Predicted Output Gap: Calvo Vs. Incentive-Based Friction

	Friction: Exogenous (Calvo)	Friction: Endogenous (Incentive Based)
Calibration	46.6	13.1
No supply shock	2.5	6.3

Notes: Output gaps in percentages. For the second row, the supply shock is turned off, i.e. the marginal cost is $k_0 < k_H$. The demand shock and the parameterization of $F(\alpha)$ remain as in the baseline calibration.

The output gap under Calvo is impressively large at 46.6%. The main reason for this large number is that, given our calibration of increase in costs, the natural level of output

[24]The model-result is the inflation rate away from steady state. When asked whether they adjust prices to inflation, 65% of firms respond that this is not a major consideration in their general pricing decisions. Among firms that increase their price after the lockdown, only 31% report that the adjustment to the "general" ('allgemein', in German) price level played a big role, while the rest of the sample reports that general price level adjustment plays a minor or no role. We conclude that there is no strong evidence of indexation in our sample.

(output under flexible prices) deviates significantly from equilibrium output under exogenous stickiness. The strategic model with endogenous frictions predicts that firms adjust to the cost shock, leading to a smaller deviation of equilibrium output and natural output, and hence a more reasonable assessment of the output gap. To explore this point further, we can consider a counterfactual where there is only the demand shock. Now, the Calvo model predicts a smaller output gap than the incentive-based model, since, under Calvo, prices are more flexible with respect to demand. It is also remarkable that the predicted output gap in the incentive-based model is not far off from the one with supply shocks: the reason is that supply shocks do not directly lead to an output gap since prices are flexible to them.[25]

The result that predicted output gaps are unreasonably large in the Calvo model highlights the extreme nature of the stickiness assumption, and how it can lead to pathological outcomes. In our simulation, firms can't adjust prices despite a large deviation of current and natural output. This peculiar prediction under Calvo pricing connects our paper to several works that have encountered similar difficulties. A seminal paper in this direction is by Ascari (2004). Ascari and Sbordone (2014) explicitly derive feasible upper bounds on trend inflation for the NK model. In a related vein, Justiniano and Primiceri (2008), and more recently L'Huillier and Phelan (2025), explain that deviations between potential and natural output are estimated to be very large in DSGE models. More recently, Lago and Hashmat (2024) emphasize that NK models feature explosive equilibrium dynamics at high trend inflation. See also Andreasen and Kronborg (2022), Maršál, Rabitsch, and Kaszab (2023) and Holden (2024).

Inspecting the Mechanism. We provide an approximate analytical formula for the inflation contributions of the strategic model. We also provide the analog for the Calvo model. We follow the notation introduced in Section 2. First, denote the price of a sticky price firm as p_{00}, where the first subindex signifies no adjustment to demand, the second subindex signifies no adjustment to supply, and k_0 is the level of marginal costs before the supply

[25]The output gap is still increasing in costs in the incentive-based model due to an interaction effect with demand: in the high-demand state, Insiders have a higher discount factor than Outsiders, causing sticky-price firms to produce higher above natural output when costs, which are passed through to prices, increase.

shock (as before, $1/k_0 = E[1/k]$). It equals

$$p_{00} = \frac{1 + k_0}{2}$$

since ζ_0 has been normalized to 1. This is the price that is part of the Perfect Bayesian Equilibrium of Proposition 1, and it is also approximately the price that obtains as the ergodic mean of the model. Similarly, write the price of a flexible firm as the monopoly's optimal price taking into account both shocks, that is

$$p_{HH} \equiv \zeta_H \frac{1 + k_H}{2}$$

These are equilibrium prices in a model where firms fully adjust to both shocks, as in the Calvo model. For the sake of the strategic model, we also need to define the price for a firm that adjusts to costs, but not to demand, which is

$$p_{0H} \equiv \frac{1 + k_H}{2}$$

Similarly, define a counterfactual price where a firm adjusts to demand, but not to supply:

$$p_{H0} \equiv \zeta_H \frac{1 + k_0}{2}$$

We obtain the following proposition, stating simple formulas for the inflation contribution of each factor. In our model, the demand inflation contribution depends not only on the demand and supply components, but also on the frequency of firms that adjust to demand.

Proposition 2 (Inflation Contributions) *Consider the inflation rate of a firm that adjusts its price to demand π_D, $\pi_D = p_{H0}/p_{00} - 1$, and the inflation rate of a firm that adjusts its price to supply π_S, $\pi_S = p_{0H}/p_{00} - 1$.*

- *In the Calvo model, the aggregate percent inflation contributions of each factor are given by:*

$$Cntr_D^{Calvo} = \frac{\pi_D}{\pi_D + \pi_S}, \quad Cntr_S^{Calvo} = \frac{\pi_S}{\pi_D + \pi_S}$$

- *In the incentive-based model, the aggregate percent inflation contributions of each factor are given by:*

$$Cntr_D^{IB} = \frac{\lambda_D \pi_D}{\lambda_D \pi_D + \pi_S}, \quad Cntr_S^{IB} = \frac{\pi_S}{\lambda_D \pi_D + \pi_S}$$

where λ_D is the fraction of adjusters to aggregate demand.

The full proof is given in the appendix, but the result follows immediately after obtaining that (up to first order) aggregate inflation in the Calvo model is:

$$\pi^{Calvo} = \lambda(\pi_D + \pi_S)$$

where λ is the frequency of price adjustment. Instead, in the incentive-based model, we get (up to first order):

$$\pi^{IB} = \lambda_D \pi_D + \pi_S$$

where λ_D is the fraction of adjusters to aggregate demand. This last expression captures the role of differential adjustment: the fraction of adjusters to supply is 1.

Notice the crucial role of the frequency of adjusters in determining the demand-supply split. This is consistent with our calibration above, since even if the demand shock is large (and hence π_D is large), if the fraction of firms that adjust to demand λ_D is tiny, the proposition states that the total contribution of aggregate demand factors to total inflation can be small. Specifically, *large* demand shocks command two effects in our model. First, with large demand shocks, π_D is relatively larger than π_S, increasing $Cntr_D^{IB}$ (and lowering $Cntr_S^{IB}$). This is the same effect as in a Calvo model. Second, as the sensitivity analysis below explores in depth, in our microfounded model, λ_D is determined endogenously, and therefore, as the size of demand shocks increase, more firms adjust to it. However, if the primitives of the model are such that prices remain sticky even for large shocks, the demand inflation contribution can remain small or even zero (and the supply contribution is 1).

At the extreme, this is stated formally as follows.

Proposition 3 (Large Demand Shocks) *Let $\Delta \longrightarrow \infty$. In the incentive-based model,*

there is a $\alpha_1(\Delta)$ *such that the demand inflation contribution is zero:*

$$Cntr_D^{IB} = 0, \quad Cntr_S^{IB} = 1$$

In contrast, in the Calvo model, large shocks would always determine the answer the model provides to the determination of aggregation inflation, given the symmetric nature of price adjustment:

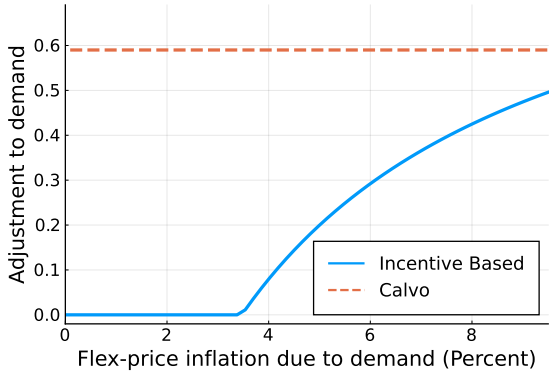
$$\lim_{\Delta \to \infty} Cntr_D^{Calvo} = 1, \quad \lim_{\Delta \to \infty} Cntr_S^{Calvo} = 0$$

4.2 Sensitivity Analysis

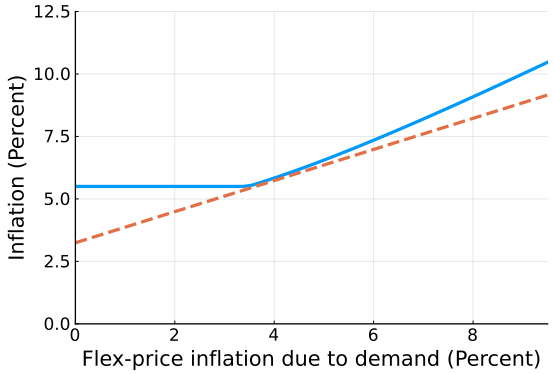
In our baseline calibration, we match $\lambda_D = 0.11$ to our survey evidence for the supply and demand shocks that we calibrate for countries in the Eurozone in 2021. We explore the model predictions for different sizes of demand shocks in Figure 4. The left panel plots λ_D, the fraction of adjusters to demand, and the right panel plots total inflation, both as a function of the demand shock. The demand shock is measured as $\zeta_H = (\Delta + 1)/2$, which is also equal to demand-driven inflation under flexible prices.

Figure 4: Different Demand Shocks

(a) Fraction of Adjusters to Demand



(b) Total Inflation



Notes: Results for the baseline calibration for the distribution of Insiders, $F(\alpha)$, and supply shock k_H. Flexible price inflation due to demand is given by $100 * (\zeta_H - 1) = 100 * ((\Delta + 1)/2 - 1)$.

The left panel shows that the fraction of adjusters increases (nonlinearly) in the size of the shock. This generates higher total inflation. This means that the model shares features of

"state-dependence" with menu cost models, additionally to exhibiting "shock-dependence" (since prices are flexible with respect to supply, but sticky with respect to demand). In our baseline calibration, prices remain fairly sticky to demand, and stickier than in the calibrated Calvo benchmark, even for big shocks.[26]

Since firms in our survey are not representative for the whole economy, it is important to analyze the model results for different calibrations of the model. We can use the result of Kwapil, Baumgartner, and Scharler (2005) that 37% of firms would increase prices in response to "markedly higher" demand as suggestive evidence that our calibration is on the lower side. We therefore present an alternative calibration of the model where the distribution of Insiders, $\tilde{F}(\alpha)$, is calibrated such that $\lambda_D = 0.5$ when firms are subject to our calibrated supply and demand shocks. Hence, in the alternative calibration, 50% of firms pass through our calibrated demand shock. Using the formulas from Proposition 2, we find that in the alternative calibration, the supply shock is still responsible for 72% of the overall inflation. That is, even though the share of firms passing through demand shocks to prices increases by 39pp compared to the baseline calibration, the relative contribution of supply to inflation falls only by 20pp. To explain this, we can state the following:

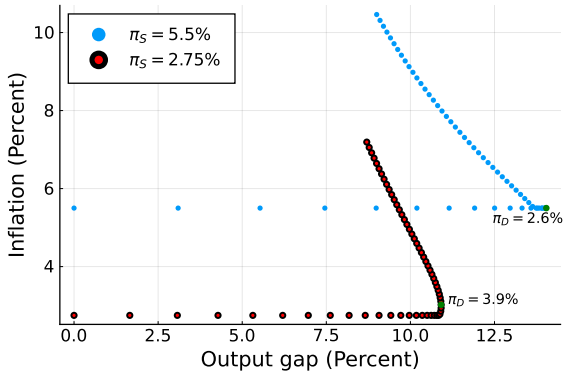
Corollary 1 (Relative Contributions: Sensitivity) *For given shock-sizes, which determine flexible-price inflation with respect to demand (π_D) and supply (π_S), the marginal decrease in the supply contribution to inflation in response to an increase in the fraction of adjusters to demand, λ_D, is bound below by $-\frac{\pi_D}{\pi_S}$ and increases (i.e. becomes weaker) in λ_D.*

The corollary follows immediately from taking the first derivative of the formula for $Cntr_S^{IB}$ in Proposition 2 by λ_D. It shows that in times where supply shocks are large, the contribution of supply to inflation is relatively insensitive to changes in the fraction of adjusters to demand. It is thus a robust finding of our model that, as long as significantly more firms adjust prices to supply than to demand—in our model, this ratio is $1/\lambda_D$, which equals 2 in the alternative calibration—and there is a large supply shock, the majority of inflation will be due to the supply shock.

