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STOCKTAKING ON EVALUATION

-- Note by Mr. Peter Ormosi --

11 June 2012

This paper by Mr. Peter Ormosi on evaluating the impact of Competition Law Enforcement is circulated to delegates FOR DISCUSSION for the forthcoming meeting of Working Party No.2 of the Competition Committee to be held on 11 June 2012.

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EVALUATING THE IMPACT OF COMPETITION LAW ENFORCEMENT

-- Note by Mr. Peter Ormosi[1]--

1. Introduction

1. Governments spend an increasing amount of resources on the enforcement of competition laws and policies and in return would like to know whether this spending has been justified and whether competition policy interventions into the economy have shifted markets closer to a competitive outcome and hence benefited consumers and contributed to a more efficient allocation of resources. For this reason measuring the impact of competition enforcement is becoming an important task in many jurisdictions. By this exercise Governments aspire – and often are accountable – to show that interventions indeed improve the social outcome and it is not only that market failure is replaced by government failure, something that critiques of Government intervention into markets often claim.

2. A large amount of work from governments, academics, and the private sector have now investigated the impact of competition interventions. The majority of these evaluations show that competition enforcement has improved welfare in one way or another. As a result of the large number of relevant studies we have now accumulated enough knowledge to be able to stop and assess what we have learnt so far and what the main general and more specific issues are that commonly arise in impact evaluation.

3. The objectives of this paper are threefold. Firstly, it provides a non-exhaustive survey of relevant research and in this sense it provides a source of references to assist further work. Secondly, it discusses some of the key issues that arise in impact evaluation and investigates whether a best practice in any areas can be established. Thirdly, it identifies some of the gaps in past works in order to provide a preliminary compass to areas where more work would be most pressing.

4. Although most of the examples referenced in this paper are from developed competition regimes, one should not underestimate the relevance this topic has for developing and emerging economies. 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. Estimates – no matter how conservative they may be – of the consumer benefits of the impact of competition enforcement would be invaluable in these circumstances.

5. The structure of this paper is organised to reflect the different purposes for which impact evaluation is required. Depending on purpose, evaluation can take many forms, and it is correspondingly undertaken by either the Competition Authorities (CAs) or external experts or both. Reference to academic research, that provides continuous feedback to policymakers, accompanies the discussion

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[1]   This paper was prepared by Peter L. Ormosi, Norwich Business School, and ESRC Centre for Competition Policy, University of East Anglia, Norwich, NR4 TJ, United Kingdom, (p.ormosi@uea.ac.uk); it draws on ongoing joint research and extensive discussions with Professor Stephen Davies, School of Economics and ESRC Centre for Competition Policy, University of East Anglia. The views reflected in this paper are the personal responsibility of the author.

throughout the paper. At the risk of over-simplification, the paper arranges impact evaluations into three broad categories. These categories necessarily overlap to some extent.

- **Evaluation for accountability**: This is typically conducted on Government request. In its most common form this includes published Annual Reports but could also refer to other types of accountability and performance reports.

- **Ex post evaluation of intervention**: These evaluations are done both internally by the CAs and by external experts (academics or consultancies), or on a much more general level by international organisations (OECD country reviews). A natural form of ex post external evaluations is court appeals. Ex post evaluation includes retrospective studies of how markets changed in the longer run following intervention.

- **Evaluating the broader impact of competition policy**: These studies are typically prepared by external experts in order to assess the impact of competition policy on more general socio-economic factors such as productivity, growth, or employment.

6. Figure 1 depicts these three categories relative to the CA. The arrows point to the direction of feedback, i.e. how the different types of evaluations inform the government and the CA.
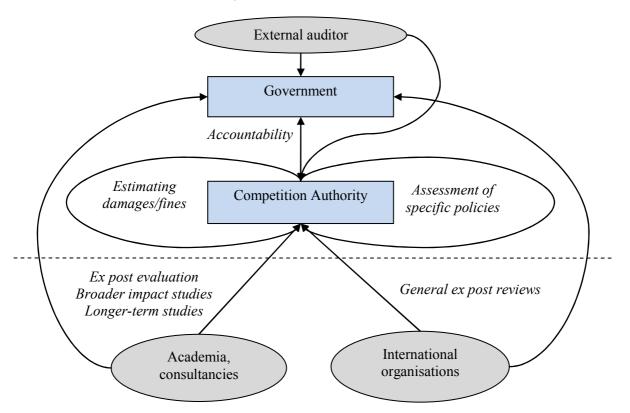
Figure 1. The purposes of evaluation

2. Evaluation for accountability

7. CAs have been reporting some information relevant to their impact to Governments for a long time. Traditionally, however, this was limited to statistics and reports on the number of cases pursued, and/or the number of successful cases. Increasingly, this reporting obligation has begun to extend to more sophisticated measures, where the CA has quantified and reported on the aggregate benefits of competition policy (measured perhaps by increased consumer surplus). This aggregate estimate is often then assessed against some pre-specified target to judge whether the CA has met its required objectives. This has been an impressive and at the same time very challenging step forward from the crude reports on number of cases to include more detailed measures of impact that accounts for the size of the affected market and – in some circumstances – the damage caused.

8. To provide an indication of the magnitudes of impact estimates, Table 1 displays the reported estimated consumer benefits (also expressed as a percentage of GDP) from three jurisdictions in which these methods are most developed: EC, UK and USA.[2] The figures are expressed in terms of consumer benefits or consumer savings, which reflects the CAs' approach to the general objectives of competition policy. It must be stressed that the purpose of this table is *not* to compare the performance of these authorities, but to illustrate the sort of magnitudes and to demonstrate some of the difficulties in interpreting these estimates. The figures were collected from CAs' respective annual reports – as listed below – and are not referenced separately in the following texts.[3]

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[2]   Although some other jurisdictions have also looked at the consumer benefits of competition enforcement, examples are only sporadic and less regular than in the analysed three countries. Davies (2010) provides a brief survey of these.

[3]   Unless otherwise mentioned, the sources are the EC's 2007-2010 Annual Activity Reports, the USDOJ Antitrust Division's Performance Budget Congressional Submissions for 2008-11, The FTC's 2007-10 Performance and Accountability Reports, and the OFT's report on Positive Impact 10/11 - Consumer benefits from the OFT's work (July 2011).

Table 1. CA estimates on the annual consumer benefits from competition interventions[4]

	Cartels		Mergers		Other antitrust	
	Consumer saving	% of GDP ×10^{-4}	Consumer saving	% of GDP ×10^{-4}	Consumer saving	% of GDP ×10^{-4}
EC (billion EUR)						
2010	7.2 (7)	5.87	4.2-6.3 (16)	4.28	Not reported (58)	−
2009	1.2 (6)	1.02	5.6 (16)	4.77	2.0 (54)	1.70
2008	1.7 (7)	1.36	5.5 (24)	4.41	4.3 (111)	3.45
2007	3.8[5] (8)	3.06	Not reported (23)	−	Not reported (133)	−
USDOJ[6] (billion USD)						
2010	0.05 (60)	0.03	0.19* (19)	0.13	0.19* (4)	0.13
2009	0.60 (72)	0.42	1.02 (12)	0.72	0.02 (2)	0.01
2008	0.02 (54)	0.01	0.48 (16)	0.33	0.05 (4)	0.03
2007	0.56 (40)	0.41	0.15 (12)	0.11	0.02 (2)	0.01
USFTC (billion USD)						
2010	N/A	−	0.59 (16)	0.40	0.51 (6)	0.35
2009	N/A	−	0.79 (13)	0.55	0.19 (7)	0.13
2008	N/A	−	0.36 (13)	0.25	0.03 (4)	0.02
2007	N/A	−	0.81 (20)	0.58	0.08 (11)	0.06
UK CC+OFT (billion GBP)						
2009/10	0.083	0.57	0.235 (11)	1.62	0.083	0.57
2008/09	0.083	0.59	0.229 (15)	1.64	0.083	0.59
2007/08	0.083	0.57	0.309 (14)	2.13	0.083	0.57

*   Merger and other civil antitrust together in 2010.
**   Cartels and other antitrust are reported together for all years.

