

The difficult road to a better competition policy: How do competition authorities reforms affect antitrust effectiveness?

Joan-Ramon Borrell 

Secció de Polítiques Públiques, Departament d'Econometria, Estadística i Economia Aplicada, Institut d'Economia Aplicada (IREA), Grup de Governos i Mercats (GiM), Universitat de Barcelona, Barcelona, Spain
IESE Business School, Public-Private Sector Research Center, Universidad de Navarra, Barcelona, Spain

Carmen García  and Juan Luis Jiménez 

Facultad de Economía, Empresa y Turismo, Grupo de Investigación: Análisis de Políticas Públicas, Universidad de Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain

Abstract

This paper estimates the impact of reforming competition authorities on perceived antitrust effectiveness using methods of causal inference. We study how 20 countries reformed their competition authorities in depth between 1995 and 2020, and what has been the outcome of such reforms in the perceived competition policy effectiveness by the business community compared with 18 control countries in a balanced panel. As the political economy literature warned, we find that reforms paradoxically have not always improved antitrust effectiveness. Some of the reforms approved stalled or backlashed as politicians opted for a Machiavelli option: undertaking “counter-reforms” even in the name of an apparent but deceptive progressiveness and pro-competition drive.

Keywords: competition authority, competition policy, effectiveness, reforms.

1. Introduction

Competition law and competition authorities are key actors in pursuing two socially desirable objectives as framed by Petersen (2013): on the one hand, competition policy aims to support economic growth; on the other, it also aims to promote democratic stability through the prevention of excessive economic concentration. Recognizing these two critical roles, countries undertake reforms in antitrust institutions continuously. It seems that there is no optimal frame to shape the structure and conduct of competition authorities. However, there is not much research on the design and effect of such reforms.

As Jordana et al. (2018) show, although there has been a worldwide proliferation of specialized public agencies with regulatory tasks (including competition authorities), there is still much more variety across countries and sectors regarding their configuration and institutional profiles such as the ones they highlight: responsibilities, managerial autonomy, political independence, and public accountability. And as these authors claim, there are important lessons to be learned from the cross-country and time comparisons.

This paper is framed on the idea that it is feasible to estimate how changes in competition authorities improve (or not) antitrust effectiveness. Concretely, we are going to study how 20 countries reformed their competition authorities in depth between 1995 and 2020, and what has been the outcome of such reforms in the perceived competition policy effectiveness. Some countries even reformed their competition authorities more than once in

Correspondence: Juan Luis Jiménez, Facultad de Economía, Empresa y Turismo, Grupo de Investigación: Análisis de Políticas Públicas, Universidad de Las Palmas de Gran Canaria, Despacho D. 2-12, 35017 Las Palmas de Gran Canaria, Spain. Email: juanluis.jimenez@ulpgc.es

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this 26-year time span. We finally will be able to estimate the impact of 24 reforms on antitrust effectiveness regarding these 20 countries.

As Guidi *et al.* (2020) explain, the “regulatory policy process” comprises a set of relationships among: (1) *input* (the structures and agency influencing decisionmaking), (2) *outputs* (the policies and regimes adopted), and (3) *outcomes* (the consequences of policies). They rightly claim that regulation, as an object of research across disciplines such as political science, public policy and administration, business, economics, and sociology, may benefit largely if scholars of the different disciplines put an emphasis on both comparative methodology and political economy framework.

From this proposed comparative political economy perspective, in this paper, we focus on studying how reforms in inputs of competition policy, such as the institutional structure of national competition authorities, affect *outputs* (the policies adopted), and finally, *outcomes*, measured in our case by the perceived effectiveness of such policies by the business community.

As also outlined by Guidi *et al.* (2020) for regulatory studies in general, we think that the connections between the structure and detailed workings of competition authorities (*the inputs*), the type of competition policy enforcement adopted (*the output*), and its effects on the markets as perceived by the business community (*the outcome*) have not been exhaustively researched yet. For this reason, the main objective of this paper is to assess the impact of those institutional reforms of competition authorities on the perceived effectiveness of their task.

Following the literature regarding the political economy of reforms, we do not take for granted that all reforms are progressive, nor that countries undertake all efficiency-enhancing reforms such as the one as delegating executive powers on an independent competition authority to promote vigorously competition in markets. By contrast, we follow the political economy literature that highlights that welfare-enhancing reforms are sometimes not implemented (Fernandez & Rodrik, 1991), or that welfare-enhancing reforms may even lose support from voters and politicians as time goes by (Van Wijnbergen & Willems, 2014).

We use methods of causal inference (*difference-in-differences* [DiD] estimator and *synthetic control method* [SCM] estimator) to identify and quantify the causal effect of the reforms on one outcome: the perceived effectiveness of competition policy across countries and time from the point of view of the business community. Our results support our prior hypothesis: competition authorities reform does not necessarily improve antitrust effectiveness, and even there are events of Machiavellian counter reforms that result in reduction in antitrust effectiveness.

2. Literature review

Our paper relates to the literature that estimates the impact of competition policy on country performance, and also to the literature on the political economy of reforms. With respect to the previous estimates of the impact of competition policy on performance, different research avenues show how competition policy and its institutional framework affect its country's economy. There are two groups of papers assessing the impact of competition policy (*policy output*) on country performance (*policy outcome*). On the one hand, those that analyze the relationship between competition policy and improvements in the country's macroeconomic results (Buccirosi *et al.*, 2013; Guidi, 2015; Mariotti & Marzano, 2021; Petersen, 2013 and Samà, 2013). And, on the other hand, other papers which analyze the relationship between competition policy and the intensity of competition in markets (Borrell & Jiménez, 2008; Dutz & Vagliasindi, 2000; Kee & Hoekman, 2007; Krakowski, 2005; Voigt, 2009). Levine *et al.* (2021) have also just assessed the impact of competition on firm's valuations.

In the first line of research, Petersen (2013) used a panel of data from 154 countries between 1960 and 2017 to estimate whether competition laws have had a positive impact on economic growth and also on democracy. Their estimates effectively support the first, by statistically confirming improvements in GDP per capita, for example, but it does not find a significant effect on indicators of democratic improvement.

Along the same line, Buccirosi *et al.* (2013) estimate a positive impact of competition policy on total factor productivity of 22 industries in 12 OECD countries. In fact, the authors argue that the effect is particularly strong for the institutional aspects of this policy, which improve the efficiency in the enforcement of antitrust legislation (see Samà, 2013, for a similar analysis). Besley *et al.* (2020) show that—with data from 10 million companies

from 90 countries covering 20 sectors over 10 years—the profit margins of companies operating in non-tradable sectors are significantly lower in countries with strong competition policies.

Guidi (2015) uses original data on formal independence of national competition agencies in European Union (EU) Member States from 1993 to 2009 to test if different degrees of independence (and changes in independence over time) affect foreign direct investment and consumer prices. The results indicate that the formal independence of a competition agency does not have any significant impact on either indicator, thus questioning the assumption that independence yields better regulatory performance.

Mariotti and Marzano (2021), for a sample of 63 countries studied for the period 1980–2017, find otherwise that the effectiveness of competition policy enforcement is a crucial factor in attracting foreign direct investment, but only in host countries characterized by institutional configurations where the lack of trust is concomitant with a high-quality regulatory institutional environment.

Regarding the second line of research, in general, the results show a positive relationship: the institutional strength of competition authorities improves both competition policy and the intensity of effective competition in the markets. Along these lines are Dutz and Vagliasindi (2000), Krakowski (2005), Kee and Hoekman (2007), Borrell and Jiménez (2008) or Voigt (2009), among others.

On the other hand, Hylton and Deng (2007) find a positive relationship between age and the scope of competition law and its effectiveness. However, the effect does not hold when considering the legal origins of the country and its economic environment, which could support the claim that countries with good general indicators are equally good in terms of competition. Weymouth (2016) studied the political origins of antitrust enforcement in developing countries. Their estimates show how anticompetitive lobbies try to delay policy reform processes to weaken the competition regime in the country.