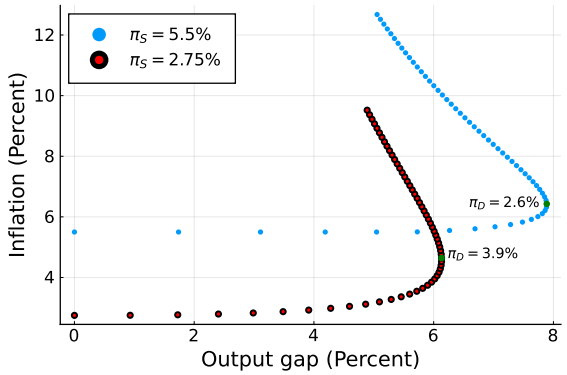
[26] We solve the model up to a demand shock-size of 9.5%, which is the limit of the admissible parameter range for our cost-shock calibration; see the proof of Proposition 1 for the calculation of the admissible parameter range.

Figure 5: Phillips Curves of Incentive-Based Model

(a) Baseline Calibration



(b) Alternative Calibration



Notes: Plots of output gap-inflation pairs for different supply shock-sizes (estimated COVID-supply shock $\pi_S = 5.5\%$ in blue, and half that size in red) and demand shock-sizes (each dot of the same color represents a different demand shock, increasing from left to right in the flat part, and from bottom to top). The green dot marks the demand shock size π_D which yields the largest output gap. Left panel: baseline calibration, $F(\alpha)$. Right panel: alternative calibration, $\tilde{F}(\alpha)$.

Figure 5 shows the correspondence of output gaps and inflation as implied by our incentive-based model for both calibrations and different shock-sizes. As one would expect, the "Phillips curve" shifts upwards with the size of the adverse supply shock. As an unusual consequence of our model, the relation between output gap and inflation is not injective: beyond a threshold level of the demand shock, which is determined by the supply shock-size, the Phillips curve *bends backwards* in response to demand; that is, at that point, higher demand increases inflation and *lowers* the output gap. The reason is, again, that our model features size-dependent pricing. Technically, one can see this by looking at the threshold of the share of Insiders, α_H^*, above which firms adjust to demand (see Proposition 1). This threshold is decreasing in $\Delta = \zeta_H/\zeta_L$, which means that more firms can adjust their price to demand, the heigher the *stakes* to adjust to demand are for the firm. The potentially bad effects for the firm's profitability increase the credibility of the firm's pricing. This effect positively interacts, therefore, with the size of the adverse supply shock, which also lowers the profitability of firms that cannot adjust to demand (since the firm has to sustain a positive output gap, driven by the demand of Insiders, at higher costs). It follows from our analysis that monetary policy wants to reduce demand more when the economy

is hit by large cost shocks: as dire supply conditions in combination with larger demand pressures give more firms the reason to adjust prices to demand, reducing demand has a larger marginal effect on inflation, and may even *increase* economic output, if the economy is in the backward-bending part of the Phillips curve.

The alternative calibration may be the more favorable macro-calibration, as it predicts that the output gap, given the large cost shock that we calibrate for the pandemic episode, is upward bound at 8%.[27] Furthermore, especially at moderate supply shock-sizes, the area of the Phillips curve with a slightly positive slope is larger in the alternative calibration. This seems to be more in line with the empirical evidence in Hazell, Herreño, Nakamura, and Steinsson (2022), who find a very small, but positive relation between output gap and inflation. Still, as we have shown above, the main result of our paper, that the supply shock is responsible for the lion's share of inflation, is robust to this alternative calibration.

5 Conclusion

What incentives do firms have to change prices, and does the answer to this question matter for our views on what caused the post-COVID inflation? We provided an incentive-based model of firms' pricing in which firms have superior information regarding the state of the aggregate economy. Firms' incentives imply that firms are quick to change prices in response to supply-driven changes in costs but are reluctant to change prices in response to demand-driven changes in the economic environment, even when firms' costs change for demand-driven reasons. We provide micro-level survey evidence consistent with the predictions of our model (and inconsistent with standard pricing frictions): firms are much more likely to change prices in response to changes in costs, and they are much more likely to do so when they can justify these price changes to their customers.

A calibrated version of our model implies that the bulk of the initial post-COVID inflation was driven by supply-driven disruptions, and that shock decompositions under exogenous stickiness might provide a distorted picture of the drivers of inflation.

[27] For example, Barigozzi and Luciani (2023) estimate output gaps for the US that are not larger than 9% in absolute terms.

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Appendices

A Full Model Description

We model an endowment economy that has two periods. It is hit by two types of exogenous shocks with binary support. The model can be embedded into a, full-blown, infinite horizon, general equilibrium model with more states (see L'Huillier (2020) for an example, using a similar environment, of how to proceed).

Time. There are two periods, the present and the future. We interpret the present as the "short run", and the future as the "long run". In the short run, trade is subject to pricing frictions. In the long run, trade is efficient in a Walrasian market.

Agents. There are three types of agents: consumers, firms, and a central bank.

Islands. The economy is subdivided into a unit mass of islands and a mainland. Each island is populated by a unit mass of consumers, and a firm. Trade within each island happens in the present (short run), and is decentralized; each island is served by the island-specific firm, which sets a price. In the future (long run), all consumers travel to the mainland where they trade with each other. This market is centralized.

Consumers. Each consumer has the following utility function of consumption:

$$u(c) + \beta\vartheta C \tag{4}$$

where good c is consumed in the short-run, good C is consumed in the long-run, and $\beta < 1$ is the time discount factor. Future marginal utility ϑ is a random variable which acts as a discount factor shock that causes short-run shifts in aggregate demand. For simplicity, $u(\cdot)$ is assumed to be quadratic: $u(c) = c - c^2/2$.[28]

The budget constraint is

$$pc + QC = d + QD$$

where p is the monopolist's price, and $Q \equiv P/(1+i)$ is the nominal price of a bond, set by the monetary authority, multiplied with the long-run price level P. C is a numeraire good. Consumers have an endowment D in units of the future good C and receive firm profits d.

[28] This assumption leads to analytical tractability when deriving the firms' cutoffs of adjustment. We can obtain similar theoretical results for any $u(\cdot)$ that is a strictly concave utility function.

Firms. Firms operate with a constant real marginal cost k, with $0 \leq k < 1$. This is a random variable. Exogenous changes to real marginal costs embody supply shocks, which could come from changes in productivity, changes to the price of inputs such as oil, or from changes to the labor supply schedule. (Nominal marginal costs will vary proportionally to the state of demand, see the firm's problem below.)

Exogenous Shocks. We model orthogonal binary states for both future marginal utility ϑ and cost k realizations. We interpret the former as a news shock: ϑ is realized when the news about future economic conditions arrives. Denoting by $\{H, L\}$ (High, Low) the realizations of the news about future marginal utility, $\vartheta_L > \vartheta_H$, and by $\{H, L\}$ (High, Low) the realizations of the cost shock, $k_H > k_L$, then we have 4 possible realizations, each with equal probability. The notation for ϑ reflects the result that optimal short-run demand will be high when ϑ is low: low future marginal utility is good news and induces more consumption today.

Monetary Policy. The central bank follows an interest rate rule that governs the reaction of the interest rate to inflation π and the output gap x in the decentralized market:

$$i = i_0 + \phi_\pi \pi + \phi_x x$$

where $\phi_\pi, \phi_x \geq 0$.

Aggregate State. The aggregate state of the economy is determined by the state of aggregate demand and aggregate supply.

The state of aggregate demand, denoted ζ, is given by the exogenous news shock about future marginal utility ϑ, by the future price level P, and by the policy rate set by the central bank i. The discount factor of consumers $\beta\vartheta$ defines the natural rate of interest ρ:

$$\rho \equiv \frac{1}{\beta\vartheta} - 1$$

and hence the shock ϑ can be equivalently thought of as shocks to the natural rate ρ. Since we assume future trade to be centralized, we normalize the future price level to $P = 1$.

Aggregate demand will be given by the total effect of the subjective discount rate ρ and the market discount rate i, on short-run demand, written as

$$\zeta \equiv \frac{1+\rho}{1+i} \tag{5}$$

The state of aggregate supply is simply given by the exogenous shock k.

Below, we index a variable to denote the state of aggregate demand by $s = \{H, L\}$ and to denote the state of aggregate supply by $\varsigma = \{H, L\}$. For instance, we use $p_{s,\varsigma}$ for the price

when demand is s and supply is ς.

Information. There are two types of consumers: Insiders (informed consumers) and Outsiders (uninformed consumers). Insiders are perfectly informed about the aggregate state; Outsiders are uninformed about the aggregate state. In particular, we assume that Outsiders do not know the interest rate rule, but that they perceive monetary policy as exogenous to the state of the economy. They know the probability distribution of the aggregate state, and draw inferences from the price set by the firm with which they trade.

The fraction $\alpha \in [0, 1)$ of Insiders on a particular island varies across islands. We use this source of heterogeneity to allow for distinct patterns of price adjustment across islands. We assume that the distribution of α is given by a cdf F, where α_0, α_1 are the lower and upper limit, respectively, of the support of F, i.e. $\alpha_0 < \alpha_1$. Hence, α_0 is the fraction of Insiders on the least-informed island, and α_1 is the fraction of Insiders on the most-informed island.

By assumption, firms know the aggregate state. The assumption that Insiders and firms know the true state is just a convenient abstraction of the idea that they are better informed than Outsiders. In particular, the idea that news about future marginal utility are received with certainty by Insiders, while Outsiders do not receive them at all, can be thought of as the extreme simplification of the outcome of a signal extraction problem where the signal observed by Outsiders is more noisy than that observed by Insiders and firms.

Demand Function. Faced with uncertainty, consumers maximize their utility (4) in expectation. Using the definition of aggregate demand (5), the first-order condition with respect to c can be written:

$$u'(c_j) = pE_j \left[\frac{1}{\zeta}\right]$$

where the expectation is subindexed by the consumer index j to denote the consumer's information set. Note that ζ can also be interpreted as the inverse of the Lagrangian multiplier of the consumer's intertemporal budget constraint.

Insiders do not face uncertainty, and solve their problem under perfect information. With quadratic utility, we get the linear demand

$$c_j^* = 1 - \frac{p}{\zeta}$$

A high aggregate demand ζ increases the demand for the short-run good c.

Outsiders observe the price p offered by the firm, but do not observe the state of aggregate demand. There are no other informative signals in this decentralized economy. Their demand

function is therefore written:

$$c_j^* = 1 - pE_j\left[\frac{1}{\zeta} \mid p\right] \tag{6}$$

Total demand on a given island is given by the sum of the demands of Insiders and Outsiders:

$$c(p) = \int c_j^* \, dj = \alpha\left(1 - \frac{p}{\zeta}\right) + (1-\alpha)\left(1 - pE_j\left[\frac{1}{\zeta} \mid p\right]\right) \tag{7}$$

Firm Problem. The firm maximizes profits given the demand function (7). We assume that nominal marginal costs are flexible and proportional to nominal aggregate demand.[29] Under this assumption, the firm's profit function is given by $(p - \zeta k)c(p)$.

B Supplementary Theoretical Material

B.1 Proof of Proposition 1

In the following, we provide the proof of Proposition 1 in the main text in several steps. First, in Proposition 4, we provide an equivalence condition, depending on the degree of information asymmetry $1-\alpha$, for when a separating equilibrium is incentive compatible for the firm. We show the condition for the optimal flexible prices, which in some sense characterize the most stable separating equilibrium. In Proposition 5, we show that there exists a pooling equilibrium, where the price is independent of the state of demand, that obtains exactly when the separating equilibrium is not incentive compatible. These results are proven while holding the firm's real marginal cost k constant. Lemma 1 provides the result on equilibrium prices when instead holding the state of demand constant. Finally, we show that having simultaneous supply and demand shocks does not substantially change the results, and derive the threshold α_H^*.

