Response to Ofgem consultation on the market stabilisation charge activation

Dermot Nolan, October 2026[1]

Summary

Ofgem's proposal to introduce a market stabilisation charge for this winter is extremely ill advised. In particular, it fails Ofgem's primary duty to protect consumers - it is almost certain to increase consumer prices but Ofgem has not given any clear or empirically supported case of how it would provide countervailing benefits to consumers. As such, it is likely to harm energy consumers and should not be adopted.

The measure will act as a device to dampen price competition in the retail energy market. Ofgem attempts to justify the measure by saying that if it is not implemented there would be considerable costs arising from supplier failure which would lead to costs being socialised across consumers in a way that could exceed the benefits of lower prices. However, it ignores the fact that (a) Ofgem has since imposed financial resilience measures to ensure that firms can deal with shocks that render the prospect of firm failures extremely unlikely; (b) the circumstances here are quite different to 2022-23 so that, even if there were failures of some suppliers, the prospect of significant socialised cost being paid for by consumers is exceptionally low. It fails to offer any reasons to show that supplier failure could happen and provides neither a theoretical basis nor empirical evidence to suggest there would be any socialisation of consumer cost.

The proposal as it stands will simply be a transfer of revenues from consumers (and potential new entrants) to incumbent energy suppliers. Ofgem's own draft impact analysis fails to show how consumers might plausibly benefit from the measure, and ultimately resorts to justifying the measure of the grounds of an entirely undefined and nebulous concept it calls "investability", which seems to translate into firms in competitive markets not being subject to the normal forces of competition.

If Ofgem has clear evidence of increased wholesale volatility above that already included in the price cap methodology, it should publish that analysis for consultation and then, if necessary, modify the cap methodology to allow for it. Instead it has published no such analysis and chooses instead to use a condition that will raise prices, distort competition and likely inhibit entry and innovation into a market that needs it. This is at variance with what an economic regulator should do.

Throughout the document Ofgem refers to the problems of energy firms facing competition, and the inherent undesirability of having cheaper competitive offers that customers would benefit from. Its empirical analysis as set out in the consultation lacks data and is impossible to properly respond to due to its failure to try and evaluate even basic concepts. Overall not only is the measure unsupported by theory or evidence but its analysis falls below the

[1] The author used to work at Ofgem. He has advised Fuse Energy in the past and owns some shares in it. However, he has not discussed this issue with Fuse, and this submission is entirely separate from it and constitutes his own views.

standard of quality and transparency that would be expected from a competent economic regulator.

Background

Ofgem proposed the market stabilisation charge back in 2022-23, and argued that it was necessary to provide "stability" to the energy retail market. After this, it then instituted a series of changes, including requiring all licensed energy suppliers to fulfil financial resilience obligations. It also increased the frequency of retail price changes by reducing the update period from six months to three months, thus ensuring that should wholesale prices change rapidly, retail prices would be able to react more quickly than before thus ensuring less of a potential “mismatch” between retail and wholesale prices. Both these measures were designed primarily with a view to ensuring that the failure of companies in 2022 resulting in the socialisation of the costs of failure would not be repeated.

Ofgem’s primary duty is to protect the interests of consumers, not suppliers. A supplier failing in a competitive market is a natural consequence of competition, and indeed Ofgem says in the paper that it does not see the retail market as being a “no exit” market. A supplier failure that causes cost to be socialised is obviously highly problematic, but Ofgem should only be assessing the impact on firms in so much as it can demonstrate that this will ultimately affect consumers. It talks about investability without ever defining what this means, but despite talking about the benefits of innovation it appears to be ignoring this instead and protecting the interests of incumbent suppliers - the MSC would also potentially raise entry barriers and deter the entry of potentially innovative new firms.

The essence of the proposed intervention appears to derive from the idea that it is unfair to suppliers to have to deal with the possibility of a fall in wholesale costs. That reasoning would suggest that if wholesale prices fall, then this will be reflected in a variety of new offers made to consumers via fixed tariffs that are - at least for the period of time until the next change in SVT rates - lower than the price cap level.

