European Journal of Political Economy 65 (2020) 101933

Contents lists available at ScienceDirect

European Journal of Political Economy

journal homepage: www.elsevier.com/locate/ejpe

Policy tolerance of economic crime? An empirical analysis of the effect of counterfeiting on Italian trade

Elton Beqiraj, Silvia Fedeli *, Luisa Giuriato

Sapienza – University of Rome, Department of Economics and Law, Via Del Castro Laurenziano 9, 00161, Roma, Italy

ARTICLE INFO

JEL classification:
E26
F14
F19
C23
K14

Keywords:
Trade openness
Export
Economic crime
Counterfeiting
Italy
Public policy ambiguity

ABSTRACT

Some governments seem ambivalent towards economic crime because, on the one hand, there are adverse effects on competition and legal businesses; on the other hand, there are benefits through (shadow) employment and income in less-developed areas, as well as benefits through relations of political clientage. We focus on counterfeiting and its economic effects on trade in Italy during the economic crisis. Using a newly built regional dataset and a dynamic panel model, we find evidence of the dual impact of counterfeiting. The production (and exchange) of fake goods depresses the legal market that relies on intellectual property rights but supports shadow-economic activities for the benefit of illegal workers, criminal organisations, and political clientele. We show that the negative effects outweigh the positive effects.

1. Introduction

Some economic crimes are perceived as more unethical than illegal, both in public opinion[1] and by politicians. As a consequence, public policies might exhibit wide tolerance margins regarding these crimes. In Italy, this has been the case with regard to illegal inefficiencies of bureaucratic officials (or corruption), tax evasion, and other forms of economic crime. In this paper, we focus on counterfeiting – i.e., the unauthorized manufacturing of articles which mimic certain characteristics of genuine goods and which may pass themselves off as registered products of licit companies (Staake et al., 2009, p. 2). Our focus on Italy is motivated by the fact that "the entire Italian economy relies on some form of intellectual property rights (IPRs). Virtually every industry either produces or uses it, which means that the Italian economy is characterized by an IPR intensity far above the EU average" (OECD, 2018, 16). In this context, counterfeiting stands out as a complex phenomenon with a number of intertwined contradictions:

(i) Counterfeiting results in a loss of about € 19.4 billion production and 103,000 jobs in the legal market (CENSIS-UIBM, 2018). Italy is ranked third, after the US and France, in the list of economies of origin of right holders whose intellectual property rights (IPRs) are infringed upon (OECD, 2019).
(ii) Unlike other European countries, Italy displays a significant propensity to export counterfeited goods – the second highest value after Greece according to the OECD's General Trade-Related Index of Counterfeiting (GTRIC-e, OECD, 2019).

* Corresponding author.
E-mail addresses: elton.beqiraj@uniroma1.it (E. Beqiraj), silvia.fedeli@uniroma1.it (S. Fedeli), luisa.giuriato@uniroma1.it (L. Giuriato).

[1] See Douhou et al. (2011).

https://doi.org/10.1016/j.ejpoleco.2020.101933
Received 21 October 2019; Received in revised form 1 August 2020; Accepted 13 August 2020
Available online 25 August 2020

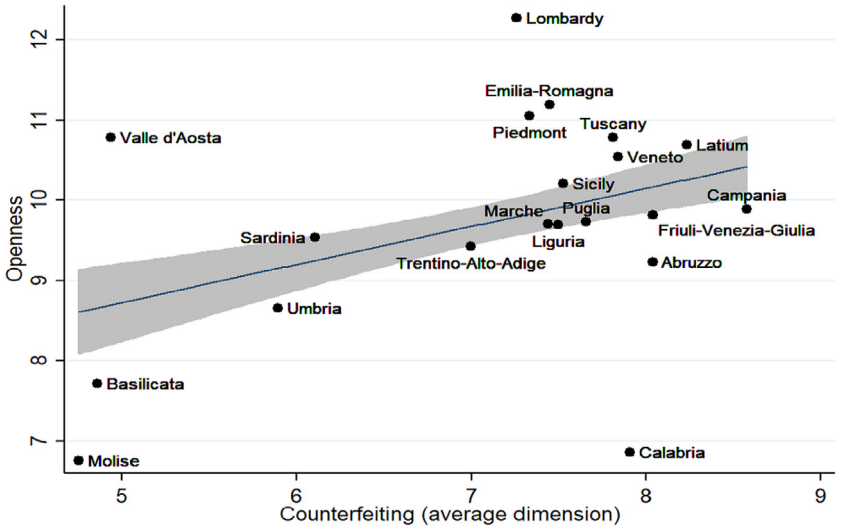

Fig. 1. Average dimension of fakes seizures and trade openness (2008–2013). Data are in logs. The grey-shaded area is the 95% confidence interval. Source: Authors'elaboration on data from ISTAT and the IPERICO data set.

(iii) Counterfeiting is run by mafia-type organisations that have increasingly turned their activities towards this highly remunerative, relatively low-risk business. As a result, counterfeiting is a serious challenge to business freedom and is a multiplier of illegal activities, including tax evasion, illegal migration, unreported employment, and money laundering.

(iv) Counterfeiting has been "politically" tolerated for positive returns in terms of (shadow) employment, income, and exchanges, and also in terms of political clientelism, and is a social buffer in areas of widespread unemployment, social and economic depression, and insufficient public control of the territory.[2]

(v) Counterfeiting is socially tolerated: A recent survey reports that about one-third of Italian consumers buys at least one fake product or utilizes an illegal service each year. Moreover, 73% of consumers believe that it is "normal" (Confcommercio, 2019).

(vi) A number of serious anti-counterfeiting measures were approved during the economic crisis to combat counterfeiting because of adverse effects on competition and legal businesses, and also to protect the country's reputation for high quality: sanctions were hardened (Law 99/2009; Law 61/2010; Law 9/2013) and investigational tools were broadened (*Piano straordinario contro le mafie*, Law 136/2010).

(vii) These same measures - possibly because of public budget constraints or perceived low harmfulness of counterfeiting - were not supported by increased enforcement resources.

The Public Prosecutor at the Anti-mafia National Directorate M. V. De Simone (2016, 3) described these contradictions as such: "*it is as if Italy worked against itself*".

Counterfeiting is a serious crime problem in Italy. It is run by organised crime groups that oblige firms to buy counterfeit products to be used in the production process or to be sold on the market. Over time, they have also become entrepreneurs in this sector, by both investing the capital of the criminal "holding" and directly managing production activities (Camera dei Deputati, 2013, 2017). In some cases, they infiltrate legal businesses (Savona and Berlusconi, 2015) and control the entire supply chain – from importing fakes to then re-export or sell within an extensive network of both national and international distribution hubs.

The ambivalent policy stance around this issue reflects the government's inability to deal with the different social welfare dimensions of counterfeiting and the unavailability of sufficient resources for crime prevention and punishment. Unlike ordinary crimes, the welfare implications of counterfeiting are mixed. Counterfeiting has deleterious consequences for the legal business climate and firms' reputations, and strengthens criminal infiltration into the legal economy, but it also supports low-income families in depressed areas. Indeed, counterfeiting employs thousands of non-criminal workers in the production, transport, and sale sectors of the shadow economy (Fedeli et al., 2018): artisans, dockers, lookouts, drivers and keepers, and retailers in the illegal commerce. These jobs provide a social buffer for low skilled workers in high unemployment areas and also depress recruitment for more violent crimes. Therefore, accounting for the welfare impact of counterfeiting is different from the assessment of the material costs and non-monetary implications of common violent crimes (Soares, 2009; Anderson, 2011; Chalfin, 2016).

As proposed in the literature on the costs of crime (Soares, 2009), policymakers should optimally allocate spending on counterfeiting prevention and punishment in a way that maximizes net social welfare. The optimal allocation requires equating marginal social benefits from further expenditures to marginal social costs. When it comes to anti-counterfeiting measures, social benefits include higher sales in

[2] Counterfeiting has long benefitted from policy tolerance not only in Italy, but also in other European countries. For example, the movement of goods in the ports of Antwerpen or Rotterdam has been largely favoured at the expense of controls.