Gutiérrez and Philippon (2018) show that the 1993 single market represented a global turning point for a competition policy with better overall results in the EU than in the United States. The authors, interested in those reforms that reduce barriers to entry, point out that negotiations between sovereign nations in a free trade area led to better results than those established by the average politician in their own country. For this reason, the countries of the EU that started from weak institutions have seen a greater improvement in competition policy and market regulation. Levine et al. (2021), using firm-level data from 99 countries over the 1990–2010 period, discover that valuations rise after countries strengthen competition laws.

A relevant underlying question for our research is how to measure the effectiveness of competition policy in a country. There is an empirical literature that evaluates, through survey-based indicators, the perception of the effectiveness of competition policy in a country. The main references are those of Nicholson (2008), Borrell and Jiménez (2008), Voigt (2009), Ma (2010, 2012, 2013), Gutmann and Voigt (2014), and Borrell et al. (2014). All of them use two main sources: those elaborated by the World Economic Forum and those collected annually by the International Institute for Management Development (IMD). Both indices are highly correlated (they exceed 80%) and are also linked to the income levels of each country, as Voigt (2009) points out.

In this paper, we are going to measure competition policy effectiveness using the index collected annually by the IMD, as we will discuss below. Thus, we assess the impact of competition authority reforms on the perceived competition policy effectiveness by the business community.

Finally, with respect to literature on the political economy of reforms, it should be noted that different papers offer us some interesting insights on why and how reforms of institutions are set-up and how those evolve over time. This literature warns us that not all reforms are progressive, nor all welfare-enhancing reforms are finally implemented. These insights are important to frame our expectations on how the national competition authorities' reforms finally affect the outcome of interest: the perceived effectiveness of competition policy.

Guidi (2015) warns us that political “independence is often considered as a necessary prerequisite for regulatory agencies. (...) However, not all IRAs [Independent Regulatory Agencies] are equally independent.” As precisely explained by the author, “independence is usually regarded as a positive characteristic for regulatory agencies, and competition authorities are not an exception,” mainly because (1) in the context of antitrust investigations “everyone expects that they decide solely on the basis of law and that they judge facts impartially,” (2) “an independent national competition authority is meant to attract private investment and create a business environment that cannot be influenced by political fluctuations,” and (3) “national governments still own

companies that play a relevant role in the market: it is therefore crucial for national and international competitors that the executive does not make decisions in which it would have a clear conflict of interest.”

The question then is why some national competition authorities are more independent than others, and why competition authorities’ reforms vary so much, across countries and time, in terms of responsibilities, managerial autonomy, political independence, and public accountability.

Guidi (2015) also warns that competition policy not only has efficiency impacts, but also redistributive effects among firms and consumers. So, he assumes rightly that politicians prefer “not to delegate power to an independent authority in salient policy fields like competition enforcement” as applying the principal-agent theory would predict. Politicians may just be willing to delegate to reduce their workload, especially of highly technical matters, or “because delegation allows them to ‘shift the blame’ for potentially unpopular measures.” And he concludes that the opportunity cost of delegating is higher in coordinated market economies and liberal market economies, but it is lower in mixed market economies that need to send “a strong signal of commitment to competition to the market.”

Eriksen (2021) additionally argues that independent agencies “inevitable have to make political judgments.” The question for this author is how the agencies are designed and organized to make the political reasoning to be legitimate in such institutions. He argues in favor of a “public reason model” that departs from just a technical efficiency perspective avoiding such value judgments and also departs from a model just based on statutory mandates only for value judgments. He also argues that agencies should “ground their value judgments in a publicly accessible framework of reasoning.” This is making clear that agencies are viewed in the political arena as framers of value and political judgments.

As the focus of our paper is to analyze the reforms of competition authorities in 20 different countries, we are then interested in the dynamics of the political economy of reforms considering that competition authorities consider political values when taking their decisions. Under this perspective, the seminal paper by Fernandez and Rodrik (1991) already showed that even when everybody gains from efficient reforms in the long run, there are winners and losers in the transitional phase. And more importantly, they highlighted that these winners and losers cannot always be identified in advance. In such prevalent cases, the authors showed that welfare-enhancing reforms may not be implemented as may have not ex-ante enough support as voters and politicians are uncertain about how the reform may affect them.

In competition policy we understand welfare as defined by Paul (2021): competition policy is delineating where it is better cooperation (horizontal and vertical), and where competition is a better form to reach the common good. Paul (2021) argues that “antitrust’s core prescription, as reconstructed from the origins of the Sherman Act, is to disperse economic coordination rights.” And welfare enhancing is, according to Paul (2021), “reached by the development of three specific tasks or functions by competition policy: (1) containing domination, (2) accommodating and promoting democratic coordination, and (3) setting the terms of fair competition.”

Van Wijnbergen and Willems (2014) added aggregate uncertainty and learning dynamics to the original individual uncertainty feature of the Fernandez and Rodrik (1991) seminal paper. In this augmented version, reforms may even lose support from voters and politicians as the individual and aggregate effects of reforms are revealed. As people learn the real effects of reforms, Van Wijnbergen and Willems (2014) show how “revelation of reform winners deteriorates the quality of the remaining pool, thereby making unreformed agents less eager to continue the reform process.” They “derive a condition under which these dynamics are so strong that they lead to the counterintuitive situation in which reform successes make the median voter begin opposing a reform he/she used to support.”

This dynamic effect may then explain why all reforms might not be progressive, but rather, some reforms may turn to be “counter-reforms” that are designed by politicians to respond to their agenda of reducing delegation to competition authorities and retaining back political discretion in competition enforcement. Or even, this may explain why politicians frame a “counter-reform” to respond to voters and the popular backlash as the previous progressive reforms have revealed who are the winners and the losers of the reform itself, and the strong effect identified by Van Wijnbergen and Willems (2014) quicks in: “the median voter begins to oppose a reform he/she used to support.”

So, we let the data talk regarding the nature and effects of the reforms of competition authorities. We analyze 24 institutional reforms of competition authorities in 20 countries. And we compare the dynamics of antitrust

effectiveness after such reforms compared to the dynamics of antitrust effectiveness in a set of 18 control countries that have not reformed their antitrust authorities. We will see whether each reform had the expected positive impact of improving the perceived efficacy of the affected national competition policy, or whether the reforms were neutral (ineffective) or even had a negative effect.

3. Reforms and data

3.1. Reforms

We focus on the reforms of antitrust authorities implemented in 20 countries between 1995 and 2020 and analyze the effect of such reforms in the perceived competition policy effectiveness. Table 1 shows the reforms of antitrust authorities we are studying in this paper.

As Table 1 shows, some countries reformed their competition authorities more than once in this 26-year time span: Hungary and Portugal, three times, and Italy, Korea, Spain, and UK, two times. Due to data constraints, we finally will be able to estimate the impact of 24 reforms on antitrust effectiveness regarding these 20 countries. Specifically, we will study all the reforms that took place once in every country, and the impact of two out of three reforms in Hungary, all two reforms in Italy, Korea, and Spain, but just one out of two in the UK.

For instance, Spain had two competition reforms: the creation of the *National Competition Commission* (CNC) in 2008; and the integration of competition and regulatory bodies in a single authority in 2013, the current *National Commission of Markets and Competition* (CNMC). France created the *Autorité de la Concurrence* (AC) in 2008, which follows the path started by Spain a year before of abandoning the traditional French model of ministerial instruction of the investigation (prosecution) and resolution in an independent body (adjudication) shared by a few countries such as France, Spain, and Belgium for many years. The Netherlands created the *Authority for Consumers and Markets* in 2013, by merging the former competition authority, the postal and telecommunications regulator, and the consumer protection authority. And finally, Finland created the *Competition and Consumers Authority* in 2012, also by merging the competition authority and the consumer protection agency. So, it is also interesting that many of the reforms analyzed included merging different regulatory agencies such as sectoral regulator bodies and/or consumer protection agencies with competition authorities.

