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A price theory of price gouging

Scott Duke Kominers ® Piotr Dworczak

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Scott Duke Kominers
Harvard University, and a16z crypto

Piotr Dworczak
FAME|GRAPE, and Northwestern University

Abstract

We propose an economic definition of price gouging: *Price gouging occurs in a competitive market when lowering the price from the market-clearing level would increase total Utilitarian welfare*. We then use price-theoretic tools to characterize determinants of price gouging in a setting with income heterogeneity and non-quasi-linear preferences that induce a motive to redistribute across agents. The circumstances under which price gouging occurs in our framework align with the contexts covered by existing anti–price gouging laws. By proposing a definition of price gouging that does not appeal to any non-economic notions of (un)fairness or excess, we hope to provide a pathway for follow-up theoretical and empirical research.

Keywords:

price gouging, price control, market design

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D47, D63, D82

Corresponding author

Scott Duke Kominers, kominers@fas.harvard.edu

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Foundation of Admirers and Mavens of Economics
Koszykowa 59/7
00-660 Warszawa
Poland

W | grape.org.pl
E | grape@grape.org.pl
TT | GRAPE_ORG
FB | GRAPE.ORG
PH | +48 799 012 202

1 Introduction

Laws forbidding "price gouging"—i.e., significant price increases that are deemed "excessive" or "unfair"—are prevalent worldwide, and have been discussed, revisited, and strengthened in recent years.[1] Despite their popularity, anti–price gouging laws would seem to be poor policy from an economics perspective. Standard economic intuition—rooted in welfare theorems—suggests that when the market-clearing price goes up in a competitive market, trade at that price is in fact particularly valuable;[2] beyond cases of collusion or monopoly power, preventing market prices from rising would result in loss of economic surplus. Moreover, price gouging may not even appear to be a well-defined concept in the paradigm of mainstream economics, as it is difficult to say what could be "excessive" or "unfair" about prices adjusting to equalize demand and supply.

Yet in this note, we argue that price gouging can be defined and analyzed within a canonical economic framework. The key idea is to consider the *redistributive* consequences of a price change. For example, a demand shock that sharply increases the market-clearing price of a certain good creates rents for the sellers at the expense of the buyers. To capture redistributive effects, we study a simple price-theoretic model of a market in which traders receive different marginal social welfare weights depending on their income and other characteristics. We propose the following definition: *Price gouging is occurring in a competitive market if a price decrease from the market-clearing level would increase social welfare.*

Without redistributive preferences, i.e., when the social planner is satisfied with any Pareto efficient allocation, price gouging—as we have defined it—cannot occur, because of the first welfare theorem. With redistributive preferences, however, it is possible that a price increase shifts surplus away from traders with high welfare weights towards traders with low welfare weights. If the negative redistributive effect is strong enough, limiting the price increase by imposing a price cap may raise total welfare, despite the resulting allocative inefficiency.

In particular, we show that price gouging is more likely to be occurring when there is significant income disparity between buyers and sellers; when low-income buyers constitute a significant fraction of total demand (e.g., because the good is essential); when there is

[1] See, for example, Caruso (2023) for a discussion of how U.S. states' anti–price gouging laws were used and expanded to address shortages early-on in the Covid-19 pandemic; Helveston (2024) for their use in response to natural disasters (such as hurricanes) and other emergencies (such as power grid collapses); and Khouri (January 16, 2025) for their recent use in response to rental price increases following the early-2025 Los Angeles wildfires; as well as Kuhn et al. (2020) and *Reuters* (December 10, 2022) for the use of similar measures in the E.U. and China. Discussions about price gouging also factored heavily into the political conversation leading into the 2024 U.S. election (see, e.g., Bourne (May 1, 2024); Deggans (December 1, 2024); Lucas and Repko (September 29, 2024)).

[2] See, for example, Giberson (2011), Miron (May 27, 2022), and Cochrane (November 11, 2024).

a gap between the market-clearing price and sellers' marginal costs;[3] and when demand and supply are relatively inelastic. For example, sharp price increases of critical goods during an emergency (such as hand sanitizer during a pandemic or sandbags during a flood) might qualify as price gouging under our definition. The reason is that the need to purchase them may strain low-income buyers while creating windfall profits for sellers that may not have a high social welfare weight. Beyond the case of emergencies, the logic just described could also apply to essential medical products and services. At the same time, price gouging is unlikely to occur in markets that are in their long-run equilibrium (with prices close to marginal costs for most sellers); for goods that have affordable substitutes (e.g., ordinary food items); or when the price increases are mostly cost-driven.

