



Competition *policy brief*

Occasional discussion papers by the Competition Directorate-General of the European Commission

***Ex post* evaluation of competition policy enforcement** **What can we learn from the literature and** **from the experience of Competition Authorities?**

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1. Introduction

Ex post economic evaluation of competition policy considers both micro and macroeconomic effects, mainly in terms of prices, consumer benefits and growth. Over the past decade competition authorities (CAs) and academic researchers have become increasingly interested in conducting *ex post* economic evaluations of their interventions. Robust *ex post* evaluations allow convincing demonstrations of the gains of competition policy in terms of better functioning markets and increased consumer welfare. Moreover, they support enforcement practice by improving the quality of decisions and regulations.

Given this interest in the *ex post* economic evaluation of competition policy, we have reviewed the academic literature and the experience of CAs in this area. The [literature review](#)¹ has been published on the Commission's website. This brief summarises the main conclusions drawn from this review.

2. *Ex post* evaluation practice

The scope of *ex post* evaluation activities is very broad, ranging from microeconomic evaluations of specific interventions on a well-defined market to the macroeconomic assessment of the broader impact of competition policy. However, most of the work done by CAs and academics has concentrated on the microeconomic (price) effects of individual merger and cartel decisions. Some CAs also calculate the consumer benefits of their interventions on a yearly basis to gain a better picture of their impact on society as a whole. Experience shows that *ex post* evaluations have to be well planned to minimise their costs and maximise their impact.

In a nutshell:

A lot can be learnt from existing work on the micro and macroeconomic impacts of competition policy. Overall, this review of the literature confirms that competition policy contributes to the good functioning of markets and improves consumer welfare.

The empirical research on the microeconomic impact of competition policy shows that the deterrent effects of merger control and antitrust enforcement largely outweigh the costs of maintaining an effective competition regime, and that the stronger enforcement of cartel policies has contributed to a decline in overcharges.

Work on the macroeconomic impact shows that competition policy and competition have a positive effect on growth, in particular via their effects on mark-ups, business dynamism, innovation and productivity. This effect is particularly important in countries and sectors where there is greater scope for reducing mark-ups. For example, aligning mark-ups in the euro area services sector to those in the United States could increase real GDP in the long term by 4.4%.

¹ http://ec.europa.eu/competition/publications/reports/expost_evaluation_competition_policy_en.pdf

Good evaluation planning is essential.

Evaluation takes time and resources, so good planning of the evaluation project is essential. Good planning results in better data and timely results. Having a plan of action, such as the multiannual evaluation programme of the Competition Directorate-General, guarantees a certain degree of regularity in evaluations. Conducting an *ex post* assessment only in response to a failure would be a very incomplete and biased form of performance measurement.

From an organisational perspective, an *ex post* evaluation project has three main steps. The first, preparatory step includes defining the project's objective, identifying the policy action to be evaluated and choosing the methods to be used. One has also to decide early on who will conduct the evaluation: insiders, outside experts or both. The second step is to execute the *ex post* evaluation project. The availability of suitable data determines what methods can be used and ultimately determines the success of the evaluation exercise. Therefore, spending more time and resources on data collection is a good investment. Exploiting the results is the third and final step. A critical, independent assessment of the results is recommended before publication.

The use of multiple (quantitative and qualitative) evaluation methods increases the robustness of the evaluation.

Various methods can be used to carry out *ex post* evaluations, including qualitative and quantitative methods as well as mixed methods, such as case studies or market studies (see Box 1). Amongst the qualitative methods, we can distinguish the relatively straightforward measurement of success in court from more resource-intensive performance measures based on surveys of stakeholders and peer reviews amongst competition authorities. Quantitative methods range from relatively simple calculation of customer savings to the estimation and simulation of complex structural models. Other quantitative methods, such as the often used Difference-In-Differences (DiD) method, are not based on an underlying model of the market, but on a comparison of actual developments following the competition policy intervention with what would have happened in the absence of such intervention (i.e. "the counterfactual"). Finally, event studies track the reaction of stock prices to a decision.