It should also be highlighted that we have a large number of competition authorities of countries that were members of the EU during the 1995–2020 time period which we study in the sample (in the case of the UK only until 23:00 London time on 31 January 2020 when the withdrawal agreement entered into force). Those are around a third of the countries in the sample.

As such, those competition authorities were not only in charge of enforcing national competition laws but also EU competition regulations, and particularly the direct enforcement of articles 101 and 102 of the TFEU since the Regulation 1/2003 that entered into force in May 2004. So, studying the impact of the reforms of those national competition authorities on perceived antitrust effectiveness allows us also to study not only the effects of reforms on the enforcement of national laws, but the effects of those reforms on the way of enforcing the supremacy of EU law by such national independent agencies in close cooperation with the European Commission.

3.2. Data

Our database contains the IMD index of competition policy effectiveness, the identification of competition authorities reforms, and a set of several covariates. The IMD provided us with information for one of the criteria reported at the country level in its World Competitiveness Yearbook,¹ an executive opinion survey that supports hard statistical data drawn from international, national, and regional sources. The surveys are sent out to senior business leaders, representing a cross-section of the business community in each country. The questions are targeted to top and middle management, who are nationals or expatriates employed in local or foreign firms with an international dimension.

Many papers have used this information as a perceived measure of antitrust effectiveness (e.g., Borrell & Jiménez, 2008; Borrell et al., 2014; Dutz and Hayri, 2000; Ma, 2011; Voigt, 2009). The index ranks on a scale from 1 to 6, although the data are subsequently converted to a 0–10 scale.

Table 1 Competition authorities' reforms by country

Country	Year	Comments
Austria	2002	Creation of the Federal Competition Authority (FCA) and the Federal Cartel Prosecutor (FCP).
Belgium	2013	A new Belgian Competition Authority was established on 26 April 2013 when the redrafted Belgian Competition Act of 3 April 2013 was passed on.
Brazil	2012	The law merges the three Brazil's competition agencies (SDE, SEAE, and CADE) into a new single agency called CADE.
Colombia	2009	The Law 1340 established the Superintendence for Industry and Commerce (henceforth SIC) as the only Competition Authority.
Denmark	2010	The country merged the competition, and the consumer enforcement functions in a single agency.
Finland	2013	The country merged the competition, and the consumer enforcement functions in a single agency.
France	2008	It creates a new competition authority which unifies the antitrust enforcement powers held by the Council and the Ministry of Economy.
Hungary†	1997, 2005, and 2014	In 1997, a new competition act entered into force and provided the authority with the possibility to set priorities. In 2005, the complaint system was completely revised, and another reform took place in 2014. We consider 2005 and 2014 reforms, as we have only two years of information previous to 1997 which is not enough to assess the impact of that first reform.
Ireland	2014	The country merged the competition, and the consumer enforcement functions in a single agency.
Italy	2007 and 2014	The country merged the competition, and the consumer enforcement functions in a single agency.
Japan	2009	It separates the competition law enforcement and consumer protection by creating the Consumer Affairs Agency of Japan.
Korea Rep.†	2006 and 2008	The country merged the competition, and the consumer enforcement functions in a single agency. We consider them as a unique reform dated in 2006.
Luxembourg	2004	Two competition authorities were created.
Mexico	2013	Constitutional reform that affects competition authority.
Netherlands	2013	The country merged the competition, and the consumer enforcement functions in a single agency.
Norway	2017	It creates the Norwegian Competition Complaints Board.
Portugal	2003, 2012, and 2014	It creates a new Competition Authority (Autoridade de Concorrência, 2003) and several reforms in 2012 and 2014.
Spain	2008 and 2013	Creation of CNC and merger of Antitrust and regulators, respectively.
Taiwan	2012	Reform of the central administrative agencies organizations yields to the Commission became an independent agency.
United Kingdom†	1998 and 2014	We do not analyze the case of the creation of the Competition Commission (CC) in 1998 because of scarce data. In 2014, it was created the Competition and Markets Authority (CMA) by the merger of CC and the Office of Fair Trading. We consider only 2014 reform, as we have only three years of information previous to 1998 which is not enough to assess the impact of that first reform.

†Countries where all reforms were not considered. *Source:* Own elaboration from Jenny and Katsoulacos (2016), OECD website, concurrances.com, and Competition Authorities websites.

The indices based on perceptions are synthetic measures of quality as stated by the persons surveyed, which are informed business executives affected by the competition policy enforcement. They correlate with the quality assessed by experts who value different dimensions of quality of enforcement.

The important feature for using such business perception surveys is that surveys provide information for many countries and many years, while quality assessments are carried out only occasionally for some of the countries of the sample. Additionally, we use IMD data while it is much correlated with the Global Competition Review ratings (higher than 80%). See Borrell and Jiménez (2008) and Borrell et al. (2014) where this data issue is discussed.

The index measures the perception of an epistemic community, and the effect we study is more related to the effect of reforms of antitrust authority on the enforcement perception by the business community. This is an indirect way to assess the impact of the reform on the antitrust enforcement by the authorities, as we do not assess direct evidence of a change in enforcement actions by the authorities.

Our dataset consists of a balanced² panel comprising a total of 38 countries in the quarter of the century between 1995 and 2020, most of the more developed countries in the world. It includes 20 countries affected by competition authorities reforms (see Table 1: summing 24 institutional reforms of competition authorities as some countries have more than one reform), and 18 countries not affected by those reforms in this period. Thus, the countries that experienced a reform will form the treatment group, while those not affected by any reform are the comparison, non-treated, or control group.³

The variables considered are the following:

- i IMD_{it} : effectiveness of competition policy of country i at year t . It ranges from 0 to 10. Source: IMD.
- ii $Population_{it}$: population (millions) in country i at year t . Source: Feenstra et al. (2015).
- iii GDP_{it} : Real gross domestic product of country i at year t , at constant 2017 national prices (in mil. 2017 US\$). Source: Feenstra et al. (2015).
- iv $Exports_{it}$: Share of merchandise exports of country i at year t , at current PPPs. Source: Feenstra et al. (2015).
- v $Regulation_{it}$: This index captures, for each country i at year t , the “perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.” It is called “quality of regulation index.” It ranges from approximately -2.5 to 2.5 . Source: World Bank Indicators.⁴
- vi Binary variables $_{it}$: we also consider three binary variables: one for considering euro area countries; another for European countries (UE28), and finally for OECD countries.

Table 2 includes the main descriptive statistics (average and standard deviation) for each variable, considering the average of the treated countries and the average of the control group.

We do not have a large number of covariates controlling for differences across countries and time, although we have six of them. We control for population, GDP, exports, quality of regulation and EU and Euro membership at the country level for taking care of the country-specific shocks on such covariates. And those covariates and the pre-treatment competition effectiveness variable are the ones that allow us to implement soundly the SCM.

In fact, we expect most of the differences in covariates to remain quite stable at country level, so the fixed country effects are taking care of such differences. And the differences across time in those variables are quite

Table 2 Descriptive statistics

Covariate	Treated countries ($N = 20$)	Control countries ($N = 18$)
IMD	5.89 (1.19)	5.49 (1.33)
Population	94.84 (254.84)	120.99 (273.92)
GDP	1.5e6 (2.7e6)	2.1e6 (3.9e6)
% exports	0.44 (0.34)	0.40 (0.43)
Regulation	1.03 (0.74)	0.82 (0.93)
UE28	0.47	0.25
Euro	0.32	0.09

Standard deviations are in parentheses. Source: Own elaboration.

common across counties. So, the time fixed effects take care of the common changes in the trend of such variables.

