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# Quantifying the Benefits of Competition Enforcement and Advocacy

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## Quantifying the Benefits of Competition Enforcement and Advocacy

### Introduction

1. The quantification of the effects of the enforcement of competition laws and policies is being examined in many jurisdictions for disparate reasons: (i) to estimate benefits arising from competition law enforcement against anticompetitive practices; (ii) to estimate damages arising from particular conduct by infringing firms for purposes of damages litigation; and (iii) to justify resources being spent on competition enforcement. While there are differing objectives to undertaking the calculations, these can be seen as different sides of the same coin as similar concepts are applied.

2. It is important to note that quantification can occur at two stages: (i) ex-ante quantification, also known as an impact assessment, where consumer benefits of the enforcement work is calculated after the issuance of an infringement decision, but based on data obtained at the time of or shortly after the intervention; and (ii) ex-post quantification, where the effects are calculated based on data collated over a period of two to three years after the intervention.[1]

3. This paper focuses on an evaluation of ex-ante impact assessment with reference to cases in Singapore, which draws from the practices by competition authorities that publish regular appraisals.[2] The paper discusses, firstly, the methodology and considerations in choosing this method of calculation; secondly, a discussion on the limitations on the measures detailed; thirdly, other possible sets of measures to look at in assessing the effects of enforcement work; and concluding on the benefits and pitfalls of impact assessments.

### Methodology

4. Similar to the method applied by the more mature jurisdictions, the impact of enforcement by the Competition Commission of Singapore (CCS) can be calculated as the overcharge that was avoided as a result of intervention to remove anti-competitive conduct. The key assumptions that this relies upon are as follows:

i) Any anti-competitive activity would result in a price increase or overcharge in the relevant affected market; and

ii) In the absence of CCS's intervention, the anti-competitive conduct would prevail for some length of time.

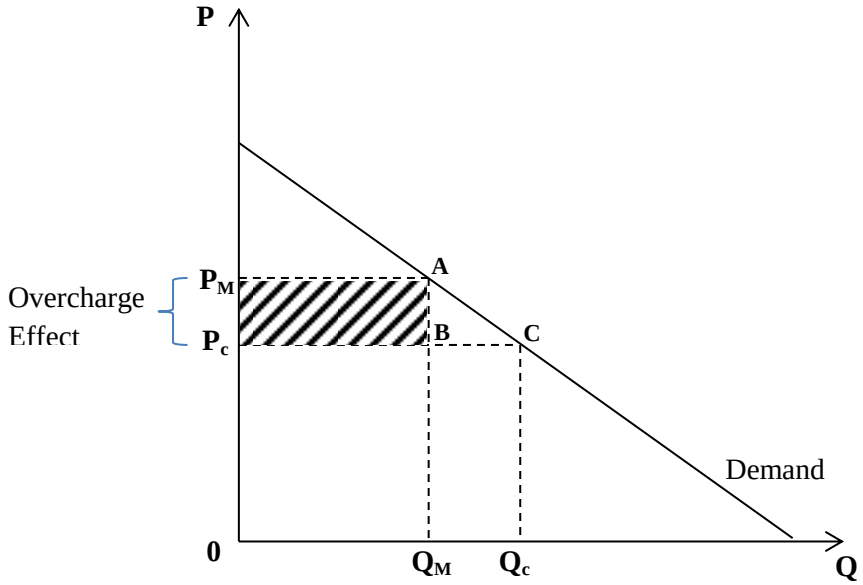
5. To illustrate what is being calculated in graphical form, we assume a simple linear

[1] CCS has undertaken *ex-post* quantification in the form of post-action studies for specific cases. This includes the *"Post-enforcement Evaluation Report"* and *"Post-Action Evaluation of CCS's Merger Clearance in the Dialysis Market"* published on the CCS website on 26 August 2013 and 26 April 2016 respectively.
URL: https://www.ccs.gov.sg/media-and-publications/publications/occasional-papers

[2] These are: the United Kingdom Office of Fair Trading (UK OFT), United States Department of Justice and Fair Trading Commission (US DoJ and FTC), the European Commission (EC) and the Netherlands Competition Authority, *Nederlandse mededingingsautoriteit* (NMa).

demand curve as depicted in Figure 1 below. The price overcharge is represented by the shaded rectangle $P_MABP_c$, which would be multiplied by the length of time that is estimated that the conduct would have persisted without intervention.

