

**Estimating the impact of competition
enforcement by the Spanish
Competition Authority
(Revised methodology)**

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The views and opinions expressed in this paper do not
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Javier García-Verdugo and Lorena Gómez
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¹ Please send any comments or suggestions to lorena.gomez@cnmc.es

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1. INTRODUCTION

Impact assessments are becoming more widely used by competition authorities, in an attempt to quantify the benefits of their activities at a time when the effectiveness of competition laws and the economic impact of competition policies are under increasing scrutiny. However, as pointed out by Van Sinderen and Kemp (2008), quantifying the costs of their activity is easier than calculating the benefits, which might lead politicians to conclude that they are too expensive to maintain, even though the benefits are indisputable. This increased interest in the effectiveness of competition authorities may result in a legal requirement to monitor the effects of their decisions in some way and, as Ilzkovitz and Dierx (2015) remark, most authorities are already required to report on their annual activities. The International Competition Network (ICN) also recommends *ex post* studies to improve the effectiveness of interventions by competition authorities (Delgado et al., 2016).

We started carrying out such assessments for the CNMC in 2016, in order to show how the interventions of the Spanish competition authority in different sectors of the economy benefit consumers (both final consumers and customers of intermediate products)². As well as their obvious usefulness, these studies are not resource-intensive, at least in their most basic form, as they require information which is already available in the enforcement files or, failing that, the use of general rules; besides, it is only recommended that these assessments be carried out once a year (Davies, 2013).

As in the previous version³, this new study includes a brief reference to the different types of assessments that can be carried out to quantify the effect on society of the enforcement activities of competition authorities. From the many possible forms of assessment, we have selected a simple methodology with prudent assumptions, which can be used as the basis for wider-ranging studies in the future. The main assumption when applying this methodology refers to the positive effect of interventions by competition authorities; in other words, it is assumed that their interventions help avoid direct adverse effects on consumers in the form of higher prices. It should also be emphasised that only the direct effects of the interventions are included, so that the estimated impact on welfare ignores a large part of the actual effect of the Spanish competition authority's activity. For example, neither deterrent effects nor positive effects on innovation are included.

We have used this methodology to assess the benefits for society of the enforcement activities of the Spanish Competition Authority from 2011 to 2019. The methodology has changed somewhat compared to our previous study, as the feedback that we received considered that the assumptions of that first document were too conservative and did not reflect adequately the real impact of the

² While the OECD (2014) uses the term 'affected consumers', the European Commission (Ilzkovitz and Dierx, 2015) refers to 'customer savings'. In this document we will follow the OCED guidelines and use the general term 'consumers' to include both final consumers and customers of intermediate products.

³ See Document AE-02/17(0403) "[Estimating the impact of competition enforcement by the Spanish Competition Authority](#)"

authority's interventions. Those assumptions were also more conservative than the recommendations of the OECD and the assumptions made by most of the leading competition authorities. Savings for consumers in a particular year due to the enforcement actions of the CNMC are computed first as savings generated by decisions published in the relevant year, and then, considering a longer duration of the price effect, as the sum of the savings generated by decisions published in the relevant and in the previous year. They are also shown in the document, following the OECD's recommendations, in the form of an annual moving average over three years, to reduce the variability in estimates resulting from cases related to particularly large or small markets that might arise in a certain year.

With the new methodology, total annual savings for consumers in this 8-year period ranged between 284.2 million euros in 2018 and 2,846.6 million euros in 2015. Even without considering 2015, which admittedly was rather unusual, annual average total savings were over 585.1 million euros. These results clearly show the significant positive effect on consumers of the activity of the Spanish competition authority⁴.

The rest of the document is structured as follows. Section 2 reviews the wide array of possible impact studies that are available, the OECD's recommendations on impact assessments, as well as the choices made by the CNMC. Section 3 deals with the specific methodology for assessing the impact of cases involving anticompetitive practices, comparing it to that used by the five competition authorities with the most experience performing these studies, while Section 4 does the same for merger cases. Section 5 sets out the estimated consumer savings, while Section 6 includes a sensitivity analysis to ensure that results are robust. Finally, Section 7 presents the conclusions of the study.

2. BEST PRACTICES FOR IMPACT STUDIES

The first step in any impact study, before establishing a methodology, is to establish a series of stages that must be followed, for which it is fundamental to decide on the objective of the assessment. The main objective of impact assessments carried out by competition authorities is to examine the situation of consumers after their decisions, or what that situation would have been if they had not intervened. Therefore, their objectives include measuring the effectiveness or impact of such interventions (to be able to maximise the impact), obtaining comments or criticisms in order to improve their activity, and increasing transparency (Delgado et al., 2016).

In recent years, various authors have described a series of stages to be followed in these studies. According to the European Commission (Ilzkovitz and Dierx, 2015), impact assessments should be based on a continuous cycle in which the different steps should complement each other. The cycle is thus divided into three blocks: policy design, which includes *ex ante* impact studies (identifying problems, setting objectives and choosing the best indicators); monitoring, once policies have been

⁴ This is especially significant considering that the CNMC's annual budget dedicated to competition activities (both enforcement and advocacy) ranged between 11 and 15 million euros between 2013 and 2019.

introduced; and *ex post* evaluation, which compares what was expected in the *ex ante* study with the actual results.

However, other authors establish a more linear, although very similar, methodology, also divided into three main blocks. Hüsichelrath and Leheyda (2010) distinguish between the preparation stage (identifying the objectives, context and moment of the assessment), the execution stage (definition of criteria and of the counterfactual⁵, and selection and application of the indicators) and the reporting stage (interpretation of the results and their importance and conclusions of the study). On the other hand, Delgado et al. (2016) also distinguish three steps: first, identifying and classifying the phenomena which could have an impact on markets or on social welfare; second, designing the indicators, with varying degrees of complexity, ranging from quantifying the activity of the competition authority to measuring the effect of that activity on social welfare; and third, calculating the indicators, gathering the necessary data and obtaining conclusions regarding the effectiveness or impact of the activity.

The objective determines both who carries out the evaluation and its level of sophistication, as generally accepted assumptions or more complex econometric methods may be used (Davies and Ormosi, 2012). In our case, our choice will be a linear methodology, first defining the objective, which is to measure the impact of the CNMC's activity in the form of savings for consumers, and then establishing the indicators to be calculated for a quantitative estimation of that impact.

The results of these estimates will not be compared with any cost-benefit objective, as occurs with the United Kingdom's Competition and Markets Authority (CMA), which is obliged by the government to generate at least £10 of benefits for every £1 of its funding. The United States' Federal Trade Commission (FTC) also compares its performance with previously set targets or with the resources which have been devoted to mergers or other anticompetitive practices (see Delgado et al., 2016). The problem is that this type of target can be arbitrary, especially if the estimates, as is usually the case, do not include the deterrent or dynamic effects of interventions by the competition authority. There would also be some pressure to find problems in all the markets under investigation and to carry out quick and decisive interventions (fines, remedies), when it might be sometimes preferable to work within a wider time frame, expecting benefits to emerge over time through a more effective competitive process (Lyons, 2016).