Using a combination of different approaches contributes to increasing the robustness of the results obtained. Using a combination of qualitative and quantitative methods allows looking at the question from different angles. However, in practice, evaluations combining different methods are less frequent because they are more costly. Finally, it is important not to forget that evaluations are used by policy-makers and they need to be able to understand the evaluation method used.

BOX 1. Evaluation Methods

Methods	Basis of analysis
Microeconomic evaluations	
Qualitative methods	
<ul style="list-style-type: none"> Court judgements 	Court judgements in response to appeals by parties concerned challenging the decisions made by competition authorities
<ul style="list-style-type: none"> Surveys and peer reviews 	Interviews with or questionnaires filled out by competitors, suppliers, customers, law firms and competition authorities
Quantitative methods	
<ul style="list-style-type: none"> Estimation and simulation of structural models 	A fully specified demand side model
<ul style="list-style-type: none"> Reduced form estimation 	Single equation based on a clearly defined theoretical framework
<ul style="list-style-type: none"> Calculation of customer savings 	Assumptions concerning expected effects on prices, sales and productive efficiency, and the expected duration of such effects
<ul style="list-style-type: none"> Quasi-experimental methods 	Comparison of performance of treatment group of companies with a control group
<ul style="list-style-type: none"> Event studies 	Reactions of stock prices of competitors to a merger announcement/appeal, and of stock prices of parties concerned by the detection of a cartel or the launch/conclusion of an antitrust investigation
Mixed methods	
<ul style="list-style-type: none"> Case studies 	Combination of the above elements of information concerning a specific case
<ul style="list-style-type: none"> Market studies/sector inquiries 	Developments in a specific market following a number of competition policy interventions affecting that market
<ul style="list-style-type: none"> Meta-retrospectives 	Academic papers and publications by competition authorities on selected issues (on antitrust or merger remedies, cartel detection and fines, e.g.)
Macroeconomic evaluations	
Qualitative methods	
<ul style="list-style-type: none"> Surveys 	Surveys to assess the effectiveness of competition policy
Quantitative methods	
<ul style="list-style-type: none"> Calculation of aggregate customer savings 	Assumptions concerning expected effects on prices, markets concerned and the expected duration of such effects
<ul style="list-style-type: none"> Macro-econometric modelling 	Reduced form estimations or simulations based on macroeconomic models

3. Microeconomic impact

Mergers

The empirical literature on the microeconomic evaluation of competition policy has concentrated on merger control and cartel policy enforcement.

On average, prices increase following a merger, even with merger control in place, and the extent of pass-through of efficiency gains to customers depends on the degree of market concentration.

Merger evaluations find that, on average, prices increase following a merger, as the market power effects of mergers outweigh the efficiency effects. At first sight, this seems to argue in favour of stricter merger control. However, a post-merger price increase can also be explained by an increase in marginal costs associated with post-merger inefficiencies, collusive conduct amongst remaining participants or, more positively, a change in the quality of goods or services produced by the merged entity. In addition, this outcome may reflect a selection bias in the sample of mergers having been subjected to *ex post* evaluation. Finally, as the actual market outcome following a merger approval decision is a stochastic event, the price rise following the decision may be a random price fluctuation explained by other, unexpected factors.

Not all mergers lead to an increase in prices. Some mergers show net efficiency gains. The extent of pass-through of such gains to customers depends on the degree of concentration in the market.

Structural remedies appear to be more effective than behavioural remedies.

It is difficult to distinguish the effects of a merger from those of the associated remedies. Nevertheless, in the literature there is a consensus that structural remedies are more effective than behavioural remedies. For example, structural remedies such as divestitures have been estimated to cut the average price increase in half. Moreover, some studies conclude that remedies are not as effective as prohibitions in deterring anti-competitive mergers.

Merger control has deterrent effects on harmful mergers.

A survey of UK competition lawyers shows that four out of five harmful mergers are deterred as a result of competition policy enforcement. However, these estimates have to be taken with caution as they are largely based on the "gut feeling" of the lawyers and companies being interviewed. More generally though, the deterrence effects of merger control appear largely to outweigh the costs of maintaining an effective competition policy regime.

The 2004 reform of the EU merger control regime has reduced the probability of anti-competitive deals being cleared.