**Figure 1: Overcharge from Anti-competitive Conduct**




### *Size of Market*

6. To calculate the value of the shaded region, we first need to obtain an estimation of the market size. This is likely to be fairly easy as it would have been assessed in the course of the investigation. Typically, competition authorities assume that the conduct would only affect the infringing parties' turnover, and resultantly, this should be the size of the market.[3] While this ignores the knock-on effects on the prices of other competitors in the relevant affected market, generally, it is considered that the narrow definition (i.e. parties' turnover) would likely reach a conservative estimate, whereas the wider alternative (i.e. market turnover) would have the opposite effect of overestimating the estimates.[4] The value of the wider alternative, in itself, can be considered to provide an estimate of the scope of the impact of enforcement activities in relation to a particular infringement.

7. In most cases, the infringing party(s) relevant turnover would be the area below the demand curve (in Figure 1) for price, $P_M$, which is the non-competitive equilibrium denoted by the area $0P_MAQ_M$, which is inclusive of the price overcharge. However, there are instances where the relevant turnover figures obtained[5] are for a period before the conduct

[3] Peter Ormosi, *"Evaluating the Impact of Competition Law Enforcement"*, Working Party No. 2 of the Competition Committee, 11 June 2012, Organisation for Economic Co-operation and Development (OECD)

[4] Stephen Davies, *"Assessment of the Impact of Competition Authorities' Activities"*, Working Party No. 2 of the Competition Committee, 25 February 2013, OECD

[5] Relevant turnover figures are usually requested in the calculation of penalties, and would usually be for the Financial Year immediately before the infringement decision is issued. It is possible for the figures obtained to be for a period prior to the conduct if the infringement decision was issued fairly quickly for a conduct that occurred for a relatively short period of time. Non-competed mergers that are notified and assessed would similarly result in turnover figures that do not include an expected price overcharge.

occurred, which would not include the price overcharge and, hence, would be represented instead by $0P_cBQ_M$. This occurred in the case pertaining to price fixing conduct by foreign worker employment agencies in Singapore, where the conduct was for a short period of approximately three months (between January and May 2011), and the relevant turnover figures obtained were for the financial years ending in 2010, prior to commencement of the anti-competitive conduct.[6]

### *Estimation of Overcharge*

8. It is assumed that all anti-competitive activity would result in a price effect in the relevant market. The relevant turnover figure would already contain the said price effect of the anti-competitive activity. The value of the price effect in a year is derived from reversing this price effect from the relevant turnover. Mathematically, this is calculated as:

$$\boldsymbol{Value\ of\ Price\ Effect} = \frac{\boldsymbol{Relevant\ Turnover}}{\boldsymbol{100\% + Price\ Effect}} \times \boldsymbol{Price\ effect}$$

9. We would look to draw from case-specific evidence to determine the figure to use as the likely price rise as a result of the conduct.[7] A non-exhaustive list of ways to estimate this figure is as follows:

*Anecdotal / Informal Evidence*

10. This could include informal or heuristic methods could be interviews with personnel from firms engaging in the anti-competitive conduct that could reveal their estimates of the overcharge.[8] Yet, there is uncertainty in such anecdotal evidence and most authorities would prefer to use more systematic *back-of-the-envelope* simulations.

*"Back-of-the-Envelope" Simulations*

11. One commonly used method to estimate the overcharge is before-after comparisons. As the name suggests, this is a simple comparison of the price before and after the conduct. However, it is not always easy to determine the exact point at which the conduct began due to the lack of clear evidence.[9] In addition, this method does not take into account other factors such as exchange rate movements, industry shocks or inflation rates that could too affect price. This could wrongly attribute some of the price changes to the anti-competitive conduct when they were instead caused by other factors.[10]

12. A second method could be to use marginal cost as the undistorted price, stemming from the concept that in perfectly competitive markets, price would equate marginal cost. Where it is difficult to estimate marginal cost figures, average cost can also be used as an