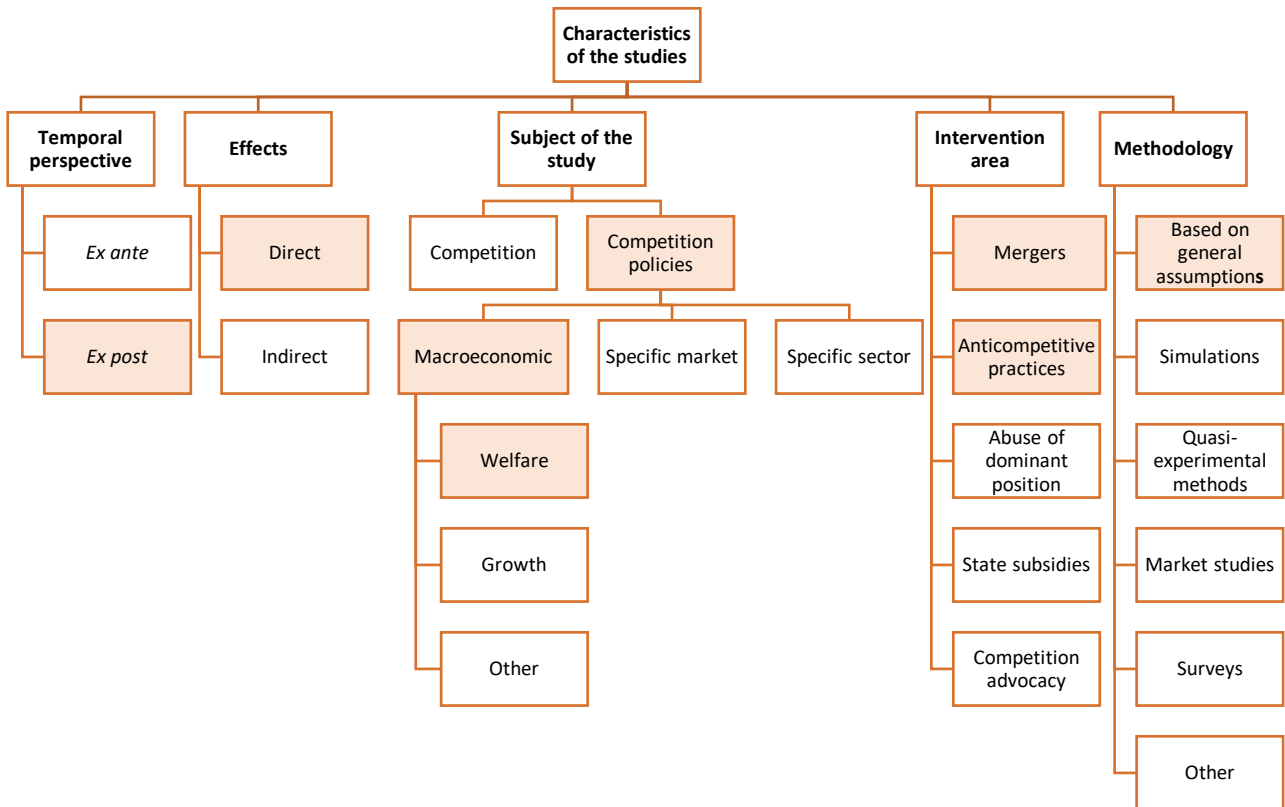
Section 2.1 explains the different types of impact studies and methodologies that can be used to quantify the effects of enforcement actions by a competition authority. Section 2.2 summarizes the OECD's recommendations on this topic before presenting our choice for the CNMC.

⁵ Establishing what the situation would have been if the intervention by the competition authority had not taken place.

2.1 Characteristics of impact studies

Given the many different approaches that can be used for impact studies, Figure 1 summarises the main characteristics which these studies can have. These features are explained in more detail in the following sections.

FIGURE 1. MAIN CHARACTERISTICS OF IMPACT STUDIES



Note: options chosen by the CNMC are shown in shaded boxes.

Source: adapted from Ilzkovitz and Dierx (2015).

2.1.1 Temporal perspective of the study

First, it is necessary to define the temporal perspective of the study. A distinction is made between *ex ante* and *ex post* evaluations. The main difference stems from the time to which the information used refers: before or after the intervention takes place and its effects on the economy can be identified. Competition authorities, such as the CMA, use both types of studies, although *ex post* studies are usually reserved for a few relevant cases (CMA, 2016).

According to the framework used by the DG Comp, Ilzkovitz and Dierx (2015) establish the main differences between these two types of studies: *ex ante* impact assessments are prospective and carried out before the intervention takes place, so their objectives are to analyse the expected effects and, where necessary, carry out the intervention; *ex post* assessments, which are retrospective and take place after the intervention, are based on real evidence and determine whether the effects are as predicted in *ex ante* studies.

Hüschelrath and Leheyda (2010), however, distinguish between three types of evaluations: *ex ante*, *ex post*, and “accompanying”. They note that the *ex post* evaluation is the most important, while *ex ante* evaluations take place in all cases where a competition authority has to study possible mergers. The third type is used to assess the effects of competition, competition policy or competition laws, as strictly speaking activities without a defined ending point cannot be studied *ex post*.

Finally, Davies (2013) describes assessments in a slightly different way, taking the view that impact assessments are carried out after the competition authority has intervened, but using *ex ante* information, as it is still too soon to observe the real effects of the intervention. This will be the definition used for the CNMC’s estimates, as it fits in with the objective of identifying and transmitting the benefits of the competition authority’s activity, which can be evaluated the year after the publication of the decisions without the need for hard-to-obtain data, as occurs in the case of *ex post* analyses.

2.1.2 Effects

Impact studies focus only on cases where an intervention has taken place or been considered. According to Davies and Ormosi (2012), this can lead to selection bias when quantifying the impact of competition policies, although there is little research on the extent of this problem.

Apart from the problem of bias, the effects measured with these impact evaluations may be direct or indirect. Direct effects are due to interventions by the authorities through, for example, merger control, thus preventing situations which would have reduced competition and increased prices. On the other hand, indirect effects are divided between those which affect productivity, innovation and growth and the deterrent effects associated with interventions by the authorities (for example, detecting and fining collusive agreements not only puts an end to the infringement in question, but also discourages other companies from committing the same infringement). In neither case is there a consolidated methodology which might allow them to be estimated without controversy. Therefore, indirect effects are usually excluded from impact studies, even though there is a consensus regarding the undeniable benefits of deterrent effects (Davies and Ormosi, 2012; Davies, 2013; Ilzkovitz and Dierx, 2015).

Some authors have attempted to measure indirect effects, among them Van Sinderen and Kemp (2008), who completed the impact estimates for the NMa in the Netherlands (precursor of the current ACM) by applying a model including not only static effects but also dynamic effects, such as the benefits that can occur as a “side effect” in other sectors, and the differences between short- and long-term effects. To do this, they used a general model of long-term equilibrium and calculated the positive effect of the NMa’s policies from 1998 to 2007 on production, employment and labour productivity in the Netherlands.

For now, the CNMC will follow the example of the five major authorities mentioned above, which include only direct effects in their static estimates, i.e., they do not distinguish between short and long term and they focus on effects on prices.

2.1.3 Subject of the study

When evaluating the impact of the competition authorities' activity, it is essential to distinguish between the impact of competition and of competition policies. In this case, we are only interested in measuring the latter, which mainly refers to competition laws and their application, leaving aside the effects of trade liberalisation or regulation (Ilzkovitz and Dierx, 2015).

According to the European Commission (DG Comp), it is possible to distinguish between the effects of these competition policies according to levels:

- a) Impact on specific markets.
- b) Impact on specific sectors.
- c) Macroeconomic impact, which may refer to welfare, employment, etc.

Impact studies tend to take a macroeconomic approach, especially those which measure effects on consumer welfare, so the CNMC will focus on this type of study, in line with other competition authorities. For example, the CMA's main external advisor on the subject clarifies that estimates are not carried out for total welfare, but only consumer welfare, as otherwise it would require a dynamic analysis which the chosen methodology would not allow (OFT, 2010).

2.1.4 Intervention area

In the course of their activity, competition authorities intervene in different areas:

- Merger control
- Anticompetitive infringements/cartels
- Abuse of dominant position
- State subsidies
- Competition advocacy

In the case of the last three, the methodology for carrying out evaluations remains scant. Instead, there is a more established methodology for evaluating the effects of ending collusive agreements and merger control. In fact, there is a predominance of studies focusing on specific markets and macroeconomics, but which measure the impact of the activity only in the areas of anticompetitive conducts and mergers (Ilzkovitz and Dierx, 2015). These are the areas included in this study.

2.1.5 Methodology

According to the framework proposed by Ilzkovitz and Dierx (2015), the main methodological approaches which can be applied and have been used in impact studies are described briefly below:

- a) Methods based on general assumptions with regard to effects on prices and their possible duration. The main variables considered are the size of the relevant or affected market and the duration of the price increase which would have happened if the infringement had continued or the merger had gone ahead without the intervention of the competition authority. This is the type of

study which will be carried out by the CNMC and which is explained in depth in this document.

Wherever possible, the information used will come from the various cases which have resulted in CNMC's decisions, both in relation to anticompetitive practices and mergers. For the time being, a reference value for prices will be used based on the literature and the best practices of other competition authorities.

- b) Simulations based on econometric models are a more elaborate way of estimating the impact of competition decisions than the above method. Econometric simulations are usually based on models which specify demand (and even supply, in the case of oligopolies). There are two large groups of models: AIDS (Almost Ideal Demand System) models, which are discrete choice demand models used by the CMA; ALM (Asset and Liability Models); and PCAIDS (a version of the AIDS model), used by the European Commission.