9.   One striking feature of the reported figures is the rather high variance over time in some instances. An important reason for this is that the sizes of the intervened markets and the scope of the cases involved can vary dramatically – when a very large market is intervened in a particular year, this can lead to lumpiness in the time series. Also, the number of cases may vary significantly too. Fluctuations in the annual number of closed cases may be due to the lengthy procedures associated with some types of investigations (especially for cartels). For example many ongoing cartel investigations in the USDOJ in 2010 could mean high agency activity, but only low measured impact in 2010, followed by much higher reported impact in subsequent years. The EC displays a more evenly distributed (over time) impact, which probably implies smaller variance in the relevant market sizes and/or shorter procedures. To soften the extent of oscillation of figures over time, the UK authorities report three-year moving-averages. Another

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4   The number of cartel convictions, merger interventions (or challenges), and other antitrust interventions are displayed in brackets. The number of challenged merger cases for the USDOJ was collected from the Hart-Scott-Rodino Annual Reports for Fiscal Years 2007-10. The number of cartel cases and the number of non-merger civil cases filed by the USDOJ was collected from USDOJ statistics (http://www.justice.gov/atr/public/workload-statistics.html). The number of challenged merger and non-merger interventions by the US FTC was collected from the FTC's Performance and Accountability Reports. For the EC, the number of interventions was collected from EC merger statistics (http://ec.europa.eu/competition/mergers/statistics.pdf) and EC cartel statistics (http://ec.europa.eu/competition/cartels/statistics/statistics.pdf) and the number of abuse of dominance cases closed was collected from Global Competition Review reports.

5   Using an average overcharge of 20%-34% from Bolotova and Connor (2006).

6   The number of cases refers to the otal number of criminal cases filed.

cause of the variance in the estimates over time is changes in the assumptions employed by the CAs, as discussed further below. For example, the large increase in estimated impact in cartels in the EC between 2009 and 2010 is probably explained by the authority's change in cartel life-span assumption.

2.1 Comparison of methodologies

10. To estimate the impact of an individual intervention, information is required on: (a) the size of the market concerned, (b) the price increase removed or avoided and (c) the length of time the increased price would have prevailed absent the intervention. Of these, market size is the easiest to estimate – this information is normally available for the CA and can be easily recalled for the evaluation process. It is easy to see that when a conduct impacts a large amount of commerce in the relevant markets, the implied transfer from consumers to manufacturers becomes substantial. As mentioned above, for this reason the size of the relevant market is likely to explain much of the variance in the estimated impact.

11. The more challenging part of the evaluation is to estimate the magnitude of price increase from the investigated conduct and the length of time it would have prevailed absent the intervention. Depending on the case type, CAs often use assumed values for these two factors in their evaluations. The following discussion briefly analyses the methodologies used in the three jurisdictions, the US, the UK, and the EC. Unless otherwise stated, the figures reported were collected from the respective CAs methodology documents.[7]

12. Table 2 summarises the assumptions used in the evaluation of the impact of *cartel investigations*. These assumptions are only used if there is no hard figure on overcharge thrown up during the investigation. On affected consumers (i.e. size of market), it is often assumed that the cartel would only affect the infringing parties' turnover.[8] The almost unanimous assumption is that the CA intervention leads to a 10 per cent reduction in price. However, the OFT has recently revised its general practice and now assumes that the cartelists will reduce price by 15 per cent following intervention. This seems more in keeping with the wider empirical evidence. Much of this evidence – meticulously collected and organised in a meta-study by Bolotova and Connor (2006) – suggests that the median cartel-induced price increase lies between 17 and 30 per cent. If so, even the 15 per cent assumption is still conservative but lies closer to empirical findings.

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[7]   The documents used for collecting information the respective methodologies are the 2007-11 DG Competition Annual Management Plans, the USDOJ Antitrust Division's Performance Budget Congressional Submission for 2008-11, The FTC's 2007-10 Performance and Accountability Reports, and the OFT's guide to Impact Estimation methods, OFT 1250.

[8]   Of course these effects are typically much more extensive; hence the affected turnover value is likely to be an underestimate of the real value.

Table 2. Assumptions used for estimating consumer savings in cartel cases[9]

	EU2009	EU2010	USDOJ2009	USDOJ2010	OFT2008-11
Assumed life span (yrs)	5	1/3/6	1	1	6
Gain from cartel	10%	10%	10%	10%	15%[10]
Affected consumers	Affected market size	Affected market size	Volume of commerce	Volume of commerce	Turnover of affected goods
Social discount rate[11]	3.5	3.5	N/A	N/A	3.5
Estimated impact	1.2 (billion EUR)	7.2 (billion EUR)	0.6 (billion USD)	0.05 (billion USD)	0.25[*] (billion GBP)

    *   Including cartels and other commercial agreements, and abuses of dominant position.

13.   The assumptions used for the expected future life-span of cartels show much larger dispersion, not least probably because of the significantly smaller amount of research that has been done on this matter. It seems tempting to rely on empirical studies of cartel duration such as Block, Nold et al. (1981) and Levenstein and Suslow (2006) however, these studies were conducted on cartels that were detected, which are likely to be different from undetected ones and the assumption here has to be made on the cartel remaining undetected. For this reason it may seem more reasonable to turn to what economic theory has to offer on the matter. Works on the incentives created by leniency programmes have shown that it is the less stable cartels that are more likely to apply for leniency.[12] For these cartels it would be reasonable to assume a shorter future life-span (i.e. that the cartel would not have survived much longer even absent intervention). In other cases however the CA detects cartels *ex officio*. Block, Nold et al. (1981) argue that the detection probability in ex officio cases increases with mark-ups. The rationale behind this is that higher mark-ups are more likely to be spotted by customers or the CA, therefore there is a higher chance of the ex officio triggering of investigations. As higher mark-up cartels are likely to be more stable, a longer life-span assumption may be more fitting in these cases. It therefore seems more appropriate to apply a case sensitive assumption for the expected duration of the cartel absent intervention. For example Harrington (2008) shows that the quality of leniency programmes (i.e. the amount of immunity leniency programmes award to firms) has an effect on how stable cartels are. This would suggest that different assumptions should apply depending on the given on the rigour of the given competition regime. Other characteristics, such as the type of the industry, specific market conditions, and entry conditions also have an impact on cartel stability. Given this potential heterogeneity, a case-dependent approach recently adapted by the EC would seem to be most in line with economic theory.[13]

14.   In *merger cases* it is fairly common to use simulations to estimate how prices, demand, and market shares might have changed had the merger gone ahead absent the CA's intervention.[14] When the price impact of a merger was estimated during the merger procedure this can be (and often is) used in impact evaluation. In other cases default assumptions are made on the price impact, which are summarised

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[9]   Among other countries, the NMa uses a 10 per cent assumed overcharge.

[10]   10% before 2010.

[11]   This allows a discounting of future estimated cartel gains.

[12]   See a discussion on this together with relevant references in Harrington (2008).

[13]   The EC classifies cartels (based on economic theory and evidence) into three categories: "unsustainable", "fairly sustainable" "very sustainable", and assumes a future cartel life of 1, 3, and 6 years respectively.

[14]   When simulations are used in merger cases, case-sensitive assumptions are often needed about the characteristics of competition, demand elasticity, and/or merger-generated cost savings. For example the OFT assumes a Cournot model for homogenous products, and PCAIDS or logit for differentiated product industries, together with a range of conservative elasticities.

in Table 3.[15] Previously the EC assumed that the future customer savings resulting from corrective merger decisions corresponds to 10% of the size of the relevant market(s) on which the concentration would have significantly impeded effective competition. This has now been changed to a practice where price effects are simulated on a case-by-case basis.

Table 3. Assumptions used for estimating consumer savings in merger cases

	EU2009	EU2010	USFTC2010	USDOJ2010	OFT2008-11
Affected consumers	N/A	Size of relevant market	Volume of commerce	Volume of commerce	Turnover of affected goods
Price effect	N/A	Simulated	1%	1%	Average of simulated
Consumer impact	10% of relevant market size	N/A	N/A	N/A	N/A
Duration of price impact (yrs)	1	Significant/high/very high	2	1	2
Estimated impact	5.6 (billion EUR)	4.2-6.3 (billion EUR)	0.59 (billion USD)	0.19 (billion USD)	0.36 (billion GBP)

*   Merger and other civil antitrust together.

15.   The suitability of these methods is more difficult to assess than in the case of cartels. Firstly, this may be due to the fact that in merger cases the CA has to ex ante decide whether a merger is anticompetitive and find a suitable intervention. This means that impact estimates would need to establish if the CA had been right to intervene at the first place. It is unlikely that any CA would admit to a wrongful intervention in their accountability reports, therefore the intervened mergers in the evaluation are always assumed to have a negative impact. Secondly, price increase estimates depend largely on the severity of the merger control regime. In a lax regime, only cartels with large and positive price effects are intervened, therefore the average estimated price impact of intervened mergers will be larger than with a stricter CA.[16] Thirdly, it is not clear what value, if any, should be given to mergers that the CA correctly did not intervene (i.e. mergers with a negative price change).