Our definition of price gouging has several advantages. First, it relies only on familiar economic primitives and assumptions, and hence lends itself to standard economic analysis. Second, it helps explain the popular perception that price gouging is unfair and should be prevented: In our framework, price gouging is socially undesirable precisely because it fails to maximize social welfare. Finally, applying the definition allows us to reason about *when* price gouging might be taking place in practice: The circumstances we identify broadly align with some of the cases anti–price gouging laws are designed to address. At the same time, our analysis supports the "baseline" economic intuition—suggesting that price controls can be harmful—in most cases.

That being said, we stress the limitations of our framework. This note does not attempt to characterize optimal market interventions. In particular, while our analysis uses a price-control intervention to *define* price gouging, it does not imply that price controls are always a desirable policy response to price gouging.[4] It does suggest, however, that anti–price gouging laws may—under relatively narrow circumstances—act as "automatic equity stabilizers." While a negative shock decreases welfare by nature, well-designed anti–price gouging laws could prevent social welfare from decreasing further due to price adjustments in affected markets (in an analogy to how automatic fiscal stabilizers dampen fluctuations in economic activity even in the absence of active policy interventions).

Another limitation is that our framework is static. While we can capture certain features of short-run shocks by appropriately choosing the parameters of the model (e.g., the distribution of marginal costs), we cannot address important policy questions related to the extent and duration of anti–price gouging interventions.

Finally, our definition of price gouging is sensitive to the specification of social preferences

[3]Such a gap may appear in the short run even in very competitive markets after a positive demand shock.

[4]In fact, as we showed in previous work (Dworczak ⓡ al. (2021)), badly designed price controls can be regressive on top of being distortionary.

for redistribution. To limit the arbitrariness of this input into our framework, we derive social marginal welfare weights from an exogenous income distribution and a common concave utility function for consumption; nevertheless, any empirical evaluation of price gouging under our framework requires making interpersonal utility comparisons.

The remainder of this note is organized as follows: In Section 2, we present our framework, formulate the definition of price gouging, and characterize its determinants. In Section 3, we discuss policy implications (Section 3.1); illustrate how our findings align with existing anti–price gouging laws (Section 3.2); and explain how our work relates to previous research on price fairness and market design under redistributive concerns (Sections 3.3 and 3.4).

2 Main Analysis

2.1 Framework

There is a unit mass of (potential) buyers of an indivisible good priced at p. Each buyer solves the optimization problem

$$\max_{c\in\mathbb{R},\, x\in\{0,1\}} \quad \{u(c)+\theta x\} \qquad \text{subject to} \qquad c+px\leq y,$$

where θ is a private preference parameter, y is the (privately-observed) disposable income, and x captures the decision to either buy or not buy the good. The variable c represents the consumption of all other goods and services (for simplicity, we allow $c<0$). The utility function $u(c)$ is concave and strictly increasing. The parameters $(\theta,\, y)$ have a joint distribution given by the marginal distribution $G_B(y)$ of income and the conditional distribution of the preference parameter $F_B(\theta\,|\,y)$, conditional on any income level y.

We can define demand for the indivisible good at price p and income level y by

$$D_y(p)=1-F_B(u(y)-u(y-p)\,|\,y),$$

and total demand at price p as

$$D(p)=\int D_y(p)dG_B(y).$$

There is a unit mass of (potential) sellers of the good. Each seller can procure one unit of the good at marginal cost k, which is each seller's private information. The sellers have the same utility function for general consumption as the buyers; their utility if they sell the good

at price p is therefore

$$u(y + p - k),$$

where y has distribution $G_S(y)$, and k has a conditional distribution $F_S(k \mid y)$.[5] If a seller does not sell the good, they obtain utility $u(y)$; hence, a seller decides to sell the good if and only if $p \geq k$. Thus, we define supply at price p as

$$S(p) = \int F_S(p \mid y) dG_S(y).$$

The dispersion in marginal costs allows us to capture various market conditions in a static framework. For example, a long-run equilibrium of a competitive market can be modeled by all sellers having the same marginal cost k_{LR}. The case of fixed supply S can be captured by specifying that a measure S of sellers have zero marginal cost and measure $1-S$ of sellers have a prohibitively high marginal cost. Finally, we can replicate the circumstances associated with a short-run demand shock by assuming that a fraction S of sellers have marginal cost k_{LR} (representing the existing stock) while a fraction $1 - S$ of sellers have marginal cost $k_{\text{SR}} > k_{\text{LR}}$, reflecting short-run constraints on the supply chain. The distribution of costs maps into the supply elasticity, which will play an important role in our analysis.