The outcomes of event studies show converging conclusions regarding the impact of EU merger control. Difficulties with the market definition or the length of the procedure appear to affect the frequency of Type I (prohibition of a pro-competitive merger) and Type II errors (acceptance of an anti-competitive merger) made by competition authorities. By contrast, the Commission's decisions are not sensitive to firms' interests and therefore, the claim that "the Commission listens too much to competitors, at the expense of consumer interests" is not supported by data. There also appears to be a consensus that the 2004 merger reform has reduced the probability of anti-competitive deals being cleared. Moreover, the 'more economic approach' of the 2004 Merger Regulation has resulted in an increased *ex ante* predictability of decisions.

Abuses of dominance

Deterrent effects of antitrust enforcement actions are strong and these actions cause reputational damage for the companies concerned.

Even though the number of studies on the effectiveness of antitrust policy enforcement under Articles 101 and 102 TFEU is very small, they all point to the conclusion that antitrust enforcement actions have real consequences for the firms involved (e.g. in terms of reputational damage), going well beyond the direct effects of fines and legal costs. Consequently, the deterrent effects of such enforcement actions appear to be substantial.

The benefits of effective antitrust enforcement are likely to be well above government spending on such enforcement. A UK survey estimates that for each abuse of dominance case, 12 potential infringements are deterred. Also, surprise inspections and infringement decisions by the European Commission appear to have a significant negative effect on share prices of the companies concerned.

Cartels

Up to four out of five cartels may remain undetected.

The probability of cartel detection is very difficult to determine, because non-detected cartels are by definition unobservable. More recently though, researchers have developed methods aimed at overcoming this challenge. One method from ecology, for example, allows making inferences about changes in the 'unobservable' detection rate based on the observed changes in the number of detected cartels. Using this and other methods, researchers have come to the rough conclusion that up to four out of five cartels may remain undetected.

Overcharge rates are, on average, between 15% and 20% of the competitive price but they show a great variance.

On average, overcharge rates (i.e. the difference between the collusive and competitive price expressed as a percentage of the competitive price) are between 15% and 20%, with overcharges achieved by cartels in Europe and North America being lower than in the rest of the world, where cartel policy enforcement may be less strict. However, there is a considerable variation in the mean overcharge reported by the different meta-studies, reflecting the extent to which outliers are taken into account.

Stronger enforcement of cartel policies has contributed to a decline in overcharges.

Meta-studies appear to agree on the conclusion that the stronger enforcement and increased scope of cartel policies in the U.S. and the EU in particular has contributed to the observed decline in overcharges (with the notable exception of overcharges resulting from bid rigging cartels).

Looking ahead, there is an argument for imposing high fines, especially on more durable and international cartels, as overcharges are higher in such cartels.

Net benefits of joining cartels depend on a number of factors, including the level of overcharges, the duration of the cartel, the size of the market, the probability that the cartel will be detected by competition authorities and the likely level of fines imposed in case of detection. Measuring these net benefits of cartel participation is difficult as it requires an assessment of the probability of cartel detection.

A number of papers have attempted to calculate the net benefits of cartel participation. On that basis they conclude that current fining levels are insufficient to deter companies from joining cartels. However, other authors consider that fines set according to the EU Guidelines are not necessarily inadequate to achieve deterrence. They suggest that other actions can be taken to diminish the inclination of companies to engage in collusive behaviour, including stronger private enforcement, the introduction of personal liability and payments for whistle-blowers, increasing the resources for cartel detection and fostering a competition culture.

If the decision were to be taken to increase fines, the results of the literature would plead in favour of focusing such increase on more durable and international cartels, because: (1) average overcharges of cross-border cartels are 14 percentage points higher than those of domestic cartels; and (2) the average level of overcharges rises by 4 percentage points for each five additional years of cartel operation.

4. Macroeconomic impact

Two main approaches can be used to assess the aggregate effects of competition policy: a bottom-up approach measuring the direct benefits of competition policy for consumers (customer savings approach) and a macro-modelling approach analysing the impact of competition policy on competition and (directly and indirectly) on growth. Empirical work analysing the impact of competition policy is less developed and conclusive than the work analysing the impact of competition.