[6] CCS 500/001/11, Notice of Infringement Decision issued by the Competition Commission of Singapore (CCS), Fixing of monthly salaries of new Indonesian Foreign Domestic Workers in Singapore, 27 September 2011.
[7] Stephen Davies, *"Assessment of the Impact of Competition Authorities' Activities"*, Working Party No. 2 of the Competition Committee, 25 February 2013, OECD
[8] James A. Brander and Thomas W. Ross, *"Estimating Damages from Price-Fixing"*, Canadian Class Action Review 01/2006, 3(1)
[9] *Ibid.*
[10] *Ibid.*

estimate, given that in the long run equilibrium of perfect competition, average cost equates to marginal cost. Yet, the assumption here can be regarded as overly simplistic as it is rarely the case that markets are perfectly competitive.[11]

13. Another method that can be used is the "analogy" method, although this is dependent on there being an alternative market that is fairly similar to the market where the anti-competitive conduct has occurred. This method compares two similar markets to draw inferences regarding the effect of the conduct in estimating the price overcharge.[12]

*Econometric Methods*

14. Authorities might also look to applying econometric methods such as demand estimation, market simulation or reduced-form estimations of price in calculating the likely overcharge averted. The common concept applied is to make an assumption on the demand function of the market in question and simulate what would happen in the market taking into account the likely form of competition (i.e. the Cournot model of competition on quantity or Bertrand model of competition on price) as well as cost information.[13]

15. While econometric methods have the advantage of calculating the entire harm averted, including the deadweight loss triangle *ABC*, it is typically very time consuming and requires significant amounts of data as compared to the more qualitative approaches detailed above.

*Default Assumptions*

16. Where case-specific evidence is not available to estimate the price effect, default assumptions on the price effects are to be relied upon. Table 1 below lists the typical assumptions followed by jurisdictions that regularly conduct impact assessments. In relation to the price overcharge, the cartel default is derived from empirical evidence suggesting that the median cartel overcharge lies between 17 and 30 per cent.[14]

**Table 1: Default Assumptions used in other jurisdictions**[15]

| | Mergers | Cartels | Abuse of Dominance |
|---|---|---|---|
| Price rise averted | 1% | 10-15% | 1-10% |
| Duration (years) | 1-7 | 1-6 | 1-6 |

17. It is considered that the appropriate defaults on the expected price effect, in the context of Singapore, can be an overcharge of: (i) 10 per cent in cartel cases; (ii) 5 per cent in abuse of dominance cases; and (iii) 3 per cent in merger cases. These are, firstly, in line with OECD countries who consider these to be conservative assumptions, based on

[11] James A. Brander and Thomas W. Ross, *"Estimating Damages from Price-Fixing"*, Canadian Class Action Review 01/2006, 3(1)
[12] *Ibid.*
[13] *Ibid.*
[14] John M. Connor and Yuliya Bolotova, *"Cartel Overcharges: Survey and Meta-Analysis"*, International Journal of Industrial Organization, Vol. 24, 2006
[15] Stephen Davies, *"Assessment of the Impact of Competition Authorities' Activities"*, Working Party No. 2 of the Competition Committee, 25 February 2013, OECD

empirical research.[16] The exception is that of raising the merger assumption to that of 3 per cent in agreement with the view raised by Davies that most authorities would likely not intervene unless there were grounds to suspect that the merger parties would raise prices by at least 3 per cent.[17]

18. Further, the results of the *ex-post* evaluation conducted by CCS in 2013, in particular, the findings of the evaluation of the Express Bus Agencies Association (EBAA) cartel, suggested a price reduction of 11 per cent from the cartel price recorded in 2008. Taking into account cost increases in labour and fuel, the price decline is approximately 25 per cent in real terms from the previous cartel price.[18] This suggests that the 10 per cent value used for the cartel price overcharge is likely to be conservative.