The competitive-equilibrium price $p^\star$ is defined by

$$D(p^\star) = S(p^\star).$$

2.2 Social welfare

We assume that the social planner aims to maximize total Utilitarian welfare. Welfare at any price $p \leq p^\star$ is the sum of all agents' utilities:

$$\begin{aligned} W(p) = &\iint \left[\mathbf{1}_{k \leq p}\, u(y + p - k) + (1 - \mathbf{1}_{k \leq p})\, u(y)\right] dF_S(k \mid y) dG_S(y) \\ + &\iint \left[\mathbf{1}_{\theta \geq u(y) - u(y-p)}\, \frac{S(p)}{D(p)}\, (u(y-p) + \theta) + \left(1 - \mathbf{1}_{\theta \geq u(y) - u(y-p)}\, \frac{S(p)}{D(p)}\right) u(y)\right] dF_B(\theta \mid y) dG_B(y). \end{aligned} \tag{2.1}$$

The first term in (2.1) is the welfare of sellers; since we assumed that $p \leq p^\star$, all sellers who want to sell (i.e., those whose cost k is below the price p) obtain utility $u(y + p - k)$; the remaining sellers obtain utility $u(y)$. The second term in (2.1) is the welfare of buyers. An

[5] For simplicity, we do not model the decision of sellers to consume the indivisible good; one interpretation is that sellers in our model are businesses, and their utility function and income are reduced-from ways of capturing redistribution of profits to business owners.

important assumption is that when $p < p^\star$, the resulting rationing is *uniform*. Buyers who would like to buy (i.e., those for whom the private value θ is above $u(y) - u(y-p)$) succeed in doing so with probability $S(p)/D(p)$ and obtain utility $u(y-p)+\theta$; the remaining buyers obtain utility $u(y)$.[6]

When maximizing Utilitarian welfare of the form (2.1), redistributive preferences arise due to an unequal income distribution and the concavity of the utility function u. The social planner in our framework has no intrinsic preference to allocate the good to the poorest agents: Indeed, if the consumption levels c were fixed for all agents, the planner would allocate the good to the agents with the highest values θ. However, when agents exchange consumption c for the good x in the market for a strictly positive price p, buying the good has a higher (opportunity) cost for agents with lower income (because the opportunity cost is approximately $p \cdot u'(c)$); this is why a change in the price p of the good has redistributive consequences, which are relevant from the planner's perspective.

2.3 Price gouging

We say that *price gouging occurs* when the competitive-equilibrium price $p^\star$ does not maximize welfare, i.e., when

$$W(p) > W(p^\star) \text{ for some } p < p^\star.$$

In our setting, as long as the utility function u is not linear, maximizing Utilitarian welfare is *not* equivalent to Pareto efficiency. Thus, even though the competitive equilibrium is Pareto efficient (the first welfare theorem holds), it need not maximize Utilitarian welfare.[7] At the same time, because we analyze a very limited set of instruments (i.e., changing the price in the market), the conclusion of the second welfare theorem does not apply: the allocation at the welfare-maximizing price may trade off redistribution against efficiency. (See Section 3.1 for an extended discussion of the relationship between our analysis and the second welfare theorem.)

Remark. Our formal definition of price gouging would remain meaningful for *any* social welfare function W. For example, we could define a welfare function with explicit social welfare weights depending on a range of characteristics, possibly context-specific.[8] The function W could also be derived in a framework with market power or allocative externalities; in such

[6] We focused on the case $p \leq p^\star$ to simplify notation; this is also the relevant case for our applications. However, our theory has a straightforward extension to cases in which the competitive price could be too *low* from a social perspective.

[7] This observation is well-known; see, for example, Negishi (1960).

[8] For example, governments may be especially concerned about redistribution in contexts where shocks affect vulnerable communities directly in addition to through purchasing patterns.

cases, prices could be too high (or too low) for reasons not related to redistributive concerns. We do not take a stance on whether such situations should be analyzed as an instance of "price gouging" per se becasue they correspond to well-recognized market *failures*—with well-understood solution frameworks.

2.4 When does price gouging occur?

To provide intuition for when the competitive price $p^\star$ does not maximize social welfare, we can compute the (left) derivative of $W(p)$ at $p^\star$. A necessary condition for the competitive price to be optimal is that $W'(p^\star) \geq 0$; otherwise, welfare can be increased by lowering the price below the market-clearing level.[9] We have

$$W'(p^\star) = \iint_0^{p^\star} u'(y + p^\star - k) dF_S(k \,|\, y) dG_S(y) - \int u'(y - p^\star) D_y(p^\star) dG_B(y) + \frac{\varepsilon_S(p^\star) + \varepsilon_D(p^\star)}{p^\star} \left(\iint \left[u(y - p^\star) - u(y) + \theta \right]_+ dF_B(\theta \,|\, y) dG_B(y) \right), \quad (2.2)$$

where $\varepsilon_S(p^\star)$ denotes the value of the (uncompensated) supply elasticity and $\varepsilon_D(p^\star)$ denotes the absolute value of the (uncompensated) demand elasticity. To interpret (2.2), let

$$\lambda_S(p) = \frac{1}{S(p)} \iint_0^{p} u'(y + p - k) dF_S(k \,|\, y) dG_S(y)$$

be the average marginal value for money for sellers who sold the good at price p, and let

$$\lambda_B(p) = \int u'(y - p) \frac{D_y(p)}{D(p)} dG_B(y)$$

be the average marginal value for money for buyers who bought the good at price p.