Direct benefits of competition policy for consumers

A relatively simple methodology is used by some CAs to estimate the customer savings resulting from competition policy interventions.

The approach used to estimate customer savings consists of calculating the reduction in prices resulting from competition policy interventions (i.e. merger decisions and cartel prohibitions). This reduction in price is multiplied by the affected turnover in the relevant market and the estimated duration of the price reduction.

The estimates obtained with this method vary widely over time and between jurisdictions.

The estimates of annual customer savings from competition policy interventions vary widely over time and among

jurisdictions (see Box 2). Such variation can be attributed to several factors, such as the size of markets in which CAs intervene, the scope of the interventions and the number of cases investigated, as well as the assumptions and estimation methods used. Recently, the OECD has made some proposals aimed at increased convergence of the assumptions and methods used by CAs.

BOX 2. Estimates of annual consumer savings (% of GDP x 10⁻²)

	2008	2009	2010	2011	2012	2013
EC	8.7	7.6	8.9-13.1	4.4-6.4	2.6-5.7	3.8- 4.7
DOJ	0.4	1.3	0.2	1.1	5.8	0.7
FTC	0.3	0.7	0.7	0.6	0.6	0.6
CMA	2.6	2.7	1.3	1.0	1.0	1.0
ACM	0.7	0.1	1.5	6.1	3.7	10.8

The customer savings approach underestimates the total benefits of competition policy for consumers as it ignores indirect, deterrent and non-price effects.

An advantage of the customer savings approach is that the estimates are directly based on the relevant decisions taken by the CAs. Its main disadvantage is that customer savings are partial estimates which only measure the direct price effects of interventions for customers. Therefore, these estimates are very small when expressed as a percentage of GDP. However, the total benefits extend well beyond prices and include effects on quality, choice and innovation. The customer savings estimates also ignore the indirect consequences of the price reduction on the whole economy and the deterrent effects of competition policy.

Macro-modelling approach

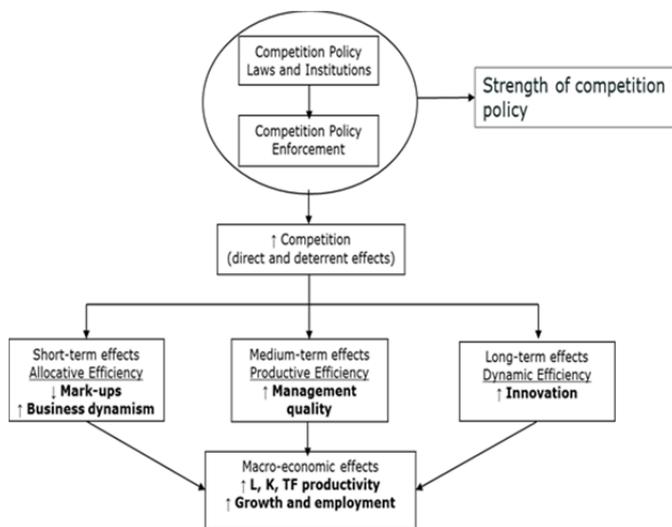
An integrated macro-modelling of the impact of competition policy should first analyse the impact of competition policy on competition, and second, the impact of competition on macroeconomic performance (see Graph 1). An increase in competition has a positive impact on macroeconomic performance via three main transmission channels: changes in allocative (reduction in mark-ups and increase in business dynamism), productive (better management) and dynamic (increase in innovation) efficiency. These changes lead to a reduction in costs and prices, an increase in productivity and ultimately an increase in growth.

The macro-modelling approach measuring the impact of competition policy requires indicators of the strength of competition policy, which is very challenging.

Indicators used to assess the strength of competition policy can be divided into three main categories: input indicators, output indicators and composite indicators combining input and output variables. Input indicators include variables measuring the human and budgetary resources employed by CAs or variables related to the quality of competition laws and institutions. Output indicators include survey results on the perceived effectiveness of competition policy and variables describing the interventions made by the CAs.