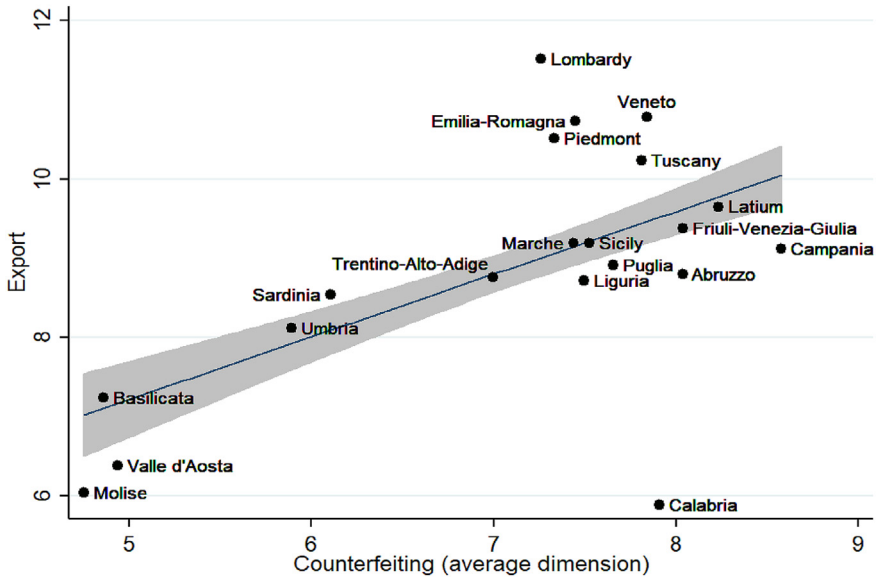

Fig. 2. Average dimension of seizures and exports (2008–2013). Data are in logs. The grey-shaded area is the 95% confidence interval. Source: Authors' elaboration on data from ISTAT and the IPERICO data set.

the legal sector, reduced intangible costs related to the labour market and business climate, reduced time opportunity costs, higher tax revenues, safety for consumers, and reduced profits for Mafia organisations. Social costs include higher unemployment in less developed regions, increased Mafia activities in other illegal sectors – such as drug and weapons trafficking, extortions, and robberies -, increased violence, and undermined relationships in low-income communities. Both social costs and benefits depend on behaviours that are not easy to predict – including the responses of criminals and workers in the counterfeiting business sector.

Finally, because of limited public resources, anti-counterfeiting spending competes with the repression of other types of crime that may entail even larger social losses - injuries or deaths, psychological traumas, fear, property disruption or loss – as well as with social services, health care, infrastructure, and other types of spending (Chalfin, 2016). Ambivalent policy responses are thus in part a result of the difficulty of striking a balance between these competing spending needs. The policy choice may also be biased by the electoral rewards for local politicians in areas where the social buffer function of counterfeiting is higher, and by the fear that anti-counterfeiting measures will be disproportionately born by the poor and the marginalized (Dominguez-Rivera and Raphael, 2015).

A first glimpse of the phenomenon under study can be understood from Fig. 1, which displays the relation between counterfeiting and trade openness (the sum of imports and exports) in the years 2009–2013, when counterfeiting was spurred by the global financial crisis (Fig. 2 shows a similar pattern for exports alone). It can be noted that regional exchanges (and exports) increase with the average dimension of disclosed fakes. In addition, counterfeiting grows together with legal businesses in regions characterized by many outward-oriented firms (Lombardy, Veneto), external connections through national borders (Friuli), large airports (Latium), or important harbours (Campania). It also emerges that both economically depressed (Abruzzo, Calabria) and flourishing (Veneto, Emilia-Romagna, Lombardy) regions attract counterfeiting: the former regions host a favourable reserve of unemployed workers and criminal activities, while the latter offer opportunities for fakes' distribution and commercialisation. In sum, counterfeiting appears to provide a positive contribution to the trade activities of a variety of Italian regions, which may explain the ineffective policy actions against it.

The strength of Italy's industrial system lies in its small-medium export-oriented firms. Counterfeiting compromises the advantage of these firms, namely their capacity to create high quality products that are highly reputed, attractive, and saleable on foreign markets. In the following we test whether the ambivalent nature of counterfeiting is mirrored by a twofold effect on trade. We expect to find evidence of a positive influence of counterfeiting on trade, because it increases trade flows, especially in the presence of commercial integration and when border controls are reduced to ease the flow of international trade. This should benefit the shadow economy with likely returns also in terms of political consensus. But we also expect a negative impact on trade indicators from substandard imitation and brand confusion, especially in high value-added sectors that suffer from credibility losses, substitution effects by illicit goods, and constraints on pricing. We also evaluate whether the negative implications socially outweigh the positive effects. Regarding this question, we have no *a priori* expectation.

Given that counterfeiting is a criminal activity, it is difficult to directly investigate fake producers and the characteristics of the market. We, therefore, rely on indirect evidence, which we present in Section 3. We focus on exports and trade openness at the regional level in order to consider the differentiated regional performance of Italian firms.[3] We concentrate on the years of the economic crisis

[3] Indeed, many regions in the South still lag behind: 97.4% of the firms employing more than 20 workers in the North-Western regions are able to export to other countries, while the share falls to 75.8% in Southern regions.

(2008–2013), when Italy was hit by a double-dip recession resulting in 9.0% GDP loss from peak-to-trough, a deep fall in industrial value added (−29.9% in the South, −20.4% in the Centre, −15.8% and −16.6% in the North West and North East, respectively), and a disruption of trade that was particularly acute in the South (Bank of Italy, 2014). In these years, counterfeiting substantially increased its market share in many countries (see for example Priporas et al., 2015, for Greece), and Italy appeared to abandon its tolerant stance by approving stricter anti-counterfeiting legislation and broadening investigational tools.

We use a unique and newly built dataset for the years 2008–2013 that contains detailed information on both counterfeiting and criminal activities (Fedeli et al., 2018). In particular, we use:

1) Regional data for economic activity and trade from the yearly statistics for the twenty Italian regions provided by the Italian Statistical Institute (ISTAT).
2) Data provided by the Italian Ministry of Justice related to the whole number of legal actions against different crimes. These data include comprehensive information provided by both the Italian District Prosecutor's Offices for Mafia investigations and the Public Prosecutor's offices re-aggregated at regional level.
3) The Intellectual Property Elaborated Report of the Investigation on Counterfeiting (IPERICO) database – developed by the Ministry of Economic Development jointly with the Tax Police Force, the Customs Agency, and the Service of Criminal Activity of the Ministry of Internal Affairs – which gives a complete account of counterfeiting in Italy.

The remainder of this paper is organized as follows: Section 2 reviews the existing literature; Section 3 provides a description of the data; Section 4 presents some stylized facts on counterfeiting in Italy; Section 5 describes the model and the empirical results; and Section 6 concludes.

2. Overview of the literature

Our study involves two strands of economic literature, that on trade and that on crime and counterfeiting. A voluminous empirical literature explains trade by a number of factors including: (i) exchange rates and their volatility; (ii) currency unions (Glick and Rose, 2002; Baldwin and Taglioni, 2007) and exchange rate regimes (Baxter and Kouparitsas, 2006); (iii) factor endowments and product differentiation; (iv) differences in technology (Davis and Weinstein, 2001) and industrial structure (Yamarik and Ghosh, 2005); (v) gravity variables to account for countries' contiguity (Anderson and van Wincoop, 2003); (vi) tariffs, trade agreements, and trade liberalization (Feenstra, 1998; Baier and Bergstrand, 2001); and (vii) returns to scale (Antweiler and Trefler, 2002), outsourcing, and trade costs (Baier and Bergstrand, 2001; Anderson and van Wincoop, 2004). However, empirical results have often shown that trade volumes are far below those predicted by standard trade models, thus requiring different explanations related to social, economic, and political factors, including crime and insecurity.

The literature provides some theoretical models on crime, trade insecurity, and protection.[4] Anderson and Bandiera (2005) explain why, in a world made insecure by thieves or extorters, globalization with its positive externality - safety in numbers - raises trade by more than the direct cost reduction can account for, with consequences in terms of tolerance/hostility in states' actions towards illicit trade. Anderson (2006) examines why smuggling operating alongside legal markets is sometimes tolerated and sometimes suppressed. He concludes that tolerance of illegal markets is rational for a revenue-motivated government when law enforcement is weak. In Anderson and Marcouiller (2002), crime determines insecurity in international exchanges and hidden transaction costs, equivalent to a hidden tax on trade.