Proposition 1. *Price gouging occurs in competitive equilibrium when*

$$\underbrace{S(p^\star) \left(\lambda_S(p^\star) - \lambda_B(p^\star) \right)}_{\mathsf{R}} + \underbrace{\frac{\varepsilon_S(p^\star) + \varepsilon_D(p^\star)}{p^\star}}_{\mathsf{E}} \underbrace{\left(\iint \left[u(y - p^\star) - u(y) + \theta \right]_+ dF_B(\theta \,|\, y) dG_B(y) \right)}_{\mathsf{G}} < 0.$$

The term G (for *gains*) in Proposition 1 represents the gains from trade that arise when buyers with the highest willingness to pay obtain the good in the competitive equilibrium. This term is always positive and represents the efficiency properties of competitive equilibrium. The G term is multiplied by a term labeled E (for *elasticity*), which measures how

[9] This condition is also sufficient when W is quasi-concave (and $p \leq p^\star$). We assume that the welfare function is continuously differentiable in the left neighborhood of the market-clearing price.

strongly demand and supply react to a price decrease. If price controls are introduced, demand increases above available supply, and hence rationing is needed. The first-order effect of rationing is the loss of trading surplus G proportional to the sum of supply and demand elasticities E.[10] Finally, the term R (for *redistribution*) captures the redistributive effect: When a price is decreased, a marginal dollar is transferred from an average seller who sold the good to an average buyer who bought the good.

Without income effects, that is, when $u(c) = c$ for all c, the redistributive effect disappears. Then, because the terms E and G are always non-negative, competitive equilibrium is welfare-maximizing. In general, however, when $u(y)$ is strictly concave, the term R could be negative. In such cases, i.e., when the marginal value for money is much higher for buyers than for sellers, a competitive price might no longer be optimal.

Term G is larger for goods for which there is larger taste heterogeneity, as measured by the dispersion of the distribution of θ—most of the gains from trade are captured by buyers whose willingness to pay exceeds the price substantially. To see that, imagine an extreme case in which there is no heterogeneity in income and tastes; this would make the term G zero in the competitive equilibrium. Intuitively, it is the heterogeneity of demand for the good that creates a role for markets to allocate to the "right" buyers. If all buyers have the same wilingness to pay for the good, it does not matter who gets it from the point of view of Utilitarian welfare—and hence rationing does not induce a welfare cost in that case.

The term E is larger when demand and supply are more elastic. This term lets us recover an intuitive statement that price gouging is not occurring in competitive equilibrium in a majority of cases. Indeed, in a long-run equilibrium of a competitive market, we would expect all marginal costs to be close to a common marginal cost k_{LR}, and the price $p^\star$ to be close to k_{LR}. In the extreme case when all sellers are identical, the long-run supply curve is perfectly elastic. As a result, even the slightest reduction in price below the equilibrium market price would eliminate supply entirely, as no seller would be willing to produce at a loss. Thus, Proposition 1 implies that price gouging is unlikely to occur in the long-run equilibrium of a competitive market, even if redistributive preferences are very strong. By contrast, the term E could become small after a demand shock that sends the market-clearing price above the long-run marginal cost k_{LR}; in fact, if supply is fixed in the short-run, supply elasticity is *zero* at any price above sellers' opportunity cost. For essential goods, the demand elasticity could also be small, limiting the allocative inefficiency of uniform rationing.

[10] Intuitively, uniform rationing leads to two kinds of inefficiencies on the buyer side relative to competitive pricing: (i) agents with high values for the good may not receive the good, and (ii) agents with willingness to pay below the price may receive it. For a small price distortion, only effect (i) is of first order (since it involves agents who are inframarginal), while effect (ii) is of second order (and hence does not appear in the formula).

Three factors determine the size of the redistributive effect R under a strictly concave u:

1. *The distribution of income among buyers and sellers:* The higher the distribution G_S of income among sellers relative to the distribution G_B of income among buyers, the larger the difference between λ_S and λ_B.