4. Methodology and results

We are interested in identifying and quantifying the impact of the competition authorities' reforms detailed in Table 1 on the perceived effectiveness of competition policy. To estimate these impacts, we employ two complementary methodologies, such as the DiD estimator and the SCM. In the former, the control group is composed by the countries that have not implemented any reform; while in the latter, a synthetic country is constructed for each country that has implemented a reform. This methodology (SCM) let us deal with potential heterogeneity problems in the DiD estimations.

4.1. DiD estimator

To estimate the impacts of interest, we first apply the DiD estimator. For all the reforms, we estimate—through a regression with country and year fixed effects, and other covariates, which include the common temporal trend in the data—the impact that each reform had on the average of the effectiveness indicator of each country after the reform.

We single out the treatment period of each treated country just including the year of passing the reform and all years after the reform is passed. The treatment period is different for each country. For instance, the treatment period is from 2008 onwards for France, 2012 and the following years for Taiwan, and 2013 onwards for the Netherlands. For all these countries, we have a pre-treatment period and a treatment period. We are then estimating the long-term effects of the reforms.

In the case of those countries with two or more reforms, we focus on average treatment. For example, for Spain, the first treatment starts at 2007 and continues forever (first reform: creation of Comision Nacional de la Competencia, CNC), and then from 2013 onwards for the second treatment (second reform: creation of Comision Nacional de los Mercados y la Competencia, CNMC). So, first and second treatments partially overlap: we estimate each long-term, permanent, effect of each reform.

Other antitrust law reforms may have been introduced after the institutional reforms for which we are estimating a separate effect. For instance, many countries have been introducing leniency programs for the discovery of cartels by which firms may obtain fine reductions if they cooperate with the authorities reporting their unlawful activities.

If such reforms are simultaneous to the authority reform, we may be attributing to the institutional reform part of the effect that is due to the new legal framework in which the competition authorities undertake their legal mandates. However, when other reforms are not contemporaneous, our estimates would not pick the effect of other reforms. For instance, we control for the introduction of leniency programs, and we do not find any aggregate effect of such other reforms in our estimates once we control for the heterogeneous effects of reforms at each country. This is consistent with the results in Borrell *et al.* (2014) where we also find that leniency programs had heterogeneous effects on competition policy effectiveness by country.

As we have in our balanced panel countries in which we do not observe any institutional reform (18 countries), they offer us the availability to control for common time fixed effects affecting all countries in the treated and in the comparison group, and to estimate the time and country fixed effects robustly. Additionally, the mean effects of legal reforms that affect antitrust enforcement in a set of countries from some moment of time on, such as the ones of the EU, are captured by the fixed effects and the common time effects, and the covariates when they are included.

Specifically, the estimate we propose is the following, where we consider two different models. In the first one, we include not only DiD variables for each country but also control variables (GDP, annual variation rate of GDP, exports and its annual variation rate, and the area binary variables); the second model adds country effects indicated in the following equation (1); in the third one, we add time fixed effects; finally, Model 4 consider a binary variable that takes value 1 after leniency program was implemented in the country analyzed. This variable controls for aggregate potential effect of the introduction of these programs in our sample.

Table 3 Difference-in-differences (DiD) estimations by country

	Model 1 (only covariates)	Model 2 (covariates + country fixed effects)	Model 3 (Model 2 + year effects)	Model 4 (Model 3 + binary after leniency)
DiD Austria	0.4106** (0.18)	0.0997 (0.34)	0.0732 (0.33)	0.0735 (0.33)
DiD Belgium	0.5620** (0.28)	0.2057 (0.24)	0.0679 (0.24)	0.0692 (0.24)
DiD Brazil	0.3921 (0.25)	−0.0125 (0.24)	−0.1813 (0.23)	−0.1783 (0.23)
DiD Colombia	−0.6016*** (0.22)	−0.9630*** (0.23)	−1.1048*** (0.23)	−1.1141*** (0.23)
DiD Denmark	1.3186*** (0.23)	0.5108** (0.23)	0.3171 (0.22)	0.3113 (0.23)
DiD Finland	0.8043*** (0.28)	0.0578 (0.24)	−0.0887 (0.24)	−0.0870 (0.24)
DiD France	0.2511 (0.22)	−0.0092 (0.23)	−0.0416 (0.23)	−0.0376 (0.23)
DiD Hungary_a	−0.4596* (0.25)	−0.6067* (0.33)	−0.5607* (0.32)	−0.5624* (0.32)
DiD Hungary_b	−0.7596** (0.37)	−0.8547*** (0.28)	−1.0211*** (0.27)	−1.0193*** (0.27)
DiD Ireland	0.5871** (0.30)	0.7263*** (0.26)	0.5966** (0.26)	0.6006** (0.26)
DiD Italy_a	−0.9929*** (0.28)	0.0219 (0.27)	0.0326 (0.27)	0.0233 (0.27)
DiD Italy_b	0.7190* (0.39)	0.6918** (0.29)	0.5478* (0.28)	0.5502* (0.28)
DiD Japan	0.6504*** (0.22)	0.8231*** (0.23)	0.6927*** (0.23)	0.6884*** (0.23)
DiD Korea (a and b)	−0.3499* (0.19)	−0.5050** (0.25)	−0.5694** (0.24)	−0.5617** (0.24)
DiD Luxembourg	−0.1711 (0.19)	0.2884 (0.28)	0.3296 (0.27)	0.3321 (0.27)
DiD Mexico	−0.2105 (0.27)	0.1522 (0.24)	−0.0052 (0.24)	−0.0078 (0.24)
DiD Netherlands	0.8188*** (0.28)	0.3926 (0.24)	0.2625 (0.24)	0.2669 (0.24)
DiD Norway	0.8255** (0.41)	0.3969 (0.33)	0.1509 (0.32)	0.1532 (0.32)
DiD Portugal_a	−0.7199*** (0.25)	0.1174 (0.32)	0.2751 (0.31)	0.2739 (0.31)
DiD Portugal_b	0.0918 (0.34)	0.0208 (0.25)	−0.1941 (0.25)	−0.1963 (0.25)
DiD Spain_a	−0.0842 (0.32)	0.7247** (0.29)	0.7738*** (0.29)	0.7652*** (0.29)
DiD Spain_b	−0.0280 (0.41)	−0.1071 (0.31)	−0.2740 (0.30)	−0.2726 (0.30)
DiD Taiwan	−0.2982 (0.25)	−0.2714 (0.24)	−0.4496* (0.23)	−0.4592* (0.23)
DiD UK_b	0.2791 (0.30)	0.6568*** (0.25)	0.5177** (0.25)	0.5229** (0.25)
Binary after leniency				0.0192

(Continues)

Table 3 Continued

	Model 1 (only covariates)	Model 2 (covariates + country fixed effects)	Model 3 (Model 2 + year effects)	Model 4 (Model 3 + binary after leniency)
Control covariates	Yes	Yes	Yes	Yes
Country effect	No	Yes	Yes	Yes
Time effects	No	No	Yes	Yes
Observations	798	798	798	798
R^2	0.69	0.84	0.86	0.86

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. Standard errors are in parentheses. Subindex “_a” and “_b” indicate the first and second reform in this country in the period considered.

Table 4 Difference-in-differences (DiD) estimations

	Model 1 (only covariates)	Model 2 (covariates + country fixed effects)	Model 3 (Model 2 + year effects)	Model 4 (Model 3 + binary after leniency)
DID all countries	-0.0706 (0.05)	0.0744 (0.05)	-0.0426 (0.06)	-0.0426 (0.06)
Binary after leniency				-8e-4 (0.01)
Control variables	Yes	Yes	Yes	Yes
Country effect	No	Yes	Yes	Yes
Time effects	No	No	Yes	Yes
Observations	798	798	798	798
R^2	0.63	0.82	0.84	0.82

Standard errors are in parentheses.

$$y_{it} = \beta_0 + \sum_{i=1}^{24} \beta_i \text{DiD}_{it} + X_{it} + \mu_t + \eta_{\text{country}} + \epsilon_{it}, \tag{1}$$

where, y_{it} is the competition policy effectiveness index (IMD) in country i at year t ; X_{it} are control variables; μ_t are year fixed effects that reflect the changes in the average effectiveness that are common to all countries (with respect to the baseline year, 1995); η_{country} are country fixed effects, which collect the permanent effectiveness differential of each country during the sample period (with respect to the baseline country, Australia in this case) and, finally, the binary variables DiD corresponding to a specific country and competition authority that take value 1 only for the country that has implemented a competition authority reform during the year in which the reform is introduced and the following years in which it is implemented.