Counterfeiting, *per se*, is not an autonomous strand of research, and is studied within different disciplines, including marketing, management, and behavioural economics.[5] At a macro level, a number of studies (EUROPOL-OHIM, 2015; OECD, 2008, 2009; 2016; Camerini et al., 2015; Frontier Economics, 2016; CENSIS-UIBM, 2018; GAO, 2010) analyse the quantitative dimensions of counterfeiting in order to obtain reliable estimates of the phenomenon. At a micro level, other than the literature on the demand for fakes, which is outside the scope of our analysis, attempts have been made to estimate firms' financial losses from counterfeiting in terms of profits, brand value, brand equity, and expenditures on countermeasures (Feinberg and Rousslang, 1990 for the United States (US); CEBR, 2000 for the European Union). Other studies have focused on the strategies available to authentic firms to distinguish themselves from counterfeiters: increasing/decreasing prices, upgrading quality, lobbying for increased public monitoring (Banerjee, 2006), investing in innovation and media-communication, and finding new solutions (licensed outlets, brand-protection offices) to help consumers distinguish original items from fakes (Grossman and Shapiro, 1988; Qian, 2008, 2014; Chaudhry and Zimmerman, 2009). Some studies have also highlighted the heterogeneous impacts of counterfeiting on legitimate sales, including positive advertising effects for brands (Qian, 2011), and bandwagon and network effects (Yao, 2005).[6]

The relationship between counterfeiting and trade mostly focuses on IPRs, their protection, and bilateral imports/exports (Maskus and Penubarti, 1995; Primo Braga and Fink, 1998; Smith, 2001). The impact of counterfeiting on trade volumes and structure has been

[4] Among others, see Garfinkel et al. (2009), Skaperdas (2001), Marcoullier (2000).

[5] See Staake et al. (2009) and Cesareo (2015) for a literature review.

[6] Due to the difficulties of accessing and analysing illicit firms, very few studies concentrate on counterfeit producers and the characteristics of the counterfeit market. Clark (2006) examines tactics counterfeiters use to disguise their activities; Hetzler (2002) and Green and Smith (2002) highlight counterfeiters' relationships with organized crime and the entrepreneurial character of their activities; Staake et al. (2012) attempt to distinguish different types of counterfeiters and examine their production capabilities, business models, and strategies.

rather neglected. Some attempts have been made by OECD (2008 and 2013), but the results are inconclusive. However, the structure of trade seems to be affected by counterfeiting, given that economies with relatively high counterfeiting rates tend to export less in countries with high health and safety standards. In this respect, significant results for pharmaceutical products have been confirmed by OECD (2008), where a specific model for US pharmaceutical imports displays a negative significant effect of exporting countries' propensity to counterfeiting. Therefore, even if counterfeiting and trade are strictly related, there is still little systematic analysis.

Finally, and consistent with our focus on Italy, we relate to the analyses of the welfare costs of crime in order to frame policymakers' difficulties in evaluating the net impact of counterfeiting and devising contrasting measures. These analyses focus mainly on ordinary crimes (Soares, 2009; Anderson, 2011; Wickramasekera et al., 2015) and find their main limit in the fact that crime is a non-market good (Chalfin, 2016). Depending on the methodology adopted, costs must be inferred using proxies for victim costs, economic losses and indirect costs (psychological costs, decreased quality of life) suffered by crime victims, the cost of the criminal justice system, private and public expenditures on protection, and opportunity costs associated with the criminal's choice to engage in illegal activities. Crime-induced production, thus, refers to resources allocated to protect properties and lives, to deterrence, justice, and incarceration, and to repair and replacement (Anderson, 2011). No positive value is usually attached to the utility of criminals. However, the extension of cost benefit analysis to crime and anti-crime policies has long been debated, given that a potential conflict may arise with a common sense of fairness and equity (Dominguez-Rivera and Raphael, 2015).

Counterfeiting is a criminal activity involving significant crime-induced production, including resources allocated to brand protection, legal disputes, increased monitoring, innovation and media-communication, investment, and consumers' health protection. However, given its broad employment of a low-skilled labour force that is not necessarily made up of criminals, counterfeiting provides incomes to poor and marginalized people who have no access to legal production and distribution markets. The welfare losses of these workers from anti-counterfeiting policies should therefore be considered, in part to avoid the risk that the burden of anti-counterfeiting activities is disproportionately born by both the poor and the marginalized parts of society, thus exacerbating the existing divides in low-developed areas.

Given our country focus, we also consider analyses of the impact of criminal activities on Italian economic performance (Scognamiglio, 2018; Daniele and Marani, 2011; Peri, 2004; Pinotti, 2015; VanDijk, 2007), and, in particular, contributions related to the relationship between counterfeiting and crime in Italy. These latter account for the infiltration of *mafia*-type organisations into the legitimate system of business (Savona and Berlusconi, 2015; Scaglione, 2016), and examine counterfeiting as a structural feature of the Italian productive system (Silvestrelli, 2018). As far as we know, no study has so far empirically investigated the impact of counterfeiting on Italian trade.

3. The data

The costs that crime imposes on society suggest adverse effects on economic performance and welfare[7] due to increased costs of doing business, reduced productivity, and the opportunity cost of money spent on legal and crime-deterrence systems. The impact of criminal activities is not well documented in cross-country studies, due to inaccurate and inconsistent data, different definitions of crime, underreporting, and different recording procedures. Therefore, proxies of criminal activities usually employed in cross-country analyses (such as indices of economic freedom, transparency, or political instability) do not correspond to the general notion of crime and account mainly for crimes that have a "political nature" (Powell et al., 2010).

Our analysis takes advantage of a unique and newly built regional dataset that contains detailed information on criminal activities, counterfeiting, and economic indicators. Detailed data on crime are drawn from the Italian Ministry of Justice that reports the whole number of legal actions against crimes classified according to the Italian Penal Code (IPC). In order to account for the presence of organized crime, *OC*, we aggregate the following types of illegal activities: *mafia*-type criminal organization (or *mafia*-type crime syndicates, art.416*bis* IPC), criminal conspiracy (art.416 comma 6 IPC) aimed at committing the crimes as from articles 600, 601, 602 of the IPC, and criminal conspiracy (art.416 IPC).

In order to consider the impact of counterfeiting, we employ the IPERICO database that collects all contrast activities to counterfeiting since 2008. For our purposes, we consider two indicators: the average dimension of fakes' seizures in each region (CA_D) and the estimated value (in Euros) of the seized counterfeits (CA_V).[8] CA_D, the ratio between the number of seized goods and the number of seizures, represents a reliable proxy for the presence of counterfeiting phenomena in a given region: high values of CA_D, could be interpreted as evidence of counterfeit production activities in the region, or that the region is a relevant exchange/distribution hub for counterfeit goods that might also come from abroad (IPERICO, 2012). Accordingly, it should be positively related with both trade indicators. CA_V highlights the expected profitability from such illegal activities. Indeed, CA_V is less affected than CA_D by elements such as the presence of big harbors or national borders, where usually more controls take place. Therefore, CA_V helps to balance the spatial bias of CA_D that emerges where the average dimension of seized goods is particularly high (IPERICO, 2012). The variable also detects the presence of counterfeiting in high-value added sectors, with consequences in terms of brand credibility and trade capacity.

Some caveats are needed to support the use of these variables (measuring successful contrast activities) not as policy variables, but

[7] See Bourguignon (1999), Lorentzen et al. (2007), Soares (2009), Dills et al. (2008).

[8] It is important to notice that data related to the number of seizures represents the universe of observations, whereas the value of the seized goods is estimated according to a methodology elaborated by the General Direction of the Ministry of Economic Development (IPERICO, 2012). Such estimates are based on the value assigned to the seized goods by the Custom Agency, according to both the quality of the goods and the differences between the expected sale price of the fake and the market price of the original good.

rather as proxies of criminal activities at a regional level. A main concern lies in the fact that they underestimate the considered phenomena because they are ultimately limited to the disclosed part of them, which emerges after successful contrast activity. However, the success of anti-crime policies in some regions is also a signal that such regions are actually those where criminality is relatively higher. These indicators might not be adequate in the long term, because their variability may depend on the magnitude/intensity of contrast activities by the police forces and not on changes in the criminal activities *per se*. Nevertheless, in the relatively short-term considered here, when no significant change has occurred in the regional distribution of police forces, the variables can be used to proxy the presence/extent of counterfeiting in the Italian regions.[9]

