

The competition economics of excessive pricing and its relation to the Covid-19 disaster period

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Abstract

The declaration of a state of national disaster in South Africa, due to the Covid-19 pandemic, was followed by pricing regulations pertaining to the pricing and supply of certain consumer and medical products and services. The regulations raise several questions that relate to the economic analysis of excessive pricing and its accompanying competition policy. What is the benchmark against which a price is to be compared in order to infer its excessiveness - that is, what is an appropriate test for excessive pricing? What are the empirical tools required for an assessment of excessive pricing? During Covid-19 disaster period, how would the test and empirical tools differ? More fundamentally, why do we expect excessive pricing to be more likely during this period - that is, how may the disaster period affect market power and its abuse? This paper studies these questions, focusing on the economic and legal basis for a retrospective benchmark, specifically when responding to a demand surge is considered the basis of market power abuse. International experience and the associated economics literature support a retrospective benchmark as preferable to other benchmarks, including cost-based benchmarks, when a structural shift is available to delineate competitive and less competitive periods. The paper distinguishes price-gouging and excessive-pricing benchmarks, and situates the South African excessive-pricing benchmark during the Covid-19 regulations between these benchmarks. It also evaluates the relevant duration of the benchmark period. The analysis relies on econometric terminology to elucidate important principles, which apply equally to (most) cases where sophisticated econometric analysis is not possible.

Introduction

Extreme exogenous shocks to the economic system (due to war or natural disaster) may bring surges in demand for various goods and services and disruption to supply, often producing sharp acceleration in prices. During such periods, price regulation may form part of the policy response. Accordingly, the declaration of a state of national disaster in South Africa, due to the Covid-19 pandemic, was followed by pricing regulations: on 19 March 2020, the Minister of Trade and Industry published regulations in the Government Gazette pertaining to the pricing and supply of certain consumer and medical products and services¹ during the disaster period.

The Covid-19 pricing regulations include revisions to South African competition policy towards excessive pricing², arguably elevating this as the core instrument of competition policy during the disaster period. While the regulations also invoke unfair pricing provisions in South African consumer law, the institutional capacity of competition authorities in handling investigations implies a de facto focus on competition law enforcement in relation to excessive pricing concerns.

The regulations raise several questions that relate to the economic analysis of excessive pricing and its accompanying competition policy. What is the benchmark against which a price is to be compared in order to infer its excessiveness - that is, what is an appropriate test for excessive pricing? What are the empirical

¹The regulations pertain to four broad groups of products and services: (a) basic food and consumer items; (b) emergency products and services; (c) medical and hygiene supplies; and (d) emergency clean-up products and services.

²Section 8(1) of the South African Competition Act deals with excessive pricing. As discussed below, the regulations were promulgated in terms of section 8(1)(f).

tools required for an assessment of excessive pricing? During Covid-19 disaster period, how would the test and empirical tools differ? As excessive pricing entails a form of market-power abuse, we commence the discussion of the appropriate standards for Covid-19 excessive pricing by considering market power concerns during this period.

Market power concerns during the disaster period

Competition policy is concerned with regulating the conduct of firms that enjoy market power, which is the ability of firms to set prices above cost. The decision to rely on competition policy to address pricing concerns during the disaster period therefore requires of practitioners to show that the firm under investigation enjoys market power and has relied on that market power to raise prices.

Crisis conditions can imbue smaller firms with market power (as is evident in the prosecution of smaller retailers during the disaster period). The crisis may also enhance the market power enjoyed by larger firm or provide incentives for currently powerful firms to raise prices. Therefore, the assessment of market power in excessive-pricing investigations must include a consideration of how the crisis conditions may have altered such power.

The traditional approach to assessing the market power of a firm involves analysing the market in which the firm operates. Within this market, competition practitioners can measure the relative size of the firm under investigation and the extent of competition (including potential competition). Consequently, the definition of the relevant market (from both a product and geographic perspective) is a critical first step in the assessment of market power: the disaster period may affect the boundaries of the market in which the firm operates and, hence, the assessment of a firm's market power.

The thought experiment that underlies market definition in most competition jurisdictions, including in South Africa, is the hypothetical monopolist (HM) test. The HM test focuses on demand-side substitutability, i.e. the substitutes available to buyers of the product or service offered by the firm under investigation. It involves the analyst considering when it would be profitable for the firm to impose a 'small but significant non-transitory increase in price' (SSNIP), assuming that the firm also controls an ever-growing set of substitutes for its own product. The smallest possible set of substitutes for which a SSNIP is profitable is considered the relevant market (together with the firm's own product): this set of substitutes significantly constrains the market power of the firm under investigation, as they are the key alternatives available to buyers. Therefore, the disaster period can affect market definition by changing demand-side substitutability.

One may advance two sets of hypotheses concerning the impact of the Covid-19 disaster on demand-side substitutability. The first hypothesis is that the disaster period may significantly raise transaction costs, including search costs, for buyers of retail goods and services, which will reduce the set of substitutes that constrain the market power of firms. In particular, transaction costs may be higher (relative to the pre-disaster period) for at least two reasons. First, lockdown and other restrictions on movement during the disaster period may reduce the mobility of customers and their associated ability and willingness to respond to price increases. Second, and related, health concerns may reduce willingness to enter alternative outlets in search of substitute products. Consequently, market definitions are likely to be narrower.

The second hypothesis is that the disaster period may significantly alter consumers' valuation of product characteristics for selected products, reducing or otherwise limiting the set of substitutes that would constrain the market power of firms selling those products. For example, whereas hand sanitizers with lower alcohol content may have been substitutable with other soaps or sanitizers, they may now be significantly less substitutable. Consequently, market definitions are likely to be narrower.

These hypotheses are likely of greater import to retail markets. Even so, the empirical support for these hypotheses will have to be considered on a case-by-case basis, as part of the market definition exercise. For example, the increase in transaction costs may be weaker in high-income retail settings. Firms offering online substitutes for the products of bricks-and-mortar retailers have rapidly expanded in a few weeks during the lockdown period, which undermines the argument that retailers of food and other essentials would gain much local power. The hypothesis may enjoy stronger support in low-income settings where consumers do not have online alternatives.