The document is somewhat confusing on where these offers will come from. It does not explicitly refer to new entrants into the market but suggests that some existing "smaller firms" would start offering lower cost fixed tariffs. No evidence is presented as to why such firms might be more likely to offer such tariffs than other firms. It notes that larger firms who already have many customers on SVTs, may also offer such tariffs in an attempt to win new customers. Presumably they would do this by buying energy on the spot market.

However, I accept that in the absence of an MSC it is likely that some fixed price tariffs would be likely to appear and that some consumers might switch to them. (I would also note that economic regulators usually associate lower prices as being good for consumers.) Even if existing suppliers did not offer such tariffs, new entrants might, although it is unlikely that over the course of a 3-month period a prospective new entrant would manage to complete the process to obtain a supply license.

The document suggests that existing firms will generally adhere to the hedging methodology used as the basis for the setting of the price cap. It claims that once firms have adopted this

hedging strategy - which is based on its projected set of customers who are on SVT tariffs - it will be vulnerable to losing customers and, potentially, profits as a result of this.

Although it is not explicitly stated, the document seems to imply that should an existing firm deviate from the hedging framework inherent in the price cap, then should wholesale prices rise it will not have enough energy purchased to meet customer demand and will be forced to buy extra energy at spot market prices. These prices will be higher than the cost it would have paid had it hedged and it will, for a period of time until the next SVT price change, not be able to pass these extra costs onto its consumers due to the retail price cap.

The document does admit that hedging is a core competence for any firm, that making such decisions is a basic function of any firm in a competitive market, and claims that it is not trying to protect incumbents. But, basically, it argues that this arrangement is unfair. The core reason for this argument appears to be that in other markets firms may be able to charge some form of exit fee, should the customer leave the contract. However, it says that this is not allowed for SVT contracts and thus firms are subject to unreasonable amounts of risk and need a protective framework such as the MSC.

Problems

There are a number of issues with this.

First, as the document itself says, hedging is a core competence of a commercial firm. Ultimately, it is a position for the firm to take a view on. It is not at all clear why the regulator would have the obligation to protect incumbent firms from the consequences of their decisions.

Related to this is the idea of the regulator putting in measures on the basis of its expectation of how future prices may develop. Regulators usually avoid attempting to predict the future and it seems strange that it should seek to put a measure in place that relies on a highly specific sequence of movements in fuel prices. If incumbent firms, and indeed Ofgem, are so sure that wholesale prices may fall then surely it would be logical for them to take a hedging position consistent with this.

Second, the document suggests that it is unfair that firms do not have such a tool as exit charges. This seems an unusual argument to make given that SVT's have been part of the energy market ever since privatisation and have never had any exit charges attached to them. Energy retailers have been operating in this framework for over 25 years - there is nothing new about the relationship between SVTs, fixed tariff, and wholesale prices as to merit the introduction of something such as the MSC.

The price cap - introduced in January 2020 - may be influencing Ofgem's view on this. It is true that a firm cannot increase its SVT if it has miscalculated its hedging position, and prices have risen. However, even during the long period of retail liberalisation before the price cap was put in place firms still had to make difficult but necessary decisions on hedging. Even if there was no price cap, if wholesale prices rose and they were insufficiently hedged they would have to raise their SVT prices which would almost certainly

see customers leaving them and moving to fixed contracts. So the risk of "mis-hedging" was always present well before the price cap framework.

Third, when the price cap was set there was a specific allowance for wholesale price variability placed within it[2]. If Ofgem is fundamentally of the view that there is now a higher level of volatility in wholesale prices, then it should empirically demonstrate that and set a new allowance in the cap mechanism. The consultation paper talks about the current environment being risky. However, it produces no quantitative evidence that the risk profile is fundamentally different from that allowed for in the cap.

A regulator is supposed to gather data and make decisions transparently on the basis of this data. Ofgem could have tried to do this, and it would have been a more transparent and accurate way of accounting for wholesale price movements. In the absence of such evidence, it should adhere to the current measure used. In any case, responding to ill-defined arguments that risk is enhanced by consciously adopting a measure that limits the scope for competition is hardly an appropriate way for an economic regulator to act.