16.   In the academic literature, there are some studies that investigate the price impact of intervened US mergers.[17] Ashenfelter and Hosken (2008) for example looked at five selected cases and found estimated price increases to be between 3% and 7%. In earlier studies Werden, Joskow et al. (1991) reported a 5.6% price increase, and Borenstein (1990) estimated a 9.5% average increase. The literature is much scarcer for other jurisdictions. However, even if we had a more comprehensive idea about the average price impact of mergers, its use as a best practice or default assumption could be questioned for various reasons. For example, as mentioned above, a systematic bias in the CAs decision making might mean that mergers with small positive price effects (when the CA is too lax) or mergers with small negative price changes (when the CA is too strict) are not picked up by the CA and hence would not appear in the evaluation. Relying on an average merger price effect assumption would therefore also require some knowledge on whether the CA is too lax or too strict. Mergers are also likely to have very different price

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[15]   Amongst some of the other jurisdictions, in the Netherlands the NMa uses the turnover of the relevant firms as a basis and assumes a one per cent price increase (Kemp and Sinderen (2008)). In Portugal, the PCA assumes mergers to lead to a 5.3 per cent price increase, which will last for two years and is discounted at 3.5 per cent (Weinberg (2007)). The Competition Commission (CC) in the UK – being a Phase II body – has more information available on the cases it looks at, therefore it does not adopt a single approach in each case, rather, it seeks to capture what the team conducting that investigation believed was the likely effect of the merger.

[16]   Carlton (2008) also discusses this possibility.

[17]   Weinberg (2007) surveys the relevant US literature.

effects depending on the economic environment and therefore assumptions based on estimates in one jurisdiction may lead to biased evaluations in the other.

17.   For these reasons it seems most reasonable for the evaluation of mergers to rely, whenever is possible, on a case by case approach and use price-effect figures from the simulations conducted during the investigation. Simulations are becoming more common, especially in the assessment of those mergers that the CA judges to be potentially more harmful and an estimated price effect would therefore be available from the investigation. In more simple cases the impact of the merger is more likely to be closer to zero and therefore excluding them from evaluations (because there is no case-specific price-impact estimate) would only have a marginal effect on the estimated aggregate impact of merger control.[18] A variation of this approach is used by the OFT, where, if simulation is not appropriate for the case, consumer savings as a proportion of turnover are assumed to be equal to the mean lower bound of the same ratio across all simulated mergers over the previous three years.

18.   The assumption on the duration of the merger-generated price impact shows more convergence (being either one or two years). On the lower bound, as Davies (2010) points out, it seems unlikely that a CA would choose to intervene if it believed that post-merger self-correction within the market would occur within the following one or two years. On the upper bound, the case-by-case approach used by the EC seems appropriate. This method categorises all cases into one of three groups: "significant", "high" and "very high" and assigns them duration period in years as the minimum time it would take to restore competition to its premerger state.

19.   Turning to *abuse of dominance cases,* as Werden (2008) points out, these pose arguably the greatest challenges for assessment since it involves establishing the extent to which rivals are harmed as well as the impact on consumers, especially in cases where impacts can go in both directions (e.g. predatory behaviour). Similarly to other case types, if case-specific information is not available, assumptions are made about the default price rise, and the duration of the infringement. Some of these assumptions are presented in Table 4. For example the OFT assumes a 15 per cent price rise and the duration is left at the investigator's discretion. The EC assumes that the consumer savings correspond to 10 per cent of the size of the relevant market, and that the price effect would last for one year. The lack of empirical IO work on abuse of dominance cases makes it difficult to assess these assumptions.

Table 4.   Assumptions used for estimating consumer savings in other antitrust (non-cartel) cases

	EU2009	EU2010	USFTC2010	USDOJ2010	OFT2008-11
Affected consumers	N/A	N/A	Volume of commerce	Volume of commerce	Turnover of affected goods
Price effect	N/A	N/A	1%	1%	15%[19]
Consumer impact	10% of relevant market size	10% of relevant market size	N/A	N/A	N/A
Duration of price impact (yrs)	1	1	2	1	6
Estimated impact	2 (billion EUR)	0 (billion EUR)	0.52 (billion USD)	0.19* (billion USD)	0.25** (billion GBP)

*   Merger and other civil antitrust together.
**   Including cartels and other commercial agreements, and abuses of dominant position.

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[18]   Using simulations also ensures that the estimated impact does not fall far from what was predicted in the investigation, which is particularly important in cases under appeal.

[19]   5% before 2010.

20. In addition, some of the CAs also conduct an assessment of other activities such as consumer protection, or advocacy. The OFT compares the pre- and post-intervention number of consumer complaints, and a reduction in the number of complaints is converted into a financial estimate of avoided consumer detriment by valuing each complaint at a proportion of the purchase value.[20] The FTC reports the number of consumer complaints and the percentage of the FTC's consumer protection law enforcement actions that target the subject of consumer complaints to the FTC. As a measure of the impact of their consumer protection activities the FTC also conducts three in-depth case studies per five years in industries that are considered to be high-priority.[21] One challenge in this area is to find the right measure of the impact of what the CA does in consumer protection law enforcement. For example, for the FTC's Do Not Call and spyware cases, the harm prevented is often measured in time but there is insufficient information on the time saved or how it could be converted into a dollar measure. Similar difficulties arise with consumer privacy cases, which is an important and large area of the FTC's consumer protection law enforcement activity.[22] Other methods such as consumer satisfaction surveys are also applied in many countries.

2.2 *Conceptual issues in accountability evaluations*

21. Some general issues arise from the above discussion. Firstly, some of the figures reported above show that estimates are very sensitive to the assumptions used. A case-by-case approach would therefore be desirable when possible. For the remaining cases, theory and evidence inspired best practice on these assumptions would allow a better comparison of estimates both over time (say to inspect the effect of a policy change) and cross-jurisdiction. The ex-post evaluations discussed in Section 3 should provide the main empirical backing to these assumptions.

22. Although evaluations are becoming increasingly more sophisticated, they usually emphasise only the price effects of interventions – the price increases avoided as a result of interventions, taking into account the size of the affected market. Of course, it is to be hoped that the total benefits should extend beyond just price and include the effects on quality, choice and innovation, but these are usually very difficult to measure accurately. For this reason, a common characteristic of these evaluations is that they typically, and deliberately, produce conservative estimates given that they do not account for some of the observable (but unquantifiable) indirect impacts. [23] Some activities of the CA are also excluded, such as competition advocacy, or consumer education.[24] The tendency for producing conservative estimates seems justified as a definitive measure of ex-post impact is often impossible (for example, we will never know what would have happened had a prohibited merger not been prohibited). Also, interventions may have an impact well into the very long-term and onto wider socio-economic factors, and the cost of conducting a comprehensive ex-post evaluation across all cases would be disproportionately large. Sections 3 and 4 discuss these longer-term and wider effects.

23. Because the estimates are necessarily conservative and because it is very difficult to gauge how far they are from the true impact of competition policy, one may consider the possibility of evaluating

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[20]   This is problematic if the number of complaints increased due to the increased consumer awareness.

[21]   The first one to be published in 2012 is on "green" consumer-claims and specifically those in relation to marketing bamboo textiles.

[22]   Based on email correspondence with Elizabeth J. Callison, Senior Economic Advisor to the Bureau Director, Bureau of Economics, FTC.

[23]   In relation to the OFT's methodology Davies (2010) argues that a static total welfare approach (lacking the analysis of dynamic impacts) would not provide a fair reflection of the OFT's work.

[24]   For example in the UK, the OFT includes merger control, enforcement of competition law, consumer protection enforcement, and market studies and reviews.

marginal impact on top of the aggregate impact that is currently reported; i.e. looking at how additional Government spending changes the impact of competition policy. This would also allow Governments to capture returns to scale (whether increasing spending increases impact). Simple measures of the marginal impact of policy or budget changes (such as consumer benefits expressed per thousand dollar spending or per CA employee) could also provide important accountability information for Governments.

24. Although practicability issues may limit the scope of impact evaluations and make it difficult to include longer-term or wider-impacts, there are some areas which seem unjustifiably omitted from these reports. Impact evaluations only look at cases where the CA had decided to intervene and therefore exclude those **cases** where there was no intervention. For example in mergers, no impact is associated with mergers that the CA rightly authorised without intervention. This may be particularly important for cleared efficiency-enhancing mergers, where the impact on consumer benefits should be increased by some measure of the positive impact that arises from the unconditional approval of the merger. Cases where parties settle before the CA reaches a final decision are also excluded from these evaluations. These settlements are clearly the result of effective enforcement and should therefore be taken in to account, for example as a result of the deterrent effect of the CA's work.

25. Because of the size difference in the relevant affected markets across cases, the aggregate savings computed may be very sensitive to one or two extreme observations. Also, potential errors in particular cases could make year to year fluctuations volatile. As Davies (2010) argues, using moving-averages helps to smooth impact estimates over the years. In the UK both the OFT and the CC applies rolling-average figures, and so does the NMa in the Netherlands.