Simulations require a large amount of data (including an estimate of the price elasticity of demand), as well as very specific assumptions, although they have the advantage of having a theoretically established counterfactual. No competition authority regularly publishes estimates based on simulations, although, as mentioned above, Van Sinderen and Kemp (2008), from the ACM's Chief Economist Team, used models for more advanced studies including effects on growth, productivity and employment in both the medium and long term.

- c) Quasi-experimental methods. These methods are based on the comparison of developments in markets that have or have not been affected by one or more competition policy interventions. For example, an evaluation of the impact of a merger decision would be based on the comparison of price developments in similar markets affected and non-affected by the decision. The Difference-in-Differences (DiD) method is most commonly used, and is based on a comparison of developments over time between the "treatment group" (the market affected by the merger decision, for example) and the control group (a similar market not affected by the decision).

This method does not rely on difficult to test assumptions, but the choice of the appropriate counterfactual determines the value of the results.

- d) Market studies. They assess how a specific market develops after an intervention relating to competition policies⁶. They may be either *ex ante* or *ex post*.
- e) Other methodologies. The most notable are surveys, case studies and event studies. The last type mainly analyses how the share prices of rival companies react when a merger is announced or a cartel is detected. It is,

⁶ This impact study methodology should not be confused with the market research undertaken by competition authorities to determine whether or not there are competition problems in a market.

therefore, a financial analysis that measures whether the market considers that the decision promotes competition and, therefore, prices are likely to fall and returns on shares are likely to be lower. Its main advantage is that it is tested empirically, trading price data are readily available and the analysis is quick. However, the result can be influenced by other variables, such as the companies' reputation.

2.2 OECD recommendations

2.2.1 The experience of competition authorities

In 2013, Professor Davies compiled a series of recommendations for the OECD (that were in turn included by the OECD in its 2014 impact assessment guide) based on impact assessments carried out by the five leading competition authorities in this area. Here we have included the most important ones, which are mainly studies based on general assumptions, and that can be considered a starting point or a list of best practices which could be adopted by less experienced authorities when carrying out this type of analysis:

- Since 2005, the CMA has published studies evaluating the impact of its interventions⁷. These studies fall into two main groups: external case-specific assessments and internal assessments focusing on measuring the benefits of the CMA's enforcement actions for consumers, reviewed by an external expert. They also distinguish between the impact of each of their activities, i.e., interventions in cartels, mergers, etc. The final results are published as a 3-year moving average (CMA, 2016; Delgado et al., 2016).
- The Netherlands' Authority for Consumers and Markets (ACM) has published impact assessments since 2004⁸ (Van Sinderen and Kemp, 2008). Its Annual Reports provide information on the savings for consumers generated by its decisions, both for competition cases and for cases involving the regulation of the energy and transport sectors; they also indicate whether their estimates have been externally reviewed (ACM, 2013). However, the complete methodology is published in independent reports, the latest of which was written by Kemp et al. (2014).
- In 2011, the European Commission's Directorate-General for Competition (DG Comp) drew up a methodology for estimating the benefits for consumers of its enforcement interventions in relation to cartels and mergers. This methodology is very similar to that used by the CMA and the ACM.
- The US Department of Justice (DoJ).

⁷ The CMA is the result of the 2013 merger of the Office of Fair Trading (OFT) with the Competition Commission (CC).

⁸ Until 2013, the assessments were performed by the former Netherlands Competition Authority (NMa, from its name in Dutch), before the merger of competition and regulation authorities to create the ACM.

- The FTC evaluates the savings for consumers derived from its competition (mergers) and consumer protection decisions, publishing them annually as 5-year moving averages (Davies, 2013).

As well as these five leading authorities in the area of impact assessment, other authorities took part in the OECD's questionnaire (2014), revealing that most of them also carry out these studies, but not regularly or with such extensive scope. They include the authorities of Hungary, Mexico, Germany and Japan, whose methodologies use similar assumptions, and New Zealand, which has considered to apply the methodology of the British CMA but decided not to carry out periodical analyses due to the impossibility of measuring indirect effects (Davies, 2013).

As Mudde (2012) indicates, while the methodologies of these authorities are very similar, there is not a commonly accepted international standard. It is, therefore, especially important to compare the specific methodology used by these five leading authorities, both in this section on general methodology and in the following sections which are specifically dedicated to the impact of interventions relating to infringements and mergers.

2.2.2 Best practices based on the experience of other authorities

First, it is advisable to carry out these evaluations annually, so that it is possible to compare results over time and also to continue refining the estimation process. Besides, the chosen methodology should not be resource-intensive either in terms of time or information. Specifically, when estimating the impact of competition decisions, it is advisable to use *ex ante* data, as there will not be enough information for an *ex post* impact evaluation when the analysis is carried out during the year following the interventions.

Second, it is assumed that no action by the competition authority has a negative impact. Third, the estimates must use conservative assumptions. Although including dynamic effects benefiting consumers (improved productivity or innovation) would be advisable, and there is a great deal of consensus regarding their importance, there is as yet no tested methodology for estimating them. Therefore, they should only be included when there are clear ways to determine them. For the same reason, the deterrent effects of fines – the infringements they prevent – or of merger control – the anticompetitive operations which are ruled out before being proposed to the competition authority – are also excluded. In fact, it is fundamental that those carrying out these impact assessments are aware of the factors limiting the analysis (Delgado et al., 2016), since the evaluations will never be complete due to the exclusion of these variables (deterrent effects, business and consumer confidence, productivity, competition advocacy, the reputation of the institution, etc.), which are quite difficult to measure.

Finally, the OECD recommends to present the assessment results both as an annual figure and as an annual moving average over a three-year period. For example, the estimated impact for 2019 using the moving average would be an average of the effects of interventions in the period 2017-2019. This methodological choice has the added advantage of avoiding excessive annual fluctuations in

estimated savings due to short-term factors, such as the size of the markets affected by the decisions of a specific year. As pointed out by Davies (2013), this argument is the main objective of the leading competition authorities when choosing to show only moving averages. They consider that comparing consumer savings between years with exceptionally big and small outcomes results in a high volatility that is smoothed by using moving averages.

Competition authorities carrying out these analyses regularly publish only total annual savings figures (normally in the form of moving averages), distinguishing where appropriate between activities (decisions relating to anticompetitive practices, mergers, etc.)⁹, but do not provide data broken down by cases or companies. We will also use this criterion for the CNMC, publishing total consumer savings both as annual figures and as 3-year moving averages, as well as savings broken down by type of activity (fining decisions for anticompetitive practices or merger control decisions), so that they are easier to compare with other competition authorities.

The following two sections discuss the specific methodology used for the CNMC to assess the impact of its competition decisions in cases of anticompetitive practices and in reviewing merger proposals.

3. METHODOLOGY FOR EVALUATING THE IMPACT OF ENFORCEMENT ACTIONS AGAINST ANTICOMPETITIVE PRACTICES

First, we compiled all the decisions by the competition authority for infringements of article 1 of Law 15/2007, on Defence of Competition (LDC)¹⁰, during the year to be evaluated. This applies even where appeals were later brought against the decisions, as it is our view that the action of initiating the proceedings and reaching a decision will effectively interrupt the infringement. This differs from the system in the United Kingdom, which includes cases that have been appealed until the decision is upheld or invalidated, and in this second case the estimate is revised to exclude them (Office of Fair Trading, 2008).

The following information can be extracted from cases relating to anticompetitive practices:

- 1) Date of the CNMC's decision.
- 2) Infringing companies involved in the case, including leniency applicants.

⁹ The CMA, for example, breaks down its results by type of activity. In fact, its evaluations show a major imbalance in the benefit each area produces for consumers (market studies and research represented approximately 75% of the total in 2015/16), making it necessary to distinguish between them (Davies, 2010).

¹⁰ Although infringements of article 2 of the LDC, prohibiting the abuse of a company's dominant position, are also anticompetitive practices, they are not included in the estimate, as the methodology to evaluate the impact of these cases on consumers is not sufficiently developed (see Section 3.5).

- 3) **Affected market turnover (AMT):** the total turnover of infringing companies in the market affected by the infringement during its whole duration.
- 4) **Duration:** duration of the infringement, expressed in years.