Proposition 4 (Demand: Incentives to Misrepresent State) *Consider the flexible prices $p_H = \zeta_H \frac{1+k}{2}$ and $p_L = \zeta_L \frac{1+k}{2}$, where the subscript denotes the state of demand $s = H, L$, while the firm's real marginal cost k is constant. The firm truthfully reveals ζ_s (using these prices) iff the following IC constraint is satisfied:*

$$(p_L - k\zeta_L)\left[1 - p_L\frac{1}{\zeta_L}\right] \geq (p_H - k\zeta_L)\left\{\alpha\left[1 - p_H\frac{1}{\zeta_L}\right] + (1-\alpha)\left[1 - p_H\frac{1}{\zeta_H}\right]\right\} \tag{8}$$

Moreover, the constraint (8) is satisfied iff the proportion of Insiders α is high enough: there is a cutoff in the proportion of Insiders $\alpha^* < 1$, such that, for $\alpha \geq \alpha^*$, constraint (8) is

[29] Specifically, the assumption is that production costs (wages or intermediate goods) are paid at the end of the first period, and therefore the production cost is the discounted value of the price level in the future.

satisfied. The separating equilibrium with prices p_H and p_L is the only one with such a simple cutoff-rule in α, and is the one that all firms would select.

Proof of Proposition 4. ONLY IF: To find the cutoff α^* we need to confirm that in the low state the firm would rather charge the low flexible price than the high flexible price (which would fool the uninformed agents). If the flexible price $\{p_s\}$ is consistent with some PBE, then if the true state is L the firm will not prefer to deviate and offer the price p_H rather than the price p_L. Note that if the true state is L and the firm offers p_H, Insiders will know that the true state is L but Outsiders will believe the true state is H. Hence the firm will not want to offer $p_H = \zeta_H(1+k)/2$ rather than $p_L = \zeta_L(1+k)/2$ if and only if:

$$\left(\frac{\zeta_L(1+k)}{2} - k\zeta_L\right)\left[1 - \frac{\zeta_L(1+k)}{2}\frac{1}{\zeta_L}\right] \geq \left(\frac{\zeta_H(1+k)}{2} - k\zeta_L\right)\left\{\alpha\left[1 - \frac{\zeta_H(1+k)}{2}\frac{1}{\zeta_L}\right] + (1-\alpha)\left[1 - \frac{\zeta_H(1+k)}{2}\frac{1}{\zeta_H}\right]\right\}$$

Simplifying:

$$\zeta_L\frac{(1-k)}{2}\left(\frac{1-k}{2}\right) \geq \left(\frac{\zeta_H(1+k) - 2\zeta_L k}{2}\right)\left(\alpha\left(\frac{2-(1+k)\zeta_H/\zeta_L}{2}\right) + (1-\alpha)\left(\frac{1-k}{2}\right)\right)$$

$$\zeta_L(1-k)\,(1-k) \geq (\zeta_H(1+k) - 2\zeta_L k)\,(\alpha\,(2-(1+k)\zeta_H/\zeta_L) + (1-\alpha)\,(1-k))$$

Letting $\Delta \equiv \zeta_H/\zeta_L$ and dividing both sides by ζ_L:

$$(1-k)\,(1-k) \geq (\Delta(1+k) - 2k)\,(\alpha\,(2-(1+k)\Delta) + (1-\alpha)\,(1-k))$$

$$(1-k)(1-k) \geq (\Delta(1+k) - 2k)\,((1-k) + \alpha(1+k)(1-\Delta))\,.$$

Note that $\Delta(1+k) - 2k > 1-k$ and $\Delta > 1$ so that $1-\Delta < 0$. Then rearranging we have

$$\alpha(1+k)(\Delta-1)(\Delta(1+k)-2k) \geq (\Delta(1+k)-2k)(1-k) - (1-k)(1-k)$$

$$\alpha \geq \frac{1-k}{\Delta + \Delta k - 2k} \equiv \alpha^*,$$

which is the desired result. Note that if $k = 0$, then we get $\alpha^* = 1/\Delta$.

IF: Given that $\alpha \geq \alpha^*$, We must construct a PBE in which prices along the equilibrium path are p_L, p_H. Hence we must show that when the true state is s the firm will not wish to deviate to a price $p \neq p_s$. PBE implies that when the Outsiders see the price p_s, they believe the true state is s, as in **(a), (c)**. However, we are free to assign arbitrary beliefs to Outsiders if they see a price p different from both p_L and p_H, as in **(b), (d)**; in that event we assign to Outsiders the belief that the true state is L. We must rule out four kinds of potentially profitable deviations

(a) The true state is L and the firm offers p_H.

(b) The true state is L and the firm offers $p \neq p_L, p_H$.

(c) The true state is H and the firm offers p_L.

(d) The true state is H and the firm offers $p \neq p_L, p_H$.

When Outsiders see a price $p \neq p_L, p_H$ they believe the state is L and PBE guarantees that when Outsiders see the price p_L they believe the state is L, so we can subsume **(c)** and **(d)** into

(e) The true state is H and the firm offers $p \neq p_H$.

We now verify that **(a)**, **(b)**, and **(e)** are not incentive compatible in turn.

(a) This follows immediately by following the steps in the ONLY IF case above, but in reverse order, noting that each inequality is *equivalent* to the one above.

(b) We have posited that when Outsiders see a price $p \neq p_L, p_H$ they believe the state is L. Insiders know the true state so they also believe the state is L. Hence aggregate demand if the firm offers p will be $1 - p\frac{1}{\zeta_L}$ and firm profit will be $(p - k\zeta_L)[1 - p\frac{1}{\zeta_L}]$. By definition, this quantity is maximized when $p = \zeta_L\frac{(1+k)}{2}$ and the maximum profit will be $\zeta_L\frac{(1-k)^2}{4}$. However this is the profit when the firm offers p_L so this cannot be a profitable deviation for any such p.

(e) We must show that when the true state is H the firm's profit if it offers p_H is at least as great as when it offers $p \neq p_H$; i.e. we must show

$$\begin{aligned}\frac{\zeta_H(1-k)^2}{4} &\geq (p - k\zeta_H)\Big(\alpha\left[1 - p\frac{1}{\zeta_H}\right] + (1-\alpha)\left[1 - p\frac{1}{\zeta_L}\right]\Big) \\ &= \alpha(p - k\zeta_H)\left[1 - p\frac{1}{\zeta_H}\right] + (1-\alpha)(p - k\zeta_H)\left[1 - p\frac{1}{\zeta_L}\right] \qquad (9)\end{aligned}$$

By definition, $(p - k\zeta_H)\left[1 - p\frac{1}{\zeta_H}\right]$ is maximized by setting $p = p_H$ and $(p - k\zeta_L)\left[1 - p\frac{1}{\zeta_L}\right]$ is maximized by setting $p = p_L$, so we must certainly have

$$\alpha(p - k\zeta_H)\left[1 - p\frac{1}{\zeta_H}\right] \leq \alpha\left(\frac{\zeta_H(1-k)^2}{4}\right) \qquad (10)$$

$$(1-\alpha)(p - k\zeta_H)\left[1 - p\frac{1}{\zeta_L}\right] \leq (1-\alpha)\left(\frac{\zeta_L(1-k)^2}{4}\right) \qquad (11)$$

The result follows by adding the inequalities (10) and (11), so we have verified **(e)**.

For the claims in the last sentence, let us define $\tilde{p}_s \neq p_s$ as some separating equilibrium that differs from the one considered above. First, we note that in any separating equilibrium, Outsiders learn the true demand state. Hence, the on-equilibrium demand is the same across all separating equilibria, which makes it clear that firms make the largest profits in the equilibrium with the prices p_s. Therefore, firms would select this equilibrium.

Next, note that the alternative equilibrium must be sustained by some off-equilibrium

beliefs by Outsiders, that prevail when the firm sets a price $p \neq \tilde{p}_s$. However, by continuity, there exists α sufficiently close to 1 such that these off-equilibrium beliefs play less of a role, and firm profits from setting p_s come arbitrary close to $\zeta_s(1-k)^2/4$. This, as argued above, is the maximum profit across all separating equilibria. Hence, only the separating equilibrium with prices p_s can be characterized by the simple cutoff-rule where the IC constraint is satisfied iff α is larger than some threshold. ■

Proposition 5 (Demand: Cutoff for Price Adjustment) *Assume that the firm's real marginal cost k is constant. Take the cutoff in the proportion of Insiders $\alpha^* = \frac{1-k}{\Delta+\Delta k-2k} < 1$ from Proposition 4. There exists a threshold $\bar{k}(\zeta_L, \zeta_H) > 0$ such that, if $k < \bar{k}(\zeta_L, \zeta_H)$, it holds that the following is a Perfect Bayesian Equilibrium (PBE):*

- *If $\alpha < \alpha^*$, the firm's price is sticky with respect to demand: $p = p_0 \equiv \zeta_0(1+k)/2$*
- *If $\alpha \geq \alpha^*$, the firm's price is flexible with respect to demand: $p = p_s$*
- *If $\alpha < \alpha^*$, the Outsiders believe that $E[\zeta^{-1}] = \frac{1}{\zeta_0}$ if $p = p_0$ and $E[\zeta^{-1}] = \frac{1}{\zeta_L}$ else.*
- *If $\alpha \geq \alpha^*$, the Outsiders believe that $E[\zeta^{-1}] = \frac{1}{\zeta_H}$ if $p = p_H$ and $E[\zeta^{-1}] = \frac{1}{\zeta_L}$ else.*
- *The Insiders' demand is $1 - \frac{p}{\zeta_s}$.*
- *The Outsiders' demand is $1 - pE[\zeta^{-1}]$, where the expectation follows from their beliefs, given α (determining the firm's strategy in equilibrium) and the observed p.*

Proof of Proposition 5. Suppose that $\alpha < \alpha^*$ and the true state is L.

The profit of the firm is given by

$$d_L(p) = (p - k\zeta_L)\Big(\alpha\big[1 - p\frac{1}{\zeta_L}\big] + (1-\alpha)\big[1 - pE\left[\zeta^{-1}\right]\big]\Big)$$

If the firm follows the equilibrium path, it sets the price $p = p_0$. The Outsiders will demand $1 - pE[\zeta^{-1}] = 1 - \frac{p}{\zeta_0}$ and the Insiders, knowing the state, will demand $1 - p\frac{1}{\zeta_L}$. Thus, the firm's profit is

$$d_L(p_0) = \left(\frac{\zeta_0(1+k)}{2} - k\zeta_L\right)\left(\alpha\left[1 - \frac{\zeta_0(1+k)}{2}\frac{1}{\zeta_L}\right] + (1-\alpha)\left[1 - \frac{\zeta_0(1+k)}{2}\frac{1}{\zeta_0}\right]\right)$$

If the firm offers a price $p \neq p_0$, the Outsiders will demand $1 - pE[\zeta^{-1}] = 1 - \frac{p}{\zeta_L}$. The Insiders, knowing the state, will demand $1 - p\frac{1}{\zeta_L}$, too. So the firm's profit is

$$d_L(p) = (p - k\zeta_L)\left[1 - p\frac{1}{\zeta_L}\right]$$

As p must not be a profitable deviation, it must be that $d_L(p_0) \geq d_L(p)$ for every p. In particular this inequality must hold when $p = p_L$. Therefore, it must be that

$$\left(\frac{\zeta_0(1+k)}{2} - k\zeta_L\right)\left(\alpha\left[1 - \frac{\zeta_0(1+k)}{2}\frac{1}{\zeta_L}\right] + (1-\alpha)\left[1 - \frac{\zeta_0(1+k)}{2}\frac{1}{\zeta_0}\right]\right) \geq \frac{\zeta_L(1-k)^2}{4}$$

Because ζ_0 is the harmonic mean of ζ_L and ζ_H, $\mathbb{E}\left[\zeta_s^{-1}\right] = 1/\zeta_0$, substituting and simplifying yields

$$\left(\zeta_0(1+k) - 2k\zeta_L\right)\left(\alpha\left[2 - \frac{\zeta_0(1+k)}{\zeta_L}\right] + (1-\alpha)(1-k)\right) \geq \zeta_L(1-k)^2$$

Note that the LHS is decreasing in α, as k is bounded above by 1. Moreover, the inequality holds if $\alpha = 0$: The LHS equals $\left(\zeta_0(1+k) - 2k\zeta_L\right)(1-k)$ and $\zeta_0(1+k) - 2k\zeta_L = \zeta_0 + (\zeta_0 - \zeta_L)k - k\zeta_L > \zeta_L(1-k)$ since $\zeta_0 > \zeta_L$. Thus, there exists a threshold $\alpha_0^* > 0$ such that this inequality holds iff $\alpha \leq \alpha_0^*$.