2. *The income composition of demand:* The larger the share of relatively low-income buyers among those who want to purchase the good (i.e., the larger the fractions $D_y(p^\star)/D(p^\star)$ for low values of y), the higher the value of $\lambda_B(p^\star)$.

3. *The sellers' profit margin:* The larger the gap between the market-clearing price $p^\star$ and the marginal costs k of the sellers who sell, the smaller the marginal value for money for the sellers $\lambda_S(p^\star)$.

In the presence of income effects (concavity of u), the strength of the redistributive effect R depends on the income distribution among potential buyers and sellers. Lowering the price—while keeping demand and supply fixed—is equivalent to effecting a monetary transfer from sellers to buyer. Importantly, the redistributive effect is stronger when low-income buyers constitute a relatively large share of total demand. This is because the redistribution associated with a lowered price is only affecting buyers who actually decide to buy at that price. Finally, the redistributive effect is more pronounced when sellers enjoy larger "windfall profits," interpreted as a large gap between the price they receive and the marginal cost, as these profits lower their marginal value for money.

2.5 Price gouging and inequality

Given the preceding discussion, it would be natural to conjecture that price gouging is more likely to occur in markets characterized by deeper inequalities. In this subsection, we use a parametrized example to refine and qualify that intuition.

Let us make a stylized assumption that

$$u'(c) = \begin{cases} 1 & c \geq \underline{c}, \\ 1+\Delta & c < \underline{c}, \end{cases}$$

for some $\Delta \geq 0$: An agent's marginal value for money is 1 as long as their consumption is above a subsistence level $\underline{c}$, but rises to $1+\Delta$ when the subsistence level is not achieved.[11] Inequality is controlled by the distributions of income G_B and G_S that determine the share of

[11] See Doligalski ⓟ Dworczak et al. (2025) for an analysis of optimal redistribution in an economy featuring agents with similar preferences.

buyers and sellers, respectively, below subsistence; Δ controls the utility impact of inequality by quantifying the level of need for people consuming below subsistence. Let us furthermore assume that income y and taste θ are statistically independent, and that sellers have a common marginal cost k_{LR} up to capacity S, which is lower than demand at the market-clearing price (e.g., supply is inelastic in the short run following a demand shock).

Relying on Proposition 1, and assuming that R is negative, we have:

$$|\mathsf{R}| \geq \Delta \left[\underbrace{(1 - F_B((1+\Delta)p^\star))}_{\mathsf{i}} \underbrace{G_B(\underline{c} + p^\star)}_{\mathsf{ii}} - \underbrace{G_S(\underline{c} - p^\star + k_{\text{LR}})}_{\mathsf{iii}} \right].$$

Term i represents (a lower bound on) the demand for the good among agents with income below $\underline{c} + p^\star$, that is, the buyers who will consume below subsistence after purchasing the good at the market price;[12] term ii is the total mass of such agents. Term iii is the total mass of sellers whose initial income plus profit is below the subsistence level.

Unsurprisingly, the redistributive effect is stronger when cross-side inequality is more pronounced: $|\mathsf{R}|$ is increasing in the share of buyers below subsistence and decreasing in the share of sellers below subsistence. Inequality is to some extent endogenous: Even if income distributions were identical for buyers and sellers, term ii would exceed term iii because purchases of the good push some buyers below the subsistence level, while the "windfall profit" $p^\star - k_{\text{LR}}$ lifts some sellers above subsistence.

The redistributive effect may increase or decrease with Δ. On the one hand, a higher Δ means that agents with low income value an additional dollar more; on the other hand, a higher Δ means that these agents are less likely to buy, precisely because higher value for money decreases their willingness to pay (term i goes down). For the redistributive effect to be strong, demand from low-income agents cannot fall too quickly with Δ. In other words, the preference parameter θ must have a distribution with a heavy right tail—a large fraction of agents must have a high need for the good.

The comparative statics of the term $\mathsf{E} \cdot \mathsf{G}$ in the degree of inequality are in general ambiguous because E tends to *increase* with inequality (as measured by Δ and the share of buyers with income below $\underline{c} + p^\star$) while G tends to *decrease* with inequality. This is intuitive: Buyers with a higher mariginal value for money are more price-sensitive, which increases demand elasticity; however, for the same reason, the gains from trade are lower for such agents.

[12] This is a lower bound since—to simplify the expression—we estimated from above the average value for money for agents whose income is between $\underline{c}$ and $\underline{c} + p^\star$ by $1 + \Delta$.

3 Discussion

In light of our analysis, the following conditions make emergence of price gouging more likely:

1. Supply and demand are inelastic (implying that the allocative inefficiency of price controls is small);
2. Sellers tend to be wealthier on average than prospective buyers;
3. The market-clearing price substantially exceeds sellers' marginal costs;
4. Demand for the good is high even among people with low income.