Finally, we employ ISTAT regional data on trade and other economic indicators. Our dependent variables are, in turn, exports and the index of trade-openness obtained as the sum of imports and exports, expressed in (log of their) absolute values. As for the economic explanatory variables - both regressors and instrumental variables -, the most important are those capturing regional competitiveness. We employ various regional indicators (all taken in log): the regional cost of labor (*W*); the average labor productivity (*ALP*) as given by one period lag of log real regional GDP minus log employment; the regional capital per worker (*CW)*; and firms' regional input costs of production (*IC*). The regional cost of labor (*W)* is the key control variable in measuring competitiveness. *W* allows us to consider one of the most relevant dimensions of regional heterogeneity by capturing the changing economic conditions and the regional divide between the South and the Centre-North. Concerning the effects of *ALP*, which, in our empirical setup, complements wages in measuring competitiveness, we expect that a low level of economic activity mainly hurts the less-developed regions, whereas higher productivity goes along with the use of more modern equipment and up-to-date skills in the most developed regions of the Centre-North of Italy. The regional capital per worker (*CW)* is directly linked to the level of specialized work and, thus, captures a further aspect of regional competitiveness. Moreover, firms' regional input cost of production (*IC)* captures competitiveness related to firms' efficiency and production attractiveness of the economic environment. For each economic regressor, if significant, we expect a positive effect on trade variables. Finally, in order to account for time-specific effects representing both the financial and sovereign debt crises, we employ a year dummy variable, *YD*, taking on value 1 in the years 2009 and 2012 and 0 otherwise.[10]

A number of control variables have been also considered. Although they do not turn out to be significant for trade indicators in the main model, where we report only significant variables, they are used to test the robustness of our estimates. We refer to the following. The private investments, *INV*, should account for the dynamism of the private sector and for the regional economic climate and entrepreneur expectations on economic activity. Factor endowments have been also considered by means of a human capital indicator, *HC*, capturing the regional percentage of people who have acquired levels of education between the upper secondary education and doctoral level or equivalent, according to the International Standard Classification of Education (ISCED11, level 3–8). The number of firms, *NF*, accounts for changes in the market size and structure and is a proxy for competition in a period when a considerable number of Italian firms exited the market because of the recession. Finally, a fiscal variable related to labor input costs, i.e. the tax wedge, *TAX*, accounts for the regional tax relieves and hence for regional economic competitiveness and attractiveness.

In order to consider (potentially) confounding factors we shall also employ a set of crime variables, which are potentially simultaneously correlated with trade and counterfeiting. They refer to the number of persons convicted (by final judgement) for: counterfeiting, alteration, and use of trademarks, distinctive signs or patents, models, and designs (*CAU)*; fraud against national industries (*FNI)*; abusive use of seals and real tools (*AST)*; forgery of tickets for public transport companies (*FTP)*; and falsehood in deeds (*FD)*.

Summary statistics of the considered variables are reported in Table 1. All variables are taken in log in order to estimate the different elasticities by means of a log-linear model (see below).

One point of interest of our analysis is that Italian regional data on trade represent a sort of controlled environment of fully integrated regions subject to identical trade/institutional regimes and restrictions. We, therefore, need not to include institutional features (currency unions, exchange-rate regimes, tariffs, trade agreements, and trade liberalization), macroeconomic variables (exchange-rates and their volatility), gravity variables (common borders, colonial ties, cultural distance), and variables related to returns to scale, outsourcing, and trade costs. The relatively short time span also implies that there is no need to include variables such as population and its age structure, which are almost constant within the period.

4. Some stylized facts

In Italy, regional exports and trade openness are larger in the North-West, followed by the North-East and Centre (Fig. 3): in the Southern regions, exports are one-third lower than in the North-West. In the first phase of the double-dip recession (2008–09), exports dropped more in the South than in the rest of the country. However, the depressive effects on product dynamics were greater in the North because of its higher dependence on exports. The second recession (2012–13) had a similar, but less depressive, impact on regional trade.

The volume and structure of regional trade during the crisis suggest some role for trade-related idiosyncrasies. We put forward the hypothesis that criminal activities and counterfeiting, in the absence of public policy actions to fight them, could account for part of regional trade variability.

[9] Indeed, counterfeiting emerges as one of the many economic activities run by *mafia*-type criminal organisations. These organisations are not defeated by seizures, which hit only the tail of large transnational networks and complex parallel markets. Counterfeiting – like drug trafficking – is not a "street phenomenon" (De Simone, 2016), but rather a sophisticated system that has great skills in preventing and avoiding police detection and controls.

[10] We thank an anonymous referee for the useful suggestion.

Table 1
Summary statistics (2008–2013, yearly frequency).

Variable (log)	Description	Obs.	Mean	Std. Dev.	Min	Max
X^*	Export	120	8.885	1.532	5.793	11.591
O^*	Economic openness: imports *plus* exports	120	9.728	1.374	6.547	12.342
CA_V	Total value of seized counterfeited goods	120	15.502	2.620	6.749	19.856
CA_D	Average dimension of fakes seizures (x 100)	120	7.108	1.600	2.550	10.308
W^*	Wages	120	15.828	1.200	13.244	18.098
CW^*	Capital per worker	120	−1.804	0.347	−3.888	−0.968
IC^*	Firms input costs of production	120	16.752	1.191	14.212	19.040
OC	Organized crime	120	4.518	1.661	0.000	7.560
YD	Year Dummies	120	0.667	0.473	0.000	1.000
ALP	Labor productivity	120	1.427	0.048	1.359	1.570
INV	Investment	120	14.935	1.184	11.995	17.202
HC	Human capital	120	4.017	0.118	3.766	4.217
NF	Number of firms	120	11.948	1.057	9.350	13.807
TAX	Tax wedge	120	0.329	0.008	0.312	0.346
CAU	Convictions of counterfeiting, alteration, and use of trademarks, distinctive signs or patents, models, and designs	120	1.542	1.194	0.000	4.357
FNI	Convictions of fraud against national industries	120	0.054	0.217	0.000	1.609
AST	Convictions of abusive use of seals and real tools	120	0.545	0.655	0.000	2.996
FTP	Convictions of forgery of tickets for public transport companies	120	0.653	0.813	0.000	2.944
FD	Convictions of falsehood in deeds	120	5.854	1.100	2.996	7.676

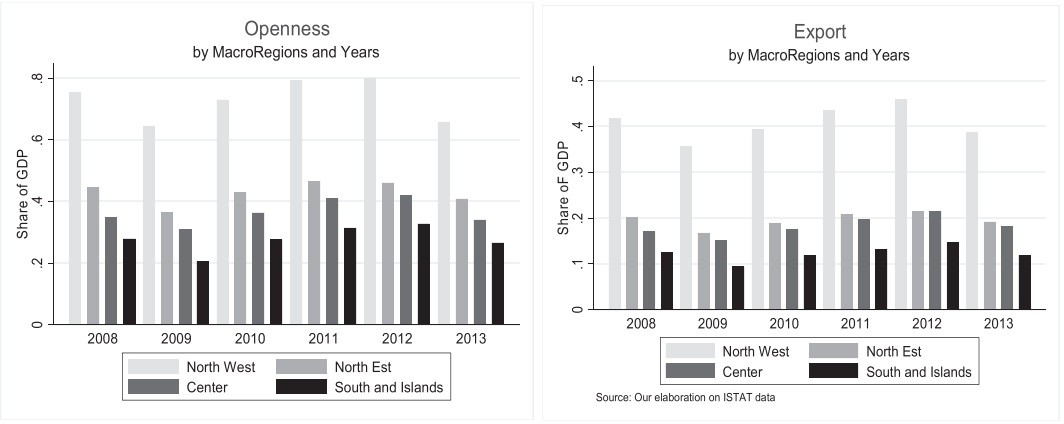

Fig. 3. Degree of economic openness and exports in Italian macro regions over 2008–2013 (share of regional GDP).
Source: own elaboration on Istat data

The counterfeiting industry is almost completely run by criminal organisations, which have turned it from a handcrafted activity into a criminal business of global dimensions (Camera dei Deputati, 2013, 2017). Different criminal organisations have different approaches to counterfeiting: *Camorra* (based in Campania) employs economic holdings[11] to directly control the counterfeit supply chain, mainly in Campania, but also in Lombardy and Latium; *'Ndrangheta* (based in Calabria) mainly provides for intermediation-services at the production and distribution level and controls the import of fakes through the Gioia-Tauro harbour and their re-export to EU member states; *Mafia* (based in Sicily) controls counterfeiting in food production only, due to its lack of tradition in fake goods and poor connections with Asian organized crime; and Chinese criminal organisations (based in Tuscany, the Northern regions, Latium, Marche and Campania) have developed synergies with Italian and African criminal groups to import and distribute fakes from China.

The pervasiveness of counterfeiting and its capacity to infiltrate the economy imply a spatial distribution different from that of organized crime. Fig. 4 shows that counterfeiting is spread over all the Italian regions, with some peaks in Southern regions, but also in the Centre (Latium and Abruzzo), and in the North (Veneto, Friuli Venezia-Giulia, Emilia-Romagna, Valle d'Aosta, and Trentino Alto Adige). In particular, some small regions in the Centre of Italy – notably, Abruzzo – have been chosen by *Camorra* as sheltered places for counterfeiting activities: thus, in Abruzzo, a relatively small number of police seizures – about 250 per year – resulted into about 2.4 million seized goods per year in the period studied.