Fourth, an exit fee is somewhat different from the mechanism proposed in the MSC. The former sees a consumer paying a charge should it wish to switch. The MSC sees the firm charging a lower price paying a charge to the losing firm. The competitive effects of the two mechanisms will depend upon the models chosen, but they are not necessarily the same.

Contracts with exit fees are common in telecoms. However, they are not omnipresent and in any case are time-limited - thus consumers who have been with the same supplier for, say, 2 years can generally switch without fees. So implying that nearly all customers in telecom markets will have to pay to switch is not correct. Moreover, SVT customers took on their supplier relationship - and generally, though not always, paid higher prices than fixed contracts[3] - with the belief that they had the right to switch without paying a cost. For the regulator to consciously “impose” such a cost on them in order to ensure they pay a cost of switching seems to violate what they were signing on for. At the very least, it requires Ofgem to fully establish the existence and extent of any such cost.[4]

Finally, while I believe there is no case established for the imposition of any MSC at all, it is not at all clear why Ofgem chose a level of 85% of the benefits to be paid to the losing supplier. This figure seems high in principle, and no justification or empirical analysis has been offered to support it.

Effects on firms

The document attempts to provide an empirical example of what might happen to incumbent firms without an MSC. It sets out a scenario where (what appears to be) wholesale prices

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[2] The wholesale additional risk allowance (WARA)

[3] Ofgem accepts that fixed contracts are usually lower than SVT prices - see paragraph 4.46 of the consultation document

[4] Consultation document, paragraph 4.50 - “*In effect, this is conceptually similar to these consumers bearing an exit fee for the costs which result from moving away from the Cap - it is a cost related to their own tariff choices.*”

rise by 20% and then fall by 3/4 of that rise a month later. It posits that in that core scenario, if 17% of customers on SVTs switched to fixed tariffs over that month, then an incumbent form might lose £21 per customer.

It is impossible to comment on the reasonableness of this example as no further information is provided to allow anyone to do this. In the document, Ofgem says that harm of £20-30 per customer for a firm would be needed to invoke the MSC. Although I do not agree with this idea, given it has posited it as a threshold then surely Ofgem should explain how it derived the £21 figure. There is no information whatsoever on what the cost functions are; what the level of demand is; or any data that would allow one to test whether the figure is reasonable. Ofgem does state that it is assuming that switching rates are not affected by the MSC - this seems to be an extraordinarly strange assumption to make. In any case, it hardly seems unfair to say that this example provides no real support for any measure given the lack of ability to test whether the figure is accurate.

Enter the MSC

Against this background Ofgem is proposing to introduce an MSC. As is generally accepted, the core idea of a competitive market is that firms face incentives to be efficient and innovative in order to lower prices to attract consumers. This competition amongst existing firms is the absolute *sine qua non* of why competitive markets can deliver benefits for consumers. What seems incontrovertible is that the introduction or even the possibility of an introduction of an MSC will dampen competition - normally in deciding whether to reduce prices, a firm balances the lower price per customer against a potentially increased number of customers and comes to a decision about what the most profitable price is. Clearly an MSC changes this decision - if a firm gains a new customer, the fact that it has to pay some of this revenue to the firm it gains the customer from reduces the incentive to cut prices.

And of course, this works both ways - a firm that is not considering reducing its prices knows that keeping its prices high will be less of a problem for it as even if its customers leave to go to a cheaper supplier, it will still gain some revenue from the customers that have gone. Of course prices are generally set simultaneously, but taking both of these effects together it is almost impossible to imagine that the net effect would not be a higher aggregate price level for energy customers than if the measure had not been put in place. In the Annex, I have included a model of how prices would be set in a market structure somewhat analogous to retail energy, and compare it with what prices would be if there was an MSC. Unsurprisingly, prices are higher in the situation with an MSC.