To determine α_0^*, let $\mathcal{D} \equiv \frac{\zeta_0}{\zeta_L}$. Then

$$\begin{aligned}
\left(\mathcal{D}(1+k) - 2k\right)\left(\alpha\left[2 - \mathcal{D}(1+k)\right] + (1-\alpha)(1-k)\right) &\geq (1-k)^2 \\
\left(\mathcal{D}(1+k) - 2k\right)\left(1 - k + \alpha\left[2 - \mathcal{D}(1+k) - (1-k)\right]\right) &\geq (1-k)^2 \\
(1-k) - \alpha(\mathcal{D}-1)(1+k) &\geq \frac{(1-k)^2}{\mathcal{D}(1+k) - 2k}
\end{aligned}$$

Recall that $\mathcal{D} > 1$ since $\zeta_L < \zeta_0$, and therefore we have

$$\begin{aligned}
(1-k) - \frac{(1-k)^2}{\mathcal{D}(1+k) - 2k} &\geq \alpha(\mathcal{D}-1)(1+k) \\
\frac{(1-k)(\mathcal{D}-1)(1+k)}{\mathcal{D}(1+k) - 2k} &\geq \alpha(\mathcal{D}-1)(1+k)
\end{aligned}$$

We can simplify the inequality to $\alpha \leq \frac{1-k}{\mathcal{D}(1+k)-2k} \equiv \alpha_0^*$. Since $\Delta \equiv \zeta_H/\zeta_L > \mathcal{D} \equiv \zeta_0/\zeta_L$, it follows that

$$\alpha^* \equiv \frac{1-k}{\Delta(1+k) - 2k} < \frac{1-k}{\mathcal{D}(1+k) - 2k}.$$

Because by assumption, $\alpha < \alpha^*$, it follows that $\alpha < \alpha_0^*$ and therefore the firm has no profitable deviation when the state of demand is L.

Suppose that $\alpha < \alpha^*$ and the true state is H.

The profit of the firm is given by

$$d_H(p) = (p - k\zeta_H)\Big(\alpha\big[1 - p\frac{1}{\zeta_H}\big] + (1-\alpha)\big[1 - pE\left[\zeta^{-1}\right]\big]\Big)$$

If the firm follows the equilibrium path, it sets the price $p = p_0$. The Outsiders will

demand $1 - pE\left[\zeta^{-1}\right] = 1 - \frac{p}{\zeta_0}$ and the Insiders, knowing the state, will demand $1 - p\frac{1}{\zeta_H}$. Thus, the firm's profit is

$$d_H(p_0) = \left(\frac{\zeta_0(1+k)}{2} - k\zeta_H\right)\left(\alpha\left[1 - \frac{\zeta_0(1+k)}{2}\frac{1}{\zeta_H}\right] + \frac{(1-\alpha)(1-k)}{2}\right)$$

If the firm offers a price $p \neq p_0$, the Outsiders will demand $1 - pE\left[\zeta^{-1}\right] = 1 - \frac{p}{\zeta_L}$. The Insiders, knowing the state, will demand $1 - p\frac{1}{\zeta_H}$. So the firm's profit is

$$d_H(p) = (p - k\zeta_H)\left(\alpha\left[1 - p\frac{1}{\zeta_H}\right] + (1-\alpha)\left[1 - p\frac{1}{\zeta_L}\right]\right) \tag{12}$$

As p must not be a profitable deviation, it must be that $d_L(p_0) \geq d_L(p)$ for every p. In particular this inequality must hold when $p = p_L$. Therefore, it must be that

$$\left(\frac{\zeta_0(1+k)}{2} - k\zeta_L\right)\left(\alpha\left[1 - \frac{\zeta_0(1+k)}{2}\frac{1}{\zeta_L}\right] + (1-\alpha)\left[1 - \frac{\zeta_0(1+k)}{2}\frac{1}{\zeta_0}\right]\right) \geq \frac{\zeta_L(1-k)^2}{4}$$

The equilibrium condition is that

$$d_H(p_0) \geq d_H(p) \tag{13}$$

Simplifying the right side of (12) yields

$$d_H(p) = (p - k\zeta_H)\left(1 - p\left[\alpha\frac{1}{\zeta_H} + (1-\alpha)\frac{1}{\zeta_L}\right]\right)$$

Define $\zeta_\alpha \equiv \left(\alpha\frac{1}{\zeta_H} + (1-\alpha)\frac{1}{\zeta_L}\right)^{-1}$ as the α-weighted harmonic mean of ζ_s. Since $\zeta_\alpha < \zeta_H$,

$$d_H(p) < (p - k\zeta_\alpha)\left(1 - p\left[\alpha\frac{1}{\zeta_H} + (1-\alpha)\frac{1}{\zeta_L}\right]\right)$$

and the RHS is maximized by setting $p = \frac{\zeta_\alpha(1+k)}{2}$ and then equals $\frac{\zeta_\alpha(1-k)^2}{4}$. Thus, it suffices to show that

$$(p_0 - k\zeta_H)\left(1 - p_0\left[\alpha\frac{1}{\zeta_H} + (1-\alpha)\frac{1}{\zeta_0}\right]\right) \geq \frac{\zeta_\alpha(1-k)^2}{4}$$

Note first that this is satisfied for $\alpha = 0$ but not for $\alpha = 1$; in the first case there are no Insiders, so setting $p = p_0$ is strictly dominant; in the second case there are only Insiders, so the flexible price is optimal. Rearranging we have

$$(p_0 - k\zeta_H)\left(1 - p_0\frac{1}{\zeta_0} + p_0\alpha\left(\frac{1}{\zeta_0} - \frac{1}{\zeta_H}\right)\right) \geq \frac{(1-k)^2}{4\left(\frac{1}{\zeta_L} - \alpha\left(\frac{1}{\zeta_L} - \frac{1}{\zeta_H}\right)\right)}$$

Note that the LHS is increasing linearly in α since $\frac{1}{\zeta_0} - \frac{1}{\zeta_H} > 0$. The RHS is increasing with α. Multiplying we have

$$\left(\frac{1}{\zeta_L} - \alpha\left(\frac{1}{\zeta_L} - \frac{1}{\zeta_H}\right)\right)(p_0 - k\zeta_H)\left(1 - p_0\frac{1}{\zeta_0} + p_0\alpha\left(\frac{1}{\zeta_0} - \frac{1}{\zeta_H}\right)\right) \geq \frac{(1-k)^2}{4},$$

which is a quadratic equation in α with a negative coefficient on α^2. Thus, if this holds at α^* it holds for all $\alpha \leq \alpha^*$. L'Huillier, Phelan, and Zame (2022) verify this condition holds for $k = 0$. By continuity it holds for k sufficiently small. Hence, there exists threshold $\bar{k}(\zeta_L, \zeta_H)$ as claimed. The largest such threshold is implicitly defined when (13) holds with equality. In practice, we check equilibrium condition (13) numerically.

Suppose that $\alpha \geq \alpha^*$ and the true state is L.

Proposition 4 shows that the firm does not want to deviate to p_H. Moreover, the firm does not want to deviate to any other $p \notin \{p_L, p_H\}$: For all those p, all consumers believe that the state of demand is L. Being the monopoly price for this demand, p_L maximizes the profit.

Suppose that $\alpha \geq \alpha^*$ and the true state is H. Being the monopoly price for the demand when all consumers believe the state of demand is H, the price p_H maximizes the profit. Deviating to any other price makes the Outsiders believe the state of demand was L, reducing their demand for all prices. As the demand is lower, there is no price that achieves a larger profit than p_H does. ■

Lemma 1 (Supply: Truthful Incentives) *Assume that the state of demand $\zeta_0 = 1$ is constant. For any Outsider beliefs about the aggregate state ς, the firm prefers posting the monopoly price:*

$$p_\varsigma = \arg\max\ (p - k_\varsigma)(1 - p) = \frac{1 + k_\varsigma}{2}$$

Thus, the firm's price truthfully reflects the aggregate supply shock k_ς, for any α.

Proof of Lemma 1. The proof is immediate. Note that conditional on the price p, Insiders and Outsiders have the same demand, $c = 1 - p\zeta_0$ with $\zeta_0 = 1$. Thus, profit maximization chooses p to maximize $(1 - p)(p - k)$, which yields the desired result. ■

We now provide the proof of Proposition 1 stated in the main text.

Proof of Proposition 1. The firm can post fully revealing prices

$$p_{H,H} = \frac{\zeta_H(1 + k_H)}{2}, \quad p_{L,H} = \frac{\zeta_L(1 + k_H)}{2}, \quad p_{H,L} = \frac{\zeta_H(1 + k_L)}{2}, \quad p_{L,L} = \frac{\zeta_L(1 + k_L)}{2},$$

or prices that pool in ζ while separating in k,

$$p_{0,H} = \frac{\zeta_0(1 + k_H)}{2}, \qquad p_{0,L} = \frac{\zeta_0(1 + k_L)}{2}$$

Except by coincidence, these six prices are distinct. Conditional on p, Outsiders demand

$$c \;=\; 1 - p\,E\left[\frac{1}{\zeta}\,\middle|\,p\right]$$

Thus, any incentive to convey or hide information via p operates only through $E[1/\zeta \mid p]$.

Fix $(s,\varsigma) \in \{L,H\}^2$. For any p, firm profits are

$$\Pi_{s,\varsigma}(p) \;=\; (p - \zeta_s k_\varsigma)\Big(\alpha\big[1 - \tfrac{p}{\zeta_s}\big] + (1-\alpha)\big[1 - p\,E[\,\zeta^{-1} \mid p]\big]\Big)$$

Case A ($\alpha < \alpha_H^*$). On-path candidate prices: $p_{0,\varsigma} = \zeta_0(1+k_\varsigma)/2$. On-path beliefs: $E[\,\zeta^{-1} \mid p_{0,\varsigma}] = 1/\zeta_0$. Off-path beliefs: $E[\,\zeta^{-1} \mid p] = 1/\zeta_L$ for $p \notin \{p_{0,L}, p_{0,H}\}$. Insiders know s.

On-path deviations (fake costs). Deviate from $p_{0,\varsigma}$ to $p_{0,-\varsigma}$. This is profitable iff

$$\begin{aligned}
&(p_{0,-\varsigma} - k_\varsigma\zeta_s)\big(1 - p_{0,-\varsigma}(\alpha/\zeta_s + (1-\alpha)/\zeta_0)\big) > (p_{0,\varsigma} - k_\varsigma\zeta_s)\big(1 - p_{0,\varsigma}(\alpha/\zeta_s + (1-\alpha)/\zeta_0)\big)\\
\Leftrightarrow\; &(p_{0,-\varsigma} - p_{0,\varsigma})\big(1 + k_\varsigma\zeta_s(\alpha/\zeta_s + (1-\alpha)/\zeta_0)\big) - (p_{0,-\varsigma}^2 - p_{0,\varsigma}^2)\big(\alpha/\zeta_s + (1-\alpha)/\zeta_0\big) > 0\\
\Leftrightarrow\; &\operatorname{sgn}(p_{0,-\varsigma} - p_{0,\varsigma})\,\frac{1 + k_\varsigma\zeta_s(\alpha/\zeta_s + (1-\alpha)/\zeta_0)}{\alpha/\zeta_s + (1-\alpha)/\zeta_0} > \operatorname{sgn}(p_{0,-\varsigma} - p_{0,\varsigma})\,(p_{0,-\varsigma} + p_{0,\varsigma}) \qquad (14)
\end{aligned}$$

Case $\varsigma = H$, $s = H$. Since $p_{0,L} - p_{0,H} < 0$, the inequality in (14) reverses. With $p_{0,\varsigma} = \zeta_0(1+k_\varsigma)/2$ and $\bar{k} = (k_L + k_H)/2$,

$$\frac{1}{\alpha/\zeta_H + (1-\alpha)/\zeta_0} + k_H\zeta_H < \zeta_0(1+\bar{k}) \quad\Leftrightarrow\quad -\frac{\alpha(\zeta_0/\zeta_H - 1)}{1 + \alpha(\zeta_0/\zeta_H - 1)} < \frac{\zeta_H}{\zeta_0}\bar{k}\big(\zeta_0/\zeta_H - k_H/\bar{k}\big) \qquad (15)$$

Since $\zeta_0/\zeta_H < 1$ and $k_H/\bar{k} > 1$, the RHS is negative while the LHS is positive. Hence (15) can never hold; no profitable deviation.