In upstream wholesale and input markets, the first hypothesis may enjoy less support. Search costs may be less significant in markets involving business-to-business transactions, where a significant portion of which may be governed by long-term contracts and involve negotiation with powerful buyers. In any event, many South African wholesale markets for food products do include a large number of smaller buyers, which already suggest market power for sellers. In contrast, the second hypothesis would imply changes in the inputs purchased by retailers, and may be supported in markets where upstream suppliers and manufacturers face weaker competition from competing suppliers due to supply disruption during the disaster period, especially in those markets where international suppliers compete.

Empirical evaluation of substitutability evidence will be different in such cases, given the short time horizon. Indeed, the conventional approach is to focus on a twelve-month period, which would require an exceptionally long national disaster period. That is, what happens if the pricing change is indeed transitory? The focus on non-transitory nature of the price increase is not, in the first instance, motivated by a concern for time horizon per se, but with a concern to allow for sufficient switching.

Markets are defined predominantly by reference to demand-side substitutability. The subsequent assessment of market power also accounts for substitutability from the supply side, i.e. the extent to and speed with which firms not currently active in the defined market may enter. In this regard, one hypothesis concerning the impact of the Covid-19 disaster would involve that, in those industries facing fixed costs, the relatively short duration of the disaster period would limit entry and, hence, supply-side substitutability. As discussed later in this paper, a lack of entry is a core consideration in excessive pricing investigations: competition practitioners are often willing to limit enforcement to high profile cases where long-run observation suggest that entry is highly unlikely or ineffective. The very nature of the Covid-19 disaster may limit the potential of new competitors to enter.

Legal test for excessive pricing

Firms enjoying market power (dominance) are prohibited from engaging in various forms of pricing conduct³. In terms of section 8(1) of South African Competition Act, a dominant firm is prohibited from charging its customers a price that is excessive. In the original formulation of the Act, an excessive price was to be determined by reference to “economic value”, a concept which was given content in subsequent case law. The amended Act attempts to define the benchmark for excessive pricing more explicitly, setting out the factors that should be considered in determining a benchmark competitive price and whether a price is deemed excessive relative to such competitive price. These factors include (a) price-cost margins and other profitability measures; (b) prices charged by the respondent in other markets and over time; (c) prices and profits of comparator firms in competitive markets; (d) duration of pricing at that level; (e) structural characteristics of the relevant market, including market share, contestability, barriers to entry and past or current advantage that is not due to the respondent’s own commercial efficiency or investment; and (f) any regulations made by the Minister of Trade and Industry, “regarding the calculation and determination of an excessive price”.

Following the declaration of a national disaster due to Covid-19, the Minister of Trade and Industry relied on Section 8(1)(f) to introduce new regulations on determining excessive pricing, in selected industries, during the period of national disaster. These regulations define an excessive price increase as a price increase that (i) does not correspond to increases in costs or (ii) results in an increased markup relative to the average markup achieved over the three-month period from December 2019 to February 2020.

The investigation of an excessive pricing complaint can be described as a three-stage process (Gilo 2018). First, the benchmark competitive price must be determined, against which the actual price is to be assessed. Such determination involves economic analysis. Second, the extent, to which the deviation of the actual price from the benchmark price is *prima facie* excessive, must be determined, which entails a legal assessment. Finally, allowance must be made for an efficiency defense. This normative structure, suggested by Gilo (2018), flows from observed policy approaches towards excessive pricing in the major antitrust jurisdictions.

The challenges associated with the first stage have led to circumscribed enforcement of excessive pricing

³Such abusive conduct, as it is termed in competition law, is described under Section 8 of the Act

provisions in key jurisdictions⁴ [US competition authorities do not rely on Section 2 of the Sherman Act to prosecute monopoly pricing. In contrast, excessive pricing is a key policy concern in the EU. For example, in the context of EU competition policy, (Drexel 2011) (p323) note that “Article 102 TFEU is only rarely applied to excessive pricing, mostly because of problems in proving a deviation from competitive prices”. In contrast, South African competition policy has been a leader in the prosecution of excessive pricing. A number of high-profile cases - including the Mittal/Harmony - raises important questions about the appropriate competitive benchmark (see Nair and Mondliwa (2017) for a comprehensive summary). It is therefore vital to study how competitive benchmark prices are determined in South African competition policy, in light of the amendments to the Competition Act, and how the Covid-19 regulations affect this determination.

Approaches to determining benchmark competitive prices

The variety of factors mentioned in the Act reflects the challenge of determining competitive prices (Whish 2009). Indeed, the list of factors may be seen as offering a summary of the approaches adopted in most jurisdictions: a competitive benchmark price is determined either on the basis of cost (as reflected in factor (a) of the South African Act) or on a comparative basis (as reflected in factors ((b) and (c)).

The two approaches are complementary, but a cost-based approach faces additional practical difficulties. First, the determination of a firm’s cost structure requires a bottom-up approach, including translating accounting costs into economic costs. The South African jurisdiction has been a front-runner in this respect, with several well-known cases involving sophisticated cost benchmarking exercises.

Second, and more important, a cost-based approach faces the task of determining a competitive profit margin. Under imperfect competition, price does not approach cost, implying that the benchmark competitive price is not the perfectly competitive one. As a range of prices are consistent with imperfect competition, a cost-based approach must determine an *upper bound* for the competitive price.

Excessive-pricing investigations often resort to comparative approaches to obtain an upper bound for the competitive price. Prices set by the firm under investigation, or by similar firms, in markets similar to the market under investigation, but for their different competitive conditions, can offer benchmark competitive prices. To the extent that cost, demand and other structural conditions are similar to the market under investigation, price differences may be attributed to differences in competition. These comparator approaches therefore requires of the analyst to account for idiosyncratic features of demand, supply or structure in the comparator markets. Many of these non-price features are often unobservable (Akman and Garrod 2011).