From this information we obtain the dimension of each company's infringement measured as the size of the affected market (affected consumers), which, alongside the price effect (the price increase avoided by the CNMC intervention) and the duration of the price effect (the time for which the practice would have continued without the intervention), are used to estimate the impact as indicated below:

$$\text{Impact of decisions published in year } t = \sum_{i=1}^{N_t} [\text{Affected consumers}_i * \text{Price effect}]$$

Where t is the year for which the analysis is carried out and the case being studied is designated by the sub-index i (with a total of N cases in year t). This way, consumer savings in year t due to the decisions published that year are the result of multiplying, for each case, the **volume of sales in the affected market (affected consumers)** by the **price effect**, then adding the results across all cases to obtain the impact of decisions by the competition authority that year. We then have to take into account the **duration of the price effect**, which represents the expected duration of the infringement (and also of the price increase) if the authority had not intervened. This will be explained later on.

Although each of the parameters used in the calculation is explained in detail in the following subsections, it must be emphasised that the values assigned to the price effect and its duration are not extracted from each of the case files, but are reference values chosen using conservative criteria and applied equally in all cases.

The following sections evaluate the methodological options of the other competition authorities we are taking as a reference, and justify the choice of the parameter values which we will use in assessing the impact of enforcement actions of the Spanish competition authority.

3.1 Affected consumers

It was deemed appropriate that the most suitable method for estimating the size of the market affected by each infringement (affected consumers) was to calculate the average of the annual affected market turnover (AMT) from the data available in the case files, that is:

$$\text{Affected consumers} = \text{Average annual AMT} = \frac{\text{Total AMT}}{\text{Duration (in years)}}$$

It should be noted that if the available Total AMT value refers to less than a year, the average annual AMT used will be larger.

Other competition authorities use similar concepts to define the affected market. The CMA also uses a simple formula which includes the turnover of the relevant

market for the affected companies (CMA, 2016), while the ACM defines it as the turnover of the affected markets for the companies found guilty and fined, in the period in which the cartel is proven to have existed (Mudde, 2012). The European Commission uses the value of the products or markets affected by the cartel (European Commission, 2015a), while, in the United States, the DoJ calculates annual sales (or sales in the months the cartel was active, if its duration was less than a year) in the relevant market (OECD, 2014).

Some cases decided years ago by the Spanish competition authority do not contain information on AMT. Therefore, when the AMT is not available we will use total turnover (TT), but only when a high percentage of the company's business is involved in the market where the collusion took place, i.e., when the company can be considered a single-product company.

3.2 Price effect (price increase removed or avoided)

In line with most competition authorities, we will use an estimated avoided price effect of 10%¹¹, although several studies have estimated that price increases are usually higher¹².

This percentage is also recommended by the OECD (OECD, 2014), and used by the ACM (Mudde, 2012) and the DoJ in the USA, although the DoJ clarifies that some of its estimates are based on public information on the real effect of the cartel (Werden, 2008).

Meanwhile, both the CMA and the European Commission use a general rule of choosing between 10% and 15%. In the case of cartels in financial markets, the DG Comp calculates the price effect using a different methodology which assumes less benefits for consumers than if the decision had affected other markets (CMA, 2016; European Commission, 2015a).

3.3 Expected duration of the price effect

Finally, we must estimate the future duration of the infringement (the duration of the price increase) if the CNMC had not intervened, which determines the expected duration of the price effect. Our conservative assumption is that, in the case of anticompetitive conducts, the infringement would have continued at least for two years, and that is therefore our estimate for the expected duration of the price effect.

¹¹ A sensitivity analysis was carried out using also 8% and 12%, but 10% was ultimately chosen, a percentage similar to that used by other authorities.

¹² Combe and Monnier (2011) concluded, based on a survey, that average cartel price increases on average exceeded 20% throughout their duration; the simulations of Allain et al. (2013) use increases of 5% to 30% as the most probable values, and Lianos et al. (2014) find an average price increase of between 10% and 20% in their review of the estimates of other studies. Boyer and Kotchoni (2015) base their work on Connor (2010), while also correcting it, as the latter's database includes only estimates, not observations. In their review, they obtain an average corrected price increase value for the entire sample of 17.5%.

However, instead of multiplying the impact of decisions published in year t (see equation above) by the duration of the price effect, we assume that the savings calculated for the decisions published in that year will also be extended to the following year. Therefore, annual consumer savings for each year would be the sum of the savings generated in that year plus the savings generated during the previous year. This is a change in methodology compared to previous documents, where we assumed that the effect only lasted for one year.

The ACM assumed in their first impact papers a duration of the price effect of 1 year, like we did previously for the CNMC, but its latest methodology, published in 2013, assumes that the savings generated by the cases published in one year continue for the next two years unless there is specific information pointing to a shorter duration (Ilzkovitz and Dierx, 2015). The price effect, therefore, would last for 3 years, and is otherwise calculated as we do. On the other hand, the US DoJ assumes 1 year and, in cases of cartels less than a year old at the time of detection, the future duration is expected to be the same number of months as the cartel had been active when detected (Werden, 2008).

These are very conservative hypothesis, especially when compared to the CMA's, which, when specific information on the case is not available, assumes that the price effect will last for 6 years (CMA, 2016). Furthermore, all future savings are assigned to the year in which the decisions are published with a 3.5% discount rate (OFT, 2010).

It is possible that future analyses will use a methodology closer to the one used by the European Commission's Directorate-General for Competition, which applies a different duration (1, 3 or 6 years) depending on their level of stability (European Commission, 2015a). Cartels are considered more or less stable according to a case by case analysis which takes into account market conditions and how easy it is to maintain the agreements, among other aspects.

3.4 Assumptions used by the competition authorities

Table 1 shows a broad comparison of the assumptions we used for the CNMC, and those recommended by the OECD and used by other competition authorities regarding the values of the parameters needed to estimate consumer savings.

TABLE 1. COMPARISON OF THE ASSUMPTIONS CONSIDERED FOR CASES OF ANTICOMPETITIVE PRACTICES

	CNMC	OECD	CMA - UK	ACM - NL	DGComp - EU	DoJ - US	FTC - US
Affected consumers	Affected market turnover	Turnover of companies under investigation in affected market	Affected goods turnover	Affected markets turnover (companies involved)	Turnover of the companies involved in the cartel	Volume of trade in the relevant market	-
Price effect	10%	10%	10-15%	10%	10-15%	10%	-
Duration of price effect (years)	2	3	6	3	1/3/6 depending on the stability of the cartel	1 year (or months of cartel life when detected if <1 year)	-

Note: the CMA discounts future savings at a 3.5% rate (OFT, 2010).

Source: OECD (2014), Ilzkovitz and Dierx (2015).

As can be seen above, the values selected for the CNMC are in line with those used by the competition authorities with the most experience in this type of analysis. However, it should be noted that, as we explained above, the duration of the price effect is not applied in the same way in all cases, which means that the results are not always comparable. Attention should be paid to the details of the methodology description presented by each authority.

3.5 Excluded cases

For the moment, we exclude cases investigated by the regional competition services, those that ended by conventional termination¹³ and cases of abuse of a dominant position under article 2 of the LDC.

Individual companies for which information is not available are also excluded. Entities that act as facilitators and associations which are fined at the same time as their member companies will also be excluded, in this second case in order to avoid double counting.

On the other hand, the analysis includes cases where individuals were fined for their activity as self-employed business owners (identified in the case files both by their own names and by their company names).

¹³ Conventional termination is a formula provided for in article 52 of the LDC and refers to legal proceedings relating to collusive agreements where the alleged infringers propose commitments to remedy the effects on competition of the infringing practices and to make sure that the public interest is sufficiently safeguarded, but there is no declaration of infringement.

Finally, cases relating to infringements where rival companies agree to act in a coordinated way towards their upstream counterparts (for example, distributors towards the product producers) will not be included in the analysis if the direct effect on consumers is not clear. Although the CNMC's intervention in these cases benefits society as a whole by improving competition conditions for the upstream operators, it is not usually possible to estimate the direct effect in terms of savings for consumers. However, there is undoubtedly a favourable effect for the producers who were under pressure to lower their prices due to the collusive agreement.

Thus, even if anticompetitive practices extend to a greater number of cases, for the various reasons already stated, some of them as well as some companies were excluded from the analysis. This means that the impact assessment can be regarded as the lower bound of the savings produced by the CNMC's decisions in relation to anticompetitive practices.

4. METHODOLOGY FOR EVALUATING THE IMPACT OF MERGER CONTROL DECISIONS

We will only include in our analysis cases in which the Spanish competition authority has blocked the mergers or in which mergers have been approved with remedies, in either first or second phase.