Case $\varsigma = H$, $s = L$. The same algebra yields

$$\frac{1}{\alpha/\zeta_L + (1-\alpha)\zeta_0} + k_H\zeta_L < \zeta_0(1+\bar{k}) \quad\Leftrightarrow\quad -\frac{\alpha(\zeta_0/\zeta_L - 1)}{1 + \alpha(\zeta_0/\zeta_L - 1)} < \frac{\zeta_L}{\zeta_0}\bar{k}\big(\zeta_0/\zeta_L - k_H/\bar{k}\big) \qquad (16)$$

Rewriting the expression in terms of Δ, where we use that $\zeta_0/\zeta_L = \frac{2\Delta}{\Delta+1}$, and after some algebra, we get that the firm deviates if

$$\frac{1}{1 + \alpha\frac{\Delta-1}{\Delta+1}} < 1 + \frac{1}{2\Delta}(\Delta k_L - k_H) \qquad (17)$$

Note that in this case, faking costs can be profitable for the firm: for islands with α small enough (in the extreme $\alpha = 0$) and fixed cost states k_L and k_H, having Δ large enough makes the deviation profitable (the term in the bracket becomes positive). For finding the threshold $\kappa(\Delta)$ such that this deviation is not profitable, we can rearrange the inequality to find the equilibrium condition

$$\kappa \geq \Delta + \frac{2\Delta\alpha(\Delta-1)}{k_L(\Delta+1+\alpha(\Delta-1))} \equiv \kappa_1(\Delta) \tag{18}$$

Case $\varsigma = L$, $s = H$. Now $p_{0,H} - p_{0,L} > 0$ and we obtain

$$\frac{1}{\alpha/\zeta_H + (1-\alpha)/\zeta_0} + k_L\zeta_H > \zeta_0(1+\bar{k}) \quad \Leftrightarrow \quad -\frac{\alpha(\zeta_0/\zeta_H - 1)}{1+\alpha(\zeta_0/\zeta_H - 1)} > \frac{\zeta_H}{\zeta_0}\bar{k}\big(\zeta_0/\zeta_H - k_L/\bar{k}\big) \tag{19}$$

Equivalently, in terms of $\Delta = \zeta_H/\zeta_L$ (using $\zeta_H = \zeta_0(\Delta+1)/2$),

$$\frac{1}{1-\alpha\frac{\Delta-1}{\Delta+1}} > 1 + \frac{k_H - \Delta k_L}{2} \tag{20}$$

This inequality characterizes when the deviation is profitable in the subcase ($s = H, \varsigma = L$). To *preclude* this deviation, impose the negation of (20):

$$\frac{1}{1-\alpha\frac{\Delta-1}{\Delta+1}} \;\leq\; 1 + \frac{k_H - \Delta k_L}{2}$$

Rearranging gives

$$k_H \;\geq\; \Delta k_L \;+\; 2\left(\frac{1}{1-\alpha\frac{\Delta-1}{\Delta+1}} - 1\right).$$

Recalling the cost spread $\kappa \equiv k_H/k_L$ (for $k_L > 0$), this can be summarized as a lower bound on κ:

$$\kappa \;\geq\; \Delta \;+\; \frac{2}{k_L}\left(\frac{1}{1-\alpha\frac{\Delta-1}{\Delta+1}} - 1\right) \;=\; \Delta \;+\; \frac{2\,\alpha(\Delta-1)}{k_L\big(\Delta+1-\alpha(\Delta-1)\big)} \equiv \kappa_2(\Delta)$$

Case $\varsigma = L$, $s = L$. The condition reads

$$\frac{1}{\alpha/\zeta_L + (1-\alpha)\zeta_0} + k_L\zeta_L > \zeta_0(1+\bar{k}) \quad \Leftrightarrow \quad -\frac{\alpha(\zeta_0/\zeta_L - 1)}{1+\alpha(\zeta_0/\zeta_L - 1)} > \frac{\zeta_L}{\zeta_0}\bar{k}\big(\zeta_0/\zeta_L - k_L/\bar{k}\big), \tag{21}$$

but $\zeta_0/\zeta_L > 1$ and $k_L/\bar{k} < 1$, so the RHS is positive and the LHS negative. Hence (21) can never hold; no profitable deviation. The claimed lower bound on κ is then found as $\underline{\kappa}(\Delta) \equiv \max(\kappa_1(\Delta), \kappa_2(\Delta))$.

Off-path deviations. We set the threshold $\bar{k}_H(\Delta) = \bar{k}(\zeta_L, \zeta_H)$ from Proposition 5. Recall that α^* is decreasing in k_ς, so $\alpha^*_H < \alpha^*_L$ and therefore $\alpha < \alpha^*$ for both realizations of the supply shock. It follows from Proposition 5 that for $\alpha < \alpha^*_H$, firms do not deviate from $p_{0,\varsigma}$ towards off-equilibrium prices for both possible cost states.

Case B ($\alpha \geq \alpha^*_H$). Candidate prices: $p_{s,\varsigma} = \zeta_s(1+k_\varsigma)/2$. On-path beliefs fully reveal (s, ς); off-path beliefs set $E[\,\zeta^{-1} \mid p] = 1/\zeta_L$. For a given cost state, the separating equilibrium with respect to demand obtains by Proposition 5 (again using that α^* is decreasing in k_ς). Since firms in this case post fully flexible (monopoly) prices, the insight of Lemma 1 also carries through: it is suboptimal for firms to "fake costs" when posting the monopoly price is obtainable in equilibrium, since the monopoly price inevitably signals the realized cost state.

■

B.2 Further proofs

In the following, we provide proofs for the propositions in Section 4.

Proof of Proposition 2. To show for the strategic model: up to first order, overall inflation can be decomposed into a supply and a demand component:

$$\pi^{IB} \approx \pi_S + \lambda_D \pi_D \tag{22}$$

To see this, note that the price of a firm reacting to both shocks is $p_{HH} = \zeta_H \frac{1+k_H}{2}$, while the price of a firm reacting to only the cost shock is $p_{0H} = \frac{1+k_H}{2}$, since ζ_0 is normalized to 1. Firms react to the demand shock iff their share of Insiders α is above the threshold $\overline{\alpha}_H$. The aggregate price level is thus given by

$$\overline{p} = \int_{\alpha_0}^{\overline{\alpha}_H} \frac{1+k_H}{2} dF(\alpha) + \int_{\overline{\alpha}_H}^{\alpha_1} \zeta_H \frac{1+k_H}{2} dF(\alpha) \tag{23}$$

$$= p_{0H}\left(1 + \lambda_D(\zeta_H - 1)\right) \tag{24}$$

where we used that $\lambda_D = 1 - F(\overline{\alpha}_H)$ is the share of firms that adjust to demand. To compute inflation π^{IB}, we divide the aggregate price level by the price in the absence of

shocks, $p_{00} = \frac{1+k_0}{2}$:

$$1 + \pi^{IB} = \frac{\overline{p}}{p_{00}} = \frac{p_{0H}}{p_{00}} \left(1 + \lambda_D \left(\zeta_H \frac{p_{00}}{p_{00}} - 1\right)\right) \tag{25}$$

$$= (1 + \pi_S)(1 + \lambda_D \pi_D) \tag{26}$$

where we used $p_{H0} = \zeta_H p_{00}$. The approximate formula follows when the multiplicative term is small: $\pi_S \lambda_D \pi_D \approx 0$.

For the Calvo model, we show that inflation can be decomposed up to first order as

$$\pi^{\text{Calvo}} \approx \lambda(\pi_S + \pi_D) \tag{27}$$

To see this, notice that irrespective of the heterogeneity in the share of Insiders, firms set the optimal price p_{HH} with probability λ, and stay at the price p_{00} otherwise. Noting $p_{HH} = \frac{p_{H0}}{p_{00}} p_{0H}$, it follows that

$$1 + \pi^{\text{Calvo}} = \lambda \frac{p_{H0}}{p_{00}} \frac{p_{0H}}{p_{00}} + (1 - \lambda) = 1 + \lambda \left(\frac{p_{H0}}{p_{00}} \frac{p_{0H}}{p_{00}} - 1\right) \tag{28}$$

$$= 1 + \lambda((1 + \pi_S)(1 + \pi_D) - 1) \tag{29}$$

The approximate formula follows when the multiplicative term is small: $\pi_S \pi_D \approx 0$. ■

Proof of Proposition 3.

The cutoff of price adjustment

$$\alpha_H^* = \frac{1 - k_H}{\Delta(1 + k_H) - 2k_H} > 0$$

since $0 \leq k_H < 1$. Hence, we can define $\alpha_0 = 0$ and $\alpha_1(\Delta) \equiv \alpha_H^*/2$. Then, no firm adjusts its price for any Δ. ■

C Regression Tables

Regressors. To conduct the regression analysis of our survey results, we construct four variables as composites of the firm-level characteristics we query. The composites are sums of Likert-item scale answers to related questions and measure a common factor among these answers. By inverting some statements, answers from inattentive respondents cancel out, which increases the statistical power of the regression. We center and standardize the variables for easier interpretation. The composite variables are described in Tables 3 to 6.

Additionally, we include as regressors the number of employees, which we split into a

Customer understanding

Sign	Statement
+	The customers express understanding for my/our prices.
−	Some customers accuse me of profiteering.
+	The reasons for price increases are understandable to customers.

Table 3: Construction of a variable measuring the understanding of the hairdresser's customers for their prices. The respondents were asked to express their agreement with the statements on a scale from 1 (totally disagree) over 3 (undecided) to 5 (totally agree).

Satisfaction with pricing

Sign	Statement
+	I am satisfied with my pricing method.
+	My prices are optimal for the firm.
−	Actually, my prices should be higher.

Table 4: Construction of a variable measuring how satisfied the owners are with their own pricing. The respondents were asked to express their agreement with the statements on a scale from 1 (totally disagree) over 3 (undecided) to 5 (totally agree).

Hairwashing mandate

Sign	Statement
+	The mandatory hair washing is like a price increase.
+	I profit from the mandatory hair washing.

Table 5: Construction of a variable measuring how the owners view the mandatory hair washing. The respondents were asked to express their agreement with the statements on a scale from 1 (totally disagree) over 3 (undecided) to 5 (totally agree).

Pessimism

Sign	Statement
+	There will be another lockdown this year.
−	We will be back to normal in one year.
+	The hygiene measures will stay for years.
+	Fear of infection will deter customers for a long time.
+	Customers' willingness to pay will lastingly decrease.
−	My personal financial situation will improve.

Table 6: Construction of a variable measuring the owners' expectations and professional uncertainty, expressed as pessimism. The respondents were asked to express their agreement with the statements on a scale from 1 (totally disagree) over 3 (undecided) to 5 (totally agree).

continuous variable (zero to six employees, *Nr. Employees*) and a dummy variable (more than six employees, *Many employees*), the *share of regular customers* (standardized), and a dummy variable indicating whether or not the firm manager owns *more than one salon*. For

Table 7: Logit regression. The dependent variable is a dummy indicating whether or not the higher demand played a big role for the firm's price increase.