Following Galiani *et al.* (2005), we test whether the treatment and control groups behave similarly in the pre-treatment period, as required in the use of the difference-differences estimator. Figure A1 (in the Appendix) depicts the IMD evolution and the parallel trends of the countries that implemented a reform and the control group.

Thus, coefficients from β_1 to β_{24} affecting DiD by country show the average impact each reform had on the index of effectiveness of competition policy in each country in the period after the reform, regarding the control group. The estimation results are shown in Table 3.

The DiD estimator is very imprecise as the effects are very heterogeneous by reform: most of the reforms do not seem to have any clear cut effect on antitrust perceived effectiveness. Using Model 4, we find clear positive effects in the reforms in Ireland, Japan, the first reform in Spain (2007) and the second reform in Italy (2014) and in the UK (2018). By contrast, we find negative effects of reforms in Colombia, the two of Hungary and in Taiwan. The other reforms appear to have not a clear permanent effect on antitrust effectiveness.

Table 5 Validity *t*-test. IMD treated vs. IMD synthetic in the period "before" the reform

	IMD treated	IMD synthetic	<i>t</i> -test
Austria	6.68 (0.23)	6.67 (0.16)	0.05
Belgium	6.23 (0.10)	6.24 (0.06)	−0.21
Brazil	5.11 (0.08)	5.11 (0.05)	−0.10
Colombia	4.77 (0.27)	4.73 (0.11)	0.22
Denmark	7.36 (0.12)	7.21 (0.07)	1.06
Finland	7.56 (0.11)	7.17 (0.07)	3.75***
France	6.25 (0.08)	6.25 (0.07)	−0.01
Hungary_a	5.12 (0.29)	5.10 (0.14)	0.09
Hungary_b	5.14 (0.25)	5.14 (0.09)	−0.02
Ireland	6.55 (0.10)	6.56 (0.06)	−0.19
Italy_1	4.74 (0.16)	4.74 (0.08)	0.00
Italy_2†	1.52 (0.03)	1.52 (0.2)	−0.01
Japan	5.65 (0.11)	5.69 (0.06)	−0.54
Korea	5.45 (0.17)	5.47 (0.11)	−0.14
Luxembourg	6.25 (0.24)	6.23 (0.15)	0.15
Mexico	4.66 (0.16)	4.67 (0.08)	−0.05
Netherlands	7.08 (0.09)	6.96 (0.05)	1.48*
Norway	6.87 (0.08)	6.85 (0.04)	0.31
Portugal_1	5.27 (0.16)	5.27 (0.12)	−0.01
Portugal_2	5.15 (0.16)	5.17 (0.09)	−0.11
Spain_1	5.56 (0.16)	5.57 (0.07)	−0.06
Spain_2	5.91 (0.29)	5.92 (0.17)	−0.07
Taiwan	5.76 (0.12)	5.79 (0.06)	−0.31
UK_2	6.19 (0.11)	6.20 (0.09)	−0.06

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. †Neperian. Standard errors are in parentheses. IMD, International Institute for Management Development.

Table 4 shows below the mean effect of all 24 reforms. The estimate is not significant in none of the estimations. This is also signaling that the DiD method is not able to estimate with precision the effect of the reforms because those seem to be very heterogeneous. To treat with such heterogeneity by country and reform in the dynamics of antitrust effectiveness the SCM is a better alternative because it is allowing for a more flexible adjustment to the pre-trends in each country and reform studied.

4.2. Synthetic control method

To identify and quantify in a much more precise manner the impact of the reforms in the 20 analyzed countries (24 institutional re-designings) we estimate the impact of the reforms using the SCM following Abadie and Gardeazabal (2003). This methodology allows to approach this problem by comparing each country and reform during the treatment period (after competition law reform) with that of a weighted combination of other countries chosen to resemble the characteristics of the treatment country (before each competition authority institutional reform). The reason to use this methodology is to find for each treated country a more similar or comparable counterfactual country, than the whole control group.

As considered in Abadie and Gardeazabal (2003), let J be the number of available control countries (18, see endnote 3), and $W = (w_1, \dots, w_J)'$ a $(J \times 1)$ vector of nonnegative weights which sum to one. The scalar w_j ($j = 1, \dots, J$) represents the weight of each country j in the synthetic Treated Country. The weights are chosen so that the synthetic unit most closely resembles the actual one, before the treatment. Let X_1 be a $(K \times 1)$ vector of pre-treatment values of K predictors. Let X_0 be a $(K \times J)$ matrix which contains the values of the same variables for the J possible control countries. Let V be a diagonal matrix with nonnegative components. The values of the diagonal elements of V reflect the relative importance on the different predictors. The vector of weights W^* is chosen to minimize $(X_1 - X_0 W)' V (X_1 - X_0 W)$ subject to $w_j \geq 0$ ($j = 1, 2, \dots, J$) and $w_1 + \dots + w_J = 1$. The vector

Table 6 Estimated mean effect of the reform. *t*-test, IMD treated vs. IMD synthetic in the period "after" the reform.

	IMD treated	IMD synthetic	<i>t</i> -test	Reform effect	Reform effect (%)
Austria	6.84 (0.15)	6.92 (0.06)	−0.46	−0.08	−1
Belgium	6.54 (0.17)	6.74 (0.06)	−1.49*	−0.20	−3
Brazil	4.84 (0.09)	5.45 (0.09)	−8.19***	−0.61	−11
Colombia	4.44 (0.14)	5.34 (0.08)	−6.29***	−0.90	−17
Denmark	7.88 (0.11)	6.94 (0.04)	7.99***	0.94	14
Finland†	7.73 (0.11)	6.98 (0.03)	6.55***	0.75	11
France	6.33 (0.07)	6.31 (0.05)	0.27	0.02	0
Hungary_a	5.14 (0.25)	5.06 (0.55)	0.32	0.08	2
Hungary_b	3.87 (0.13)	5.39 (0.12)	−11.10***	−1.52	−28
Ireland	7.27 (0.15)	7.07 (0.07)	1.35	0.20	3
Italy_1	4.63 (0.14)	4.31 (0.11)	2.38***	0.32	7
Italy_2‡	1.65 (0.03)	1.54 (0.04)	5.45***	0.54	12
Japan	6.72 (0.09)	5.96 (0.07)	8.51***	0.76	13
Korea	5.35 (0.12)	5.66 (0.05)	−2.72***	−0.31	−5
Luxembourg	6.50 (0.09)	6.38 (0.05)	1.37*	0.12	2
Mexico	4.70 (0.17)	5.14 (0.13)	−2.49***	−0.44	−9
Netherlands†	7.62 (0.11)	6.97 (0.04)	6.22***	0.65	9
Norway	7.49 (0.10)	6.92 (0.07)	7.53***	0.57	8
Portugal_1	5.15 (0.16)	5.23 (0.06)	−0.55	−0.08	−2
Portugal_2	5.11 (0.17)	5.27 (0.13)	−1.22	−0.16	−3
Spain_1	5.91 (0.29)	4.82 (0.06)	3.54***	1.09	23
Spain_2	5.69 (0.17)	6.48 (0.08)	−3.68***	−0.79	−12
Taiwan	5.86 (0.13)	5.82 (0.07)	0.38	0.04	1
UK_2	6.97 (0.10)	6.47 (0.07)	4.46***	0.50	8
Mean significant and valid positive effect				0.61	11
Mean significant and valid negative effect				−0.68	−12

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. †Synthetic control method does not fit and results may be not valid. ‡Neperian. Standard errors are in parentheses. Positive effects are in light grey, and negative effects are in dark grey. IMD, International Institute for Management Development.