The following information can be extracted from merger case files:

1. Date of the decision by the CNMC.
2. Companies and subsidiaries involved in the merger.
3. Relevant market turnover (RMT), which is the sum of the turnovers of the different relevant markets affected by the merger (including those of the rival companies).

Again, as in the case of anticompetitive conducts, from this information we obtain the relevant market (affected consumers), which, alongside the price effect (the price increase avoided by the CNMC intervention) and the duration of the price effect (the time during which the price increase would have continued without the intervention), is used to estimate the impact as indicated below:

$$\text{Impact of decisions published in year } t = \sum_{i=1}^{N_t} [\text{Affected consumers}_i * \text{Price effect}]$$

As before, t is the year of the analysis and the sub-index i indicates the merger being studied (with a total of N mergers a year). This way, consumer savings in year t due to the decisions published in relevant year (t) are the result of multiplying, for each case, the **volume of the relevant market (affected consumers)** by the **avoided price increase**, and then adding the results across the different mergers to obtain the total impact of merger control activity for that year. We also have to take into account the **duration of the price effect**, which represents the number of years that

the price increase would have remained if the authority had not intervened. This will be explained later on.

Also as before, although the parameters used in the calculation are explained in detail below, it must be emphasised that the values assigned to the price effect and its duration are not extracted from each case file, but are reference values applied equally to all cases.

The following subsections evaluate the methodological options of the leading authorities and justify the choice of the parameter values which will be used in assessing the impact of interventions by the CNMC.

4.1 Affected consumers

In merger cases, affected consumers are identified by the turnover in the relevant market (RMT) of the merger operation. We assume that, in the absence of an intervention by the competition authority, the prices of the products of the companies involved in the merger and those produced by their rivals could certainly rise due to the umbrella effect of the merger.

This is the option chosen by many of the other competition authorities when evaluating their merger control activity (Davies, 2013). Specifically, the ACM uses the turnover of the affected goods, although it should be emphasised that, in the end, the entire effect of merger interventions is not always considered. If the merger was approved unconditionally or the companies withdraw the proposal, it will not be taken into account, unless the withdrawal is the result of the merger being questioned by the authority, in which case 70% or 100% of the turnover is taken into account, depending on the phase of the investigation at the time of withdrawal. In short, if the merger was approved with conditions, they consider 100% of the turnover; if blocked in the first phase, 70%; and if blocked in the second phase, 100% (Mudde, 2012). Meanwhile, the DG Competition considers the size of the relevant market (Ilzkovitz and Dierx, 2015). The ACM emphasises that the selected relevant turnover is usually that of the entire relevant market (Mudde, 2012). In the United States, both the DoJ and the FTC use also the turnover of the relevant market (OECD, 2014).

The figure of the relevant market turnover need not be annualised, as in the case of anticompetitive practices, because it always refers to a specific year. Finally, if we do not have the RMT, we estimate it from the total turnover (TT) of the relevant market, or find an approximation to one of these two values from the data in the case files.

4.2 Price effect

Our assumption of a price effect of 1% in previous estimates of the impact of merger interventions by the CNMC was very conservative. For one thing, this previous assumption was quite unrealistic, since, as the OFT (2010) mentions, "*mergers are very unlikely to be blocked if they lead to such modest increases in price levels*". For another, several studies show that even mergers where competition authorities had

intervened produced a greater effect on prices¹⁴. Therefore, our analysis will now be based on the hypothesis that a merger control intervention avoids a 3% price increase.

The great majority of competition authorities use simulations to estimate the price effect in merger cases and 1% or 3% is the default percentage used if a simulation was not carried out. The CMA carries out simulations based on case-specific characteristics in terms of price elasticity, market shares and relative prices. Using different models, it computes the equilibrium before and after the merger, and the difference obtained is the estimated effect of the merger on prices if the competition authority does not intervene (Mudde, 2012). The ACM also uses simulations and resorts to a default 1% price effect only when its case files do not provide the necessary information (Mudde, 2012). The DoJ also uses simulations based on Bertrand and Cournot models¹⁵ to establish the price effect and, when it is not possible to carry them out, it predicts a 1% increase (Werden, 2008). Finally, the European Commission considers a price effect of between 3% and 5% (Ilzkovitz and Dierx, 2015) and the FTC one of 1% (OECD, 2014).

4.3 Expected duration of the price effect

In this case, in line with the more habitual hypothesis assumed by the leading competition authorities, we select an expected duration of 2 years; i.e., we consider that the price increase would have remained for two years without the CNMC's intervention. In the future, this assumption should be adjusted for cases where the remedies accepted by the companies have a different duration and that duration is specified in the case file. However, as merger remedies are usually imposed for longer periods of time, it is reasonable to assume a duration of the price effect of only 2 years.

Following the same methodology as with anticompetitive conducts, instead of multiplying the impact of decisions published in year t (see equation above) by the duration of the price effect, we assume that the savings calculated for the decisions published in that year will also be extended to the following year. Therefore, annual consumer savings for each year would be the sum of the savings generated in that year plus the savings generated during the previous year. This is another change in the methodology compared to previous documents, where we assumed that the effect only lasted for one year.

Finally, it should be noted that our estimates do not include the deadweight welfare loss averted by the intervention that authorities such as the DoJ or the CMA do take into account when calculating the avoided price increase. This is because of the need to keep the assumptions uncontroversial and to simplify the study as much as

¹⁴ Davis (2013) estimates that the average price increase in these cases is 3%. For cases of mergers in the United States, Kwoka (2013) estimates an average price increase of 7.2%, although the results vary with the conditions imposed ("remedies") for the approval of the mergers. In contrast, the European Commission (2015b) reproduced this study for cases in the EU and found average price increases of 3.7% (4.7% for mergers approved without conditions and 1.6% for those approved with conditions).

¹⁵ Bertrand for non-homogeneous products and Cournot for homogeneous products.

possible. However, in theory it should be included, as the avoided price increase would not only benefit consumers who remain in the market, but also those who no longer decided to leave it (Davies, 2013).

For other accepted criteria, the DoJ maintains the 1-year hypothesis it uses in relation to cartels (Werden, 2008), while the ACM maintains the criterion it uses in relation to anticompetitive conducts and assumes that the effects last 3 years (assigning savings in the same way as the CNMC). Finally, both the CMA and the FTC assume a duration of 2 years (Mudde, 2012; OECD, 2014). The CMA indicates that they discount future savings with a 3.5% discount rate (OFT, 2010), while the European Commission assumes 2 years or more, depending on the identified barriers to entry (Ilzkovitz and Dierx, 2015).

4.4 Assumptions considered by the competition authorities

Table 2 shows a broad comparison of our assumptions for the CNMC and those recommended by the OECD and used by other leading competition authorities regarding the values of the parameters needed to calculate consumer savings.

TABLE 2. COMPARISON OF ASSUMPTIONS CONSIDERED FOR MERGER CASES

	CNMC	OECD	CMA - UK	ACM - NL	DGComp - EU	DoJ - US	FTC - US
Affected consumers	Turnover of the relevant market	Turnover of all the firms in affected market(s)	Affected goods turnover	Affected markets turnover (entire market)	Size of the relevant market (including rivals)	Volume of trade in the relevant market	Volume of trade in the relevant market
Price effect	3%	3%	Simulated for the case; if not, average of previous simulations	Simulated for the case; if not, 1% as a general rule	3-5%	Simulated for the case; if not, 1%	1%
Duration (years)	2	2	2	3	2 or more, depending on barriers to entry	1	2

Note: the CMA discounts future savings at a 3.5% rate (OFT, 2010).

Source: Mudde (2012), OECD (2014), Ilzkovitz and Dierx (2015).

As can be seen above, the values selected for the CNMC are in line with those recommended by the OECD and used by the DGComp. Simulation as a tool for estimating the price effect was deemed too resource-intensive for the time being. It should be noted that, as we explained above, the duration of the price effect is not applied in the same way in all cases, which means that the figures are not always

comparable. Attention should be paid to the details of the methodology description presented by each authority.

5. ESTIMATED SAVINGS FOR CONSUMERS (2011-2019)

5.1 Results for cases of anticompetitive infringements

The following data were taken into account for the analysis of cases of anticompetitive infringements:

TABLE 3. NUMBER OF CASE FILES AND COMPANIES INVOLVED

Year	Case files included	Companies included (*)	Companies excluded (*)	Average duration (years)
2019	5	73	38	6.3
2018	8	46	15	6.9
2017	5	67	17	9.5
2016	14	90	8	7.2
2015	17	264	30	4.2
2014	8	48	29	5.1
2013	17	139	29	7.3
2012	15	56	29	7.7
2011	22	160	11	2.8
Total	111	943	206	5.7

(*) The term “companies” here also refers to associations and self-employed business owners.