### *Estimation of Length of Time that Conduct would have Persisted*

19. It is further assumed that anti-competitive conduct would only last for a limited period, even if intervention by authorities did not occur. Again, case-specific information could help to shed light on appropriate figures to use in estimating the expected duration. With respect to cartels, a possible factor to look at in estimating the expected duration is whether or not there was an application for leniency. It is suggested that less stable cartels are more likely to apply for leniency,[19] and as such, it would be prudent to apply a shorter life-span on cartels detected through leniency. Higher mark-ups might also be indicative of the stability of the cartel given that higher mark-ups would come with the risk of higher probability of detection by customers.[20] For mergers and abuse cases, factors to look at could be the market structure and barriers to entry and expansion that could affect the speed at which market self-correction could occur i.e. new entry or rival expansion.

20. Where information is limited, we can again rely on default assumptions on the expected duration: (i) 3 years for cartel and abuse cases, and 2 years for merger cases. The shorter duration used for merger cases would account for the fact that, in most cases, there are still more competitors in the relevant market post-merger as compared to in abuse cases and, hence, market self-correction should occur more quickly.

21. The product of these two estimated figures – price overcharge and expected duration – will give the total price effect expected to have been avoided with CCS's intervention.

[16] OECD, *"Guide for helping competition authorities assess the expected impact of their activities"*, 2014
[17] Stephen Davies, *"Assessment of the Impact of Competition Authorities' Activities"*, Working Party No. 2 of the Competition Committee, 25 February 2013, OECD
[18] CCS, *"Post-Enforcement Evaluation: Methodologies and Indicative Findings"*, 26 August 2013
[19] Joseph E. Harrington Jr., *"Optimal Corporate Leniency Programs"*, Journal of Industrial Economics, 2008, 56, pp. 215 – 246
[20] Michael K. Block, Frederick C. Nold and Joseph G. Sidak, *"The Deterrent Effect of Antitrust Enforcement"*, Journal of Political Economy, June 1981, Vol. 89, No. 3

## Limitations

22. A common observation on the impact assessment figures reported by the four authorities that publish their estimates is that the variance on the number, size and scope of cases can be significant across the years. This is likely a result of lengthy procedures, often spanning more than a year, and a matter of timing.[21] For example, should many cases be opened in a particular year, the measured impact would likely be low for that year but be much higher in subsequent years when these cases are concluded. The UK authorities report three-year moving-averages to correct for such fluctuations in the estimates.[22] Further, these figures are sensitive to the assumptions used.[23] Thus, in determining the estimates to use, a case-by-case approach is preferred to ensure that there is logical basis for each assumption. Authorities should also conduct regular ex-post evaluations as they could form the main empirical backing for assumptions used in ex-ante impact assessments.

23. Secondly, the calculations only take into account static consumer benefits (price effects), ignoring both dynamic effects and deterrence effects.[24] Dynamic effects refer to effects on the quality of products, the amount of choice and innovation in the market in question. Singapore applies a total welfare standard as compared to a consumer welfare standard in some jurisdictions, and hence, taking into account dynamic effects would be more in line with the total welfare standard. In relation to deterrence effects, the OFT commissioned a survey by Deloitte in 2007 to guess the magnitude of deterrent effects which suggested that for every investigated case, there are five other cases which do not occur because they are deterred.[25] High deterrence effects could have the perverse effect of lowering measurable impact as there would be fewer cases for authorities to look into.[26] Yet, there could also be the opposite effect of a deterrence of pro-competitive activities. As dynamic and deterrence effects are relatively unobservable, most jurisdictions, including Singapore, apply a conservative approach in the calculations focusing on consumer welfare, noting that they would underestimate the total impact of competition enforcement work.

24. Finally, there are some forms of work that competition authorities undertake that could have benefits to consumers and businesses alike, but are not included in impact assessments. For instance, CCS undertakes advocacy work like outreach sessions to consumers and businesses promote competitive culture, or government advisories to assist in ensuring policies implemented do not result in inadvertent anti-competitive effects. Additionally, there are merger clearances that could be efficiency-enhancing that are typically not considered in impact assessments.[27]

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[21] Peter Ormosi, *"Evaluating the Impact of Competition Law Enforcement"*, Working Party No. 2 of the Competition Committee, 11 June 2012, OECD
[22] *Ibid.*
[23] *Ibid.*
[24] *Ibid.*
[25] Deloitte, *"The deterrent effect of competition enforcement by the OFT"*, November 2007.
[26] Peter Ormosi, *"Evaluating the Impact of Competition Law Enforcement"*, Working Party No. 2 of the Competition Committee, 11 June 2012, OECD
[27] *Ibid.*