Ofgem states that the MSC will only apply if wholesale prices actually fall, and if they do not then the MSC will have no impact. **This seems incorrect, and even the possibility that the MSC will be invoked over a 4 to 5 month period will be sufficient to harm competition.** If a firm - whether an incumbent or a new entrant - is thinking of reducing prices but faces the possibility that at any point over the length of this price reduction that an MSC period will be introduced, that is sufficient to reduce the incentive. Essentially, any supplier will have to put an ex *ante* probability of how long an MSC may actually be in operation over the winter period, and use that when setting its prices. It is the possibility

that an MSC may automatically come into force that will reduce the statistically expected benefits of a price cut, and make lower prices less likely in the market.

This measure is almost certain to reduce the incentive to compete and therefore increase the average price paid by energy customers. One of Ofgem's main justifications for the MSC is that it supports "investability", which is not a concept it has defined clearly. However, Ofgem has continually signalled its desire for more innovation in the retail space and introducing an MSC seems contrary to this - what this measure seems to be showing is it will act to protect the interest of incumbent firms at the expense of consumers and potential entrants and innovators.

Is an MSC necessary even assuming Ofgem is right on figures?

In any case, let us suppose for now that the estimate of "harm" to incumbent firms is basically accurate - that a pattern in wholesale prices will occur that would lose up to £21 per customer.

First, the idea that a regulator would be concerned that firms might lose revenue due to competition from other firms in a competitive market seems strange. The essence of competition is the process that sees one firm trying to win business from others as the vehicle that drives overall consumer welfare. For a regulator committed to competition to say that consumers gaining from more offers in the market is a problem seems perverse.

Second, I referred at the start to circumstances being different than during the crisis of 2022-23. Ofgem has stated that its primary response to that crisis was to develop a comprehensive framework for financial resilience of retail firms. This was developed over a period of time, and is now a license condition that all firms in the industry must adhere to. This framework was based on requiring all retail suppliers to hold a certain amount of capital per customer to allow them to withstand shocks to the market. It was developed and consulted on over time, and withstood an appeal by at least one supplier to the CMA.

Quoting directly from a relevant Ofgem document: "*licensed energy suppliers who supply energy directly to residential customers must at all times....hold or be working towards a 'capital target' of £115.*"[5] A few paragraphs later it is noted that: "*We choose the level of £115 after extensive consultation. We calculated this to be the reasonable minimum we expect a financially responsible, well hedged, supplier would need to have as a buffer for resilience in the event of a severe but plausible shock*".

As noted above, this capital requirement was the subject of some controversy in the industry with some stakeholders arguing that it was unnecessary, favoured incumbents, and would deter new and innovative entry. Ofgem maintained that it was necessary to ensure resilience against shocks.

Given this clear policy decision, it is entirely mysterious why Ofgem is now proposing to also apply the MSC to protect against the very shocks that the financial resilience requirements were supposed to prevent. Ofgem did not provide a specific definition of what was a 'severe

[5] https://www.ofgem.gov.uk/sites/default/files/2025-04/FRC_transparency_report.pdf Pages 10-11

but plausible shock" but it is hard to imagine that a 20% increase in wholesale price prices followed by a fall of 3/4 of that rise could be anything other than a plausible shock. Given that financial resilience requirements were supposed to protect against this, why would a regulator place an extra requirement to guard against exactly the same thing?

It should also be pointed out that there is a capital buffer of £115 per customer. Even on Ofgem's own figures in the current consultation, which we suggest are probably in any case too high, it is suggesting that there is a potential loss of £21 per customer. This is around 18% of the capital buffer explicitly put in place to withstand shocks. The current document has essentially completely ignored this figure, and it remains entirely unclear why having such a significant buffer in place, Ofgem now feels that is insufficient and an MSC must be added.

All UK regulators have been told to avoid unnecessary regulation. It is hard to understand why a regulator would put in place a complex measure designed to achieve a certain aim, and then needlessly add another measure designed to achieve exactly the same aim. This is particularly true given Ofgem's recent report on financial resilience in the retail energy sector[6], where it says "*The aggregate levels of capital in the domestic market in March 2026 remain significantly above the regulatory minimum requirement implemented last year, with £6.8 billion of regulatory capital against a target of £3.1 billion.*" This would suggest that £115 is much lower than true financial resilience. There have also been two supplier failures with no socialisation of costs.

Would suppliers fail?