A total of 1,149 companies were analysed, of which 943 – involved in 111 cases – were finally included in the calculations to estimate the savings for consumers. Of the 195 companies excluded from the analysis, in most cases it was due to lack of data needed for the estimation (mainly the affected market turnover), while some associations or facilitators were excluded to avoid double counting. The rest referred to cases with no clear direct effect on consumers, or cases related to the infringement of articles 2 or 3.

The average duration of the infringements shown in Table 3 varies significantly from year to year. The average duration of the included cases and companies between 2011 and 2019 was 5.7 years; while in four of those years it was over seven years, in 2015 it was barely over 4 years and in 2011 below 3 years. This directly affects the calculation of the average AMT and therefore the final estimate of consumer savings.

The estimated savings generated for consumers are presented in the following table:

TABLE 4. ESTIMATED CONSUMER SAVINGS DUE TO PROSECUTION OF ANTICOMPETITIVE PRACTICES (IN EUROS)

Year	Annual savings (decisions in relevant year)	Total annual savings (decisions in relevant & previous year)	3-year moving average of total annual savings
2019	388,301,568	477,235,172	284,569,530
2018	88,933,605	186,923,799	881,830,617
2017	97,990,195	189,549,618	1,569,786,487
2016	91,559,424	2,269,018,432	1,599,316,853
2015	2,177,459,009	2,250,791,409	948,810,586
2014	73,332,400	278,140,718	297,050,762
2013	204,808,317	317,499,630	-
2012	112,691,313	295,511,939	-
2011	182,820,626	-	-
Average	379,766,273	783,083,840	930,227,473

Note: we only include the result for the years when the necessary information is available. For this reason, total annual savings cannot be estimated for 2011 and 3-year moving averages cannot be shown for 2011-2013.

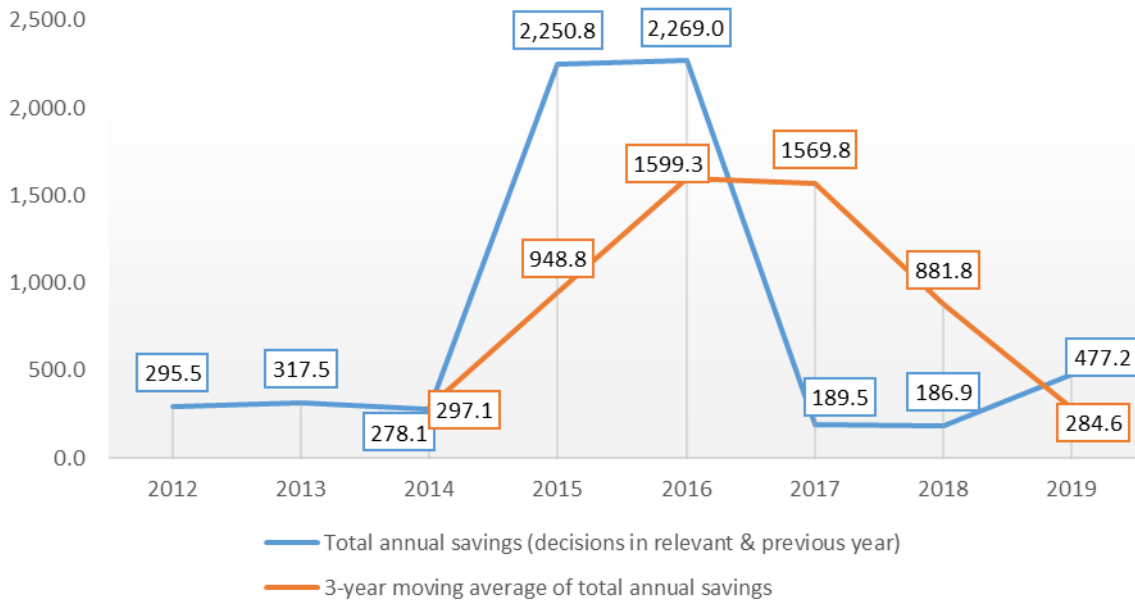
The interventions of the Spanish competition authority in cases of anticompetitive infringements between 2011 and 2019 produced a figure of total annual savings that ranged from 186.9 million euros in 2018 (of which 88.9 million were due to decisions published that year) to a maximum of 2,269 million euros in 2016 (of which 91.6 million were due to decisions published that year).

As can be seen in the table above, the savings in 2015 were particularly high. The reason was because several decisions in that year referred to cases involving an unusually large market turnover (over 1,000 million euros) and an average duration of the infringements (4.2 years) that was significantly lower than the average duration for cases decided between 2012 and 2019 (6.8 years), and therefore both the average annual affected market turnover (AMT) and the savings were higher. Besides, the high savings generated in 2015 had a very strong effect on the total annual savings in 2016 due to the methodology applied (a duration of the price effect of 2 years).

Together, the results of these two years heavily influence the average of total annual savings (783.0 million euros), which is higher than total annual savings for most years in the series. Interestingly, both annual and total annual savings were higher in 2019 than in any other year excluding 2015/2016.

Figure 2 shows the evolution of total annual consumer savings.

FIGURE 2. SAVINGS DUE TO PROSECUTION OF ANTICOMPETITIVE PRACTICES (MILLIONS OF EUROS)



It should be emphasised that the estimated savings generated by the CNMC do not coincide with the fines imposed, which are usually lower. While the fines are intended to deter companies from engaging in anticompetitive practices, the impact is estimated by calculating the benefit for consumers of the CNMC’s intervention in these cases.

5.2 Results of merger control cases

The merger cases that we used in our analysis are shown in Table 6. As can be seen, the Spanish competition authority intervened – in the sense of imposing remedies, as was explained before – in relatively few cases (around 5% of total reported mergers), and the number is fairly stable over the 9 years analysed.

TABLE 5. NUMBER OF MERGER CASES INCLUDED IN THE ANALYSIS

Year	Number of case files
2019	5
2018	4
2017	3
2016	4
2015	3
2014	3
2013	5
2012	3
2011	4
Total	34

As indicated in the methodology, the savings generated for consumers were estimated with the prudent assumption that merger control interventions avoided a

3% price increase during two years. The result of the estimation for each year both in total annual savings and in 3-year moving averages is shown in Table 7.

TABLE 6. ESTIMATED CONSUMER SAVINGS DUE TO CASES OF MERGER CONTROL (IN EUROS)

Year	Annual savings (decisions in relevant year)	Total annual savings (decisions in relevant & previous year)	3-year moving average of total annual savings
2019	391,563,454	468,202,633	252,033,665
2018	76,639,179	97,304,533	284,413,163
2017	20,665,354	190,593,829	450,577,675
2016	169,928,475	565,341,126	528,667,276
2015	395,412,651	595,798,070	470,901,674
2014	200,385,419	424,862,632	336,616,327
2013	224,477,213	392,044,321	-
2012	167,567,108	192,942,029	-
2011	25,374,921	-	-
Average	185,779,308	365,886,147	387,201,630

Note: again, we only include the result for the years when the necessary information is available. For this reason, total annual savings cannot be estimated for 2011 and 3-year moving averages cannot be shown for 2011-2013

Since 2011, the Spanish competition authority has decided to intervene in 34 merger cases¹⁶ and those actions have produced total annual savings for the consumers between **97.3 and 595.8 million euros**.

Differences in savings can vary significantly from year to year. This is due, on the one hand, to the number of cases analysed and, on the other, to the turnover of the relevant market in each case. For example, the 2013 and 2018 figures include part of the savings from 2011 and 2017, respectively, which were significantly lower than the rest of the period analysed due mainly to the size of the relevant markets. Meanwhile, in both 2014 and 2015 the authority intervened in fewer mergers, but some of them involved very large companies with higher relevant market turnovers.