Comparisons based on the same, rather than a different, market may largely avoid this problem. Where the same market can be observed, under periods with different competitive dynamics, price differences between the periods can be related to competitive differences with relatively high confidence. Consequently, where data availability permits⁴, the preferred comparator market should be the market *under investigation* over an earlier or subsequent time period.

The utility of a retrospective benchmark vitally depends on the presence of an exogenous structural shift in the market, which results in different competitive conditions *ex post*. This feature of a retrospective benchmarking approach is well illustrated by its use in estimating price overcharge in cartel damage cases. Price overcharge models compare pricing during collusion with prices prior to or following collusion and depend critically on the presence of exogenous shifts in competitive conditions associated with the end (or onset) of cartels⁵.

In the context of excessive-pricing investigations, Gilo (2018) suggests that the entry of new competitors is a key structural shift materially affecting *ex-post* competitive conditions. As discussed in the subsequent section, Covid-19 regulations suggest that the national disaster may also offer practitioners a structural shift that delineates the competitive pre-disaster and less competitive disaster period, allowing the identification of pricing changes that are due to changes in competition.

Benchmark competitive prices under Covid-19 regulations

⁴Price comparisons may not be possible in the case of investigations where *ex-ante* data is limited or too far back in the past - see Boshoff (2015) for a South African study related to this problem.

⁵The collapse of a cartel may well be linked to demand or cost shocks, although the standard position in the empirical collusion literature is to treat the collapse as exogenous.

The additional regulations suggest important changes to the assessment of excessive pricing during the disaster period. In terms of the three stages of assessment identified by Gilo (2018), a key change relates to the specified benchmark. The new regulations signal that South African competition authorities should rely on a retrospective competitive benchmark in assessing excessive pricing during the disaster period⁶.

Factor (f) implies that past prices - i.e. prices during an ex-ante competitive period - are to be used as a comparator, as it requires profit margins to remain constant. Price is therefore deemed excessive if:

$$\pi_t > \pi_{t-1} + \epsilon$$

$$P_t - C_t > P_{t-1} - C_{t-1} + \epsilon$$

Therefore:

$$P_t - P_{t-1} > C_t - C_{t-1} + \epsilon$$

Consequently, the regulations permit increases in price relative to the disaster period if these are consistent with cost increases. From an economics perspective, therefore, the new regulations explicitly adopt a retrospective benchmark. As argued earlier, this offers the most suitable competitive reference price and is consistent with the aim of the factors mentioned in the Act, namely to identify a competitive price. This elevation of the retrospective benchmark, albeit limited to the disaster period, is an important policy development.

Of course, the specific conditions under which this benchmark is introduced implies particular limitations and special challenges. The structural shifts on which retrospective benchmarking relies are determined on a case-by-case basis, while the regulations determine the benchmark period for all cases as December 2019 to February 2020. As discussed later, this period raises key problems for the proper analysis of the relationships between price, demand and cost.

The regulations also implicitly identify the source of the structural shift delineating competitive and less competitive periods as the start of the national disaster period. A retrospective benchmark is useful to the extent that a structural shift, causing changes in the competitive conditions in the relevant market, delineates the period under investigation from the benchmark period. Competition authorities do not typically consider a consistent relationship between price increases and cost increases as sufficient evidence of competitive behaviour. In some markets characterised by persistent anti-competitive conduct, price responses may be commensurate with cost changes, even while markups remain very high. In the absence of structural change, retrospective benchmark models would therefore predict little difference between actual and competitive pricing in such markets.

The Covid-19 regulations identify the start of the national disaster period as such a structural shift. The implicit argument is therefore that the onset of the disaster will have alter competitive conditions, implying changes in price. The effectiveness of this shift, in allowing identification of anti-competitive price changes, is vitally linked to its exogeneity with respect to demand and cost. While the regulations are explicit about the merit of cost-based price increases, they are silent on how demand-based responses to price.

An extreme interpretation would be that the regulations identify price response to demand during the disaster period as anti-competitive. As discussed below, while policy on price gouging laws during disaster periods may well be aimed at identifying any response to demand as unfair, competition policy is not primarily concerned with prohibiting price changes that reflect exogenous changes in demand or supply. Restricting demand- or cost-based price changes would undermine efficiency, including consumer welfare. Motta and Streeck (2007) note that “a competitive price is not only determined by supply-side factors (in particular the cost of production), but also by demand side factors (demand elasticity, willingness and ability to pay)”. Indeed, in discussing the merits of a retrospective benchmark for excessive pricing, Akman and Garrod (2011) (p413) emphasise that “it is crucial to establish a reference transaction with similar supply and demand conditions to the transaction under investigation”.

⁶There is a legal question about whether a single factor ((f) in this instance) can dominate other factors in the Act. This is, partly, the result of the amended Act forgoing a reliance on the “economic value” concept - and allowing case law and economic analysis to inform interpretation - in favour of an explicit set of factors. This paper accepts factor (f) as a sufficient condition for excessive pricing.

One may argue that the regulations do allow for price responses to normal demand. As shown, the requirement for a consistent price-cost relationship is similar to requiring a consistent profit margin. If demand during the disaster period follows a trajectory similar to that of demand during the pre-disaster period, and price responded to such demand evolution, the associated price increase will not change price margins. This requires *inter alia* an empirical distinction between price responses to ‘normal’ as opposed to extraordinary demand changes. As discussed below, determining normal, or competitive, demand behaviour may involve assessing how price responded to demand in the benchmark period (in this case, the pre-disaster period).