In some cases, the high average dimension of seized goods is due to the presence of big harbours (Calabria, Abruzzo, and Veneto) or national borders (Friuli Venezia-Giulia, Trentino Alto-Adige, and Valle d'Aosta) that might determine an over-disclosure of the

[11] Criminal economic holdings are parallel, formally legal, business structures that are strictly incorporated into the criminal organisations.

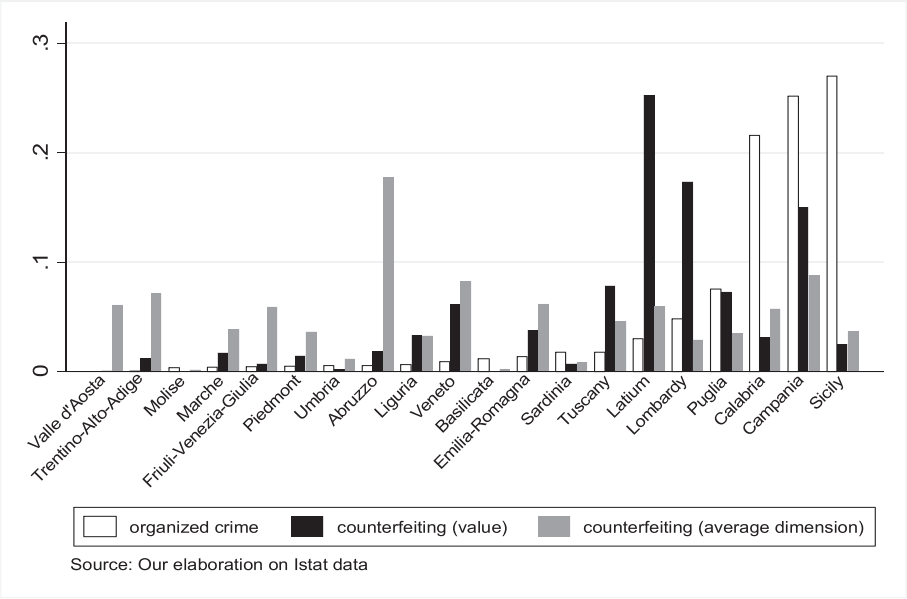

Fig. 4. Counterfeiting (average dimension and value of seized goods) and organized crime: regional share (2008–2013).

phenomenon with respect to other parts of Italy. For this reason, as mentioned, we also consider a different indicator of counterfeiting, namely, the estimated value of the seized goods, which is a reasonable signal revealing the regional diffusion of valuable counterfeiting activities.

Fig. 4 shows that the regions with the highest peaks of seizures are different from those with the highest value of seized goods. In particular, the highest values of seized goods can be found in those regions characterized either by a significant level of criminality (Campania and Puglia) or by rich markets in big metropolitan areas (Rome for Latium, Milan for Lombardy, and Naples for Campania). Finally, as in Tuscany and Veneto, counterfeiting might also be supported by the presence of a strong industrial background. For example, in Tuscany, an important economic area (Prato), with a fierce industrial history in textile and leather sectors, has been turned into an area of shadow production of counterfeited products.

In recent years counterfeiting has started to be considered a dangerous criminal industry, but the government's response has been slow and often weak. First, it proved difficult for public and judicial authorities to grasp the complex network of counterfeiting, its national and international dimensions, and criminal organisations' involvement. Second, anti-counterfeit policy has tended to be local and circumscribed, while only cooperation and coordination at national and international level could effectively measure the dangerousness of the challenge and offer adequate answers and the eradication of complex criminal networks (De Simone, 2016). The General Department against Counterfeiting-UIBM in the Ministry for Economic Development was created only in 2009 and the inter-ministry coordination council (Anti-Counterfeiting National Council CNAC) only in 2010. Third, in spite of the new laws adopted in 2009, a tolerant stance has persisted and can be measured in terms of missing resources both for actions against counterfeiting and for the police force in charge of detection: the budget resources devoted to anti-counterfeiting measures by the Ministry for Economic Development rapidly decreased from € 0.9 million in 2011 to € 0.25 million in 2013. Moreover, from 2009 to 2013, the overall staffing of the police forces[12] decreased by 11.300 units (−3.5%).[13]

5. The model and empirical results of regional trade and counterfeiting

In order to evaluate the impact of criminal activities on Italian trading firms, we focus on both the overall indicator of trade-openness and exports, our dependent variables. Given that we employ annual data that may adjust with delay to changes in their own direct determinants, we opt for a regional dynamic panel data model with a Generalized Method of Moments (GMM) estimator (Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 1998) that includes the lagged dependent variable as covariate - capturing the persistence of the agents' behavior with a partial adjustment mechanism -, as well as endogenous and predetermined variables. Our reference equation takes the following form:

$$y_{i,t} = \alpha y_{i,t-1} + X'_{it}\beta + \eta_i + v_{it}, \quad \text{with} \quad \eta_i + v_{it} = \varepsilon_{it} \tag{1}$$

where the error term ε_{it} has two components: the fixed effects η_i and the idiosyncratic shocks v_{it}. Our dependent variable, $y_{i,t}$, rep-

[12] The data include Police, Carabinieri, Guardia di Finanza, and Polizia Postale.
[13] Data come from the Conto annuale della Ragioneria dello Stato.

resents, in turn, trade openness and exports in region i at time t. The matrix $X'_{i,t}$ includes all regressors at a regional level. The correlation of the lagged dependent variable, $y_{i,\,t-1}$, with the fixed effects in the error term, causes Nickell (1981) dynamic panel bias, which can be overcome by taking the first differences of the original model (equation (2)):

$$\Delta y_{it} = \lambda_1 \Delta y_{i,t-1} + \lambda_2 \Delta X'_{it} + \Delta v_{it} \tag{2}$$

The first difference estimator eliminates time-invariant regressors and fixed effects. For this reason, we shall refer to both estimators: in level for our main results and the difference GMM estimation as a robustness check. We are aware of the fact that correlation between the differenced lagged dependent variable (and other endogenous variables) and the disturbance process may still remain. For this reason, along with the internal instruments employed in the present empirical setup, i.e. $y_{i,t-1}$ and $\Delta y_{i,t-1}$, we instrument the variables of the GMM with external instruments given that the usage of internal instruments may be not sufficient to remove the endogenous components in the data.[14]

In order to assess this issue, we rely on the Arellano-Bond test, on the over-identifying restrictions Sargan/Hansen tests, and on the instrument diagnostic suggested by Bazzi and Clemens (2013).

We exploit the properties of the GMM estimator and, also, report the estimates obtained with OLS and FE regressions that we use as a robustness check only for the lagged dependent variable of the GMM. In the OLS regression the lagged dependent variable is positively correlated with the error term (because of the presence of fixed effects), giving rise to an upward biased coefficient; at the opposite, the FE estimator yields a downward biased coefficient (Nickell, 1981). Therefore, robust GMM estimates of the lagged dependent variable are supposed to lie between these bounds. In Tables 2 and 3, column A shows the output of the two-step GMM regression,[15] whereas columns B and C report the OLS and FE regressions, respectively; in parentheses, we display the standard errors adjusted for the correction of Windmeijer (2005).

We follow a general-to-specific methodology (Hendry, 1983 and Hoover and Perez, 1999). Therefore, for each equation of Tables 2 and 3, the estimates are only those with explanatory variables that are significant in the GMM estimates.

As in Watt and Janssen (2003), the insertion of the lagged dependent variable is supposed to take into account the persistence of our time series. Both the degree of openness and exports are expected to be affected by their previous values, because of the inertia associated with changes in the regional markets' variables.

Along with the lagged dependent variable, in order to avoid the potential endogeneity bias in some of our regressors, we also consider lagged wages as a GMM internal instrument. Other internal instruments are the proxies for the level of regional competitiveness, i.e., input costs (*IC),* and labor productivity (*ALP)*. Notice that we do not consider the other lagged regressors, i.e. CA_D and CA_V, as internal instruments on the basis of the endogeneity test performed over the Hansen statistics (Hayashi, 2000; Baum et al., 2007).