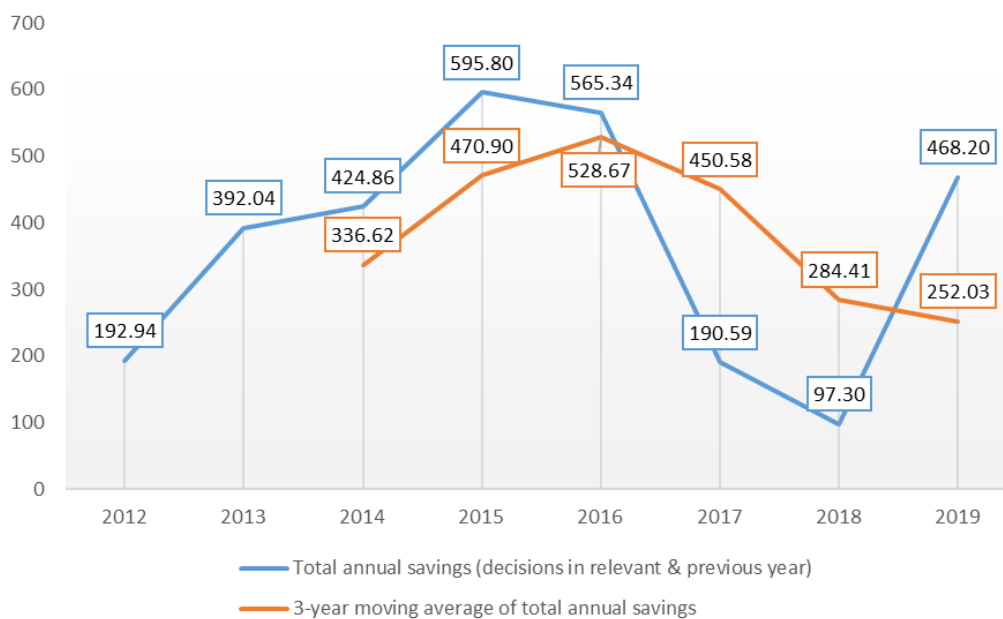
It should be pointed out that one of the 2016 companies was an interested party in two of the merger cases and, in the proposed transactions, would acquire shares in the same relevant market, so part of the savings have been excluded from one of the cases to avoid double counting.

¹⁶ As indicated in the methodology section, the only mergers used were those which were notified to the Spanish competition authority and which were either blocked or approved with remedies, in either first or second phase.

Savings have also increased significantly due to merger decisions published in 2019, when up to five mergers were approved with remedies in either first or second phase, the same number as in 2013, but affected bigger markets. Therefore, total annual savings in 2019 reached over 468.2 million euros in spite of 2018 being the lowest year in consumer savings due to merger control.

Figure 3 shows the evolution of total annual consumer savings due to merger control by the CNMC.

FIGURE 3. SAVINGS DUE TO MERGER CONTROL CASES (MILLIONS OF EUROS)



5.3 Total results

As we have seen in the previous two sections, after choosing the methodology for estimating the savings for consumers, we collected the data needed for the calculation from the CNMC’s decisions between 2011 and 2019. The figures in Table 7 are obtained simply by adding the estimates shown in Tables 5 and 6, which correspond to savings produced by infringements and merger control interventions respectively.

A total of 145 case files were included in the calculation, with a variation in the number of files from 8 to 26. The total annual savings for consumers thanks to enforcement actions by the CNMC in both merger and infringement cases from 2012 to 2019 ranged from 284.2 in 2018 to 2,846.6 million euros in 2015, with an annual average of 1,149.0 million euros.

TABLE 7. TOTAL CONSUMER SAVINGS DUE TO ENFORCEMENT ACTIONS BY THE CNMC (IN EUROS)

Year	Annual savings (decisions in relevant year)	Total annual savings (decisions in relevant & previous year)	3-year moving average of total annual savings	Case files included
2019	779,865,021	945,437,805	536,603,195	10
2018	165,572,784	284,228,332	1,166,243,779	12
2017	118,655,549	380,143,447	2,020,364,162	8
2016	261,487,899	2,834,359,559	2,127,984,129	18
2015	2,572,871,660	2,846,589,480	1,419,712,260	20
2014	273,717,820	703,003,350	633,667,090	11
2013	429,285,530	709,543,951	-	22
2012	280,258,421	488,453,968	-	18
2011	208,195,547	-	-	26
Average	565,545,581	1,148,969,987	1,317,429,103	145

Note: as before, we only include the result for the years when the necessary information is available. For this reason, total annual savings cannot be estimated for 2011 and 3-year moving averages cannot be shown for 2011-2013

As can be seen in the table above, the high savings generated in 2015 had an effect also on the total annual savings in 2016 due to the methodology applied (a duration of the price effect of 2 years). However, even if we do not consider the extraordinary savings in 2015 the average of total annual savings between 2012 and 2019 amount to 585.1 million euros. As highlighted before, it is interesting to note that both annual and total annual savings were higher in 2019 than in any other year excluding 2015/2016.

6. SENSITIVITY ANALYSIS

Finally, we carried out several sensitivity analyses to check that the assumptions chosen for calculating the impact of the CNMC's actions, in relation to both conducts and mergers, are prudent and that there is no risk of overestimating consumer savings.

This section, then, analyses how the estimated savings vary when the price effect avoided by the interventions, and the duration of this effect, are defined using different assumptions. The values of the parameters shown here, although based on similar assumptions, never match completely those used by other competition authorities. For example, they do not take into account the characteristics of each case, but rather general assumptions are always applied. The effect of the size of

the affected market turnover was excluded from this analysis, as we used for all scenarios the same data according to the information in the case files.

First, several values were chosen, based on the best practices of competition authorities, which could be used for the price effect and its duration in estimating the impact of enforcement actions in cases of anticompetitive practices¹⁷.

TABLE 8. ASSUMPTIONS FOR THE SENSITIVITY ANALYSIS: ANTICOMPETITIVE PRACTICES

	Price effect	Duration of the price effect
A	10%	1 year
B (CNMC)	10%	2 years
C	10%	3 years
D	10%	6 years
E	15%	1 year
F	15%	3 years
G	15%	6 years

Besides the values used for the CNMC, explained above, other six scenarios were considered. All of them assume a price effect of 10% or 15%, while the duration of the effect ranges from 1 to 6 years.

In scenarios D and G all the savings are added up and calculated as savings for the year the decisions are published. Therefore, we discount savings of future years using a 3.5% rate, and assign all of them to the relevant year/the year the decision was published.

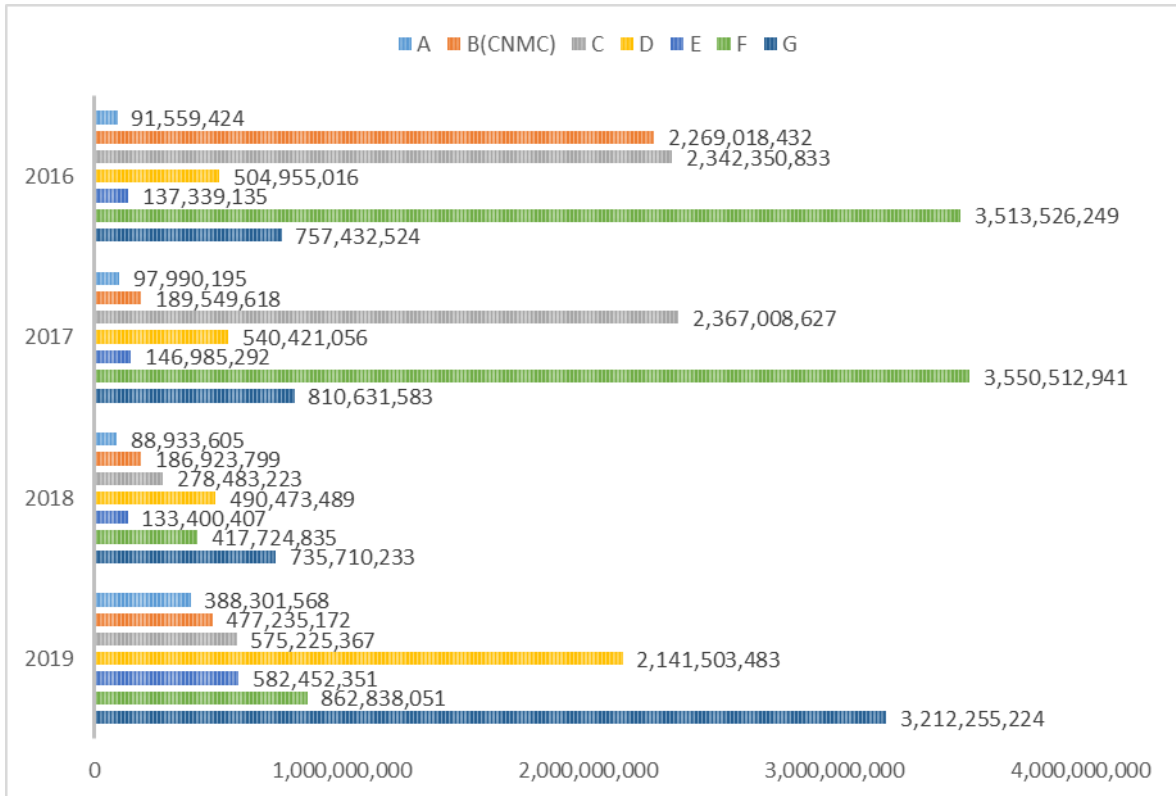
In the rest of the scenarios for which duration is higher than 1 year, the effects of the decisions published that year are assigned to the relevant year and the next ones.