The regulations could therefore be interpreted as signalling a competition policy concern with pricing in response to abnormal demand during the disaster period. An emphasis on excessive demand-based price increases is consistent with the aims of competition policy. Gilo (2018) (p26) notes that “a case that mentions that demand considerations, and not only supply or cost considerations, are relevant in order to determine the competitive price, does not diverge from the standard advocated in the bulk of the case law, according to which price should be compared to the competitive price to see if it is excessive”. Even so, competition policy does not allow firms with market power to set prices in order to fully exploit demand. A benchmark that allows prices to reflect customers’ willingness to pay would amount to a permissive approach to monopoly pricing. A rational monopolist will fully exploit demand, so that an excessive pricing benchmark dependent on willingness to pay would not be enforceable⁷.

Yet it would be incorrect to identify the price response to the excess demand - or demand surge - as necessarily anti-competitive. It would be necessary to consider the extent to which price has responded to demand surges in the past and how this is related to changes in competitive conduct. We return to this matter in the subsequent discussion.

While the Covid-19 excessive pricing regulations seek to provide legal certainty on the type of benchmark and benchmark period, the discussion above suggests that various retrospective benchmarks could be identified, depending on how which part of price-response to demand is considered anti-competitive. It is vital to competition policy to properly distinguish these benchmarks, and to discuss the link between price gouging and excessive pricing, which lies at the heart of these distinctions.

Benchmarks for price gouging and excessive pricing: a comparative assessment

The previous section argues that the new regulations relies on the structural shift associated with the Covid-19 disaster period to implement a retrospective benchmark. Conventionally, the relevant comparator period would be identified on a case-by-case basis. It also argues that the implied retrospective benchmark should reflect responses to cost and counterfactual, or ‘normal’, demand. Its requirement of consistent responses to price as well as of stable profit margins accommodates such price responses as competitive. Its implied specificity, in terms of the type of demand response considered competitive, is a departure from the standard retrospective benchmark. Furthermore, this particular benchmark implies a policy focus reminiscent of that of price gouging - especially when read in conjunction with the accompanying consumer law regulations.

This section therefore compares various retrospective benchmarks for excessive pricing and price gouging, identifying appropriate benchmarks for evaluating excessive pricing under the Covid-19 crisis. We start by contrasting the benchmarks for standard excessive pricing and price gouging and then proceed to situate the new excessive-pricing regulations within that framework.

Conventional benchmarks for excessive pricing versus price gouging

Retrospective benchmarking requires a study of price and its elasticity with respect to both demand and cost shocks during the benchmark period⁸. The elasticity of price with respect to demand and cost drivers during the benchmark period, when applied to demand and cost data from the period under investigation,

⁷See Gilo (2018) for an extensive discussion on the lack of a case-law justification in Europa for a demand-based benchmark.

⁸This paper relies on econometric models to elucidate its key argument. Practical considerations may prevent the explicit use of econometric analysis, especially in the context of excessive pricing investigations under the new regulations. Even so, the econometric methodology outlined here provides a set of guidelines for an empirical strategy based on qualitative analysis or more rudimentary quantitative techniques, conditional on the type of data available. Even where econometric analysis is feasible, it is preferable to rely on alternative approaches to triangulate estimates. See Boshoff (2011) for a defense of limited-information quantitative tools in competition analysis, with applications to South African competition policy.

generates a counterfactual, or benchmark, price. In this paper, the disaster period is taken as the period under investigation and the ex-ante period as the competitive benchmark period.

Consider a reduced-form model of price during the pre-disaster period ($t = 1, \dots, T_1$, with T_1 the end of the period):

$$P_t = \alpha_0 + \alpha_1 P_{t-1} + \alpha_2 D_t + \alpha_3 D_{t-1} + \alpha_4 C_t + \alpha_5 C_{t-1} + \varepsilon_t \quad (1)$$

where P is the price of the product, D is a demand driver and C is a cost driver, with $\varepsilon_t \sim \mathcal{N}(0, \sigma^2)$. The autoregressive distributed lag (ARDL) specification reflects the dynamic adjustment of price, cost and demand. Dynamic specifications are standard in counterfactual models of price in competition policy, reflecting partial adjustment and enabling a separation of short-run from long-run adjustment (Boshoff and Jaarsveld 2019).

Benchmarking involves relying on the parameter estimates from (1) to obtain dynamic price forecasts \hat{P}_t during the disaster period ($t = T_1 + 1, \dots, T_2$):

$$\hat{P}_t = \hat{\alpha}_0 + \hat{\alpha}_1 \hat{P}_{t-1} + \hat{\alpha}_2 D_t + \hat{\alpha}_3 D_{t-1} + \hat{\alpha}_4 C_t + \hat{\alpha}_5 C_{t-1} \quad (2)$$

where $\bar{D} = \frac{1}{T_1} \sum_{i=1}^{T_1} D_i$.

This approach produces what may be termed a ‘standard’ excessive pricing benchmark. It is the approach advocated by a number of scholars and relies critically on a structural difference between the pre-disaster and disaster period. Under this approach, price is excessive to the extent that it deviates from the level suggested by both demand and cost factors⁹. Applied to the Covid-19 disaster, the assumption is that the deviation of the actual and benchmark price during the disaster period is a reflection of a change in market power due to the crisis, the sources of which were discussed earlier (and relate to changes in both demand- and supply-side substitutability).

The standard approach would predict no excessive pricing if the elasticity of price with respect to demand is unchanged. This benchmark is likely to be different from relevant benchmarks in price gouging analysis. Price gouging laws differ across a variety of jurisdictions (including within the US), but a generally accepted approach to obtaining benchmark prices involves allowing for cost-related price increases only. Indeed, US authorities have rejected a hypothesis of price gouging after natural disasters, citing evidence that cost explains most of the price increases following disaster, at least if one excludes the initial few days following a natural disaster (Wilson 2014). Therefore, one approach to obtaining a benchmark price for the purposes of assessing price gouging would involve relying only on the cost parameter estimates from (1) - expressly excluding the surge in demand - to obtain price forecasts during the disaster period:

$$\hat{P}_t = \hat{\alpha}_0 + \hat{\alpha}_1 \hat{P}_{t-1} + \hat{\alpha}_2 \bar{D}_t + \hat{\alpha}_3 \bar{D}_{t-1} + \hat{\alpha}_4 C_t + \hat{\alpha}_5 C_{t-1} \quad (3)$$

where $\bar{D} = \frac{1}{T_1} \sum_{i=1}^{T_1} D_i$ and $\bar{D}_t = D_{T_1}$ (demand is assumed unchanged).