W^* defines the combination of control countries which best resemble the treated before the treatment takes place.

In our case, we consider the following covariates in the implementation of the SCM: the IMD index (and its log) for the period before competition authority is reformed; the annual variation rate of IMD (and its log) in this pre-treatment period; population, GDP, exports, the regulation quality index, and binary variables for EU28 and EURO. Figure A2 in the Appendix show all synthetic analyses by country and institutional reform.

The figures show clearly that actual competition policy perceived effectiveness departs from the synthetic country trend, the one we simulate as the more likely path of competition policy effectiveness without competition authority reform in many countries: for the good and for the bad.

We first test the validity of this comparison, and then we offer the mean result of this comparison testing whether there are statistically significant differences in the mean of the perceived competition policy effectiveness in the treated (reformed) versus the control (not reformed) states.⁵ Table 5 shows that the SCM is valid for all reforms except that in Finland and Netherlands. The validity test of mean differences is carried out comparing the treated and control *before* the reform. We expect this mean difference to be null as, by construction, the treated (reformed) and control (non-reformed) country should be as similar as possible before the reform for the SCM to be valid.

These tests, together with the series depicted in Figure A2 in the Appendix which also represent the pre-treatment trends of the treated and synthetic units, show that, on average, the SCM provides a good fit in the

pre-treatment period. These results, together point out that we can use the SCM to infer the causal mean impact of the reform on the treated countries (those implementing the reform).

The *t*-tests do not reject equal means of the reformed and non-reformed cases before the reform except for Finland and Netherlands. So, in these cases the SCM is failing, and we cannot infer causality as the pre-reform trend does not match for the actual and the synthetic competition policy effectiveness. So, we will only be able to estimate the effect of 22 reforms out of 24 using SCM.

The effectiveness of the reforms is tested estimating the mean differences when comparing the treated and control *after* the reform in Table 6. Excluding Finland and Netherlands for which the estimates are not valid, Out of the 22 institutional reforms, we find 8 reforms with positive effects on antitrust enforcement perceived effectiveness, while 7 reforms have negative effects which then qualify as counter-reforms, and 7 reforms without a significant effect in the long term.

The SCM offers very different estimates from DiD. This is showing that the DiD method is not able to track the heterogeneity in the previous trends in each country. Instead, SCM is able to adjust to such country-specific heterogeneity before the reforms are implemented.

And once the reforms are implemented, results also are very heterogeneous. The eight reforms with positive significant and valid effects have a mean effect of 11% on antitrust perceived effectiveness. By contrast, the seven reforms with negative significant and valid effects have a mean effect of -12% .

Spain is a unique country with a reform with strong positive significant effects in 2007 (23% increase in antitrust effectiveness) that is partially canceled out by a true counter-reform in 2013 with also a strong negative significant effect (-12% decrease in antitrust effectiveness).

There are seven reforms that have a neutral effect on competition policy effectiveness. Those show how difficult is to get finally the reforms that effectively promote the originally intent, or that the reforms were finally framed in a way that no improvement of competition policy is reached, may be the underlying outcome desired by some Machiavellian politician in charge of designing the reform.

5. Conclusions

Countries struggle to pass welfare-enhancing reforms, and as Fernandez and Rodrik (1991) seminal paper showed, there are even some reforms that are permanently blocked when there is uncertainty with respect to their distributional effects. Even when some reforms are approved, there are cases in which reforms stall or backlash once the public learns who wins and who losses from them (Van Wijnbergen & Willems, 2014). Politicians may then opt for a Machiavelli option: undertaking “counter-reforms” even in the name of progressiveness and competition fostering reforms.

Analyzing the case of 24 reforms of national competition authorities in 20 different countries, we use methods of causal inference (synthetic control techniques and DiD estimator) to identify and quantify the causal effect of the reforms comparing the perceived effectiveness of competition policy by the business community (IMD survey) of those countries with respect to the control group.

Our results show that reforms had heterogeneous effects: most of them had the expected positive significant effects (10 reforms out of 24), but also many of them had an unexpected negative significant effect (7 reforms out of 24), or no significant effects at all in the long term. In one case, we see a reform for the good (Spain 2007) and a true counter-reform (Spain 2013) that partially cancels out the improvements achieved in antitrust effectiveness in the long term.

Our paper offers strong causal evidence of what Guidi (2015) warns and highlights: competition policy not only has efficiency impacts, but also redistributive effects among firms and consumers. As such, sometimes politicians prefer “not to delegate power to an independent authority in salient policy fields like competition enforcement” as applying the principal-agent theory would predict. Politicians may indeed be interested in reducing the discretion and independence of antitrust authorities in pursuing the goals of improving efficiency of markets and enhancing the balance of power of democracies.

The mixed evidence we provide on the effects of competition authority reforms is consistent also with the perspective of Eriksen (2021) that argues that independent agencies “inevitable have to make political judgments.” And politicians are aware of this: agencies are viewed in the political arena as framers of value and

political judgments. This is driving the tensions in favor and against reforming competition authorities to make them more effective in pursuing more competitive and power balanced markets.

The causal evidence we offer for the case of competition policy is not unique. Reforms in other policy domains seem also to follow progresses and backlashes as the continuous shift in other industrial and economic policies show.

Assessing the effects of reforms offers some new light on the issue of whether the combination of inputs in the policy process offer the expected results in terms of output of the political game, and of real outcomes in the policy domain. We show that outcomes are uncertain, and at best are aligned with the expected progressive results, but this is not guaranteed as sometimes reforms are neutral in outcomes, and do not fulfill the expectations. And what is worse, there are cases in which reforms are used for undoing the progress attained in previous reforms, sometimes even in a game with the output being politicians covering their real intentions claiming that their reforms are also for the good, and obtaining negative outcomes in the detriment of the delegated competition authority, and regaining partisan discretion.

Further research is required to understand the reason why some competition authorities' reforms improve antitrust effectiveness and why others are not successful, or even are framed and/or decrease antitrust effectiveness. Factors related to the content and context of the reforms, whether those are imposing more technically oriented mandates or mandates that allow the authorities to engage in judgment values, the time elapsed since the last (related) reform, the quality of the rule of law in different polities, and the level of trust in governments/public authorities, which varies across countries and over time, may explain these differences.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from International Institute for Management Development (IMD). Restrictions apply to the availability of these data, which were used under license for this study. Data are available from the author(s) with the permission of IMD.

Endnotes

- ¹ The criteria “Competition legislation” is in section 2.4.10 called “Business legislation. Competition and Regulations,” and the specific question is “Competition legislation is (or not) efficient in preventing unfair competition.”
- ² Except for Hungary and UK, as explained in Table 1.
- ³ Countries belonging to the control group are the following: Australia, Canada, Chile, Czech Republic, Germany, Greece, Hong Kong, India, Malaysia, Philippines, Poland, Russia, Sweden, Switzerland, Thailand, Turkey, USA, and Venezuela.
- ⁴ <https://databank.worldbank.org/source/worldwide-governance-indicators>
- ⁵ According to Arkhangelsky and Imbens (2021), the Netherlands and Finish cases would require the application of an alternative estimator (the synthetic difference-in-differences estimate) in which the parallel trend condition is accepted, while the treatment units are not necessarily identical to the control units. This would require taking into account the existing differences between the treatment and control units across time in the pre-treatment period.