26. When impact estimates are acquired for accountability reasons, an important source of bias could be caused by the fact that given finite resources, coupled with a need to substantiate its impact, it is rational for any CA to pursue the 'easy options' in its enforcement activities; i.e. to cherry pick easier cases at the expense of more difficult cases (for which the probability of 'success' is lower or where there is greater uncertainty.) A related danger is highlighted by Neven and Zengler (2008), who suggest that the evaluation programme itself may introduce an additional motive for distortionary discretion in CA conduct: "Faced with simplistic assessment, authorities may be tempted to be overly interventionist, to spend too many resources and to ignore relevant information." If evaluation is driven by external accountability (to verify whether the CA delivers its objectives) and especially if undertaken by the CA itself, the CA is prone to fall into the trap that is also identified by Chang and Harrington (2010), i.e. CAs will not seek to maximise deterrence, but focus on something that is observable/measurable (e.g. the proportion of Art.102 cases that are won, or the number of cartels detected). This can have important feedback effects, not just for evaluation, but also for success in achieving the ultimate objectives of competition policy and in extreme cases even bias decision-making. These reasons may justify in some cases the use of an external auditor to conduct the assessment.

2.3 *Unobserved impact of competition policy*

27. As mentioned above, impact evaluations necessarily focus on only a selected part of the total effect of competition policy and law enforcement. Some of the impacts are not observed and are therefore not measurable or very difficult to estimate. The impact estimates presented above therefore do not include the deterrent effect of competition policy, or behaviour that remain undetected, or conducts that the

CA detects but decides not to investigate or intervene.[25] Unless the evaluation understands how this selection process works, any impact estimate will be inherently biased.[26]

28.   Impact evaluations also typically ignore the possibility that there may be deterred pro-competitive cases. Baker (2003) notes that his suspicion is that the costs from deterred pro-competitive activities do not exceed the direct costs (to the firms) of enforcement. Although he does not go into further analysis, this statement seems intuitively reasonable on the assumption that only those pro-competitive conducts are deterred that are less profitable than the firm's assessment of the expected cost of litigation, implying that if a conduct is sufficiently pro-competitive, it is more likely to take place. A statement like this would of course only hold true if the CA is unbiased and free of hostility towards efficiency gains.[27]

29.   To account for the deterrent effect of enforcement, one would need to be able to measure deterrence. While this is still an area which defies definitive quantification, there some work of interest, particularly where a competition policy index is constructed from institutional, legal, and social factors that are expected from economic and legal theory to deter certain types of behaviour. For example Buccirossi, Ciari et al. (2009b) created an index of a set of institutional and enforcement features that are expected to have an impact on the level of sanctions incurred by those who are convicted, the (perceived) probability of being detected and convicted, and the (perceived) probability of being wrongly convicted or acquitted. Using these types of indices allows an ordinal measurement of the levels of general deterrence across countries.

30.   A related issue arises regarding cases that the CA did not detect. For example empirical works suggest that not more than a fifth of all cartels are detected.[28] Should these forgone opportunities appear in impact evaluations (for example as an opportunity cost)?

31.   Although deterred cases are not observed, the OFT's impact assessments attempt to acknowledge the problem by hazarding a guess at the magnitude of deterrent effects using the assumption that, for every investigated case, there are five other cases which no not occur because they are deterred (based on a survey conducted by Deloitte (2007)) and therefore the estimated impact based on intervened cases are multiplied by five.[29] This of course relies on the fragile assumption that deterred cases share the same characteristics as intervened ones, which – according to economic theory – is unlikely to be the case. Taking the example of cartels, economic theory implies that more stable cartels are less likely to be deterred and detected.[30] Therefore any estimate will ignore those cartels that are likely to be the most harmful. Similar arguments could also be used for mergers. If mergers with high price-increasing effects

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[25]   Whereas the two former categories are by definition unobserved and hence more difficult to grasp empirically, the latter is often recorded by the CA and therefore could be made part of a total valuation of competition law enforcement.

[26]   Davies and Ormosi (2010) discuss this in more details. Carlton (2009) also warns about this in his discussion of measuring the average impact of merger control.

[27]   See Werden, Joskow et al. (1991) Leary (2007) on the evolution of the treatment of efficiencies in antitrust.

[28]   Bryant and Eckard (1991) or Ormosi (2011).

[29]   The consumer savings point estimates used to calculate the benefit cost ratio reported to the Treasury do not include this deterrence effect. In a more recent survey London Economics (2011) reports significantly higher ratios.

[30]   Chang and Harrington (2010) argue that less stable cartels are more likely to apply for leniency. If cartel investigations are triggered dominantly by leniency applications (in the EC 2/3 of the cartel investigations result from leniency) then the investigated cartels will be the less stable ones.

are more likely to be deterred[31] then impact estimates based on investigated cases only will be negatively biased.

32.   Another seemingly simple way to get a grasp of the level of deterrence is to look at how the number of cases changes over time. This leads to the problem that the number of detected cases is an ambiguous indicator of deterrence, as an increased number of observed cases could mean either an increase in the detection rate or a decrease in the deterrence rate of enforcement, or both. A change in the number of observed cases can only be meaningfully interpreted if, at the same time, the change in detection rate is also known. This of course may not pose an insurmountable problem in areas where the rate of detection is expected to be constant, which is likely the case in merger control regimes with compulsory pre-merger notification rules. Barros, Clougherty et al. (2010) build on this feature when they estimate the deterrent effect of merger policies. Otherwise, Ormosi (2011) proposes a way to estimate how detection rate changes over time in anti-cartel enforcement, which in turn could be used to make inferences on the rate of change in deterrence. It may indeed be this latter category (the marginal impact of competition policy on deterrence) where future work should focus, i.e. whether additional Government spending increases deterrence.

3.   Ex-post evaluation of intervention

33.   The main difference in comparison to the previous section is that ex-post evaluation here gathers those impact assessment activities that are conducted after the competition policy intervention using information available post-intervention. When conducted or commissioned by the CAs, the purpose of ex post impact assessment is typically to evaluate a specific area of policy (e.g. merger control), the success of a particular intervention (e.g. a prosecuted cartel, or prohibited merger), the quality of its own decision-making – the rigour of its analysis, data collection etc – and/or to help set internal priorities. The purpose of this section is to provide some illustrative examples for ex post evaluation conducted or commissioned by the CA. The discussion below is necessarily exemplificative. Although academic works typically constitute a significant source of feedback for CAs, to maintain the focus of this paper only reference is made to these works where appropriate.[32]

3.1   *Methods used for evaluation*

34.   Various methods have been developed for the evaluation of the impact of competition law enforcement.[33] These methods have different strengths and weaknesses and each one is better suited for some purposes than others. The three most frequently used methods are: simulation, event studies, and difference-in-differences techniques (DiD). Whilst simulations and simple DiD are frequently used by CAs, event studies are more prevalent in academic evaluations of the impact of competition policy. Also, DiD is typically better suited for the analysis of specific interventions, whereas simulation scores more strongly when evaluating the general quality of the CA's decision-making-analysis.

35.   Simulation refers to techniques based on (i) explicit formal modelling of the nature of competition in the market, then (ii) calibrating the model with real world information (sometimes estimated econometrically), before (iii) using it to assess how the equilibrium will change with and without an

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[31]   For example Barros, Clougherty et al. (2010) suggest that firms may reduce the restrictiveness of their merger in order to increase the chances of approval.

[32]   More detailed surveys are provided by Davies and Ormosi (2010), who discuss the pros and cons of each method depending on the circumstances given by the analysed problem. For an overview of methods see also Bergman (2008).

[33]   Of course these methods – particularly simulation – are used in accountability evaluations as well. However, for presentational reasons they are discussed here.

event/intervention. Simulation may be either ex-ante or ex-post counterfactual analysis. The latter is backward-looking – what outcome would have happened, had, say, a cartel not actually existed; while ex-ante looks forward – anticipating whether or not, say, a merger would have had coordinated effects, if cleared. As Davies and Ormosi (2010) summarise, although the simulation approach has the advantage of explicitly using economic theory to identify the counterfactual, it is very sensitive to modelling assumptions,[34] and is not appropriate to be applied to some markets.[35]

36. Event studies use stock market data to measure the effect of an economic event on the market valuation of a firm. If financial markets are efficient, then the effect of any event (e.g. the announcement of a merger) on a firm's discounted profits will be instantaneously observable through the changes in the prices of its shares. Event studies are often criticised because the observed, event-generated abnormal returns can have ambiguous interpretations (e.g. a drop in the price of rival firms' valuation may be a sign of increased competition but can also imply exclusionary practices),[36] that it is often difficult to separate out confounding effects from the effects that the researcher is interested in,[37] and that the theory used for the interpretation of abnormal returns may only apply in very specific market conditions.[38]

37. The basic idea behind DiD methods is to compare data (such as price or market shares) before and after an event (or sometimes before, during and after) in the market concerned relative to performance in another similar (control) market, unaffected by the event.[39] The standard DiD application is typically econometric, in which the performance measure (usually product price) is tracked over time to include the pre- and post-periods in the treatment (e.g. merger) and compared against the same in the control market. DiD analysis is typically done ex-post as it requires post-event data for the comparison. It is very appealing for policy analysis as it uses observed data from the relevant product market (i.e. what actually happens) in comparison with observed data in a control market, where the event does not occur.[40]

38. There are other methods also used for impact evaluation. Court appeals offer an obvious evaluation of the work of the CA.[41] Some more aggregate macro-level studies employ cross-country or panel data, attempting to identify the effects of competition policy on macro or sector aggregates, e.g. price-cost margins, GDP, productivity.[42] Finally, other types of evaluations would include high-profile

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[34] These qualifications are well documented elsewhere (see for example Buccirossi, Ciari et al. (2008)).