More extreme (i.e. lower) price-gouging benchmarks may also include limits on price increases during the disaster period, even if justified by cost.

The difference between (2) and (3) is of key importance: in conventional excessive pricing cases, the focus is on pricing due to a lack of competition after controlling for non-competition factors and specifically demand and supply considerations. In price gouging cases, the focus is on the price response to demand and supply. Indeed, price gouging does not involve or require market power considerations.

Benchmark for Covid-19 excessive pricing

The Covid-19 excessive pricing regulations permit cost-based price increases. At face value, this may be interpreted as determining the price-gouging benchmark in (3) - which allows cost-based price increases only -

⁹The forecasting approach set out in (1) and (2) is equivalent to a so-called dummy-variable approach, which involves estimating (1) over both the pre-disaster and disaster period, but adding a disaster-period dummy variable as well as a set of variables capturing interactions between the dummy variable and the various demand and supply terms. The sum of the coefficients on these additional variables then measure the extent to which price deviates from the predicted pre-disaster level. There is an extensive literature on the conditions for equivalence between these approaches. See Boshoff (2015) for South African applications and Boshoff and Van Jaarsveld (2020) for a discussion of the impact of time-series properties on the choice between forecasting and dummy-variable models. This paper relies on the forecasting method, for simplicity of exposition.

as the benchmark for excessive-pricing investigations during the disaster period. Yet, as mentioned earlier, the focus of the regulations is not solely on cost: the regulations also require margins to remain constant between the disaster and an immediate pre-disaster period. If demand during the disaster period follows a trajectory similar to that of demand during the pre-disaster period, and price responded to such demand evolution, the associated price increase will not change price margins. Therefore, an alternative interpretation of the regulations is that they signal a competition policy concern with pricing in response to abnormal demand during the disaster period.

Demand behaviour in the pre-disaster period provides an estimate of counterfactual demand, neutral to a disaster-period demand surge. Consider an autoregressive demand specification for $t = 1, \dots, T_1$ ¹⁰:

$$D_t = \rho_0 + \rho_1 D_{t-1} + \epsilon_t \quad (4)$$

The estimated equation (4) can be used to generate a dynamic forecast of counterfactual demand, \hat{D}_t , during the disaster period ($t = T_1 + 1, \dots, T_2$). Counterfactual prices (\hat{P}^*), neutral to a demand surge during the disaster period ($t = T_1 + 1, \dots, T_2$), would then be:

$$\hat{P}_t^* = \hat{\alpha}_0 + \hat{\alpha}_1 \hat{P}_{t-1}^* + \hat{\alpha}_2 \hat{D}_t + \hat{\alpha}_3 \hat{D}_{t-1} + \hat{\alpha}_4 C_t + \hat{\alpha}_5 C_{t-1} \quad (5)$$

\hat{P}_t^* , obtained from (5), will be higher than \hat{P}_t , obtained from (3) (given positive elasticities), if demand was generally increasing in the pre-disaster period. Even so, the prices from (5) are still likely to be lower than those from (2), at least to the extent that price would have responded to the demand surge. Consequently, the excessive-pricing regulations under Covid-19 represent a stricter standard for excessive pricing compared to the standard approach.

To appreciate the difference in the benchmarks of (2) and (5), consider a price model with the following parameterization for the pre-disaster period $t = 1, \dots, 50$:

$$P_t = \alpha_0 + 0.6P_{t-1} + 0.4D_t + 0.4D_{t-1} + 0.5C_t + 0.3C_{t-1} + \epsilon_t \quad (6)$$

where demand and cost evolve as follows:

$$D_t = 0.4 + D_{t-1} + \epsilon_{D_t} \quad (7)$$

$$C_t = 0.4 + C_{t-1} + \epsilon_{C_t} \quad (8)$$

The disaster period, $t = 51, \dots, 100$, is characterised by an instant surge in demand of size 20 at time $t = 51$ and demand subsequently evolves as follows:

$$D_t^{surge} = 0.8 + D_{t-1} + \epsilon_{D^{surge}_t} \quad (9)$$

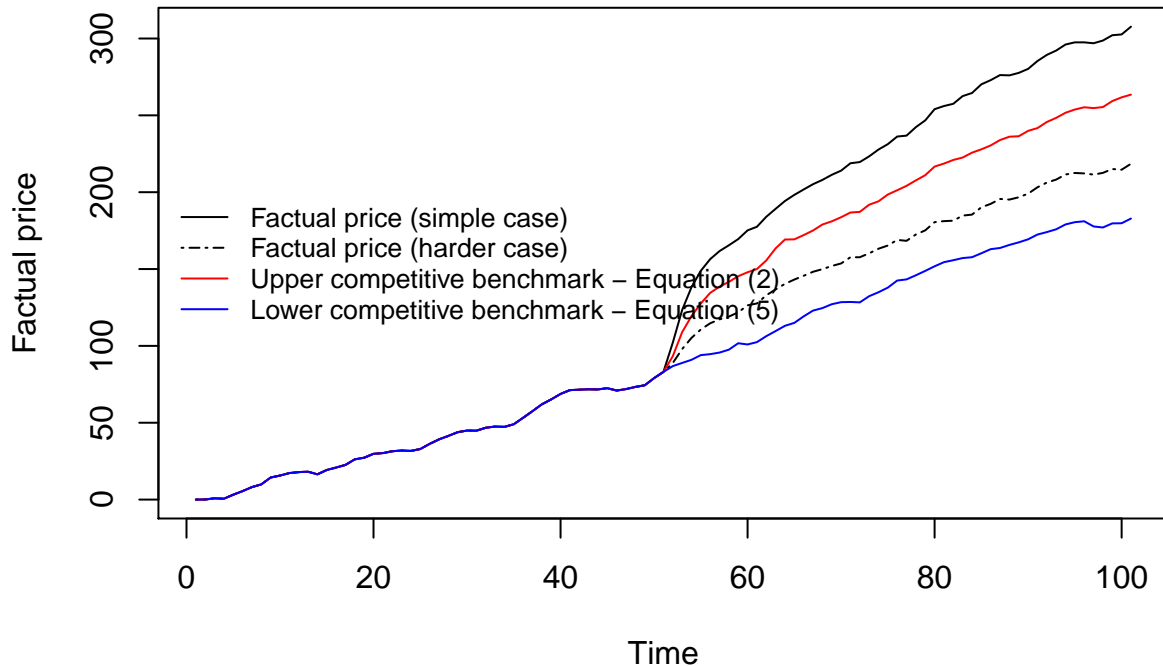
Figure 1 shows both the competitive benchmark price in standard excessive-pricing cases (\hat{P} , based on equation (2)) and the lower benchmark price under the new regulations (\hat{P}^* , based on equation (5)). It also shows two factual prices, one where the price response to a demand surge is proportionately higher than in the pre-disaster period¹¹ one where the price response to demand is comparatively muted¹².

```
## Registered S3 method overwritten by 'quantmod':
##   method           from
##   as.zoo.data.frame zoo
```

¹⁰The random-walk specification in (4) can be altered to exclude drift.

¹¹We use the following parameterization: $P_t = \alpha_0 + 0.6P_{t-1} + 0.5D_t + 0.5D_{t-1} + 0.5C_t + 0.3C_{t-1} + \epsilon_t$

¹²We use the following parameterization: $P_t = \alpha_0 + 0.6P_{t-1} + 0.3D_t + 0.3D_{t-1} + 0.5C_t + 0.3C_{t-1} + \epsilon_t$



Both of the factual prices shown in Figure 1 reflect an increase in price in response to a demand surge. That is, both price series show increases beyond that merited by either cost or ‘normal’ demand changes. As shown, the higher of the two prices (labelled the ‘simple case’) would trigger scrutiny under a conventional retrospective benchmark. Exceeding the conventional benchmark price is a sufficient condition for excessive pricing under the new regulations. Prices related to a number of the excessive-pricing investigations by the competition authorities since the publication of the regulations may well meet this condition, especially those involving triple-digit price increases. Even so, exceeding the upper benchmark, determined by (2), is not a necessary condition for excessive pricing. The lower benchmark in (5) suggests that the lower of the two prices (labelled the ‘harder case’) will also attract scrutiny under the new regulations. However, as argued below, such cases - where price falls between the two benchmarks - require a consideration of the link between market power and demand in order to judge whether the price should be viewed as excessive.

Competition during demand surges

As discussed earlier, the benchmark under the regulations entails an amended price-gouging benchmark. It allows for both cost-based increases (consistent with most price-gouging laws) as well as ‘normal’ demand-based increases (which some but not most price-gouging laws seek to prohibit). Disallowing price responses to a demand surge as a legitimate competitive reaction implies a particular view of competitive conduct in the face of a demand surge. Such a benchmark assumes that a large and unexpected positive demand shock must give rise to intense price competition among rivals, leaving prices unchanged *ceteris paribus*. In econometric parlance, the benchmark assumes that heightened competition, induced by a demand surge, must produce a zero-valued elasticity of price.

There is some support for the view that demand shocks may give rise to greater competition and limited price increases. For example, the Rothenburg and Saloner model shows that commitment among oligopolists to maintain higher prices is undermined in the face of large and unexpected demand shocks. An unexpected and large demand shock increases the incentive to compete for the significantly larger profit in the current period relative to the incentive to forgo current profits (by coordinating) in exchange for larger future profits. Therefore, even under imperfect competition, demand shocks of larger magnitudes may not translate into higher prices.

Furthermore, there is evidence to suggest that firms valuing customer relationships may not raise prices following disasters. The FTC’s position in its assessment of price increases following Hurricane Katrina relied heavily on the absence of any evidence of sustained demand-based response in price as an indication of the absence of any possibility of anti-competitive conduct.

However, different from hurricanes and earthquakes, the Covid-19 disaster may persist for a number of months, which implies that firms will predict the demand surge not to dissipate immediately. To the extent that demand shocks are correlated, incentives for coordinated price increases may still dominate incentives to compete heavily on price.

Consequently, case-by-case evaluation is required. To the extent that a firm's demand history includes episodes of large demand shocks, it may be possible to infer its likely competitive conduct during the disaster period. A recourse to the firm's history suggests an investigation horizon beyond the December-February period as envisaged in the regulations. If the elasticities of price with respect to normal demand evolution and demand surges are similar, the conventional benchmark offers an appropriate benchmark for evaluating price responses during the disaster period. If the elasticities differ, courts would have to judge the extent to which the price response deviates from the predicted response.

Where the market history does not include other instances of large shocks, courts may have to resort to a comparison of behaviour across similar firms or similar markets, experiencing a similar surge, to benchmark behaviour¹³. This implies that the evaluation, despite

To the extent that policymakers wish to consider evidence from other firms or markets to judge competitive response to a demand surge, such analysis would imply a departure from a retrospective benchmark.

Duration of conduct

The discussion so far has focused on differences in the implied level of competitive prices. Yet the analysis of excessive pricing is crucially concerned with the duration of excessive pricing, that is, the duration of the time period for which factual prices exceed the implied competitive level.

Minimum duration of anti-competitive conduct

Competition authorities are primarily concerned with *sustained* pricing behaviour, as is also explicitly reflected in the South African Competition Act (see factor (d)). The simulation example offered above reflects such sustained abnormal behaviour, featuring a shift to higher factual prices over the disaster period. In contrast, price-gouging laws are often aimed at addressing short-term price increases, especially during or immediately after natural disasters. Given the relationship between Covid-19 excessive-pricing concerns and price gouging, as discussed earlier, it is important to consider the relevant duration and its motivation in terms of competition economics.