Our survey shows that there is still room for improving the quality of the existing indicators measuring the strength of competition policy. On the one hand, indicators based on the staff and budget of CAs are relatively simple and objective. But they give a very partial view of the strength of a competition policy and assume that there is a positive relationship between the resources of a CA and the strength of its competition policy, which is not necessarily right. Similarly, the surveys based on the views of business leaders are over-simplistic, often based on a single question, and very subjective. On the other hand, composite indicators combining input, output and survey results raise a number of problems: aggregation, choice of the benchmark, and difficulty of interpretation as they combine very different elements of competition regimes. They also do not show much variability across countries, which reduces their usefulness for empirical work. Moreover, there is little or no correlation between the input and output indicators of competition policy. This casts doubt on the quality of these indicators and shows how difficult it is to summarise the complex competition laws and practices in a simple indicator.

GRAPH 1: Integrated framework



Macroeconomic impact of competition policy

The introduction of competition laws and/or the strength of competition policy seem to have a positive impact on the perceived effectiveness of competition policy.

Most studies find the existence or strength of competition laws on the books has a positive impact on the perceived effectiveness of competition policy. Some of these studies go

deeper into the institutional features of competition policy which determine its effectiveness. The conclusion is that the design of antitrust policy is important; in particular, countries with an economic approach to dominance investigation, an effective leniency policy and an independent CA are perceived as having more effective antitrust policies.

The strength of competition policy has a positive impact on competition but having wealthy, large and open markets is as important for competition.

A few studies come to the conclusion that the strength of competition policy (as perceived by business leaders or as measured by the quality of competition laws and institutions) has a positive impact on the perceived competition intensity. Other variables, such as the size of the economy, the population of the country, its degree of openness and GDP per capita also have a positive impact on competition, suggesting that having wealthy, large and open markets is as important for competition as good competition laws. However, these results are not always robust.

Competition policy also seems to have a positive effect on growth, via its impact on the number of firms in the industry, mark-ups, productivity and investment.

A number of relatively recent studies attempt to assess whether countries with competition laws and more effective competition laws achieve faster growth. A competition policy indeed seems to have a positive impact on growth, via its impact on the number of firms in the industry, mark-ups, productivity and domestic and foreign investment. For example, the introduction of competition laws has a highly positive and long-lasting effect on the number of firms in the industry: after 25 years, the number of firms increases by 29% on average in a sample of 28 industries in 42 countries. Competition policy also seems to have a positive impact on productivity, with the improvement in competition policy being responsible for as much as one-fifth of the increase in productivity in the UK at the beginning of 2000s. However, again, the conclusions are not clear-cut, as other studies fail to find a significant impact of competition policy on productivity, mark-ups and foreign investments.

Macroeconomic impact of competition

Conclusions from the empirical work analysing the macroeconomic effects of competition are more robust and broadly convergent.

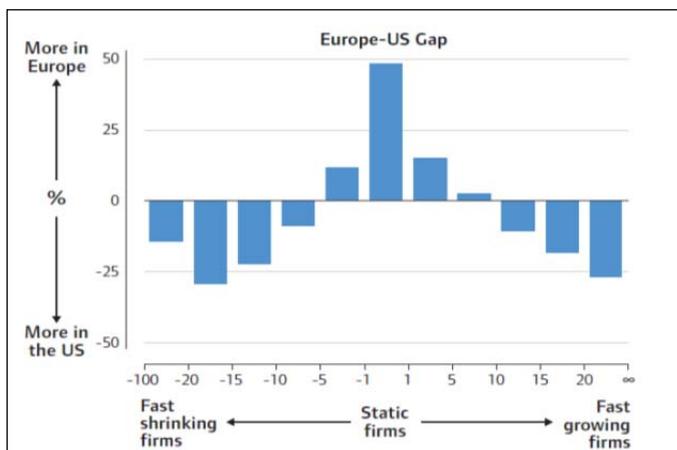
A reduction in mark-up and an increase in business dynamism have a significant positive impact on growth, for example, contributing to reducing by half the GDP per capita gap between the euro area and the United States.