[35] Seminal and/or illustrative contributions in the academic literature include Farrell and Shapiro (1990), Werden and Froeb (1994), Hausman and Leonard (1997), Werden (2000), Nevo (2000), Pinske and Slade (2004), Ivaldi and Verboven (2005), Peters (2006), and Verboven and Van Dijk (2009).

[36] Davies and Ormosi (2010).

[37] Werden and Williams (1989).

[38] For examples of various uses of event studies see: Duso, Neven et al. (2007), Duso, Gugler et al. (2010; Duso, Gugler et al. (2011), Diepold, Feinberg et al. (2008), Warren-Boulton and Dalkir (2001), Langus, Motta et al. (2010), Bosch and Eckard Bosch and Eckard (1991), Carletti, Hartmann et al. (2011), Bizjak and Coles (1995), Whinston and Collins (1992).

[39] A simple variation of DiD is when CAs compare the market after an event with the market before the same event.

[40] Examples for relevant applications of DiD methods are given in Aguzzoni, Argentesi et al. (2011), Levenstein and Suslow (2006), Symeonidis (2002), Connor, Feldman et al. (1998), Shaw and Simpson (1986).

[41] Provided that the court reassesses both the factual findings of the CA and the legal conclusions drawn from these facts. Bergman (2008) provides a useful summary of the limitations of using court decisions for measuring the impact of enforcement authorities.

[42] These are discussed and well summarised by Bergman (2008), who provides some of the key references.

annual peer reviews evaluating the performance of different CAs around the world (e.g. the Global Competition Review and OECD country reviews) and expert commentaries and case studies.[43]

3.2   *Examples of ex-post evaluation*

39.   Ex post evaluations can be loosely broken down into two main types. Qualitative studies typically survey the market post intervention in an attempt to find out whether the predictions at the time of the intervention have proven to be true or not. These studies systematically look at how market entry and expansion conditions changed in the years following intervention and assess whether the predictions at the time of the decision turned out to be accurate. The other type relies more on quantitative works by trying to establish causality between the intervention and, for example, a change in the market price. In practice it is common that if the evaluation is commissioned by the CA then a mixture of these two types of method is used. The following examples only contain some of the evaluations that are found in the public domain.

40.   A valuable example of a review that applies a mixture of methodologies is provided from the UK, where the CC, the OFT and the relevant Government Department regularly conduct (or commission) retrospective merger reviews, reflecting upon market developments following the merger interventions.[44] Various methodologies have been used for this purpose. For example the 2009 evaluation used interviews with market participants, and simulations, whereas a 2011 assessment chose to rely on DiD and a survey of market actors. Follow-up questionnaires and/or interviews with the interested parties and related firms often provide invaluable insights but are inevitably prone to a number of potential limitations: low response rates, respondent bias, the parties often have short corporate memories, and in their view, interventions can often be overtaken by other subsequent and more important events. Clarke, Davies et al. (1998) includes a number of examples of the latter. The OFT also reviews (or commissions) two of its cases every year.[45] These assessments involve a post-event monitoring of market developments.[46] The OFT and the CC also regularly conduct an assessment of the impact of market studies.

41.   A similar exercise is when the survey focuses on the perception of stakeholders regarding the CA's practice in general. The purpose of these surveys is typically to provide an objective measure of the experiences and the satisfaction of stakeholders with the CA's work. The surveyed stakeholders may include parties to the given case, third party businesses, interested businesses, professional advisors, government bodies. Examples for this are given by the CC,[47] and the EC.[48]

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[43]   See Jr. and White (2004), and Lyons (2009).

[44]   *Ex post evaluation of mergers*, March 2005, A report prepared for the Office of Fair Trading, Department of Trade and Industry and the Competition Commission by PricewaterhouseCoopers LLP; *Evaluation of the Competition Commission's past cases*, Final report, January 2008; and *Review of merger decisions under the Enterprise Act 2002*, A report prepared for the Competition Commission, Office of Fair Trading and the Department for Business and Regulatory Reform by Deloitte, March 2009; *The ex-post evaluation of two merger decisions*, CC1057, A Report prepared by Lear for the UK Competition Commission, September 2011. The 2008 report was conducted in-house by the Competition Commission.

[45]   In 2011 the OFT evaluated the impact of the 2001 abuse of dominance case against Napp Pharmaceuticals, and the 2005 consumer enforcement case against Foxtons. http://www.oft.gov.uk/OFTwork/publications/publication-categories/reports/Evaluating/

[46]   OFT examples would include the impact assessment of the Payment Systems Task Force review: http://www.oft.gov.uk/shared_oft/reports/financial_products/oft901.pdf

[47]   CC Stakeholder Survey for financial years 2005, 2007, 2010, http://www.competition-commission.org.uk/our_role/analysis/evaluation_reports.htm

[48]   DG Comp Stakeholder Studies, http://ec.europa.eu/competition/publications/reports/surveys_en.html

42.   The EC commissions some of their evaluation work to external experts. Buccirossi, Ciari et al. (2006) for example use a combination of an event study and a survey to examine whether the EC made the right decision in the Pirelli/BIC merger. A recent example from the new Competition Commission of Mauritius examined the evolution of market price, the change in the market structure and a calculation of possible savings to consumers following its intervention in an abuse of dominance case.[49]

43.   Some studies have assessed the quality of CA decision-making by the frequency of court appeals and/or the success rates in those appeals.[50] For certain purposes this may be a valuable extra source of (presumably well-informed and objective) evaluation, but obvious limitations include the likelihood of selection bias, and the fact that court decisions will sometimes involve judgement on the correctness of legal process rather than economic substance. Although courts analyse cases ex post, they typically rely only on information that had already been available at the time of the CAs intervention. Bergman (2008) also points out that relying too much on appeal success ratios may have an incentive effect (similar to what has been discussed above), because CAs may become more interested in pursuing simple cases or enforcing only against blatantly illegal conduct.

44.   A specific case of impact evaluation is when the harm caused by the investigated conduct is assessed. This may happen in private damages cases (or indeed when a CA sets a fine, where applicable), which entails an evaluation of harm, and, by implication, the gains resulting from the CA intervention to remove that harm.

45.   Certain high-profile annual reviews provide an alternative approach to ex post assessment, based on peer review evaluation of the performance of different CAs around the world, e.g. the Global Competition Review and OECD country reviews. These enable international comparisons over time at the aggregate level, but are often based on subjective opinion rather than quantitative methodologies.

46.   Some of the CAs have also conducted or commissioned case studies of the successfulness of their enforcement toolkit. For example the success of merger remedies has been analysed by the USFTC, the EC and the UK CC.[51] These evaluations look at whether past merger remedies were suitable to remedy a competition problem. Likewise, some CAs analyse in retrospect the overall impact of their competition legislation.[52]

47.   Similarly to what has already been said about evaluation for accountability purposes, there is an innate danger in the internal assessment of specific policies, which stems from the risk of self-reporting bias, especially in cases still pending appeal, as the CA has a strong incentive to report high consumer savings otherwise to avoid providing evidence against their own case.[53] Given the potential risk of this bias, third-party evaluations may be preferred in some circumstances.[54]

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[49]   http://www.gov.mu/portal/sites/ccm/pdf/INV001-EvaluationReport-Non-Confidential.pdf

[50]   Bergman (2008) provides a brief survey of these and discusses their limitations in more details.

[51]   USFTC (1999) *A Study of the Commission's Divestiture Process*, UK Competition Commission (2010) *Understanding past merger remedies: report on case study research*, European Commission (2005) *Merger Remedies Study*. See also an EC commissioned study by Davies and Lyons (2007) on merger remedies.

[52]   See for example: http://www.weko.admin.ch/dokumentation/00216/01035/index.html?lang=en for a summary of the evaluation of the impact of the Swiss Cartel Act. Hüschelrath, Leheyda et al. (2011) provide an academic evaluation of the same Act.