Furthermore, in the exogenous instruments matrix we instrument our endogenous variables only with potential external instruments, including the indicators of firms' capital per worker (*CW),* a year dummy (*YD)*, and regional organized crime (*OC)*. The employment of these variables is justified on different grounds. *CW* in different regions is directly linked to the level of specialized work and, thus, to the level of competitiveness. Therefore, *CW* may be able to instrument our endogenous variables (*W,* CA_V and CA_D), delivering an error term uncorrelated with the explicative variables. Moreover, in order to account for period-specific effects, we consider the year dummy (*YD)*, which takes into account the financial and sovereign debt crises of 2009 and 2012, respectively. Finally, the organized crime variable *(OC)* is also considered as an instrument, given that criminal activities are deemed to be associated with the existence of counterfeiting activities but not with the disturbances. We find the external instruments to be essential, since their presence in the exogenous instruments matrix greatly improves the consistency of the resulting estimates.

To test the validity of the instruments, we employ the Sargan test of over-identifying restrictions, whose null hypothesis corresponds to the joint validity of the instruments. The value of the test statistics (18.40 and 23.90 for openness and exports, respectively), accompanied by a sufficiently high p-value (0.242 and 0.200, respectively) induce us to accept the null-hypothesis and to consider our instruments particularly appropriate. The Hansen test confirms the result found with the Sargan test, adding further evidence for the validity of the instruments used. We also report the Difference-in-Hansen tests of exogeneity of instruments subsets. This statistic under the null hypothesis of joint validity of the full instrument set is chi-squared distributed. In all our estimates, these tests do not reject the null hypothesis of exogeneity of the joint validity of the instruments in the restricted regression, with p-values almost equal to unity for both the internal and exogenous instruments matrices.

Moreover, to better address potential concerns regarding identification problems, we have performed the instrument diagnostic suggested by Bazzi and Clemens (2013). The under-identification test based on Kleibergen-Paap LM statistic and the overidentification test based on Hansen J statistic obtained from an extended instrumental variables estimation provide further support for the validity of the instruments. In addition, we present the Arellano-Bond test, which searches for the presence of autocorrelation in the idiosyncratic disturbance term that can make some lags invalid as instruments, even after controlling for the fixed effects. The Arellano-Bond test supports the findings of the Sargan/Hansen test, confirming our choice of the instruments. Moreover, we perform the test of the endogeneity of the regressors, in the spirit of Baum et al. (2007), on the subset of the regressors related to the counterfeiting activities, i.e. CA_D and CA_V. The test strongly suggests that these potentially endogenous variables can be considered exogenous in both empirical investigations of trade-openness and exports. Nevertheless, we recognize that the test does not exhaustively deal with the issues regarding endogeneity, which we address by relying on the system GMM estimator.

[14] The easiest way to instrument our not strictly exogenous variables is the 2SLS estimator, within the Anderson and Hsiao (1982) difference and levels estimator (see Roodman, 2009a).

[15] Two-step estimates are asymptotically more efficient than one-step estimates (see Blundell and Bond, 1998).

Table 2
Openness and counterfeiting.

Variables	A GMM	B OLS	C FE
	F(4,19)=60.92	F(4,95)=1615.83	R-sq:
	P>F=0.000	P>F=0.0000	within=0.2066
		R-squared=0.9855	between=0.6791
		RootMSE=0.1702	overall=0.6750
			F(4,76)=4.95
			P>F=0.0013
Ot-1	0.617**	0.978***	0.161
	(0.217)	(0.020)	(0.081)
CA_V	−0.377***	−0.036**	−0.083***
	(0.106)	(0.017)	(0.026)
CA_D	0.362***	0.028	0.067**
	(0.097)	(0.021)	(0.027)
W	0.813***	0.076**	0.937**
	(0.280)	(0.035)	(0.453)
Constant	−5.905**	−0.637**	−5.873
	(2.308)	(0.289)	(7.432)
	Wald test βCAV = βCAD		
	p-value=0.001		
	χ2=14.54		
	Sargan test		
	χ2=18.40 P> χ2=0.242		
	Hansen test		
	χ2=14.46 P> χ2=0.491		
	Arellano-Bond test for AR(1)		
	z = -2.40 P>z=0.017		
	Arellano-Bond test for AR(2)		
	z=-1.50 P>z=0.134		
	Difference-in-Hansen tests of exogeneity of instrument subsets		
	GMM (Ot-1, Wt-1, ALP, IC)		
	Hansen test excluding group: χ2=11.26 P> χ2=0.422		
	Difference (null H=exogenous): χ2=3.20 P> χ2=0.525		
	IV (OC, YD, CW)		
	Hansen test excluding group: χ2=12.80 P> χ2=0.384		
	Difference (null H=exogenous): χ2=1.66 P> χ2=0.646		
	Kleibergen-Paap LM statistic: χ2=16.507 P> χ2=0.002		
	Hansen J statistic: χ2=19.868 P> χ2= 0.000		

Notes: Number of observations = 100, number of groups = 20. The under-identification test based on Kleibergen-Paap LM statistic and the overidentification test based on Hansen J statistic are obtained from an extended instrumental variables estimation. The empirical investigation is performed under small sample adjustments. Standard deviations are in parenthesis. ***, **, and * correspond to the 1%, 5%, and 10% level of significance, respectively.

Finally, in addition to what is reported above regarding the use of the potential external instruments – i.e. capital per worker, regional organized crime, and the year dummy -, we provide also the Hansen test excluding group statistic related to the exclusion restriction. However, as stated previously, we are aware that the test for the exogeneity of instrument subsets may be particularly weakened by the low degree of overidentification (Roodman, 2009b).

Table 2 reports the estimates for trade openness across the Italian regions. The value of the coefficient of the lagged dependent variable O_{t-1} (0.617) implies that the level of regional persistence of the degree of economic openness is relatively high. Our proxy for competitiveness, *W*, positively and significantly affects economic openness. This suggests that the regions with higher costs of labor, possibly due to higher cost for specialized workers, have also experienced the greatest increase in their degree of economic openness.

As expected from Fig. 3, the variable signaling counterfeiting activities, i.e. *CAD*, positively and significantly affects the degree of economic openness. The estimated coefficient (0.362) suggests that counterfeiting activities increase, on average, exchanges with the rest of the world. This result accounts for the role played by counterfeiting in some Italian regions where low value/quality fake goods are either imported or produced in great number, falsely labelled, and sent abroad or to other regions for selling. However, this is only part of the story. Most importantly, our estimates display a negative and statistically significant impact of the estimated value of counterfeiting (*CAV*) on the degree of economic openness. The estimated coefficient of *CAV* (−0.377) clearly suggests that high value/profitable counterfeiting activities reduce the degree of economic openness and, hence, damage economic exchanges at the regional level. When counterfeiting activities are very remunerative, they infringe on IPRs and depress legal production and trade activities. This confirms the best Italian brands' vulnerability to counterfeiting. Moreover, the estimated coefficient of *CAD* is lower in absolute value than that of *CAV* and clearly shows the net damage for trade from counterfeiting. Given the similar size in absolute value of the two estimated coefficients of *CAV* and *CAD*, the result of the Wald test, on the difference of the two elasticities, is also reported in Table 2. As can be easily noted, the *p*-value shows that the difference of the two elasticities associated with the two different dimensions of counterfeiting activities is statistically highly significant.

Table 3
Export and counterfeiting.

Variables	A GMM	B OLS	C FE
	F(4,19)=147.48	F(4,95)=2043.99	R-sq:
	P>F=0.000	P>F=0.0000	within=0.1913
		R-squared=0.9885	between=0.9427
		RootMSE=0.1693	overall=0.9370
			F(4,76)=4.49
			P>F=0.0026
Xt-1	0.384**	0.917***	0.211**
	(0.164)	(0.031)	(0.100)
CA_V	−0.270***	−0.042**	−0.082***
	(0.090)	(0.017)	(0.027)
CA_D	0.250***	0.035*	0.067**
	(0.065)	(0.021)	(0.028)
W	0.934***	0.171***	0.711
	(0.144)	(0.050)	(0.474)
Constant	−6.922***	−1.571***	−3.464
	(1.173)	(0.434)	(7.757)
	Wald test βCAV = βCAD		
	p-value=0.002		
	χ2=13.50		
	Sargan test		
	χ2=23.90 P> χ2=0.200		
	Hansen test		
	χ2=18.32 P> χ2=0.501		
	Arellano-Bond test for AR(1)		
	z = -2.51 P>z=0.012		
	Arellano-Bond test for AR(2)		
	z=-0.81 P>z=0.420		
	Difference-in-Hansen tests of exogeneity of instrument subsets		
	GMM (Xt-1, Wt-1, ALP, IC)		
	Hansen test excluding group: χ2=16.95 P> χ2=0.322		
	Difference (null H=exogenous): χ2=1.38 P> χ2=0.848		
	IV (OC, YD, CW)		
	Hansen test excluding group: χ2=17.80 P> χ2=0.336		
	Difference (null H=exogenous): χ2=0.52 P> χ2=0.914		
	Kleibergen-Paap LM statistic: χ2=16.507 P> χ2=0.002		
	Hansen J statistic: χ2=19.868 P> χ2= 0.000		

Notes: Number of observations = 100, number of groups = 20. The underidentification test based on Kleibergen-Paap LM statistic and the overidentification test based on Hansen J statistic are obtained from an extended instrumental variables estimation. The empirical investigation is performed under small sample adjustments. Standard deviations are in parenthesis. ***, **, and * correspond to the 1%, 5%, and 10% level of significance, respectively.