Condition 1 requires the good to satisfy a relatively basic need and have no close substitutes; it also requires that supply cannot be increased easily (at least in the short run). Condition 2 is likely to be satisfied if the good is primarily sold by corporations (even in competitive industries). Condition 3 is met during sudden and severe crises such as natural disasters or pandemics, causing large shifts in demand or disruptions in supply chains. Finally, Condition 4 may apply to goods that are necessities or are highly valuable in the context of an emergency situation.

3.1 Policy implications

Whenever price gouging occurs in our framework, there is—definitionally—some intervention that can improve welfare relative to competitive equilibrium allocation. The "gold standard" for such an intervention is set by the second welfare theorem: If the planner can directly transfer resources to agents with high marginal utilities, redistribution need not conflict with market efficiency.

In practice, information available to the policymaker is imperfect at best, which leads to a trade-off between efficiency and equity. Even in this case, however, the simple price-control intervention that we used to define price gouging need not be an optimal way to resolve the trade-off. In fact, as our previous work has emphasized (see, in particular, Dworczak ⓡ al., 2021), it is most likely *not* optimal: As long as willingness to pay is negatively correlated with marginal values for money (which seems to be the right assumption for most applications), rationing at a single price is a regressive policy on the buyer side.[13] Instead, the optimal mechanism tends to combine a subsidized option subject to rationing with a market option—targeting the implicit subsidy to the needy without creating excessive rents for the wealthy.

[13]For example, lowering the price of hand sanitizer during a pandemic from \$50 to \$40 delivers a \$10 benefit to all (successful) buyers who are wealthy enough to want to buy sanitizer regardless of its price, but delivers no benefits to buyers who cannot afford to pay \$40.

The case for anti–price gouging laws emerging from our analysis is thus as follows: If applied in the right circumstance, anti–price gouging laws may help mitigate the initial undesirable redistributional consequences of price adjustments in markets affected by sudden demand or supply shocks. However, they should be treated as a temporary measure that is an imperfect substitute for more refined redistributive tools. From that perspective, well-designed anti–price gouging laws may serve as "automatic equity stabilizers" in an analogy to automatic fiscal stabilizers that dampen the adverse effects of economic fluctuations but do not substitute for conventional policy tools.[14]

A good illustration is the context of extreme shocks creating acute need, such as natural disasters or pandemics. For example, sharp increases in prices of hand sanitizer and masks at the outset of the Covid-19 pandemic may have been instances of price gouging (Kominers (March 16, 2020)), in the sense in which we define it. And indeed, such cases were addressed by existing anti–price gouging laws—in particular when people bought up large stocks expressly for the purpose of reselling at higher prices (see, e.g., Gans (2020)).[15] Our framework suggests that price gouging may also be present in certain medical goods markets (consistent with arguments about fair drug pricing advanced by Sample (2017) and Persad (2020)), but only when those goods are to some extent necessary to consume, have no lower-priced substitutes, and are sufficiently expensive to produce strong income effects among disadvantaged populations.

The limited support for anti–price gouging policies provided by our framework calls for caution when expanding their scope. Importantly, under our definition, high prices are not an *a priori* indication of socially suboptimal pricing. For example—barring extreme shocks—price gouging is unlikely to occur in markets for groceries or other ordinary consumer products because for those types of goods, the welfare impact of consumers internalizing the price increase is unlikely to outweigh the cost of non-market allocation; if there are social concerns about pricing in these sorts of contexts, antitrust policy or expansion of conventional social programs (such as food stamps programs) may provide better remedies.

Additionally, as our analysis incorporates through the elasticity term E, all the factors in favor of responding to price gouging must be weighed against supply effects—if the supply impact of not letting price adjust is too high, then market pricing will be optimal despite

[14] In this sense, our framework aligns with the argument of Helveston (2024) that "[. . .] allowing market pricing in the wake of emergencies grants firms a surplus windfall. Price control laws serve as a direct check against this and, in doing so, help preserve the allocation of surplus between consumers and firms that is present in non-exigent circumstances."

[15] Finestone and Kingston (2022) observed that during a crisis such as a global pandemic that unfolds over a long period of time, as the crisis continues, the need for the price to adjust to drive supply to a new steady state becomes more important. This is line with our argument that as the suppply elasticity increases over time, the new steady-state price may remain high but no longer constitute price gouging in our sense.

its (potentially adverse) redistributive consequences. This again points in the direction of contexts such as natural disasters, where local price changes are both likely to be transient and unlikely to be first-order for triggering a supply response.[16]

Well-designed anti–price gouging laws should also take into account factors not captured by our framework. The knowledge that price controls and rationing will occur in an emergency situation may encourage consumers to hoard supplies (see, e.g., Parsons (2020); Chakraborti and Roberts (2021))—although the direction of this effect is unclear because hoarding can also happen if consumers anticipate significant price increases.[17] Moreover, instituting price caps may discourage conservation of resources precisely when those resources are most needed (Giberson (2011)).[18] Finally, rationing during emergency situations may force consumers to incur high search costs and potentially take excessive risk as they try to locate where essential supplies are available (see, e.g., Chakraborti and Roberts (2023)).