Figure 4 shows the results of the sensitivity analysis in the cases involving anticompetitive conducts. It can be seen that the values chosen for the CNMC are undeniably conservative compared to the others (on average our results would be either the second or the third smallest out of all the methodologies included here), as the results derived from the other hypotheses are, for some years, up to 20 times greater.

This means that the estimated impact of the competition authority’s activity according to the values chosen for the CNMC is probably significantly lower than the real impact of its interventions.

¹⁷ It is important to emphasise again that, although based on the methodologies of the competition authorities described above, it was decided to exclude their names and simply identify them with letters, as they are never exact reproductions and always use default values (excluding market turnover).

FIGURE 4. RESULTS OF THE SENSITIVITY ANALYSIS FOR ANTICOMPETITIVE PRACTICES (EUROS)



For mergers, we defined also various values based on the best practices of competition authorities, which can be used as the parameters needed to estimate the savings generated by competition authorities' interventions in this area¹⁸. The values are shown in Table 9.

TABLE 9. ASSUMPTIONS FOR THE SENSITIVITY ANALYSIS: MERGERS

	Price effect	Duration of the price effect
A	1%	1 year
B	1%	2 years
C	1%	3 years
D	2%	2 years
E(CNMC)	3%	2 years
F	3%	3 years
G	5%	1 year
H	5%	2 years

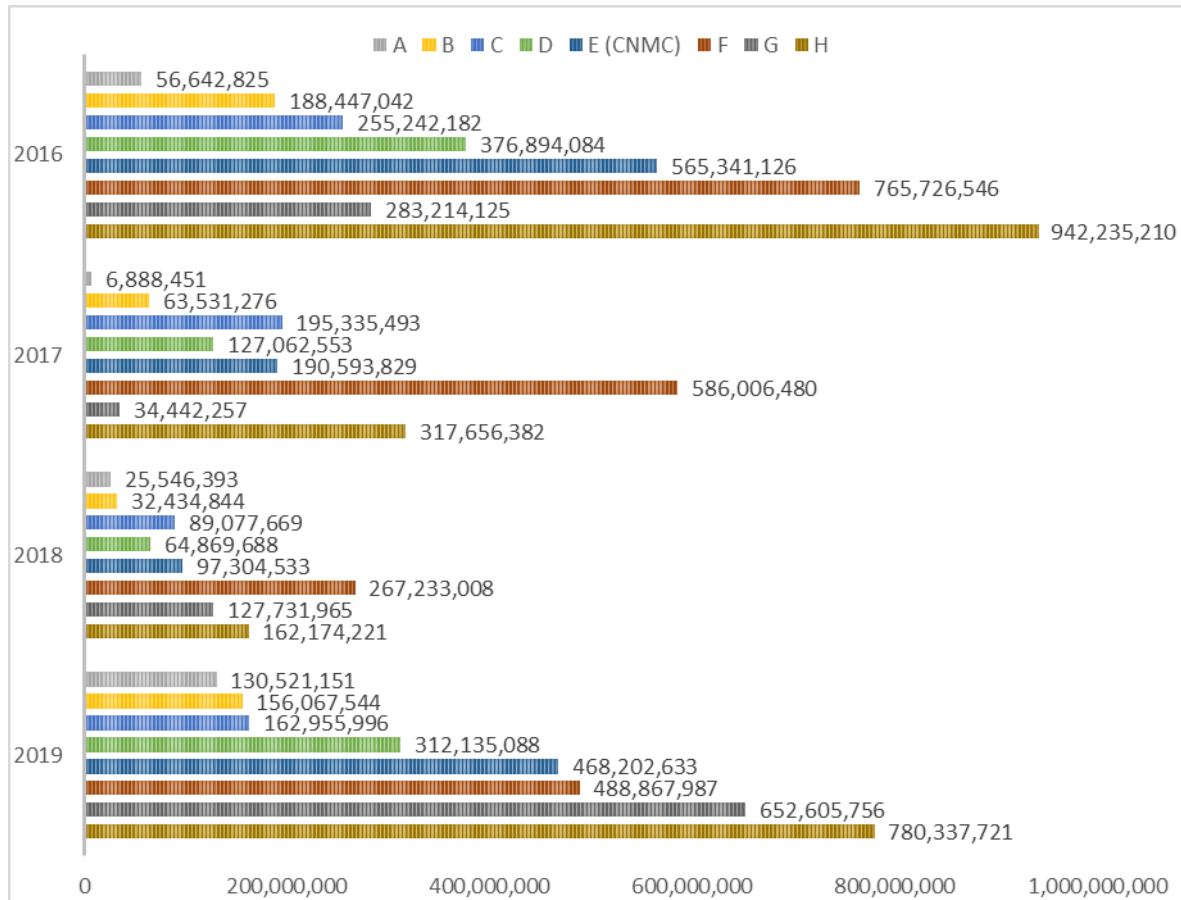
Again, in all the scenarios for which duration is higher than 1 year, the effects of the decisions published that year are assigned to the relevant and year and the next ones.

¹⁸ See footnote 17.

Apart from the values that we chose for the CNMC, as explained above, another seven scenarios were used. All of them assume a price effect of 1%, 3% or 5%, while the duration of the effect may be 1, 2 or 3 years.

Figure 5 shows the results of the sensitivity analysis for mergers, in the form of total annual savings. It can be seen that the values of the parameters chosen for the CNMC result in average estimates of total annual savings for consumers.

FIGURE 5. RESULTS OF THE SENSITIVITY ANALYSIS FOR MERGERS (EUROS)



7. CONCLUSIONS

The world's leading competition authorities are increasingly producing impact assessments which quantify the benefits to society of their activity. We started carrying out such assessments for the CNMC in 2016, to show how the interventions of the Spanish competition authority in different sectors of the economy benefit consumers, while at the same time measuring the effectiveness of its activities.

The study first defines the objective (measuring the impact of the CNMC's activity in the form of savings for consumers) and then establishes the indicators that are to be calculated to obtain the impact estimates. To establish these indicators, it is necessary to review all the available methodologies, both theoretical and used by

the five leading competition authorities (CMA, ACM, DGComp, DoJ and FTC), as well as the OECD's recommendations on impact analysis. In this way, the best method can be chosen for estimating the saving for consumers from the CNMC's interventions in relation to practices mergers.

Although conducted *ex post*, the study uses *ex ante* information, and each case is considered to have an effect from the year of publication of the final decision. Only direct effects are included, as indirect effects (improved productivity, innovation, deterrence, etc.) are difficult to quantify and there is no definitive methodology. It was decided to estimate the benefits of competition policies for consumers based on three variables (the affected market, the price effect avoided due to the CNMC's intervention and the duration of the price effect), and according to previously established parameters, rather than more sophisticated methods such as simulation. Finally, only the decisions regarding anticompetitive practices and mergers were included.

This methodology, which suffered some changes compared to previous studies, was used to assess the benefits for society of the CNMC's enforcement actions from 2011 to 2019. Total annual savings for consumers (assuming that the positive impact on consumers is considered to extend to the year following the publication of the decision) range from 284.2 million euros in 2018 to a maximum of 2,846.6 million in 2015. In 2019 total savings amount to 945.4 million euros. These results clearly show the significant positive effect for consumers of the activity of the Spanish competition authority.

A sensitivity analysis confirmed that our assumptions are in line with those recommended by the OECD and other competition authorities, and ensure that the savings for consumers are not overestimated. Therefore, since the impact was restricted significantly by excluding both indirect effects and activities unrelated to practices or mergers, the estimates published for the CNMC should be regarded as the minimum savings benefiting consumers.

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