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APPENDIX

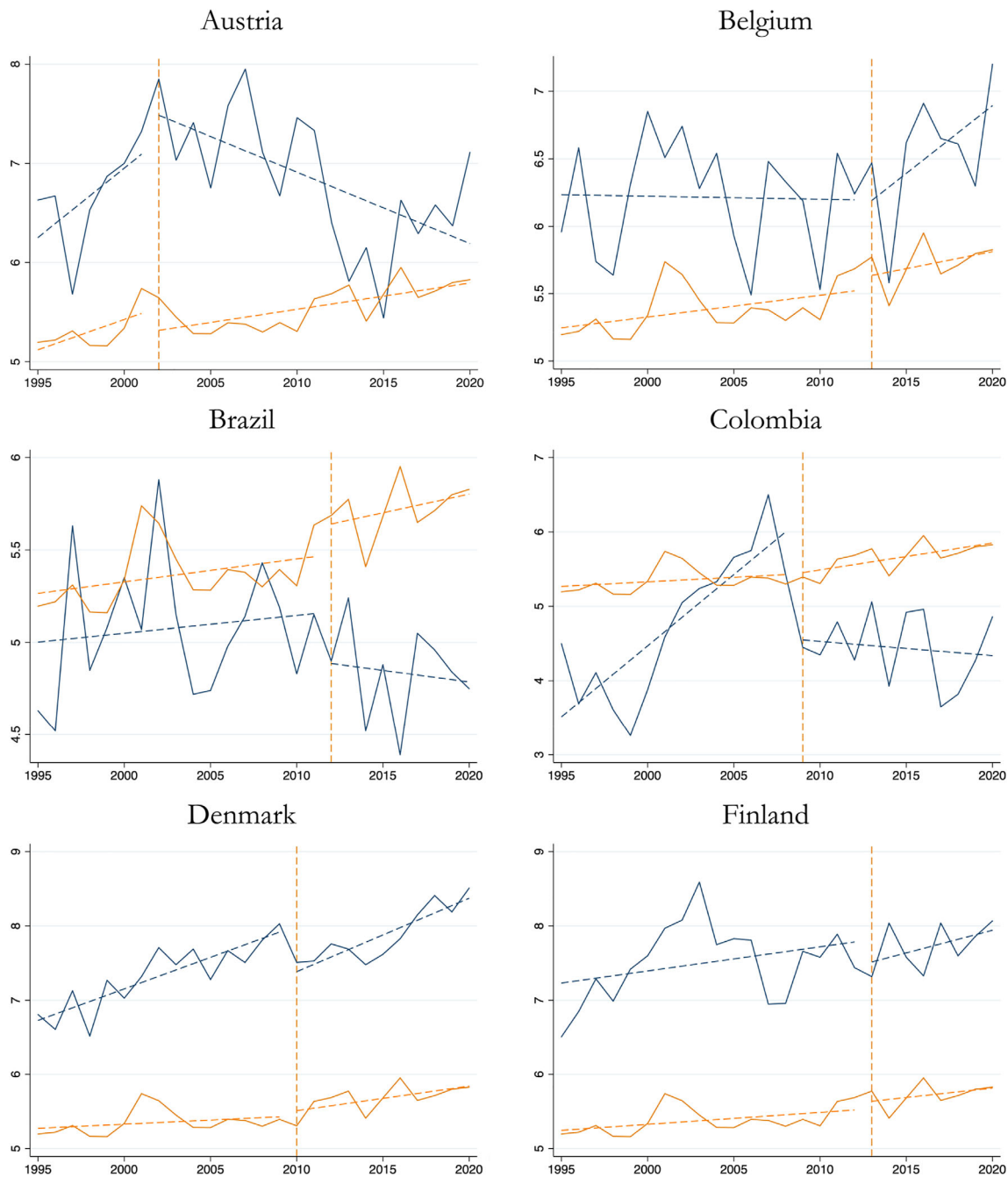


Figure A1 IMD evolution (country vs. control group) and parallel trends (before and after competition policy reforms). Orange lines correspond to control groups. Dashed ones are trend lines for each period. *Source:* Own elaboration.