Our assumption of uniform rationing may also be overly simplified. In practice, any rationing scheme induces some degree of screening on unobservable characteristics, favoring people who are more resourceful, have a lower opportunity cost of time, or stronger social connections—all of which may correlate with income and other welfare-relevant characteristics. Depending on these correlations, accounting for more realistic rationing schemes could either reinforce or mute the redistributive benefits of anti–price gouging laws.[19] Similarly, resale may reduce the effectiveness of anti–price gouging laws by dissipating surplus through rent-seeking and redirecting it towards "profiteers." For anti–price gouging laws to work well in practice, it thus seems desirable to complement price caps with strategies for managing excess demand and reducing hoarding and resale (see, e.g., Smith (March 19, 2020)).

3.2 Anti–price gouging laws

Our analysis in Sections 2 and 3.1 gives intuition and qualified support for the form that anti–price gouging laws often take in practice. Indeed, the way that "price gouging" is characterized in these laws is often abstract and at first read may seem non-economic, but at least qualitatively tracks closely with our conclusions in Section 3.1: For exam-

[16] Even if price spikes do attract more supply on the margin—for example, by way of people bringing resources from neighboring areas—in the context of large disasters, the supply response is often coordinated by the government or other agencies, rather than the market.

[17] Additionally, as Fleck (2014) noted, creating foreseeable shortages can be welfare-positive if it leads to better preparedness in contexts where individuals would otherwise underinvest.

[18] Giberson (2011) noted that because wealthier agents have more ability to buy on the margin, this could happen in a way that further exacerbates inequality: "Capped prices tend to discourage conservation of needed goods or services. One family, evacuated from its home, may reserve two hotel rooms at a capped rate when they would have taken one at higher prices; late-arriving evacuees will find fewer rooms available."

[19] See Yang et al. (2024) for a formal theory of how to compare screening devices.

ple, the United States Congress (2024) has defined price gouging as "[selling] a good or service at an excessive price" "during an exceptional market shock"; the Commonwealth of Massachusetts (2020), meanwhile, used the language "unconscionably high price" "during [an] emergency".[20] These price gouging definitions—which are fairly representative at least within the U.S.[21]—explicitly incorporate the idea of a price increase through a significant, and likely transient, shock to demand, as well as language that gestures at welfare concerns.

Moreover, our framework at least conceptually suggests an economic approach to what constitutes an "excessive" or "unconscionably high" price increase: prices should be considered "too high" when their redistributive impact is high relative to the allocative benefits from market pricing. As Section 2.5 indicates, this is more likely to be the case when demand and supply are inelastic, and when the market-clearing price is substantially higher than marginal cost—and anti–price gouging laws also directly reflect these economic intuitions. For example, Commonwealth of Massachusetts (2020) *940 CMR 3.00* states:

> It shall be an unfair or deceptive act or practice, during any declared statewide or national emergency, for any business at any point in the chain of distribution or manufacture to sell or offer to sell to any consumer or to any other business any goods or services necessary for the health, safety or welfare of the public for an amount that represents an unconscionably high price. [...] A price is unconscionably high for the purposes of 940 CMR 3.18(3) if:
>
> (a) there is gross disparity between the price charged or offered; and
>
> 1. the price at which the same good or service was sold or offered for sale by the business in the usual course of business immediately prior to the onset of the declared statewide or national emergency; or
> 2. the price at which the same or similar product is readily obtainable from other businesses; and
>
> (b) the disparity is not substantially attributable to increased prices charged by the business's suppliers or increased costs due to an abnormal market disruption.

[20] Other anti–price gouging laws give explicit price increase thresholds, but the levels vary across states and it is not clear that there is any precise quantitative motivation behind them (other than the fact that they all correspond to substantial increases relative to standard market prices). For example, the State of Minnesota (2024) defined an "unconscionably excessive price" as being "more than 25 percent above the seller's average price during the 60-day period before an abnormal market disruption", while the nearby State of Arkansas (2024) set the threshold at "more than ten percent (10%) above the price charged by that person for those goods or services immediately prior to the proclamation of emergency".

[21] For a summary of U.S. price gouging laws by state, see FindLaw (2024).