[53]   Bergman (2008) also emphasises this possibility.

[54]   Similar recommendation is given by Buccirossi, Ciari et al. (2006).

48.   In addition to studies whose purpose is an independent check, many ex-post studies are conducted for academic purposes. The immediate objectives of external research may be more academic, focusing primarily on the development/testing of theory and/or empirical techniques. Nevertheless, these studies often employ important anti-trust cases, and have frequently led to developments in evaluation methodologies.

49.   To conclude, various methods are being used for ex post evaluations. Although their use may often be constrained by the availability of information and resources, most convincing results are created where econometric studies are supplemented by qualitative type information. What stands out from this short summary, is that more of the ex post evaluations have been on mergers, and less for example on the impact of anti-cartel enforcement or abuse of dominance interventions.[55] This may simply be because merger control is necessarily a predictive exercise based on more or less rigorous predictions on how the market would change in the future. For this reason CAs are probably more eager to know whether these predictions were right. Cartel and abuse of dominance cases on the other hand first require sufficient proof of an infringement before intervention takes place. This of course does not mean that it is indifferent what happens afterwards although in these cases a longer perspective may be more justified.

3.3   *Longer run effects of competition policy*

50.   In general it is always difficult to assess the long-run effect of any public policy, given the exponential rise of possible compounding effects with time, which makes it difficult to distinguish effects that were caused by the intervention from effects triggered by exogenous factors. One potential way of doing this is through case studies regarding the evolution of markets following regulatory intervention.[56] This could highlight concerns about the time dimension which applies to any one-off evaluation (no matter what the methodology is) – that it runs the risk of closing the story prematurely. The wider IO literature (both theoretical and empirical) suggests various possibilities for how a specific event might trigger a sequence or chain of subsequent events – each of which might be evaluated independently, but which are in reality clearly path-dependent. For example, the literature on endogenous mergers alerts us to the possibility that, if merger A is cleared, this makes a subsequent merger B more or less likely. Similarly, in failing firm merger cases, the consequences of intervention may include subsequent alternative merger proposals by other parties as happened in the case of Airtours.[57] Airtours had to change its brand name (My Travel group) following the blocking of its takeover attempt on First Choice. Eventually My Travel was acquired by Thomas Cook Travel.

51.   There is case study evidence which suggests that sometimes when some practice is prohibited, it is replaced by others. Clarke, Davies et al. (1998) cite examples from the UK where firms responded to the prohibition of one form of vertical restraint by introducing an alternative form,[58] or where a prohibited restraint was replaced by full-fledged integration. In other cases, such as following intervention in exclusionary abuse of dominance the market may trigger market entry in the longer-run. For example

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[55]   But see Hüschelrath, Leheyda et al. (2010).

[56]   Another way would be to examine how competition policy shaped firms' long-run decisions that are formed immediately following the policy intervention. This way the scope of possible compounding effects is reduced to minimum and we get some sort of idea about longer-run impacts. To define long-run decisions for example Symeonidis (2002) refers to those decisions that determine the set of conditions that firms must take as given when making short-run choices. One example would be firms investing in long-run R&D projects following competition intervention.

[57]   The Airtours/First Choice merger was blocked in 2000 by the EC although the decision was overturned by the ECJ in 2002 – although the deal by then had been long dead.

[58]   See: http://www.competition-commission.org.uk/rep_pub/reports/1998/417birds.htm#full.

following the US intervention in the bundling of Microsoft Internet Explorer web-browser and the Windows operating system the market of web-browsers now accommodates 3 larger firms (Internet Explorer, Firefox, and Google Chrome) and a fringe with a number of other browsers.

52.   It has long been recognised that horizontal mergers may sometimes be an alternative to cartelisation. Symeonidis (2002) shows that cartel legislation in the UK in the 1950s provoked a subsequent merger wave through the 1960s. Similarly, following the 2002 detection of a cartel, which included Mittal Steel and Arcelor (the first and second-largest steel producers in the world), in 2006 the two firms merged.[59]

53.   Sidak and Teece (2009) provide an insightful discussion on why competition analysis has been so one-sidedly fixated on static effects. They draw upon recent developments in evolutionary economics, the behavioural theory of the firm, and strategic management to propose a more dynamic and robust support for competition economics. Although their discussion focuses mostly on enforcement issues, much it has direct relevance for ex post impact evaluation as well.

54.   Finally, liberalisation and privatisation (and potentially the advocacy activities of CAs that may trigger liberalisation) will also have long as well as short-term impacts. Sector inquiries by the EC are prime examples of evaluation that looks back to market interventions such as liberalisation and examines how the market evolved in the medium and longer run.[60] For example the EC report on leased telecommunication lines found that the 1998 full liberalisation of the EU telecommunications infrastructure and services brought about greater choice for users, lower prices and better quality of services across the EU.[61] At the other extreme, the inquiry into the European energy sector, found that years after the liberalisation of the internal energy market, barriers to free competition remain.[62] OECD Country Reviews also frequently provide a longer perspective analysis of liberalisation and privatisation activities in the past.

55.   To summarise, it matters what happens after the intervention, and 'after' should sometimes be interpreted as long-term and not too narrowly. The importance of looking at longer effects is unquestionable. As Werden (2008) pointed out citing Easterbrook (1992): "An antitrust policy that reduced prices by 5% today at the expense of reducing by 1% the annual rate at which innovation lowers the cost of production would be a calamity. In the long run a continuous rate of change, compounded, swamps static losses." Some evaluation studies have acknowledged this, albeit indirectly, by considering sequences of cases, for example Sabbatini (2008) for Italian baby-milk; Pinske and Slade (2004) for a sequence of mergers in UK beer and Nevo (2000) who includes various different mergers in his simulations, but these are the exception rather than the rule.

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[59]   Although Kumar, Marshall et al. (2011) claim that when free, firms choose cartels over mergers, suggesting that they perceive the payoffs to a cartel to be higher than the payoffs to the merger of the same firms.

[60]   The EC has so far published sector inquiries in the following markets: pharmaceuticals, financial services, energy, local loop, leased lines, roaming, and media (3G). For more information see: http://ec.europa.eu/competition/antitrust/sector_inquiries.html

[61]   http://ec.europa.eu/competition/sectors/telecommunications/archive/inquiries/leased_lines/index.html.

[62]   Inquiry pursuant to Article 17 of Regulation (EC) No 1/2003 into the European gas and electricity sectors.

4. Evaluating the broader impact of competition policy

56. The discussion in Section 2 focussed on evaluating the overall impact of *competition policy* (measured predominantly by price changes). Section 3 provided a brief overview of the issues arising from measuring the impact of competition enforcement on the intensity and quality of *competition*. This section looks evaluates the ways in which the impact of competition on *wider socio-economic factors* can be measured. This of course inevitably touches upon the interplay between governments' competition policy, the activities of competition authorities and some broader social and economic factors.

57. This section follows the structure shown on Figure 2 by distinguishing between two strands of literature: works that look at the impact of *market competition* on productivity, growth, etc,[63] and research that attempts to measure the impact of *competition enforcement* on the same factors. This classification of course does not mean to imply that competition enforcement directly impacts factors such as growth or productivity, as these latter works inevitably rely on the assumption that any benefit generated by competition enforcement is necessarily through the increased level of competition in the marketplace.
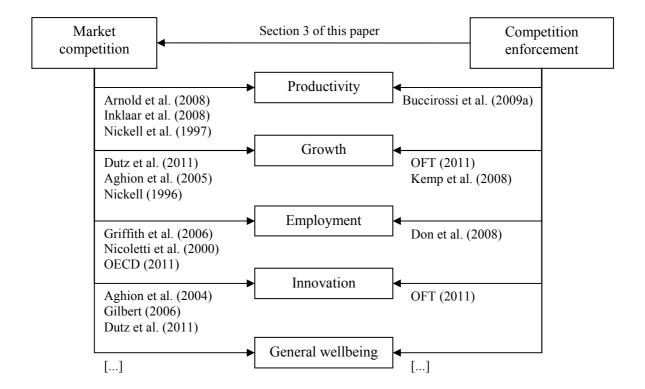
Figure 2: The impact of competition enforcement on wider socio-economic factors

58. Although Figure 2 references some of the relevant empirical works, the purpose of the summary to follow is not to exhaustively survey the literature but to provide a selected representative sample of relevant works, it is not necessarily comprehensive and reflects the author's subjective choice.

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[63]   There is a potential overlap between the listed categories.