So far we have taken a view that the proposed measure is likely to be anti-competitive and cause consumer prices to be higher than they would otherwise have been, which is something Ofgem itself admits in its draft impact assessment. What are the negative consequences to **consumers** of not having the MSC in place? Even if we accept that incumbent firms suffer some revenue loss - we would note that there could be new firms entering whose increase in revenue should also be noted - Ofgem accepts that the standard by which it is judged must be consumer welfare. It states that the benefits of imposing the MSC come from (a) "an expected reduction in the supplier of last resort (SOLR) levy"; and (b) "the positive consequences from supporting investability."[7]

Socialisation of costs

It cites the cost of socialisation of supplier losses as costing over £2 billion in the previous crisis and - correctly - notes that this is something it is keen to avoid. However, in its general analysis and specifically in the impact analysis, it puts this in as a cost to consumers as a result of not having an MSC. It never specifies exactly how this £21 cost to consumers would translate into a significant number of failed companies whose losses needed to be socialised across the consumer base. Surely if it is saying that consumer prices would increase as a result of the MSC it needs to set out a detailed and convincing case of how

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6 https://www.ofgem.gov.uk/sites/default/files/2026-06/Supplier-financial-resilience-report-2026-v.1.1.pdf .

7 See the consultation document - A1.26

this consumer gain would be "wiped out" by the socialised costs. At no stage does it do anything like this.

Indeed, at one point - paragraph 4.54 - it makes the puzzling claim that "*our proposal to activate the MSC is not based on an assessment that the activation or otherwise of the MSC would likely or necessarily be pivotal to the financial position of any individual supplier*". If Ofgem means this, it would seem to suggest that the MSC will not protect the financial position of any supplier and that, whether the supplier fails and has socialised costs or not, is not affected by the presence or lack of the MSC. However, given Ofgem's case for proposing the MSC is by its own admission largely based on ensuring that any socialised costs are minimised, then it appears to make no sense to introduce it.

In any case, there is an important difference between the crisis of 2022-23 and the future scenario that Ofgem is contemplating. In the former situation, wholesale prices were rising more quickly and retail prices - which at the time were only changed every six months - did not keep up with this. Firms took significant losses because they had not hedged according to the methodology of the cap and had to purchase energy on the spot market, which was far more expensive than they could charge customers on the SVT cap. As a result, many ran into financial distress and their customers had to be sold to other suppliers. The key point with those sales was that the acquiring firms had to be compensated - the wholesale cost of, say, taking on 1 million new customers was much higher than the cost firms were allowed to recover from those customers until the next change of the price cap. This was the source of the entire socialised cost - the need to compensate those suppliers for taking on customers with high spot market costs.

The situation envisaged here is the reverse. First, the period between retail price changes is now three months rather than six, which means that any mismatch between wholesale and retail prices would be significantly shorter and any associated costs would be less. In fairness, Ofgem's example was for only a relatively short mismatch period. However, there is a more fundamental reason why socialised costs would not occur. Should an incumbent firm run into financial distress and have to dissolve and its customers be sold to another firm, the wholesale cost of serving such customers (which will be determined by buying energy on the spot market) would in fact be less than what customers could be charged. In such a situation, moving customers to another firm would not incur costs that needed to be socialised as such customers would almost certainly be profitable for the acquiring firm.

This was the situation from 2016 to 2020 when a number of firms failed, but all the customers were sold on without any serious socialisation of cost. There would be some administrative cost in terms of the regulator having to run processes to deal with this and firms having to spend some time acquiring customers but these are unlikely to be very large. Also, firms closing would not be positive for competition but it is entirely possible some of the customers might be acquired by new entrants which would allay that concern.

“Investability”

The second benefit that Ofgem feels justifies the introduction of the MSC is that it will promote “investability” - this is mentioned a number of times throughout the document but Ofgem never attempts to give any further explanation of what that means, apart from

perhaps that firms should be protected from suffering losses. Yet it claims that putting in an MSC will promote investability; it also claims that investability will lead to better consumer outcomes and innovation over time; and it also claims that its secondary duty to consider the effects on economic growth is satisfied because investability will promote economic growth. Given the main impact of this measure will be higher prices than would otherwise have been the case, it is hard to see how it facilitates economic growth.