Here, price gouging is scoped explicitly to cover only essential goods in the context of an emergency, and the pre-emergency price is taken as a reference point. Additionally, there is an explicit exception when the price increase is driven by an increase in the marginal cost, exactly as our framework would suggest.

3.3 Fair pricing

Beyond specific policies, there is widespread belief among both policymakers and the public that some degree of "fairness in pricing" is both meaningful and valuable. In a survey study building on the work of Okun (1981), Kahneman et al. (1986) found that consumers assess sharp price increases in times of need to be unfair, except when those increases are associated with corresponding increases in seller costs.[22] In the context of the Covid-19 pandemic, Holz et al. (2024) found that many experimental subjects had nontrivial willingness to pay to report sellers they perceived as pricing masks and hand sanitizer unfairly.

Of course, there may be many different reasons why individuals are uncomfortable with pricing and market outcomes in contexts like those just described. But our analysis here shows at least that such responses are consistent with a phenomenon that can be defined and interpreted entirely using classic economic principles in a welfare maximization framework. And indeed, Holz et al. (2024) observed that the decision to report "[was] partially driven by a distaste for firm profits or markups, implying that the distribution of surplus between producers and consumers matters for welfare" (Holz et al., 2024, p. 33), which is a key determinant of what constitutes price gouging in our framework.

3.4 Redistributive impacts of market allocation

A business ethics literature initiated by Zwolinski (2008) has argued that restricting prices is inappropriate (and arguably unethical) even in the context of extreme demand shocks, as it reduces the extent to which the market can internalize the change in demand. The underlying argument is that in times of sharp increases in aggregate need for a good, there is—if anything—*more* appeal for market allocation to help ensure that those who most demand the good are able to acquire it (see also, e.g., Zwolinski (2009); Lee (2015)). Zwolinski (2008, pp. 351–352, emphasis in original), for example, argued:

[22] Elias et al. (2022) likewise found in a survey that consumers opposed significant price increases—although their disapproval attenuated somewhat when they were primed to think about the economic trade-offs inherent in implementing price controls. A survey by Buccafusco et al. (2023), meanwhile, revisited the setting of Kahneman et al. (1986), and also examined consumers' assessments of price fairness regarding pandemic-induced price increases; they found results directionally consistent with Kahneman et al. (1986), but at higher price thresholds than in most extant anti–price gouging laws in the U.S. at the time.

> [W]hile the price of generators might rise dramatically in the wake of a disaster which knocks out power to a certain population, so too does the *need* people have for generators. Their willingness to pay the higher price is a reflection of this increased need, and not the product of mistake or irrationality.

Moreover, Zwolinski (2008, p. 360) argued:

> If prices are not allowed to rise above a[n] exogenously specified level, there will be no way of discriminating between those who value goods more highly than the level reflected by that price, no way of using higher prices to ration scarce supply, and needs that could have been satisfied will go unmet. Indeed, the most urgent needs may go unmet precisely because the scarce resources were sold at a price too low to exclude consumers whose need was not urgent.

While we are not able to speak to ethics directly, our analysis does highlight a sense in which the Zwolinski (2008) argument is incomplete: Willingness to pay is not a direct measurement of value, per se. In particular, because willingness to pay depends on both an individual's value for a good and their marginal value for money, it can be a particularly poor measurement of value in markets with significant inequality among participants. In this sense, our findings match up with the analysis of Snyder (2009b,a) in his rejoinder to Zwolinski (2008, 2009), in which he argued that "price increases following a disaster can undermine equitable access to the goods essential to minimal human functioning. [...] While price increases can decrease consumption rates of essential goods [and thus preserve supplies], they do so at the cost of giving the wealthiest members of a community the greatest access to limited supplies."[23]

This ties in with the work on optimal allocation in the presence of heterogeneous welfare weights. Weitzman (1977), Condorelli (2013), and our previous papers with other collaborators (Dworczak ⓡ al., 2021; Akbarpour ⓡ al., 2024b; Akbarpour ⓡ al., 2024a) have all characterized ways in which it may make sense to distort market prices when the market's distributive consequences outweigh its allocative benefits. As we have argued, however, price gouging is most likely to occur in circumstances that are transient and hence calls for a different type of market design; one that is perhaps more automatic, robust, and easier to deploy. The limitations of our framework mean that more research is needed on this topic. Our work helps provide a starting point for future research by pointing out that economic analysis of price gouging requires only familiar economic concepts.

[23] Caruso (2023) made an analogous point in terms of risk-sharing, arguing that "critics and supporters alike have overlooked a potentially important impact of anti-gouging regulation: the possibility that such rules can help equalize the risk between wealthier and poorer communities that people will face unjustified price hikes in the event of an emergency."

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