The regulations explicitly require an assessment of price "during the disaster period" and the much publicised prosecution of excessive pricing during the disaster period suggests that the competition authorities have chosen to focus on a short time horizon. From the initial settlements with the competition authorities, it would appear that competition authorities have focused on changes in the immediate weeks prior to, or following, the start of the disaster period. Given key differences between price-gouging laws and excessive-pricing policy, what is the competition economic basis for this focus?

Competition policy focuses on sustained excessive-pricing behaviour.

Practitioners wish to avoid prosecuting price spikes that follow from transitory demand or cost shocks. A transitory shock can be defined as one that does not alter the long-run path of the associated variable. It is the long-run relationship between price, demand and cost that matters in determining benchmark levels¹⁴.

The Covid-19 disaster - different from other natural disasters - may well be characterised as a non-transitory shock. While hurricanes and earthquakes are often once-off events (or events that occur over a comparatively short time horizon), the Covid-19 disaster already extends over a number of months. The size of the associated

¹³Evidence that allows a comparison of estimates of market-level demand and firm-level demand may be particularly useful, if data over both the pre-disaster and disaster period is available. Changes in the relationship between firm-level and market-level demand may suggest changes in market power. From an econometric perspective, such and other data that allows difference-in-difference assessment may be particularly useful (see Boshoff (2015) for a South African application)

¹⁴In econometric terms: it is the long-run solution of models, such as those in equations (1) to (5), that provide the basis for estimating counterfactual prices.

demand and/or cost shocks therefore merits a potentially different approach, as these shocks may well result in price changes that will persist.

The duration over which a demand or cost shock - and its effect on price - is considered ‘permanent’ is the subsequent of considerable debate in econometrics. The general position in economics, however, is that the ‘long run’ is determined by the speed with which the implied equilibrium between price, demand and cost is re-established following shocks. For markets characterised by high-frequency price changes, the relevant period may be quite short.

Even if demand or cost shocks are judged non-transitory, practitioners may postpone prosecuting price increases because at last part of a price response may be related to economic uncertainty. By allowing a sufficient period for price adjustment following structural shifts in demand and supply, authorities are able to identify whether price changes may be considered permanent.

Particularly relevant to the current context, the literature suggests that a sharp increase in price immediately following a disaster is often a response to significant uncertainty about demand and cost conditions¹⁵. Consequently, policymakers must be able to distinguish between the effect of uncertainty - which forms part of competitive behaviour - and anti-competitive conduct. Even in price gouging cases related to disasters, the literature suggests that initial price responses may well reflect uncertainty: studies of potential price gouging during natural disasters suggest that short-run price spikes typically occur in the days immediately following the disaster, after which price often returns to levels consistent with cost increases.

In the current context, this concern is partially addressed by the significant re-allocation of resources to deal with these cases; under normal circumstances, the large number of other competing cases would render the opportunity cost of pursuing every short-term price increase too high. Even so, increasing resource need not simplify the matter, as it is not clear how authorities would incorporate uncertainty especially without some broader time horizon. The appropriate time horizon depends on the dynamic behaviour of price in response to cost and demand shocks in the past.

Firms may restrict price changes when it is costly to do so. Menu costs (including the cost of re-negotiating prices or changing list prices) may limit the response of price to small cost changes as well as the speed of adjustment, as firms seek to smooth production over time to avoid costs related to varying production. Evidence on the frequency of price changes in South Africa suggests that businesses tend to change prices less frequently¹⁶. Therefore, a sufficient period of investigation is required in order to assess the dynamic changes in pricing behaviour and the role of uncertainty in these changes. Whereas econometric methods are capable of accounting for these dynamic considerations, a qualitative approach will have to pay careful attention to internal documents in order to identify changes in price responsiveness¹⁷

Finally, as noted earlier, competition authorities may view a lack of entry as an important condition for prosecuting excessive pricing (Jenny 2018): as excessive pricing may well be tempered by entry in the medium run, limiting enforcement costs. The Covid-19 disaster may give rise to significant, though transitory, market power with no prospect of an immediate increase in competition: the short duration of the disaster period may limit the probability of entry. Yet, supply-side substitutability must be assessed on a case-by-case basis.

Consequently, a concern with ‘temporary’ abuse of market power - with shorter time horizons triggering antitrust scrutiny - may well be merited under particular conditions.

Minimum duration of the benchmark period

¹⁵The monetary policy literature also shows that there is a strong correlation between uncertainty and price increases

¹⁶Studying the underlying price data used by Statistics South Africa to calculate the Consumer Price Index, Ruch, Rankin, and Plessis (2016) show that the median frequency of price changes is about once every eight months

¹⁷Changes in the timing of price responses to demand or cost changes can be assessed econometrically by studying the speed-of-adjustment towards a long-run equilibrium relationship between price, demand and cost, as suggested by equation (1). Equation (1) can be re-expressed in error-correction form as follows: $\Delta P_t = \alpha_0 + \beta_1 \Delta D_t + \beta_2 \Delta C_t + \gamma(P_{t-1} - \theta_1 D_{t-1} - \theta_2 C_{t-1}) + \varepsilon_t$ where $\gamma < 0$ is the so-called speed-of-adjustment parameter, which ensures re-establishment of the long-run equilibrium and which remain unchanged between the pre-disaster and disaster periods. Suppose $\gamma = -0.25$, which implies 4 time periods for equilibrium adjustment. If γ were to increase to $\gamma = -0.5$, it would imply a doubling in speed of adjusting to a cost shock. To assess changes over the disaster period would require estimating a similar model over $t = T_1 + 1, \dots, T_2$, to obtain γ^{Covid} .