## Other Measures

25. Given the limitations of the measure based on the price overcharge averted, other measures should be considered in assessing the impact of CCS's intervention. This includes:

### *Harms or illegal gains by infringing parties*

26. The calculation of the actual harm caused by the anti-competitive conduct follows similar assumptions to that detailed above in relation to the averted harm. The main difference is that the duration used is that of the actual duration of the anti-competitive conduct. However, it is recognized that this calculation has its limitations given that it assumes the same level of overcharge across the entire period of the conduct, which in reality, would likely not be the case. Further, there is not always conclusive evidence on the actual duration of the conduct.

### *Value of the market opened for competition*

27. Another value that should be considered is that of the size of the market that would experience more competition, as a result of CCS's intervention. This would apply, specifically, to cases that have clearer elements of foreclosure, mainly abuse cases.[28] This measure assumes that of the relevant turnover, only a portion has been obtained through anti-competitive activity whereas the remainder can be considered to be achieved on merit. For instance, in CCS's landmark abuse of dominance case, the abusing ticketing company, SISTIC, it was assessed that the accumulated foreclosure attributable to the exclusive agreements was in the range of 60 to 65 per cent by revenues.[29] The value of the market opened for internal consideration was considered to be SISTIC's relevant turnover multiplied by this 60 to 65 per cent. Such a calculation, though unpolished, provides an estimation of the benefits that enforcement work has for businesses and competitors.

### *Deadweight loss estimation*

28. Referring to Figure 1, it is observed that the averted harm should also include the triangle *ABC* in addition to the shaded rectangle. This triangle can be regarded as the deadweight loss averted – harm that arise due to the reduced use of the product.[30] The difficulty in estimating this value is the need for demand elasticity figures, which are not easily available. The value of the deadweight loss, based on the assumption of unit demand elasticity, yielded relatively small values as compared to the overcharge estimate, which corresponded to the literature review.[31] Hence, it should be considered practical to put less emphasis on this figure.

[28] It is to be noted that there are also some cartel cases, for example, that of collective boycotts where foreclosure elements are more apparent.
[29] CCS 600/008/07 Notice of Infringement Decision issued by CCS, Abuse of Dominant Position by SISTIC.com Pte Ltd, 4 June 2010
[30] James A. Brander and Thomas W. Ross, *"Estimating Damages from Price-Fixing"*, Canadian Class Action Review 01/2006, 3(1)
[31] *Ibid.*

## Conclusion and Caveats

29. Newly established competition authorities often struggle to establish the level of public acceptance and credibility that they would need to help them fulfil their tasks and objectives.[32] Impact assessments can form a quick accountability measure to show the benefits of competition enforcement work.

30. However, as discussed, there are many limitations to the current methods of impact assessment used, in particular, the dependence on many assumptions. Hence, there is a need to conduct regular ex-post evaluations to constantly refine the assumptions that are fed into impact assessments to ensure that the calculations are logical and takes into account the specificities of each jurisdiction.

31. Authorities should also be wary to not be tempted to exert "distortionary discretion" and be overly interventionist in seeking to maximize the value of the impact calculated.[33] This could include pitfalls such as cherry-picking "easy" options for intervention activities or focusing on cases that are more observable or measurable, rather than seeking to maximize deterrence effects or ensuring dynamic efficiency.[34]

[32] Peter Ormosi, *"Evaluating the Impact of Competition Law Enforcement"*, Working Party No. 2 of the Competition Committee, 11 June 2012, OECD

[33] Damien Neven and Hans Zengler, *"Ex Post Evaluation of Enforcement: A Principal-Agent Perspective"*, De Economist, 2008. 156:477-490

[34] Joseph E. Harrington Jr. and Myong-Hun Chang, *"Modeling the Birth and Dealth of Cartles with an Application to Evaluating Competition Policy"*, Journal of the European Economic Association, Vol. 7, Issue 6, Dec 2009, pp. 1400 - 1435