59.   There is an extensive amount of evidence showing the central role that competition can play in economic growth. It is a key constituent of driving growth through three different channels: by putting pressure on firm managements to reduce inefficiencies,[64] by fostering innovation,[65] and by the better allocation of resources to more efficient firms.[66] It can also contribute to growth by boosting innovation,[67] and can help create a more favourable macroeconomic environment in various other ways, such as through reducing inflation rates,[68] or improving international competitiveness.[69]

60.   When analysing the relationship between *market competition and wider economic factors* the main challenge is to find an adequate measure of competition.[70] Simple measures such as market concentration do not always provide a reliable stand-in for competition.[71] Price-cost margins (PCM) have been a popular measure although not fully supported by economic theory.[72] Boone (2008) offers an alternative to PCM; a measure that has a more robust theoretical backing and has the same data requirements as for PCM. One frequently used way of measuring competition follows the seminal paper by Nickell (1996), who estimates the impact of competition on firm performance. To proxy for competition, Nickell used a mix of measures including market share, concentration, import penetration, a survey-based measure of competition, and a measure of average rents.[73] Another way of measuring product market competition is given by Przybyla and Roma (2005) who use a different mix of measures, which includes mark-up measured as the inverse of the labour income share in the economy, profit margin as the ratio of operating surplus to output, profit rate as net unadjusted operating surplus/capital stock, a World Economic Forum (2002) index number, the level of regulation, and market openness. Finally, Haffner, Nickell et al. (2000) use simple measures such as similarities and convergence over time of price structures, differences in price levels and estimates of the levels and trends of profit margins. The rationale behind this is the intuition that if competition was intensive then cross-border competitive pressure would result in prices converging at a European level. Another frequently used 'proxy' for competition is trade liberalisation, which is used in time-series or longitudinal structural analyses. Most of these studies find robust evidence for the positive effect of competition on firm performance, growth and productivity.[74]

61.   Another branch of literature investigates how *competition enforcement and policy affect various macro- and socio-economic factors* through fostering competition in the market.[75] The OFT (2011) for

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[64]   Meyer and Vickers (1997), Schmidt (1997); page 28 in McKinsey Global Institute (2010b).

[65]   Gilbert (2008) surveys economic theory and empirical studies on the relation between market structure innovation.

[66]   Arnold, Nicoletti et al. (2008).

[67]   In a survey of more than 26,000 manufacturing establishments across 71 countries Dutz et al. (2011) found empirical evidence that innovation drives employment growth and that the underlying innovations are fostered by a pro-competitive business environment. See also Gilbert (2006).

[68]   Przybyla and Roma (2005).

[69]   Mitschke (2008).

[70]   Aghion and Griffith (2005) give a detailed overview of the development of econometric techniques aimed at measuring competition, productivity, and innovation.

[71]   See for example Boone (2001).

[72]   See Boone (2008) for a brief discussion on this matter.

[73]   Nickell finds that competition is associated with higher rates of total factor productivity growth.

[74]   See OECD (2011). For a review of studies on non OECD member countries see: Tussie and Aggio (2006) and Parikh and Stirbu (2004).

[75]   Some of these aggregate studies are discussed and well summarised by Bergman (2008), who provides some of the key references.

example studies the impact of competition interventions on various elements of economic growth, such as natural resources, capital, innovation, and management. One key challenge in this line of literature is to find the right measures of competition enforcement or competition policy. Buccirossi, Ciari et al. (2009a) warns of this and claims that the lack of evidence of a positive effect of competition policy in some of the studies is a result of inadequate measures. In this respect, competition policy indices, such as the ones in World Economic Forum (2002), Buccirossi, Ciari et al. (2009a), and Hüschelrath and Leheyda (2010) may be better suited to capture those characteristics that are likely to have an impact on the effectiveness of policy. The composition of a competition policy index typically relies on institutional and enforcement characteristics such as the degree of formal independence of the CA, the separation of adjudicatory and prosecutor functions within the CA, the scope of investigative powers of the CA, the level of enforcement (size of sanctions, size of budgets and resources, etc.), and the seriousness of sanctions that the CA can impose.[76] The related econometric problems are familiar in any international comparisons based on production functions or related concepts, e.g. identification, simultaneity and the requirement that the underlying functional forms are stable across countries.[77]

62. Competition policy, when interpreted more widely than just the enforcement of competition laws, has also contributed to economic growth. This includes government policies on facilitating market entry, for example by liberalising or privatising markets. European-wide market liberalisation for example has led to greater competition and consequently reduced prices across Europe.[78] More specifically there is evidence that market liberalisation has contributed to innovation and productivity, for example in the UK,[79] India,[80] or China.[81] Reducing barriers to entry and trade, and eliminating price controls also increases employment rate through increased demand in markets.[82]

63. The impact of competition policy in the geographically broader sense is a yet unexplored area, where more work is long overdue. Competition policy impacts conducts that are turning increasingly global in their scope. Therefore the enforcement of competition law and the design of competition policy in one country will inevitably have an effect on other economies, although effects of competition policy in one country may be difficult to disentangle from the effects of competition policy from another country. The challenges of measuring this type of impact are similar to some of the already discussed issues.

64. Finally, recent developments in behavioural economics and particularly some of the key results from happiness research suggest that one may also want to start paying more attention to factors that are not captured by traditional measures of performance, growth or productivity. Governments around the world are becoming more aware that these traditional measures fail to account for many aspects of society's well-being, and economic, environmental and social sustainability, and hence paint a picture of the economy that falls far from the way the public may perceive it. In 2008 following a French initiative, a

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[76] Which reflects the understanding that the effectiveness of competition law enforcement largely depends on the strength of legal systems, the quality of the judiciary system, and other indicators of legal origin (La Porta, de Silanes et al. (2008)).

[77] One area where more work would be welcome is a comparison of the impact of competition enforcement on socio-economic factors depending on whether the CA's decisions are rooted in static or dynamic economic analyses. Following the arguments from Sidak and Teece (2008) one would expect that the latter should show a more positive impact.

[78] McKinsey Global Institute (2010a)

[79] Aghion, Blundell et al. (2009).

[80] Sivadasan (2009)

[81] Zheng and Ward (2011)

[82] Griffith, Harrison et al. (2006).

Commission of Nobel laureates was established "*to identify the limits of GDP as an indicator of economic performance and social progress, to consider additional information required for the production of a more relevant picture, to discuss how to present this information in the most appropriate way, and to check the feasibility of measurement tools proposed to the Commission.*"[83]   Similar opening to bringing general wellbeing more into policy has happened in the UK, much in the footsteps of Professor Lord Richard Layard's work on happiness. These works advocate for the use of improved measures of productivity and performance, whilst supplementing them with measures such as social wellbeing, sustainability, environment conservation, safety, social connectivity, and health.

65.   For the measurement of wellbeing, the report prepared by Stiglitz, Sen et al. (2009) offers key recommendations such as the importance of evaluating material well-being by looking at income and consumption rather than production, the emphasis on the household perspective, considering income and consumption jointly with wealth, giving more prominence to the distribution of income, consumption and wealth, and broadening income measures to non-market activities. To my knowledge there has been no systematic work that would have looked at the wider impact of competition on these measures. If considerations on general wellbeing are going to be translated into policy, then more research on the impact of competition on wellbeing has been long overdue.

5.   Conclusion and recommendation for further work

66.   This paper surveyed some of the recurring issues in the evaluation of the impact of competition enforcement and policy. It has been established that different issues may arise depending on the purpose of the evaluation. Impact assessment for accountability purposes requires a different approach from evaluating impact with a retrospective view, or assessing the wider impact of competition enforcement. Although a large quantity of relevant studies have been accumulated over time, some common gaps and weaknesses in previous works can be identified. This section highlights some of the areas where the author of this paper feels further work would be most pressing.   The list below is necessarily exemplificative and reflects the subjective judgement and selection of the author.

67.   Probably the most important overarching issue is the presence of selection bias in most of the estimates. This may be caused by various reasons. First, available methodologies are better suited to deal with some areas than others, which means that the choice of the method necessarily leads to a sample selection. For example using simulations raises the strong likelihood that evaluation is heavily skewed towards certain types of markets. Second, high demands on data means that samples consist of cases where data is available. For example an event study can only select stock market quoted firms, or demand elasticities are easier to estimate where high quality disaggregated datasets constructed from scanner sources are available (for example for products sold through supermarkets). Third, in empirical studies on any area of competition enforcement the samples are drawn exclusively from detected investigated cases, which may not be representative of the unknown population of undetected cases. Undetected cases are likely to be different from detected ones therefore using the selected sample will provide biased estimates for the total population. For example estimates of cartel duration are likely to be negatively biased as undetected cartels are likely to live longer. Similarly, unintervened cases are also potentially different from intervened ones. As Carlton (2009) points out in connection with the evaluation of merger control, any evaluation must keep in mind that the cases one examines already reflects a decision by the government agency to challenge the merger. To widen the scope of evaluation, value could be given to cases where the CA decides not to intervene. Finally, any evaluation of the benefits of policy based only on investigated cases may be a serious underestimate, probably by an order of magnitude because of the failure to account for deterrence. Although it is widely acknowledged that the beneficial deterrent effects

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[83]   Stiglitz, Sen et al. (2009).

of competition enforcement are likely to be considerable, probably far outweighing the measurable benefits of the actual caseloads of CAs, we know remarkably little about the magnitudes of this underestimate.