Ofgem also refers to the benefits of innovation in the retail sector. It is hard to see how ensuring incumbents are protected from the consequences of their own decisions is promoting innovation. It is far more likely that the barriers to entry and expansion by potentially more efficient and innovative firms that are deliberately put up by Ofgem will deter innovation, and thus that the MSC will harm consumer welfare by limiting the scope for innovation.

Ultimately, these are qualitative arguments that are hard to resolve. The key point is that Ofgem has not sought to do any proper analysis to support the idea of “investability” contributing to consumer welfare. A serious regulatory body would attempt to provide a genuine analytic framework for this and to only impose a measure that they know will increase prices if it had a concrete and empirically supported set of reasons for why and how it would affect consumer welfare.

Ofgem has not done this. Merely stating that “investability” is a good thing that will benefit consumers without attempting to provide any analysis, or even define what it is, constitutes a clear failure to adhere to its duties as a regulator.

Costs and benefits, and conclusion

Ofgem has avoided directly comparing the benefits and cost of this measure, saying that it is not required to do a RIA in this case. Nevertheless it seems to accept that prices will rise as a result of the MSC being activated - table A1 on page 48 suggests that consumers might expect to lose a total of £0.2bn as a result of the MSC. How it derives this figure is unclear and again one would expect that a regulatory body would explain where its data and assumptions have come from.

It is puzzling how it can say that without the MSC firms would lose £0.5bn and customers would gain 0.2bn. Should they not be the same amount? What happens to the other £0.3bn? This could accrue to new entrants but Ofgem makes no mention of them, and if it does, that should be netted against the £0.5bn loss occurring to existing firms. The analysis in this whole section is unclear, and far below the level of precision and rigour one would expect a regulator to exhibit.

Overall, however, Ofgem accepts that prices will rise due to the MSC. I would note that prices will rise even if the MSC is never actually triggered - albeit to a lesser extent - as the very possibility that it may be activated will deter firms from lowering prices as they know they will not get the same increase in customer numbers in response.

As against this, it has provided absolutely no evidence of any countervailing benefits to consumers that would more than compensate for this price rise. It has not shown any

mechanism that could plausibly lead to costs being socialised across the consumer base. It relies instead purely on an entirely vague notion of investability, and ignores its own decision to impose strong financial stability requirements. These requirements were almost certainly costly and have likely already increased entry barriers into the retail market. Instead of relying on its own licence conditions, Ofgem has chosen to introduce another measure that will raise prices further. It should not do this.

Annex

This is a stylised model of a market that would have, in my view, relatively similar characteristics as the energy retail market. This is a Bertrand price setting model, with a degree of product differentiation between firms. This is a relatively sensible model for the retail energy market as it assumes firms choose their price as the key variable, and allows for some difference between firm offers. Both of these factors seem to correspond to energy retail, though it should be noted that the degree of differentiation between firms in energy retail is probably relatively low.

The model is solved to find the equilibrium price. It is then solved again in a slightly simpler (2-firm) framework when any firm that attempts to charge below its rival has to pay half of the price difference if one of the customers from its rival joins it. The equilibrium price is solved for here as well, and is higher than without this measure (which is essentially the MSC).

I should be explicit that this model was generated by AI. I have however checked its results, and it is in any case a fairly standard model that is broadly equivalent to similar models in many economic textbooks.

Any model is never a perfect representation of real conditions in a market, and I am not suggesting that this one is. However, it is a fairly reasonable proxy and I would suggest that the result shown here - that equilibrium prices are higher as a result of the introduction of an MSC - would be true in most other models of a market characterised by setting prices with a limited degree of product differentiation.