	(1)	(2)	(3)
const	-1.39***	-1.34***	-1.25
	(0.46)	(0.48)	(1.47)
Expand opening hours (dummy)	-1.14*	-1.35**	-1.64*
	(0.62)	(0.67)	(0.88)
Pessimism		-0.58*	-0.78
		(0.35)	(0.48)
Share of regular customers		-0.60	-0.84
		(0.48)	(0.59)
High underst. clients (dummy)			-1.08
			(1.01)
Nr. Employees (linear part)			0.33
			(0.29)
Many employees (dummy)			-0.00
			(1.54)
More than one salon (dummy)			-0.22
			(1.49)
Satisfaction with pricing			-0.26
			(0.31)
Hairwashing mandate			0.41
			(0.39)
Observations	111	106	99
Pseudo R2	0.04	0.09	0.17

Standard errors (HC3) in parentheses. * p<.1, ** p <.05, ***p <.01

Table 8: Marginal effects at means of logit regression. The dependent variable is a dummy indicating whether or not the higher demand played a big role for the firm's price increase.

	(1)
Expand opening hours (dummy)	-0.1139**
	(0.0506)
Pessimism	-0.0538*
	(0.0313)
Share of regular customers	-0.0585*
	(0.0351)
High underst. clients (dummy)	-0.0746
	(0.0660)
Nr. Employees (linear part)	0.0230
	(0.0217)
Many employees (dummy)	-0.0001
	(0.1064)
More than one salon (dummy)	-0.0155
	(0.1037)
Satisfaction with pricing	-0.0182
	(0.0210)
Hairwashing mandate	0.0283
	(0.0265)
Observations	99

Standard errors (HC3) in parentheses. * p<.1, ** p <.05, ***p <.01

the sake of interpretation of the results, we also introduce a dummy variable that indicates whether or not the firm's customer understanding is above the 40% quantile (in our sample, we see two clusters below and above this quantile), which we call *High underst. clients*. For some regressions, we also add a dummy variable indicating whether or not the firm has *expanded their opening hours* after the second lockdown.

Results. Table 7 shows the result of a logistic regression on whether or not higher demand played a big role for the firm's price increase. We find that whether or not the firm expanded its opening hours after the second lockdown is the only consistently significant regressor. Additionally, the degree of pessimism and the share of regular customers are borderline significant regressors. Table 8 shows the marginal effects at means of the logistic regression. We find that having expanded opening hours lowers the probability that higher demand played a big role for the price increase by 11pp. A one standard deviation higher value for pessimism, and a one standard deviation higher share of regular customers, also lowers the probability of higher demand playing a big role for the firm's price setting, by 5pp and 6pp, respectively.

Table 9 shows the result of a logistic regression on whether or not a firm increased its

Table 9: Logit regression. The dependent variable is a dummy indicating whether or not the firm increased their price during the lockdown.

	(1)	(2)
const	0.82***	0.89**
	(0.16)	(0.44)
Customer understanding	0.59***	0.66***
	(0.18)	(0.23)
Nr. Employees (linear part)		-0.05
		(0.14)
Many employees (dummy)		0.10
		(0.60)
More than one salon (dummy)		0.24
		(0.57)
Satisfaction with pricing		-0.17
		(0.21)
Hairwashing mandate		0.02
		(0.19)
Pessimism		-0.05
		(0.20)
Share of regular customers		0.08
		(0.22)
Observations	193	171
Pseudo R2	0.06	0.07

Standard errors (HC3) in parentheses. * p<.1, ** p <.05, ***p <.01

price after the second lockdown. We find that only the customer understanding variable predicts this decision. The coefficient is positive and highly significantly different from zero. To understand the economic significance, we compute the marginal effects at means of the logistic regression. The result is in Table 10. We find that being in the upper 60% of customer understanding increases the probability of a firm to increase its price by 26pp. The effect is highly significantly different from zero.

Table 10: Marginal effects at means of logit regression. The dependent variable is a dummy indicating whether or not the firm increased their price during the lockdown.

	(1)
High underst. clients (dummy)	0.2647***
	(0.0814)
Nr. Employees (linear part)	-0.0089
	(0.0288)
Many employees (dummy)	0.0563
	(0.1299)
More than one salon (dummy)	0.0338
	(0.1290)
Satisfaction with pricing	-0.0138
	(0.0411)
Hairwashing mandate	0.0153
	(0.0400)
Pessimism	-0.0097
	(0.0410)
Share of regular customers	0.0328
	(0.0451)
Observations	171

Standard errors (HC3) in parentheses. * p<.1, ** p <.05, ***p <.01

D Survey Questions

The following is the translation of our survey into English. Below the translation is the German original.

English Translation of Our Questionnaire

Page 1

Dear Sir or Madam,

on March 1, you were finally allowed to open up again. For our dissertations in economics at the University of Bonn, we investigate how the pandemic and the lockdown in Germany affect the hairdressers and the prices for haircuts.

We kindly ask you to take 10 to 15 minutes to fill out our survey. If you have less time at your proposal, we would also be happy for partially filled out forms (all answers are optional). You can also save your progress and continue the survey later; to do so, please click on "save progress" on the bottom of the page.

The survey is anonymous. We do not ask for or save any personal data. Your answers will be treated confidentially and only used for scientific purposes.

Thank you very much for your support!

Thomas Kohler and Maximilian Weiß

Page 2

First, we would like to get to know you and your firm better.

1. What is your role in the firm?
() I am the owner.
() I am a franchisee.
() I am an employed manager.
() I am an employee.
() Other: [free text field]
() not applicable

2. Are you involved in the pricing in your firm?
() Yes, I set the prices.
() Yes, I suggest prices to my superior.
() Yes, I set the prices in accordance with my franchising contract.

() Yes, my associates and I set the prices together.
() No
() Other: [free text field]

3. How many branches does your firm have? (In case of franchises, please for the franchisee)
() no branch (mobile hairdresser)
() one branch
() two branches
() three to five branches
() more than five branches
() can't or won't say

4. How many employees does your firm have? (In case of franchises, please for the franchisee)
() none
() one to three
() three to six
() more than six
() can't or won't say
Comment: [free text field]

5. Which share of your customers are regulars?
() 0 % to 19 %
() 20 % to 39 %
() 40 % to 59 %
() 60 % to 79 %
() 80 % to 100 %
() can't or won't say

Page 3

On this page, we'll ask you some questions about the price of a man's haircut in your firm. If you do not offer this haircut, please indicate so (You will then receive questions about the price of a woman's haircut).

6. What is the price of the following man's haircut in your firm?
short back and sides, wash, cut, blow dry, 25 minutes

Please fill in the price including a possible hygiene surcharge.
Please fill in the base price if you charge other surcharges (e.g. for Mondays, late appoint-

ments, new customers, or other).

Before this lockdown (until December 16, 2020): [free text field] Euros
() can't or won't say

First week of March 2021: [free text field] Euros
() can't or won't say

[Planned] April 2021: [free text field] Euros
() can't or won't say

() I don't offer this kind of haircut (in this case, please indicate "can't or won't say" everywhere in this question, ignore the rest of the page, and click on "Continue").

7. Had you lowered your prices because of the VAT reduction in the second half-year of 2020?
() yes
() no
() can't or won't say

8. Pricing parts (begin of March 2021)
If the price you filled in (for begin of March 2021) contains a hygiene surcharge, please indicate what it is. If you charge different hygiene surcharges for different services, please indicate the hygiene surcharge for the haircut described above.
If new customers pay more than regular customers, please indicate the price difference.
If you charge a surcharge for late appointments, Monday appointments or weekend appointments, please indicate the surcharge.

hygiene surcharge: [free text field] Euros
new customer surcharge: [free text field] Euros
surcharge for late appointments: [free text field] Euros
surcharge for Monday appointments: [free text field] Euros
surcharge for weekend appointments: [free text field] Euros
() can't or won't say

9. Do you make more or less profit per customer with the haircut described above compared to before the pandemic (February 2020)?
() today less
() same

() today more
() can't or won't say

10. Do you make more or less profit per customer with the haircut described above compared to before the last lockdown (December 2020)?
() today less
() same
() today more
() can't or won't say

Page 4 [only if indicated that the reference man's haircut is not offered]

On this page, we'll ask you some questions about the price of a woman's haircut in your firm.

11. What is the price of the following woman's haircut in your firm?
Length is to the shoulders; wash, cut, brush, blow dry. Total time around 45 minutes. No dying or highlights or similar.

Please fill in the price including a possible hygiene surcharge.
Please fill in the base price if you charge other surcharges (e.g. for Mondays, late appointments, new customers, or other).

Before this lockdown (until December 16, 2020): [free text field] Euros
() can't or won't say

First week of March 2021: [free text field] Euros
() can't or won't say

[Planned] April 2021: [free text field] Euros
() can't or won't say

12. Had you lowered your prices because of the VAT reduction in the second half-year of 2020?
() yes
() no
() can't or won't say

13. Pricing parts (begin of March 2021)
If the price you filled in (for begin of March 2021) contains a hygiene surcharge, please indi-

cate what it is.
If you charge different hygiene surcharges for different services, please indicate the hygiene surcharge for the haircut described above.
If new customers pay more than regular customers, please indicate the price difference.
If you charge a surcharge for late appointments, Monday appointments or weekend appointments, please indicate the surcharge.

hygiene surcharge: [free text field] Euros
new customer surcharge: [free text field] Euros
surcharge for late appointments: [free text field] Euros
surcharge for Monday appointments: [free text field] Euros
surcharge for weekend appointments: [free text field] Euros
() can't or won't say

14. Do you make more or less profit per customer with the haircut described above compared to before the pandemic (February 2020)?
() today less
() same
() today more
() can't or won't say

15. Do you make more or less profit per customer with the haircut described above compared to before the last lockdown (December 2020)?
() today less
() same
() today more
() can't or won't say

Page 5 [only if the indicated price for March strictly larger than the price for December]

16. Why have you increased your prices since December?
You have indicated that at least one of your prices was larger in March 2021 than in December 2020. Which role did the following factors play in your increasing the prices?
Reduced capacity due to distancing rules
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Recoup lost revenue / reduced reserves due to lockdown
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Increased demand
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Increased financing cost (for example because of new loans)
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Adjustment to the general price level
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Increased wage cost
() no role
() a small role
() a big role
() does not apply
() can't or won't say

The price increase is only temporary
() no role
() a small role

() a big role
() does not apply
() can't or won't say

Increased incidental cost
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Increased hygiene cost (masks, disinfection, time)
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Expectation that the customers understand the price increases
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Competitors have increased their prices
() no role
() a small role
() a big role
() does not apply
() can't or won't say

End of the VAT reduction
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Other important factors:
[free text field]
[free text field]
[free text field]

17. To what extent do you agree with these statements about your experiences with your customers?

The customers express understanding for my/our prices.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

The customers complain to me about their own financial situation.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

Some customers accuse me of profiteering.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

The customers tip more.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

The customers tip less.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

page 6 [only if the indicated price for March is not larger than the price for December]

18. Why have you not increased your prices since last December?

You have indicated that at least one of your prices is not larger in March 2021 than in December 2020.
Which role did the following factors play in your decision to not increase the price?
The prices are contracted
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Within the firm, we could not agree on a price increase
() no role
() a small role
() a big role
() does not apply
() can't or won't say

I am not sure whether increased prices would be better for the firm
() no role
() a small role
() a big role
() does not apply
() can't or won't say

A price increase would seem larger than it actually is
() no role

() a small role
() a big role
() does not apply
() can't or won't say

Increase the market share / gain new customers
() no role
() a small role
() a big role
() does not apply
() can't or won't say

The prices were already increased after the first lockdown (spring 2020)
() no role
() a small role
() a big role
() does not apply
() can't or won't say

The customers' budgets are smaller during the pandemic
() no role
() a small role
() a big role
() does not apply
() can't or won't say

VAT reduction was not passed on in the second half-year of 2020
() no role
() a small role
() a big role
() does not apply
() can't or won't say

The competitors have not increased their prices
() no role
() a small role
() a big role
() does not apply
() can't or won't say

The prices were not increased, so they don't have to be decreased again soon
() no role
() a small role
() a big role
() does not apply
() can't or won't say

The costs have not increased
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Retaining regular customers
() no role
() a small role
() a big role
() does not apply
() can't or won't say

Other important factors:
[free text field]
[free text field]
[free text field]

19. To what extent do you agree with these statements about your experiences with your customers?

The customers express understanding for my/our prices.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

The customers complain to me about their own financial situation.

() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

Some customers accuse me of profiteering.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

The customers tip more.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

The customers tip less.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

Page 7

On this page we ask you questions about how your company is dealing with the political measures and how you assess future developments.
20. If you received more requests for appointments for the beginning of March than you could satisfy: how did you deal with it?

Multiple answers are possible.

[ ] preferential treatment of new customers
[ ] hire more employees to offer more appointments
[ ] preferential treatment of customers that had appointments canceled in the past months
[ ] preferential treatment of regular customers
[ ] first come, first served
[ ] extend the opening hours to offer more appointments
[ ] charge a surcharge for new customers
() does not apply
() can't or won't say

21. To what extent do you agree with these statements about the mandate to wash the customers' hair?

I feel safer when I wash the customers' hair before the treatment.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

The mandatory hair washing is like a price increase.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

The customers find the mandatory hair washing acceptable.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

I profit from the mandatory hair washing.

() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

22. How accurate do you think the following predictions are?

We will be back to normal in one year.
() not at all
() rather not
() unclear
() rather
() very
() can't or won't say

The hygiene measures will stay for years.
() not at all
() rather not
() unclear
() rather
() very
() can't or won't say

Fear will deter customers for a long time.
() not at all
() rather not
() unclear
() rather
() very
() can't or won't say

My personal financial situation will improve (compared to today).
() not at all
() rather not
() unclear
() rather
() very

() can't or won't say

Due to (fighting) the pandemic, the customers' willingness to pay will lastingly decrease.
() not at all
() rather not
() unclear
() rather
() very
() can't or won't say

There will be another lockdown this year.
() not at all
() rather not
() unclear
() rather
() very
() can't or won't say

23. How unsure are you about your own professional future?
() not at all
() barely
() somewhat
() a lot
() can't or won't say

Page 8
On this page, we ask general questions about pricing in your firm.

24. In general, what do you pay most attention to when setting prices?
Multiple answers are possible.

[ ] Costs
[ ] The competitors' prices
[ ] The quality of my offer
[ ] Customer satisfaction
[ ] Adjustment to the general price level
[ ] Something else: [free text field]
() can't or won't say

25. To what extent do you agree with these statements about your pricing?

I am satisfied with my pricing method.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

My prices are optimal for the firm.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

Actually, my prices should be higher.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

The reasons for price increases are understandable for customers.
() totally disagree
() somewhat disagree
() undecided
() somewhat agree
() totally agree
() can't or won't say

Page 9

Thank you very much for participating in our study!
26. If you want to tell us anything, you can do so anonymously here (note: this answer will be saved together with the other answers, but without any personal information).
If you have a question that you would like an answer to, please feel free to email us.

[free text field]

Last page

Thank you again for participating!
Your answers have been saved, you may close the browser window now.

oeffnung_der_friseure → base 19.04.2021, 11:38

Seite 01

Startseite

Sehr geehrte Damen und Herren,

am 01. März durften Sie endlich wieder öffnen. Im Rahmen unserer Doktorarbeiten in VWL an der Universität Bonn untersuchen wir, wie sich die Pandemie und der Lockdown in Deutschland auf die Friseur/innen und die Preise für Haarschnitte auswirken.

Wir bitten Sie, sich 10 bis 15 Minuten Zeit zu nehmen, um unseren Fragebogen auszufüllen. Sollten Sie weniger Zeit zur Verfügung haben, würden wir uns auch über teilweise ausgefüllte Bögen freuen (alle Antworten sind optional). Sie können auch Ihren zwischenzeitlichen Fortschritt abspeichern und die Befragung zu einem späteren Zeitpunkt an der Stelle fortsetzen; dazu klicken Sie bitte auf "Fortschritt speichern" am unteren Rand der Seite.

Die Befragung ist anonym. Es werden keinerlei personenbezogene Daten erhoben oder gespeichert. Ihre Angaben werden vertraulich behandelt und nur für wissenschaftliche Zwecke verwendet.

Herzlichen Dank für Ihre Unterstützung!
Thomas Kohler und Maximilian Weiß

PHP-Code

```
$pageNr = 1;
replace('%ownPageNumber%',$pageNr);
option('progress',round(100*$pageNr/7));
option('progress.last','KO');
```

Seite 02

PHP-Code

```
$pageNr = 2;
replace('%ownPageNumber%',$pageNr);
option('progress',round(100*$pageNr/7));
```

Teil 1 Allgemein

Zunächst möchten wir etwas über Sie und Ihr Unternehmen erfahren.

AI03

1. Was ist Ihre Rolle in Ihrem Unternehmen?

- ○ Ich bin der/die Besitzer/in
- ○ Ich bin Franchise- oder Lizenznehmer/in
- ○ Ich bin angestelle/r Betriebsleiter/in
- ○ Ich bin Angestellte/r
- ○ Anderes:

- ○ Nicht zutreffend

AI02

2. Sind Sie an der Preissetzung in Ihrem Unternehmen beteiligt?

- ○ Ja, ich bestimme die Preise selbst
- ○ Ja, ich schlage meiner/m Vorgesetzten Preise vor
- ○ Ja, ich wähle die Preise im Rahmen meines Franchise-Vertrags
- ○ Ja, mein/e Geschäftspartner/in und ich wählen die Preise gemeinsam
- ○ Nein
- ○ Anderes:

AI04

3. Wie viele Filialen hat Ihr Unternehmen? (Bei Franchises bitte für das Franchise-nehmende Unternehmen)

- ○ keine Filiale (mobiler Friseur)
- ○ eine Filiale
- ○ zwei Filialen
- ○ drei bis fünf Filialen
- ○ mehr als fünf Filialen

- ○ Kann / Möchte ich nicht sagen

AI05

4. Wie viele Angestellte hat Ihr Unternehmen? (Bei Franchises bitte für das Franchise-nehmende Unternehmen)

- ○ keine
- ○ eine/n bis drei
- ○ drei bis sechs
- ○ mehr als sechs

- ○ Kann / Möchte ich nicht sagen

AI08

Anmerkung:

5. Welcher Anteil Ihrer Kunden sind Stammkunden?

AI01

- ○ 0 % bis 19 %
- ○ 20 % bis 39 %
- ○ 40 % bis 59 %
- ○ 60 % bis 79 %
- ○ 80 % bis 100 %

- ○ Kann / Möchte ich nicht sagen

Seite 03

PHP-Code

```
$pageNr = 3;
replace('%ownPageNumber%',$pageNr);
option('progress',round(100*$pageNr/7));
```

Teil 2 Preise Haarschnitt 1

Auf dieser Seite stellen wir Ihnen einige Fragen zum Preis eines Herren-Haarschnitts in Ihrem Unternehmen. Falls Sie diesen Haarschnitt nicht anbieten, markieren Sie dies bitte (Sie erhalten dann Fragen zum Preis eines Damen-Haarschnitts).

PL01

6. Wie viel kostet der folgende Herren-Haarschnitt in Ihrem Unternehmen?

Klassischer Fassonschnitt. Waschen, Schneiden, Föhnen. Gesamtdauer etwa 25 Minuten.

Bitte geben Sie den Preis inklusive einer eventuellen Hygienepauschale an.

Bitte geben Sie den Grundpreis an, falls Sie andere Zuschläge (z.B. montags, späte Termine, für Neukunden oder ähnliches) erheben.

Vor diesem Lockdown (bis zum 16. Dezember 2020)		Euro	☐ Kann / Möchte ich nicht sagen
Erste Märzwoche 2021		Euro	☐ Kann / Möchte ich nicht sagen
April 2021		Euro	☐ Kann / Möchte ich nicht sagen

PL14

☐ Ich biete diese Art Haarschnitt nicht an (Bitte kreuzen Sie in diesem Fall bei dieser Frage überall „Kann ich nicht sagen“ an und ignorieren Sie bitte den Rest dieser Seite und klicken auf „Weiter“.)

PL16

7. Hatten Sie aufgrund der Mehrwertsteuersenkung im zweiten Halbjahr 2020 Ihre Preise gesenkt?

○ ja	○ nein	○ Kann / Möchte ich nicht sagen

PL05

8. Preisbestandteile (Anfang März 2021)

Falls der angegebene Preis (Anfang März 2021) eine Hygienepauschale beinhaltet, geben Sie bitte an, wie hoch diese ist. Falls Sie eine unterschiedlich hohe Hygienezuschläge für unterschiedliche Dienstleistungen erheben, geben Sie bitte den Hygienezuschlag für den oben beschriebenen Haarschnitt an.

Falls Neukunden mehr zahlen als Stammkunden, geben Sie bitte den Preisunterschied an.

Falls Sie einen Zuschlag für späte Termine, für Termine am Montag oder für Termine am Wochenende erheben, geben Sie bitte die Höhe des Zuschlags an.

☐ Hygienepauschale: Euro

☐ Neukunden-Zuschlag: Euro

☐ Zuschlag für späte Termine: Euro

☐ Zuschlag für Termine am Montag: Euro

☐ Zuschlag für Termine am Wochenende: Euro

☐ Kann / Möchte ich nicht sagen

9. Machen Sie mit dem oben beschriebenen Haarschnitt pro Kunde heute mehr oder weniger Gewinn als vor der Pandemie (Februar 2020)?

heute weniger	gleich viel	heute mehr	Kann / Möchte ich nicht sagen
○	○	○	○

10. Machen Sie mit dem oben beschriebenen Haarschnitt pro Kunde heute mehr oder weniger Gewinn als vor dem letzten Lockdown (Dezember 2020)? PL10

heute weniger	gleich viel	heute mehr	Kann / Möchte ich nicht sagen
○	○	○	○

Seite 04

PHP-Code

```
if (value('PL14_01')==1){
goToPage('PH');
}
$pageNr = 3;
replace('%ownPageNumber%',$pageNr);
option('progress',round(100*$pageNr/7));
```

Teil 2 Preise Haarschnitt 2

Auf dieser Seite stellen wir Ihnen einige Fragen zum Preis eines Damen-Haarschnitts in Ihrem Unternehmen.

PL02

11. Wie viel kostet der folgende Damen-Haarschnitt in Ihrem Unternehmen?

Haarlänge: etwa schulterlang

Waschen, Schneiden, Kämmen, Föhnen. Gesamtdauer etwa 45 Minuten.

Keine Farbe, Strähnchen oder ähnliches.

Bitte geben Sie den Preis inklusive einer eventuellen Hygienepauschale an.

Bitte geben Sie den Grundpreis an, falls Sie andere Zuschläge (z.B. montags, späte Termine, für Neukunden oder ähnliches) erheben.

Vor diesem Lockdown (bis zum 16. Dezember 2020)		Euro	☐ Kann / Möchte ich nicht sagen
Erste Märzwoche 2021		Euro	☐ Kann / Möchte ich nicht sagen
April 2021		Euro	☐ Kann / Möchte ich nicht sagen

PL17

12. Hatten Sie aufgrund der Mehrwertsteuersenkung im zweiten Halbjahr 2020 Ihre Preise gesenkt?

○ ja	○ nein	○ Kann / Möchte ich nicht sagen

PL13

13. Preisbestandteile (Anfang März 2021)

Falls der angegebene Preis (Anfang März 2021) eine Hygienepauschale beinhaltet, geben Sie bitte an, wie hoch diese ist. Falls Sie eine unterschiedlich hohe Hygienezuschläge für unterschiedliche Dienstleistungen erheben, geben Sie bitte den Hygienezuschlag für für den oben beschriebenen Haarschnitt an.