68.   Many of the previous works acknowledge the problem of potential selection bias, yet there is little discussion of how the selection process works and how it affects the derived estimates. Any estimates acquired without accounting for this selection will be biased for two reasons: (1) it ignores that only a small proportion of cases are looked at;[84] and (2) it overlooks the heterogeneous nature of the total population of cases, i.e. deterred, undetected, and intervened cases are likely to be different. Although deterrence and detection are both difficult to measure, impact estimates should rely more heavily on what economic theory says about how unobserved cases differ from observed ones.[85]

69.   A central issue running throughout most antitrust analysis is the choice of the counterfactual – what *would* have happened had some event, policy or practice not occurred?[86]   The issue of the counterfactual has both conceptual and empirical dimensions – which counterfactuals are theoretically tenable, and how do we calibrate them with plausible estimates of key parameters?   Given the omnipresence of this issue in most evaluation methodologies, criticism of any empirical work is often aimed at the counterfactual. For example the pre-event (merger or cartel) equilibrium is often used as counterfactual in any type of analysis. Davis and Garces (2009) argue that this ignores the possibility that the market was not in equilibrium pre-event and the event happened to get to equilibrium. Using cartels Davies and Ormosi (2010) also demonstrates the difference that choosing a counterfactual other than the pre-event equilibrium means. Sidak and Teece (2009) also warns about the sensitivity of analysis to the choice of the counterfactual.[87]   In many cases choosing the counterfactual is less theory-driven but is constrained by the availability of data.[88]   Nevertheless, it is important – not least for the credibility of evaluations – to always investigate and discuss the limitations that choosing a given counterfactual may represent.

70.   For a credible estimate of consumer savings from competition enforcement it is most reasonable to rely on case-specific estimates acquired throughout the investigation. When these are not available, several assumptions are made. Some of these assumptions are similar across jurisdictions (such as the 10 per cent cartel overcharge assumption), whereas some diverge very significantly (for example the assumed future life-span of a cartel). Common practice assumptions could be worked out for the individual case types (for example post-merger price increase, or cartel overcharge) and could also include areas that so far have been less transparent (for example how do assumptions for cartel overcharge and future duration differ for bid-rigging cases).[89]   This may be more feasible for some cases than for others. For example, – for reasons discussed in Section 2 – it is likely that intervened mergers have a different average price impact across jurisdictions and therefore using a common assumption would lead to biased estimates.

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[84]   See Davies and Ormosi (2010) for a simple quantification of how small it may be.

[85]   For example Harrington and Chang (2009) provide a theoretical discussion on cartel deterrence, and literature on the economics of crime show that deterred cases are typically the ones with smaller payoff to cartel members.

[86]   For a useful cross-discipline analysis of the use of counterfactuals in antitrust and mergers, see Colley and Marsden (2010) at: http://www.biicl.org/files/5106_the_use_of_the_counterfactual_in_antitrustv2.pdf.

[87]   In one of the examples they give, they argue that when using a SSNIP test in periods of economic downturn, the counterfactual for a proposed merger may be that prices that would otherwise fall might be stabilised.

[88]   For example Davies and Olczak (2008) used Germany as counterfactual in studying the effect of repealing RPP in the UK.

[89]   In lack of a better solution both the USDOJ and the OFT use the same assumptions for bid-rigging as for cartels, although acknowledging the evidence that the two practices should be treated differently.

These common practice assumptions can be driven by comparative datasets, such as the meta-analyses of cartels by Bolotova and Connor (2006), which predicts the mean cartel overcharge to be in the region of 30 to 50 per cent depending on the choice of the counterfactual.[90] As far as mergers are concerned Bergman (2008) rightly points out the scarcity of econometric studies on the price effects of mergers despite the economic importance of mergers and given that merger effects is a topic that is well suited for this type of quantitative analysis.

71.   More attention should be devoted to the accuracy of the methodologies to predict actual outcomes. Ashenfelter and Hosken (2008) summarise on this count by suggesting that "careful evaluation of their effectiveness seems long overdue". For example for simulation, this could be done through the ex post comparison of market outcomes with those predicted by the simulation model applied by the CA. This could also help in comparing how far from the actual outcomes estimates fall depending on the methodology (simulation, event study, DiD) or the sophistication of the methodology (back of the envelope, complex econometric estimates). This way the precision of those more simple methods could be gauged that are attractive for their lower demands of data (for example the UPP method proposed by Farrell and Shapiro (2010)). On a more ambitious level an ideal approach for comparing the alternative evaluation methodologies would be to assemble an ideally very large, random sample of cases, and attempt to apply all the methodologies to all cases in the sample. While it is likely that some CAs and advising consultancies do sometimes conduct parallel assessments during their conduct of a particular case (experimenting simultaneously with, say, an event study and a simulation), these do not appear in the published literature of course. More generally, attempting such a task across a large sample of cases would be difficult, and, in the event, has not occurred to date.

72.   Davies and Ormosi (2010) point out the paucity of evaluation works in some enforcement and policy areas. For example there is very little work on abuse of dominance cases,[91] and it is difficult to tell whether this is due to the limitations of the existing methodologies, the greater difficulty in detection, the greater deterrence of existing policy, the greater caution by CAs in prosecuting abuse of dominance cases, or because the net harm in most abuse of dominance cases is considered to be too small to merit much priority.[92] This is probably also symptomatic of a more general scarcity of empirical IO work in the broad area of abuse of dominance.[93] Although in most developed competition regimes there is a lack of abuse of dominance cases this is not necessarily true in countries with newly established competition authorities, where there is a large number of exploitative abuse investigations, which often makes up the majority of CAs decisions. The difference in attitude seems unjustified as the paucity of these cases in many CAs is probably due to the hazards associated with identifying and remedying exploitation.[94] Measuring the impact of these types of abuses may seem simple at first glance, but it would include the thorny task of finding the right counterfactual against which a price is alleged to be exploitative. It therefore seems awkward that more of these cases are investigated in countries where CAs agreeably operate on scarcer resources than in their more developed counterparts. Other policy areas where there is a scarcity of impact estimates include competition advocacy, the education of firms (compliance programmes) and consumers. For competition advocacy, this occupies a large part of many CAs' budget, yet, there has been little

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[90]   A subsequent work by Boyer and Kotchoni (2011), using the same dataset but correcting for some of the methodological shortcomings of Bolotova and Connor (2006) reports a mean bias-corrected overcharge of 13.9%.

[91]   See Davies's review (2010).

[92]   See also Werden (2008).

[93]   Slade (2008) concludes her survey of the empirical literature on the effects of vertical restraints by suggesting that "Perhaps the most important lesson that can be learned is how scant that evidence is, especially when compared to the amount of theoretical research."

[94]   Lyons (2008).

research measuring the impact of competition advocacy, and the work that has been done is predominantly qualitative.[95]

73.   Aguzzoni, Argentesi et al. (2011) and Deloitte (2009) and many others have emphasised the need for the CA to collect information throughout the procedure in order to facilitate future impact evaluations. It is of course not easy to decide what type of information will be needed for future evaluations but experience from previous evaluations should help in this respect. Especially in the case of mergers, the CA could require as a condition to the approval of the merger from merging firms to provide information following the closure of the case to facilitate the evaluation process.

74.   Finally, there is surprisingly little work on the impact of international cooperation in the enforcement of competition laws. We know very little on those externalities that competition interventions create in other jurisdictions. For example the prohibition of a merger in one country may lead to the merging firms having to shut down their businesses elsewhere. Similarly, one country may benefit from authorising a multinational merger, while another affected country's consumers may experience higher prices because of the same merger. Although this type of impact is 'internalised' within the EU – with Community-level enforcement – it is a typically unaccounted issue elsewhere. Apart from externalities international cooperation often results in important synergies in any area of enforcement. For example the overseas impact of a cartel may have to be worked out by a CA, something that could be done easier if arranged within some type of cooperation scheme. Another example is the review of multinational mergers, where important savings could be realised for society (having only to pay one filing fee, or by avoiding multiple remedies, or simply by reducing information disclosure burdens). Cooperation could also influence impact by making enforcement more effective, for example by increased rates of cartel detection, and/or increased deterrence that comes from improving the effectiveness of enforcement. More work on estimating the impact of cooperation would therefore be welcome, although measurement issues may complicate matter rather significantly. An important issue would relate to finding the right counterfactual, i.e. what would have happened had an investigation been conducted by two (or more) authorities separately.

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[95]   See for example OFT (2010).

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