Model Setup

1. Demand Function

Consider a market with n symmetric firms indexed by \(i = 1, 2, \dots, n\). Each firm produces a differentiated, imperfectly substitutable product. [1, 2]

We use a linear demand specification for firm i:

$$q_i = \alpha - \beta p_i + \gamma \sum_{j \neq i} p_j$$

- p_i: The price charged by firm i.
- p_j: The price charged by rival firm j.
- $\alpha > 0$: The base level of market demand.
- $\beta > 0$: The own-price sensitivity of demand (how much firm i's demand drops when its own price increases).
- $\gamma > 0$: The cross-price sensitivity of demand (how much firm i's demand rises when a competitor raises its price).
- **Substitutability condition**: We assume $\beta > (n-1)\gamma$ and $\gamma > 0$, meaning a firm's own-price effect dominates the sum of cross-price effects from all rivals, and goods are economic substitutes. [1, 2]

2. Cost Function

Each firm has a constant marginal cost $c \geq 0$ and zero fixed costs, such that the total cost for firm i is:

$$C(q_i) = c \cdot q_i$$

Deriving Equilibrium Price

1. Profit Maximization

Each firm i simultaneously chooses its price p_i to maximize its profit π_i, taking the prices of all rival firms (p_{-i}) as given: [1, 2]

\(\max _{p_{i}}\pi _{i}=(p_{i}-c)q_{i}=(p_{i}-c)\left(\alpha -\beta p_{i}+\gamma \sum _{j\ne i}p_{j}\right)\)

2. First-Order Condition (FOC)

Differentiate the profit function with respect to p_i and set the derivative to zero:

$$\frac{\partial \pi_i}{\partial p_i} = \alpha - \beta p_i + \gamma \sum_{j \neq i} p_j - \beta(p_i - c) = 0$$

$$\alpha + \beta c + \gamma \sum_{j \neq i} p_j - 2\beta p_i = 0$$

3. Reaction Function

Rearranging for p_i gives the best-response (reaction) function for firm i: [1, 2]

$$p_i(p_{-i}) = \frac{\alpha+\beta c+\gamma\sum_{j\neq i} p_j}{2\beta}$$

4. Symmetric Equilibrium

Because all n firms are identical and symmetric, they will choose the same equilibrium price: $p_i = p_j = p^*$ for all i, j.

Substitute $p_i = p^*$ and $\sum_{j\neq i} p_j = (n-1)p^*$ into the reaction function:

$$p^* = \frac{\alpha+\beta c+\gamma(n-1)p^*}{2\beta}$$

Multiply both sides by 2β:

$$2\beta p^* = \alpha + \beta c + \gamma(n-1)p^*$$

Collect terms involving p^* on the left side:

$$[2\beta - \gamma(n-1)]p^* = \alpha + \beta c$$

Solve for the equilibrium price p^*:

$$p^* = \frac{\alpha+\beta c}{2\beta-\gamma(n-1)}$$

Deriving Equilibrium Quantity

To find the equilibrium quantity q^* for each individual firm, substitute the symmetric equilibrium price $p^*i = p^*j = p^*$ back into the individual demand function:

$$q^* = \alpha - \beta p^* + \gamma(n-1)p^*$$

$$q^* = \alpha - [\beta - \gamma(n-1)]p^*$$

Substituting the expression for p^*:

$$q^{*} = \alpha - [\beta - \gamma(n-1)]\left(\frac{\alpha+\beta c}{2\beta-\gamma(n-1)}\right)$$

This yields the symmetric quantity produced and sold by each of the n firms in the differentiated Bertrand market.

We now move to a market which has the similar characteristics save that any firm that attracts a customer from the other firm has to pay half the difference to the firm losing the customer. For tractability, we use a two-firm example with differential costs.

We will look at a **two-firm market ($n = 2$) with different marginal costs**, where Firm 1 is highly efficient (c_1) and Firm 2 is less efficient ($c_2 > c_1$).

The new asymmetric equilibrium prices are:

- $p_1^{*} = \frac{2\beta(\alpha+\beta c_1)+\gamma(\alpha+\beta c_2)+\gamma^2(c_2-c_1)}{4\beta^2-2\gamma^2}$
- $p_2^{*} = \frac{2\beta(\alpha+\beta c_2)+\gamma(\alpha+\beta c_1)+\gamma^2(c_1-c_2)}{4\beta^2-2\gamma^2}$

Step-by-Step Derivation

1. The Asymmetric Profit Functions

With two firms, the demand equations are:

$$q_1 = \alpha - \beta p_1 + \gamma p_2$$

$$q_2 = \alpha - \beta p_2 + \gamma p_1$$

If Firm 1 sets a lower price than Firm 2 ($p_1 < p_2$), it captures $\gamma(p_2 - p_1)$ customers from Firm 2 and must pay a transfer of $\frac{1}{2}(p_2 - p_1)$ per customer.