Falls Neukunden mehr zahlen als Stammkunden, geben Sie bitte den Preisunterschied an.

Falls Sie einen Zuschlag für späte Termine, für Termine am Montag oder für Termine am Wochenende erheben, geben Sie bitte die Höhe des Zuschlags an.

☐ Hygienepauschale: Euro

☐ Neukunden-Zuschlag: Euro

☐ Zuschlag für späte Termine: Euro

☐ Zuschlag für Termine am Montag: Euro

☐ Zuschlag für Termine am Wochenende: Euro

☐ Kann / Möchte ich nicht sagen

14. Machen Sie mit dem oben beschriebenen Haarschnitt pro Kunde heute mehr oder weniger Gewinn als vor der Pandemie (Februar 2020)?

heute weniger	gleich viel	heute mehr	Kann / Möchte ich nicht sagen
○	○	○	○

15. Machen Sie mit dem oben beschriebenen Haarschnitt pro Kunde heute mehr oder weniger Gewinn als vor dem letzten Lockdown (Dezember 2020)? PL12

heute weniger	gleich viel	heute mehr	Kann / Möchte ich nicht sagen
○	○	○	○

Seite 05
PH

PHP-Code

```
if (
(
(value('PL14_01') == 1) and (value('PL01_02') <= value('PL01_01'))
)
or
(
(value('PL14_01') == 2) and (value('PL02_02') <= value('PL02_01'))
)
){
goToPage('PG');
}
$pageNr = 4;
replace('%ownPageNumber%',$pageNr);
option('progress',round(100*$pageNr/7));
```

PL03

16. Weshalb haben sich Ihre Preise seit letztem Dezember erhöht?

Sie haben angegeben, dass mindestens einer Ihrer Preise im März 2021 höher ist als er im Dezember 2020 war. Welche Rolle haben die folgenden Faktoren bei der Preiserhöhung gespielt?

	Keine Rolle	Eine kleine Rolle	Eine große Rolle	Trifft nicht zu	Kann / Möchte ich nicht sagen
verringerte Kapazität durch Abstandsregelungen	○	○	○	○	○
Ausgleich des entgangenen Umsatzes / des Rücklagenabbaus durch den Lockdown	○	○	○	○	○
höhere Nachfrage	○	○	○	○	○
gestiegene Finanzierungskosten (zum Beispiel wegen Kreditaufnahme)	○	○	○	○	○
Anpassung an das allgemeine Preisniveau	○	○	○	○	○
gestiegene Lohnkosten	○	○	○	○	○
Die Preiserhöhung ist nur kurzfristig.	○	○	○	○	○
gestiegene Nebenkosten	○	○	○	○	○
gestiegener Hygieneaufwand (Masken, Desinfektionsmittel und Zeit)	○	○	○	○	○
Erwartung, dass Kunden für Preiserhöhung Verständnis haben	○	○	○	○	○
gestiegene Preise der Konkurrenz	○	○	○	○	○
Ende der Mehrwertsteuersenkung	○	○	○	○	○

PL07

Sonstige wichtige Faktoren:

17. Inwiefern stimmen Sie diesen Aussagen über Ihre Erfahrungen mit Ihren Kunden zu? PL15

	stimme gar nicht zu	stimme eher nicht zu	unent-schieden	stimme eher zu	stimme voll zu	Kann / Möchte ich nicht sagen
Die Kunden äußern Verständnis für meine/unsere Preise.	○	○	○	○	○	○
Die Kunden beklagen sich aufgrund ihrer eigenen finanziellen Situation über die Preise.	○	○	○	○	○	○
Einzelne Kunden haben mir vorgeworfen von der Krise profitieren zu wollen.	○	○	○	○	○	○
Die Kunden geben mehr Trinkgeld.	○	○	○	○	○	○
Die Kunden geben weniger Trinkgeld.	○	○	○	○	○	○

Seite 06
PG

PHP-Code

```
if ((value('PL01_02') > value('PL01_01')) or (value('PL02_02') > value('PL02_01'))) {
goToPage('RA');
}
$pageNr = 4;
replace('%ownPageNumber%',$pageNr);
option('progress',round(100*$pageNr/7));
```

PL04

18. Weshalb haben sich Ihre Preise seit letztem Dezember nicht erhöht?

Sie haben angegeben, dass mindestens einer Ihrer Preise im März 2021 nicht höher ist als er im Dezember 2020 war. Welche Rolle haben die folgenden Faktoren bei der Entscheidung, den Preis nicht zu erhöhen, für Sie gespielt?

	keine Rolle	eine kleine Rolle	eine große Rolle	Trifft nicht zu	Kann / Möchte ich nicht sagen
Die Preise sind vertraglich festgelegt.	○	○	○	○	○
Innerhalb des Unternehmens konnten wir uns nicht auf Preissteigerungen einigen.	○	○	○	○	○
Ich weiß nicht, ob höhere Preise besser für das Unternehmen wären.	○	○	○	○	○
Eine Preiserhöhung würde größer scheinen als sie wirklich ist.	○	○	○	○	○
Erhöhung des Marktanteils / neue Kunden gewinnen	○	○	○	○	○
Die Preise wurden bereits nach dem 1. Lockdown (Frühjahr 2020) erhöht.	○	○	○	○	○
Zahlungskraft der Kunden ist in der Pandemie geringer	○	○	○	○	○
Mehrwertsteuersenkung im zweiten Halbjahr 2020 wurde nicht weitergegeben	○	○	○	○	○
Die Konkurrenz hat ihre Preise nicht erhöht.	○	○	○	○	○
Die Preise wurden nicht erhöht, um sie nicht in absehbarer Zeit wieder senken zu müssen.	○	○	○	○	○
Die Kosten sind nicht gestiegen.	○	○	○	○	○
Erhalt der Stammkunden	○	○	○	○	○

PL08

Sonstige wichtige Faktoren:

19. Inwiefern stimmen Sie diesen Aussagen über Ihre Erfahrungen mit Ihren Kunden zu? PL15

	stimme gar nicht zu	stimme eher nicht zu	unent-schieden	stimme eher zu	stimme voll zu	Kann / Möchte ich nicht sagen
Die Kunden äußern Verständnis für meine/unsere Preise.	○	○	○	○	○	○
Die Kunden beklagen sich aufgrund ihrer eigenen finanziellen Situation über die Preise.	○	○	○	○	○	○
Einzelne Kunden haben mir vorgeworfen von der Krise profitieren zu wollen.	○	○	○	○	○	○
Die Kunden geben mehr Trinkgeld.	○	○	○	○	○	○
Die Kunden geben weniger Trinkgeld.	○	○	○	○	○	○

Seite 07
RA

PHP-Code

```
$pageNr = 5;
replace('%ownPageNumber%',$pageNr);
option('progress',round(100*$pageNr/7));
```

Teil 3 Zustand nach Lockdown

Auf dieser Seite stellen wir Ihnen Fragen dazu, wie Ihr Unternehmen mit den politischen Maßnahmen umgeht, und wie Sie die zukünftige Entwicklung einschätzen.

LO04

20. Falls Sie für Anfang März mehr Terminanfragen erhalten haben, als Sie Termine zu vergeben hatten: wie sind Sie damit umgegangen?

Mehrfachantworten sind möglich

- ☐ Bevorzugung von Neukunden
- ☐ Anstellung von Mitarbeitern, um mehr Termine anbieten zu können
- ☐ Bevorzugung von Kunden, deren Termine in den letzten Monaten abgesagt werden mussten
- ☐ Bevorzugung von Stammkunden
- ☐ Wer zuerst angefragt hat, hat Termine bekommen
- ☐ Ausweitung der Öffnungszeiten, um mehr Termine anbieten zu können
- ☐ Erhebung eines Zuschlags für Neukunden

- ☐ Trifft nicht zu
- ☐ Kann / Möchte ich nicht sagen

LO01

21. Inwiefern stimmen Sie diesen Aussagen über die Pflicht zum Haarewaschen zu?

	Stimme gar nicht zu	Stimme eher nicht zu	Unent-schieden	Stimme eher zu	Stimme voll zu	Kann / Möchte ich nicht sagen
Ich fühle mich sicherer, wenn die Haare der Kunden vor der Behandlung gewaschen werden.	○	○	○	○	○	○
Die Pflicht zum Haarewaschen ist wie eine Preiserhöhung.	○	○	○	○	○	○
Die Kunden finden die Pflicht zum Haarewaschen akzeptabel.	○	○	○	○	○	○
Ich profitiere finanziell von der Pflicht zum Haarewaschen.	○	○	○	○	○	○

LO07

22. Für wie zutreffend halten Sie die folgenden Vorhersagen?

	gar nicht	eher nicht	unklar	eher ja	sehr	Kann / Möchte ich nicht sagen
In einem Jahr werden wir wieder den Zustand von vor der Pandemie haben.	○	○	○	○	○	○
Infektionsschutzmaßnahmen werden noch für Jahre vorgeschrieben bleiben.	○	○	○	○	○	○
Die Angst vor dem Virus wird manche Menschen noch lange Zeit von einem Friseurbesuch abhalten.	○	○	○	○	○	○
Meine persönliche finanzielle Situation wird sich längerfristig verbessern (verglichen zu heute).	○	○	○	○	○	○
Infolge der Pandemie(bekämpfung) wird die Zahlungsbereitschaft meiner/unserer Kunden nachhaltig sinken.	○	○	○	○	○	○
Es wird dieses Jahr einen weiteren Lockdown geben, in dem Friseurläden wieder schließen müssen.	○	○	○	○	○	○

LO08

23. Wie unsicher sind Sie sich über Ihre berufliche Zukunft?

gar nicht	kaum	etwas	sehr	Kann / Möchte ich nicht sagen
○	○	○	○	○

Seite 08

PHP-Code

```
$pageNr = 6;
replace('%ownPageNumber%',$pageNr);
option('progress',round(100*$pageNr/7));
```

Teil 4 Preissetzung allgemein

Auf dieser Seite stellen wir Ihnen allgemeine Fragen zur Preissetzung in Ihrem Unternehmen.

PA01

24. Im Allgemeinen, worauf achten Sie am meisten bei der Preissetzung?

Mehrfachantworten sind möglich

- ☐ Kosten
- ☐ Preise der Konkurrenz
- ☐ Qualität meines Angebots
- ☐ Kundenzufriedenheit
- ☐ Anpassung an das allgemeine Preislevel
- ☐ Anderes:

- ☐ Kann / Möchte ich nicht sagen

PA02

25. Inwiefern stimmen Sie diesen Aussagen über Ihre Preissetzung zu?

	stimme gar nicht zu	stimme eher nicht zu	unent-schieden	stimme eher zu	stimme voll zu	Kann / Möchte ich nicht sagen
Ich bin zufrieden mit der Art wie ich/wir Preise setze/n.	○	○	○	○	○	○
Die Preise sind optimal für das Unternehmen gewählt.	○	○	○	○	○	○
Eigentlich sollten die Preise höher sein.	○	○	○	○	○	○
Die Gründe für Preiserhöhungen sind für die Kunden nachvollziehbar.	○	○	○	○	○	○

Seite 09
KO

PHP-Code

```
$pageNr = 7;
replace('%ownPageNumber%',$pageNr);
option('progress',round(100*$pageNr/7));
```

Danke

Vielen Dank für Ihre Teilnahme an unserer Studie!

S001

26. Wenn Sie uns etwas mitteilen möchten, können Sie dies hier anonym tun

Anmerkung: Diese Antwort wird zusammen mit Ihren anderen Antworten, aber ohne personenbezogene Informationen gespeichert.

Sollten Sie eine Frage haben, auf die Sie eine Antwort wünschen, können Sie uns gerne eine E-Mail schreiben.

Letzte Seite

Nochmals vielen Dank für Ihre Teilnahme!

Ihre Antworten wurden gespeichert, Sie können das Browser-Fenster nun schließen.

Thomas Kohler und Maximilian Weiß, Bonn Graduate School of Economics

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