The regulations also specify the period (December 2019 to February 2020) applicable in determining the retrospective benchmark. The literature proposing retrospective benchmarks refrain from linking such benchmarks to particular time frames. A benchmark price is typically the average price over a competitive period of suitable duration, where the duration should reflect a balance between obtaining a thorough assessment of price setting and minimising the risk of structural or other factors contaminating the assessment. As far as the former requirement is concerned, a period of sufficiently long duration is required in order to assess the dynamic nature of price, cost and demand as well as their respective relationships.

From the perspective of the latter requirement for structural stability, a period of sufficiently short duration is required to ensure that market conditions approximate those prevailing during the period under investigation. The trade-off between a choice of duration that enables a complete assessment and one that limits structural changes is heavily dependent on the frequency of price changes and the availability of data. Low-frequency price changes (quarterly and lower) would imply that periods of a longer duration is required, while the availability of data may also result in a duration less than the ideal. Even where price changes are of a higher frequency, it may be necessary to look beyond the December-February period, when historically subdued demand and cost increases, seasonal fluctuations or other idiosyncratic price behaviour (including special discounts) characterise the market. More important, in relation to demand surges, it may be particularly important to consider past response to periods of unexpected and large demand (or cost) shocks. Consequently, a three-month period is not appropriate for the estimation of underlying elasticities, even for prices set at a relatively high frequency.

Efficiency defence

It may be argued that the regulations stipulate cost-based price increases and stable profit margins, implying that any price increase purely in response to the demand surge cannot be allowed. Even so, the third stage of any excessive pricing investigation - and one also acknowledged by the regulations - is that firms may offer an efficiency defence for excessive pricing. In the current context, to the extent that higher prices is required to address shortages caused by disaster-led increases in demand and disaster-led disruptions to supply, the competition authorities may wish to allow a degree of price elasticity with respect to the demand surge. If indeed there has been a non-transitory shift in price - albeit at a shorter horizon than typically considered in an excessive pricing case - the authority must still consider the extent to which it is willing to permit such price increase for market clearing.

Summary and conclusions

The regulations signal a shift in the focus of competition policy during the disaster period. Historically, the prosecution of excessive pricing in South Africa has been limited to select high-profile cases. The re-allocation of resources within the competition authorities accompanying the new regulations have allowed authorities to massively expand both screening of complaints and subsequent prosecutions. The change in focus is reflected in reduced enforcement activity in relation to mergers and other forms of anti-competitive conduct. Such enforcement effort readily increases the probability of detecting anti-competitive conduct, thus increasing the cost of contravening the Act.

The South African excessive-pricing regulations for the Covid-19 disaster period introduce a retrospective benchmark for the evaluation of excessive pricing. International experience and the associated economics literature support such a benchmark as preferable to other benchmarks, including cost-based benchmarks, that have featured in previous excessive pricing cases in the past. The basis of a retrospective assessment is the presence of a structural shift that is not related to conventional demand and supply conditions. Often this may take the form of entry of new competitors or the introduction of regulation, which alters competitive dynamics rather than underlying demand and cost conditions. The benchmark during the Covid-19 crisis, however, relates to a surge in demand. Competition economists do not view price responses to demand changes as incompatible with competitive behaviour. Even in competitive markets, prices will increase significantly in the face of a substantial increase in demand. Nevertheless, a surge in demand for a particular firm's product or service may be associated with a change in the market power of that firm, as the disaster period may be associated with changes in transaction cost or in consumers' valuation of certain product

characteristics - narrowing the relevant market and increasing market power. In addition, the disaster period may affect entry, expectation of which traditionally moderates enforcement effort against excessive pricing. These market power developments must be assessed on a case-by-case basis. The paper suggests that these conditions merit the use of a range for a benchmark price, in which the upper bound views the crisis-period demand as the appropriate proxy for demand (resulting in a higher price) and a lower bound accepts pre-crisis demand as the appropriate proxy (resulting in a lower price). Price above the upper bound would be excessive, as it represents the conventional retrospective benchmark.

Judging whether price within the range is excessive will require a consideration of the extent to which firm demand is consistent with market demand. A demand surge consistent with a surge in market demand (consistent with a hypothesis of no additional market power for the firm under investigation during the disaster period) would suggest that the total demand surge must be considered 'normal', implying that the conventional retrospective benchmark (the upper bound) is the more appropriate benchmark. Alternatively, if the demand surge suggested by a firm-level proxy is much stronger than the surge in market demand, there is additional market power for the firm beyond what it had enjoyed prior to the crisis. Consequently, one must account for only a portion of the current demand surge. The lower bound would represent the extreme case where all of the demand surge is considered firm-specific and courts may well have to decide the extent to which they allow for prices beyond this lower level.

There is at least one reason for leaning towards the upper bound: as prices are also critical in encouraging expanded production (and entry, to the extent that it seems feasible), any intervention should balance the potential impact on distorting appropriate market signals.

The regulations also specify a comparatively short benchmark period (December 2019 to February 2020). The assessment of both demand and cost requires a pre-disaster period of sufficient duration, depending on the dynamic adjustment of price to cost and demand developments and the frequency of price changes. Consequently, the benchmark period must be established on a case-by-case basis, suggesting that the December-February period will not be appropriate to many of these cases.

The regulations signal changes to the loss function of competition authorities during this period, suggesting that authorities consider the cost of falsely judging an excessive price not to be excessive significantly higher than the cost of falsely judging a competitive price to be excessive during the disaster period. The re-allocation of resources within the authorities, the short adjudication period for complaints and a reverse onus placed on firms, significantly raise both the probability of being convicted (including falsely) and the cost of non-compliance relative to compliance (i.e. profit loss). The likely consequence is that firms refrain from increasing prices or will maintain pedestrian price increases below cost. Especially smaller firms may well find it better to comply. In this sense, the excessive pricing regulations will have the effect of de facto price control. Even so, as the disaster period continues, it is likely that firms under investigation - and especially larger firms - will challenge these provisions.

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