Table 3 reports the empirical findings for Italian regional exports. This variable is a component of trade openness. Therefore, the estimates of regional exports can also be taken as a test of the goodness of fit of the main trade variable. The coefficient of the lagged dependent variable, X_{t-1}, (0.384) reveals a relatively low persistence in the level of regional exports in the period considered. This also means that the higher persistence of trade openness to its previous value is mainly driven by imports. In line with previous results, we find a negative and statistically significant impact of the estimated value of counterfeiting (*CAV*) (−0.270), which supports the view that a reduction in the level of regional exports is associated with the likely presence of a profitable market for counterfeited goods. Profitable counterfeiting activities reduce exports and, hence, damage the economic performance of high-value brands. Again, the average dimension of fake good seizures positively and significantly impacts exports. The estimated coefficient (0.250) for *CAD* suggests that production/exchange of counterfeited goods contributes to regional exports. Moreover, the *p*-value associated with the Wald test suggests that the difference of the two elasticities associated with the two different dimensions of counterfeiting is statistically highly significant. The estimated coefficient of *CAD* is again lower than *CAV*, confirming a negative and statistically significant net effect of crime on regional exports.

The variable capturing competitiveness positively and significantly affects exports, as in trade openness estimates. The estimated elasticity of wages (0.934) suggests that the productivity divide between Centre-North and Southern regions is mirrored also in an export divide. Notice, however, the higher impact of wages on exports than on trade openness, which possibly reflects the effect of skill-intensive production (Aitken et al. 1997) that dominates over the positive effect of the increased demand for imported goods, due to the increase in wages.

The simultaneous presence of both a positive and a negative impact on trade of the two variables for the value and the dimension of counterfeiting confirms the dual impact of fake products, which both depress the legal market relying on IPRs, and support Italian economic activity in the shadow market. These positive economic returns of counterfeiting can potentially make fighting it more

difficult, weaken repression by public authorities, and pave the way to tolerance – a mix of inertia and complicity. Therefore, the widespread presence of counterfeiting cannot be accounted for only by the difficulties that public authorities meet in fighting increasingly sophisticated illegal markets. Neither can it be interpreted, in line with Anderson (2006), just as the rational response by policymakers who have low enforcement capacity. In any case, evidence of the overall negative net impact of counterfeiting on exports and trade openness should call for the abandonment of the so far ambiguous policy stances towards what is considered a 'soft' form of economic crime.

5.1. Robustness

In order to assess the robustness of our results, we provide some additional specifications of the basic model of trade openness by means of a set of specific control variables. Tables 4 and 5 report the results of this exercise.

In particular, Table 4 addresses two important issues that might arise in the basic model. First, the main estimates do not contain year fixed effects. This would be a problem of the empirical model because there have been exogenous shocks during our observation period that hit the entire Italian economy and that, if left unconsidered, bias our results. Second, those variables, considered as strictly exogenous instruments, not used as regressors in the empirical equation, might *per se* originate a problem of endogeneity.

Table 4 reports the outcome of the different model specifications to overcome these legitimate doubts. More precisely, column (1) reports the estimation results obtained by considering the difference GMM model specification, which removes the time invariant components. Nevertheless, we are aware of the fact that this estimator is shown to perform relatively poorly in high memory time series data (Bond et al., 2001). Therefore, column (2) reports the results obtained by an alternative specification of the benchmark model that controls for the year dummy *(YD)* among the explanatory variables. Columns (3) and (4) detail the outcomes of the empirical model when, respectively, capital per worker *(CW)* and organized crime *(OC)* are considered among the regressors. The outcomes of all of these exercises show that once the different and potentially strictly exogenous variables are taken into account, the results are qualitatively and quantitatively in line with the results obtained from the main empirical model, further confirming also the overall net negative impact of counterfeiting on trade, i.e. $|CAD|<|CAV|$.

Table 5 addresses additional robustness tests. In particular, column (1) reports the results obtained from the benchmark model specification augmented by private investments, *INV,* to account for the dynamism of the private sector and for regional economic climate and entrepreneur expectations of economic activity. Column (2) reports the results obtained by including human capital, *HC,* a proxy for knowledge and, indirectly, for technical progress and investment attractiveness. Given the particular period under

Table 4
Robustness check on the empirical specification.

Variables	(1)	(2)	(3)	(4)
Ot-1	0.579* (0.299)	0.665*** (0.211)	0.612** (0.219)	0.558* (0.285)
CA_V	−0.360*** (0.084)	−0.347*** (0.098)	−0.376*** (0.104)	−0.374*** (0.106)
CA_D	0.331*** (0.098)	0.337*** (0.103)	0.364*** (0.099)	0.370*** (0.115)
W	0.894** (0.407)	0.735** (0.273)	0.809*** (0.274)	0.891* (0.463)
Constant	−6.860* (3.880)	−5.427** (2.230)	−5.858** (2.276)	−6.558 (3.920)
Diff-GMM	YES	NO	NO	NO
YD	NO	YES	NO	NO
CW	NO	NO	YES	NO
OC	NO	NO	NO	YES
Wald test βCAV = βCAD	χ2=15.49	χ2=12.72	χ2=14.37	χ2=11.87
	P>z =0.001	P>z =0.002	P>z =0.001	P>z =0.003
Sargan test	χ2=20.88	χ2=17.16	χ2=18.40	χ2=18.34
	P> χ2=0.141	P> χ2=0.248	P> χ2=0.189	P> χ2=0.192
Hansen test	χ2=12.00	χ2=15.37	χ2=14.30	χ2=14.55
	P> χ2=0.679	P> χ2=0.353	P> χ2=0.428	P> χ2=0.410
Arellano-Bond test for AR(1)	z=-2.39	z=-2.31	z=-2.37	z=-2.37
	P>z=0.017	P>z=0.021	P>z=0.018	P>z=0.018
Arellano-Bond test for AR(2)	z=-1.64	z=-1.42	z=-1.59	z=-1.52
	P>z=0.101	P>z=0.156	P>z=0.111	P>z=0.128
Difference-in-Hansen tests of exogeneity of instrument subsets				
GMM (Xt-1, Wt-1, ALP, IC)				
Hansen test excluding group	χ2=10.96	χ2=11.66	χ2=11.29	χ2=9.77
	P> χ2=0.446	P> χ2=0.308	P> χ2=0.335	P> χ2=0.461
Difference (null H=exogenous):	χ2=1.03	χ2=3.71	χ2=3.01	χ2=4.78
	P> χ2=0.905	P> χ2=0.447	P> χ2=0.557	P> χ2=0.311
IV (OC, YD, CW)				
Hansen test excluding group	χ2=11.29	χ2=13.56	χ2=12.75	χ2=11.94
	P> χ2=0.505	P> χ2=0.259	P> χ2=0.310	P> χ2=0.368
Difference (null H=exogenous):	χ2=0.71	χ2=1.81	χ2=1.54	χ2=2.61
	P> χ2=0.871	P> χ2=0.612	P> χ2=0.672	P> χ2=0.456

Notes: Number of observations = 100, Number of groups = 20. Standard deviations are in parenthesis. ***, **, and * correspond to the 1%, 5% and 10% level of significance, respectively.

Table 5
Robustness check for specific control variables.