Accounting for this, the profit functions for both firms are:

\(\pi _{1}=(p_{1}-c_{1})q_{1}-\frac{\gamma }{2}(p_{2}-p_{1})^{2}\)

\(\pi _{2}=(p_{2}-c_{2})q_{2}-\frac{\gamma }{2}(p_{1}-p_{2})^{2}\)

2. First-Order Conditions (FOC)

We maximize each firm's profit with respect to its own price.

For **Firm 1**:

$$\frac{\partial \pi_1}{\partial p_1} = (\alpha - \beta p_1 + \gamma p_2) - \beta(p_1 - c_1) - \frac{\gamma}{2} \cdot 2(p_2 - p_1)(-1) = 0$$

$$\alpha - 2\beta p_1 + \beta c_1 + \gamma p_2 + \gamma(p_2 - p_1) = 0$$

$$\alpha + \beta c_1 - (2\beta + \gamma)p_1 + 2\gamma p_2 = 0 \quad --- \quad (Equation\ 1)$$

For **Firm 2**:

$$\frac{\partial \pi_2}{\partial p_2} = (\alpha - \beta p_2 + \gamma p_1) - \beta(p_2 - c_2) - \frac{\gamma}{2} \cdot 2(p_1 - p_2)(-1) = 0$$

$$\alpha - 2\beta p_2 + \beta c_2 + \gamma p_1 + \gamma(p_1 - p_2) = 0$$

$$\alpha + \beta c_2 - (2\beta + \gamma)p_2 + 2\gamma p_1 = 0 \quad --- \quad (Equation\ 2)$$

3. Solving the System of Equations

We can express the reaction functions from Equations 1 and 2:

$$p_1 = \frac{\alpha + \beta c_1 + 2\gamma p_2}{2\beta + \gamma}$$

$$p_2 = \frac{\alpha + \beta c_2 + 2\gamma p_1}{2\beta + \gamma}$$

Substituting p_2 into the equation for p_1 and solving simultaneously yields the equilibrium prices stated above.

To see the economic impact clearly, we can rewrite the equilibrium prices by grouping the cost asymmetry term $(c_2 - c_1)$:

$$p_1^* = \frac{\alpha(2\beta + \gamma) + \beta(2\beta c_1 + \gamma c_2)}{4\beta^2 - 2\gamma^2} - \frac{\gamma^2(c_2 - c_1)}{4\beta^2 - 2\gamma^2}$$

$$p_2^* = \frac{\alpha(2\beta + \gamma) + \beta(2\beta c_2 + \gamma c_1)}{4\beta^2 - 2\gamma^2} + \frac{\gamma^2(c_2 - c_1)}{4\beta^2 - 2\gamma^2}$$

The transfer rule **fundamentally alters the equilibrium** when firms have different costs:

- **The Efficient Firm ($Firm1$) Moderates Its Aggression:** Because $c_1 < c_2$, Firm 1 naturally wants to price lower to steal market share. However, the

presence of the $-\gamma^2(c_2 - c_1)$ dynamic forces Firm 1 to price *higher* than it normally would in a standard asymmetric Bertrand game. It prices higher because it knows undercutting requires a cash payout to its rival, softening its incentive to price-gouge.

- **The Inefficient Firm ($Firm2$) Obtains a Defensive Subsidy:** Firm 2 prices *higher* because of the $+\gamma^2(c_2 - c_1)$ term. It can afford to keep its prices elevated because the transfer rule acts as an insurance policy—if it loses customers to the cheaper Firm 1, it gets compensated directly out of Firm 1's margins.
- **Collusive Effect:** Overall, this rule dampens price competition in asymmetric markets. It shifts the equilibrium toward higher prices for both firms, effectively penalizing operational efficiency and protecting less competitive players.