Figure A1 Continued

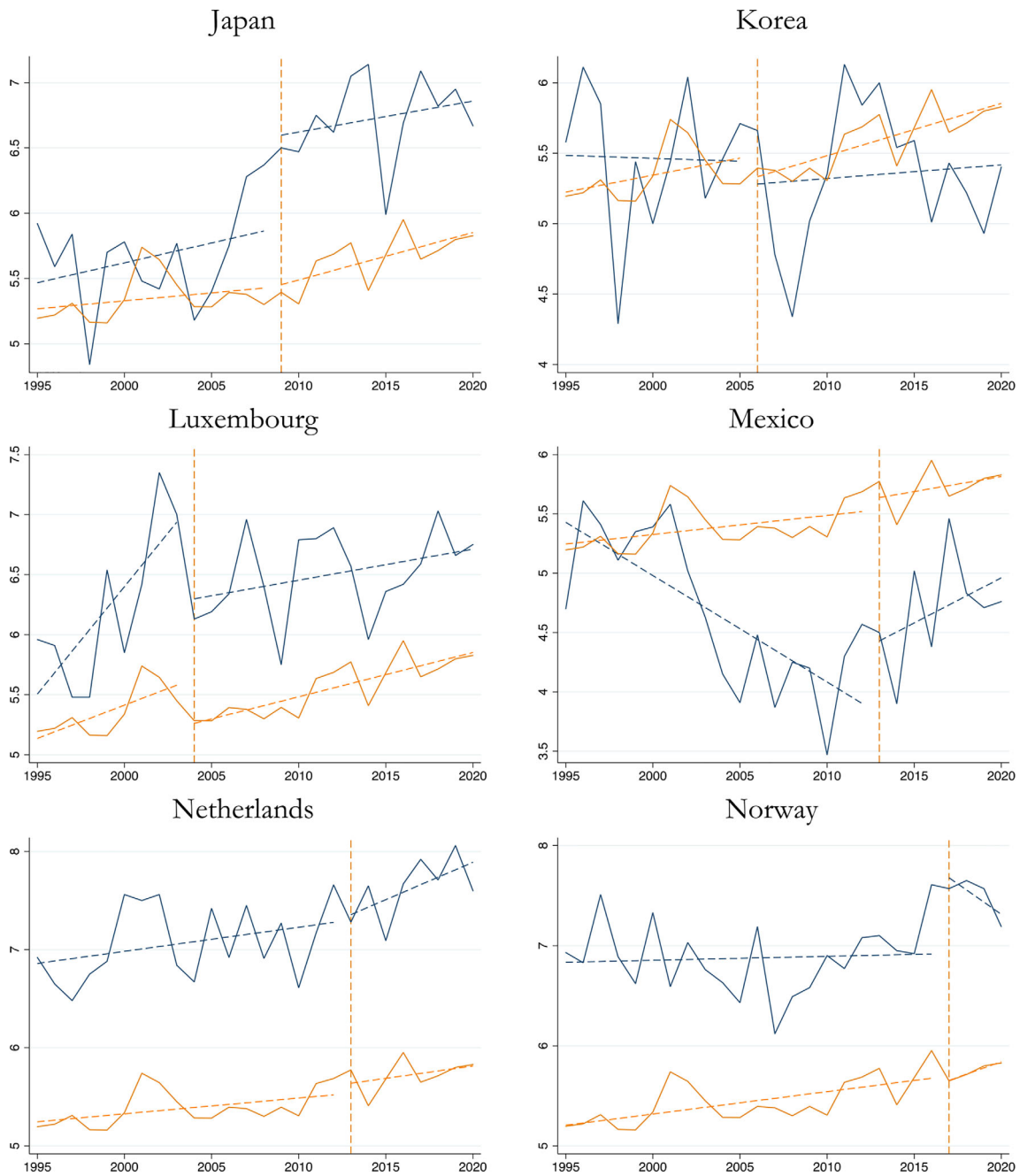


Figure A1 Continued

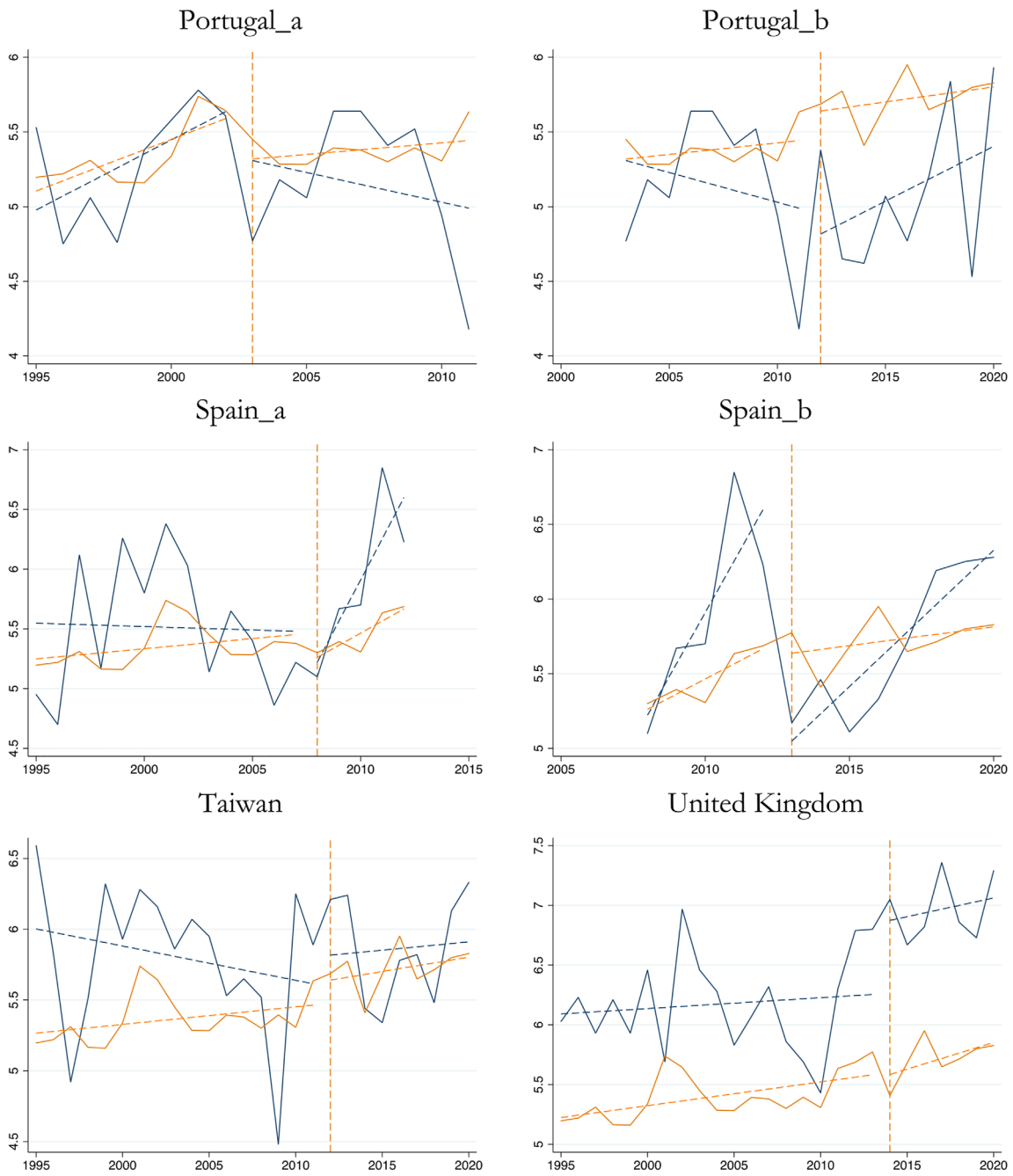


Figure A1 Continued

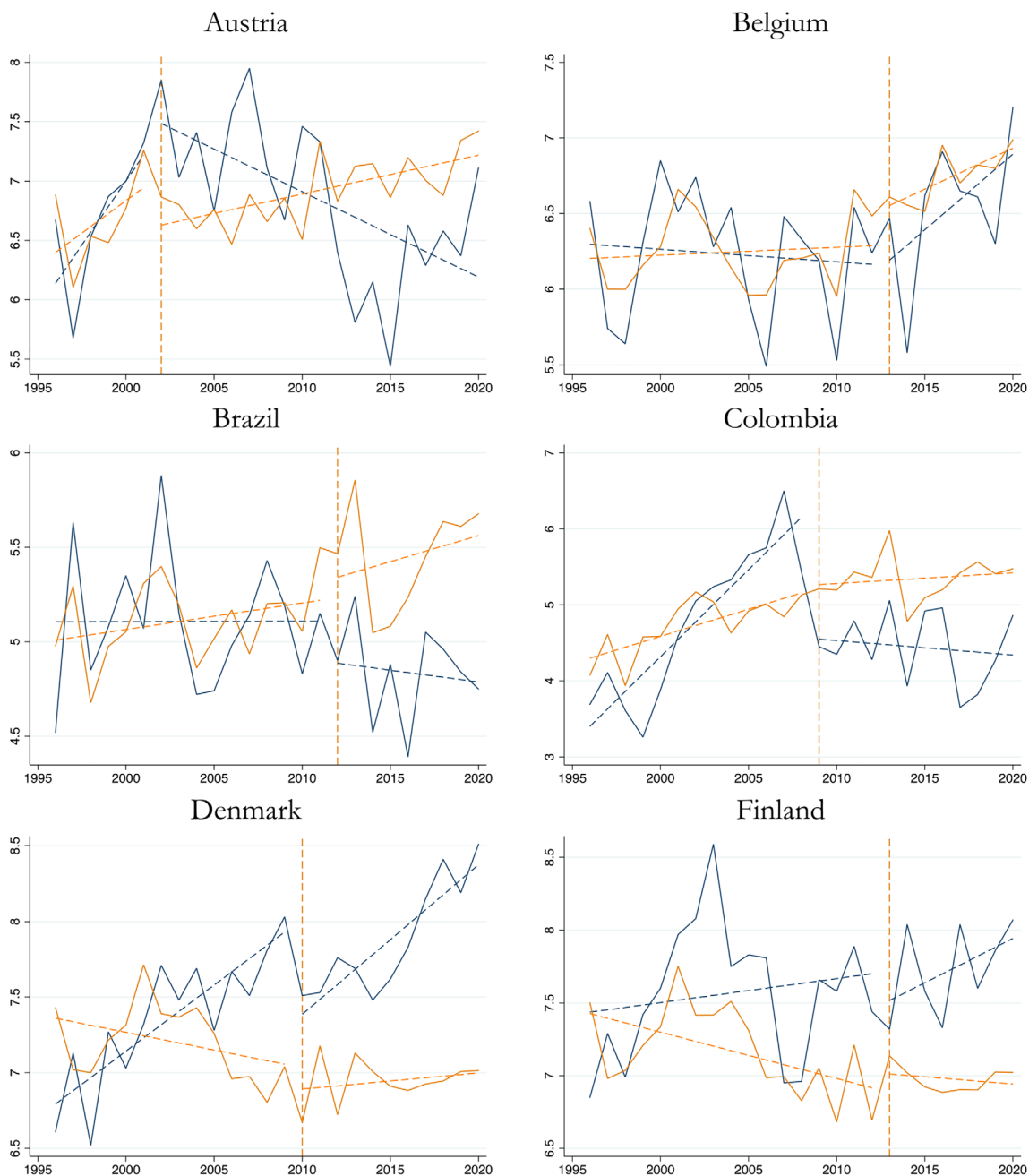


Figure A2 Synthetic control of IMD by country (and trends before and after competition policy reforms). Orange lines correspond to synthetic. Dashed ones are trend lines for each period. *Source:* Own elaboration.



Figure A2 Continued



Figure A2 Continued



Figure A2 Continued