The degree of competition (as measured by the mark-up) is still lower in Europe than in the United States, especially in the services sector, where the mark-up is estimated to be 44% higher in the euro area than in the United States. The macroeconomic impact of a mark-up reduction is significant. For example, a study concludes that differences in competition between the euro area and the United States account for half their gap in GDP per capita. Another study finds that a reduction

of mark-ups (by 30%), aligning the mark-up in services in the euro area to that in the United States, could increase real GDP in the long term (by 4.4%). Most of these empirical studies also conclude that the positive effects of a reduction in mark-ups on productivity are higher in low-competition sectors (such as services) and low-competition countries.

Business dynamism is also lower in Europe than in the US (see Graph 2). For example, the share of static firms (firms with an annual employment growth rate between -1% and +1%) is 30% lower in the US than in Europe, while the share of growing firms is 30% higher over the period 2002-2005. Reducing the share of firms with very modest or zero growth in the EU could reduce to a large extent the EU-US gap in TFP growth (by up to 80%).

GRAPH 2. US-Europe gap in business dynamism



Source: Bravo-Biosca, Albert (2010), "Growth dynamics. Exploring business growth and contraction in Europe and the US", Nesta report.

A competitive environment also contributes to better management performance and improved productivity performance.

A more competitive environment is positively correlated with better management practices in manufacturing and in some services (hospitals, schools and public retails). Other factors than competition also contribute to explaining better management practices, such as flexible labour markets, the availability of skilled people, private equity ownership and the multinational character of the company. Moreover, better management practices are significantly associated with higher productivity: management practices account for up to one-third of the differences in productivity between firms and countries.

There is empirical support for the existence of an inverted-U shaped link between competition and innovation.

The link between competition and innovation is more complex, in particular because measuring innovation is at least as challenging as measuring competition and because of endogeneity problems. However, there is empirical support for the existence of an inverted-U shape link between competition and innovation, with too little or too much competition reducing innovation.

Competition policy is particularly beneficial in industries with firms that are technologically advanced.

The technological gap and the type of industry will influence the relation between competition and innovation. The positive impact of competition on innovation is greater in 'neck to neck' industries, i.e. industries with the same technological levels, and for firms and industries close to the technology frontier. In such sectors, product market competition reduces pre-innovation rent, thereby increasing the incremental profits from innovation. This is known as the 'escape-competition effect'. However, competition reduces the post-innovation rents for firms further behind the technology frontier in sectors with a high technology spread, thereby lessening their incentive to catch up. Within this framework, competition policy is particularly beneficial in industries with firms that are technologically advanced.

There are significant positive gains in terms of innovation and productivity to be made downstream by stimulating competition in upstream sectors, such as the transport, energy and telecommunications sectors.

Weak upstream competition can curb productivity growth in downstream markets, as it reduces the incentive for downstream firms to innovate or adopt new technologies because: (1) the rents which downstream firms can expect from efficiency improvements are likely to be partially captured by the suppliers of the intermediate inputs upstream; and (2) a lack of competition in the upstream market can generate entry barriers limiting competition downstream if access to downstream markets requires using intermediate inputs produced upstream. Some studies suggest that increasing competition in upstream markets, such as the transport, energy or telecommunications market, would increase multi-factor productivity growth by 1 to 1.5% per year in the observed OECD countries.

5. Conclusions

While a lot can be learnt from existing work on the micro and macroeconomic impact of competition policy, there are a number of areas where further research can be done. Box 3 proposes a non-exhaustive list of topics which could be further investigated. Work has started in the Competition Directorate-General in some of these areas, but contributions by academics or practitioners on these issues would be most welcome.

BOX 3. Areas for further research

- Definition of the counterfactual: identification of parties not affected by the decision or policy in order to address selection biases
- Non-price effects of merger and cartel decisions, including effects on quality and variety of products, market entry, mark-ups or innovation
- Meta-study of existing quantitative and qualitative evaluations of merger decisions by European competition authorities
- Understanding of the effects of competition policy on the functioning of key sectors in the economy, including the interaction between competition and regulatory policy instruments at the sector level
- Knowledge of the deterrent effects of competition policy enforcement
- Assessment of the aggregate effects of competition policy
- Assessment of the effects of competition policy on inequality