Variables	(1)	(2)	(3)	(4)
Ot-1	0.626** (0.221)	0.617** (0.233)	0.612** (0.230)	0.582** (0.208)
CA_V	−0.378*** (0.110)	−0.376*** (0.091)	−0.370*** (0.109)	−0.382*** (0.115)
CA_D	0.365*** (0.106)	0.362*** (0.086)	0.359*** (0.087)	0.373*** (0.108)
W	0.694** (0.324)	0.812*** (0.272)	0.847 (0.513)	0.880*** (0.286)
Constant	−5.877** (2.276)	−5.962 (6.337)	−5.967** (2.590)	−9.375* (4.561)
INV	YES	NO	NO	NO
HC	NO	YES	NO	NO
NF	NO	NO	YES	NO
TAX	NO	NO	NO	YES
Wald test βCAV = βCAD	χ2=12.85	χ2=19.92	χ2=15.97	χ2=12.52
	P>z =0.002	P>z =0.000	P>z =0.001	P>z =0.002
Sargan test	χ2=16.63	χ2=18.45	χ2=18.79	χ2=16.83
	P> χ2=0.276	P> χ2=0.187	P> χ2=0.173	P> χ2=0.265
Hansen test	χ2=14.42	χ2=11.29	χ2=12.37	χ2=13.66
	P> χ2=0.419	P> χ2=0.663	P> χ2=0.576	P> χ2=0.476
Arellano-Bond test for AR(1)	z=-2.29	z=-2.46	z=-2.43	z=-2.45
	P>z=0.022	P>z=0.014	P>z=0.015	P>z=0.014
Arellano-Bond test for AR(2)	z=-1.43	z=-1.50	z=-1.46	z=-1.47
	P>z=0.153	P>z=0.133	P>z=0.145	P>z=0.140
Difference-in-Hansen tests of exogeneity of instrument subsets				
GMM (Xt-1, Wt-1, ALP, IC)				
Hansen test excluding group	χ2=11.02	χ2=10.06	χ2=10.96	χ2=10.86
	P> χ2=0.356	P> χ2=0.435	P> χ2=0.361	P> χ2=0.369
Difference (null H=exogenous):	χ2=3.40	χ2=1.23	χ2=1.41	χ2=2.80
	P> χ2=0.494	P> χ2=0.873	P> χ2=0.842	P> χ2=0.592
IV (OC, YD, CW)				
Hansen test excluding group	χ2=12.09	χ2=11.01	χ2=10.71	χ2=12.52
	P> χ2=0.357	P> χ2=0.443	P> χ2=0.468	P> χ2=0.326
Difference (null H=exogenous):	χ2=2.32	χ2=0.28	χ2=1.67	χ2=1.13
	P> χ2=0.508	P> χ2=0.963	P> χ2=0.645	P> χ2=0.769

Notes: Number of observations = 100, Number of groups = 20. Standard deviations are in parenthesis. ***, **, and * correspond to the 1%, 5%, and 10% level of significance, respectively.

investigation, when a considerable number of Italian firms exited the market because of the crisis, in column (3) we consider the number of firms in different years, *NF*, accounting for the changes in market size and structure and as a further proxy for competition. Column (4) includes the tax wedge, *TAX*, which accounts for regional economic attractiveness.

Table 5 shows that including these control variables does not change the results of the benchmark model. Moreover, the robustness analysis confirms the conclusions drawn from the main estimates for both variables proxying counterfeiting activities. The negative elasticity of *CAD* in all model specifications clearly suggests that profitable counterfeiting activities reduce the degree of economic openness, with most results being very close to those obtained in the main model. Overall, and most importantly, Table 5 provides additional evidence of the overall net negative impact of counterfeiting on trade, i.e. $|CAD|<|CAV|$, further validating the empirical results suggested by the benchmark specification.

Finally, in order to account for (potentially) confounding factors,[16] Table 6 reports the results for different empirical specifications based on a set of crime variables potentially simultaneously correlated with trade and counterfeiting. Column (1) reports the results when the benchmark model includes a measure of counterfeiting activities not directly related to seizures, i.e. convictions for counterfeiting, alteration, and use of trademarks, distinctive signs or patents, models, and designs (*CAU*). Column (2) details the results obtained by including the number of convictions for fraud against national industries (*FNI*) in order to control for a more direct additional confounding factor having detrimental effects on the regional producers. In Column (3) we further investigate whether the presence of activities related to regional counterfeiting captured by the abusive use of seals and real tools (*AST*) affects the main results. Columns (4) and (5) show the results obtained by considering two additional crime variables, namely forgery of tickets for public transport companies (*FTP*) and falsehood in deeds (*FD*), respectively. The results obtained clearly confirm both the robustness of our empirical results to (potentially) confounding control variables and the conclusions drawn from the benchmark model, also in terms of signs and in size of the estimates.

6. Conclusions

We have analyzed the impact of counterfeiting criminal activities on Italian regional trade indicators during the economic and financial crisis. Counterfeiting activities might have beneficial effects on trade and the local economy thanks to their positive returns in

[16] We thank an anonymous referee for the suggestion.

Table 6
Robustness check for potentially confounding criminal indicators.

Variables	(1) CAU	(2) FNI	(3) AST	(4) FTP	(5) FD
Ot-1	0.603** (0.234)	0.617** (0.217)	0.617** (0.219)	0.617*** (0.213)	0.611** (0.236)
CA_V	−0.371*** (0.097)	−0.377*** (0.106)	−0.376*** (0.107)	−0.379*** (0.108)	−0.371*** (0.095)
CA_D	0.360*** (0.096)	0.363*** (0.093)	0.363*** (0.094)	0.362*** (0.099)	0.363*** (0.103)
W	0.837** (0.339)	0.814*** (0.277)	0.814** (0.285)	0.808** (0.294)	0.836* (0.410)
Constant	−6.171* (3.001)	−5.915** (2.263)	−5.937** (2.415)	−5.794** (2.602)	−6.117 (3.627)
CAU	YES	NO	NO	NO	NO
FNI	NO	YES	NO	NO	NO
AST	NO	NO	YES	NO	NO
FTP	NO	NO	NO	YES	NO
FD	NO	NO	NO	NO	YES
Wald test βCAV = βCAD	χ2=15.82	χ2=15.16	χ2=14.75	χ2=14.15	χ2=16.70
	P>z =0.001	P>z =0.001	P>z =0.001	P>z =0.001	P>z =0.001
Sargan test	χ2=18.26	χ2=18.35	χ2=18.50	χ2=18.07	χ2=18.74
	P> χ2=0.195	P> χ2=0.191	P> χ2=0.185	P> χ2=0.203	P> χ2=0.175
Hansen test	χ2=13.29	χ2=14.07	χ2=13.64	χ2=14.23	χ2=10.98
	P> χ2=0.504	P> χ2=0.445	P> χ2=0.477	P> χ2=0.433	P> χ2=0.687
Arellano-Bond test for AR(1)	z=-2.10	z=-2.41	z=-2.42	z=-2.40	z=-2.36
	P>z=0.035	P>z=0.016	P>z=0.016	P>z=0.017	P>z=0.018
Arellano-Bond test for AR(2)	z=-1.35	z=-1.39	z=-1.41	z=-1.48	z=-1.43
	P>z=0.176	P>z=0.163	P>z=0.158	P>z=0.139	P>z=0.153
Difference-in-Hansen tests of exogeneity of instrument subsets					
GMM (Xt-1, Wt-1, ALP, IC)					
Hansen test excluding group	χ2=7.40	χ2=10.55	χ2=11.30	χ2=10.98	χ2=9.26
	P> χ2=0.687	P> χ2=0.393	P> χ2=0.335	P> χ2=0.359	P> χ2=0.507
Difference (null H=exogenous):	χ2=5.89	χ2=3.52	χ2=2.34	χ2=3.25	χ2=1.72
	P> χ2=0.208	P> χ2=0.476	P> χ2=0.673	P> χ2=0.516	P> χ2=0.787
IV (OC, YD, CW)					
Hansen test excluding group	χ2=12.39	χ2=12.73	χ2=12.50	χ2=12.69	χ2=10.22
	P> χ2=0.335	P> χ2=0.312	P> χ2=0.327	P> χ2=0.314	P> χ2=0.511
Difference (null H=exogenous):	χ2=0.91	χ2=1.34	χ2=1.14	χ2=1.55	χ2=0.77
	P> χ2=0.824	P> χ2=0.719	P> χ2=0.769	P> χ2=0.672	P> χ2=0.858

Notes: Number of observations = 100, Number of groups = 20. Standard deviations are in parenthesis. ***, **, and * correspond to the 1%, 5% and 10% level of significance, respectively.

terms of (shadow) employment and income. As police authorities observe, organized crime has made counterfeiting a highly structured, well-organized industry, applying techniques from other criminal activities and marketing models that grant diffusion and success to illegal trade. The counterfeit industry can also intercept global trade flows and impact regional trade, acting as a social buffer in areas of widespread unemployment, social and economic depression, and insufficient public control of the territory.

The benefit of increased trade flows, however, might be offset by the loss of private investors' confidence, limits to business innovation, and the destruction of true competitiveness with negative consequences for Italian firms, which are very exposed to counterfeiting because their small size makes it difficult to adequately react. Therefore, in the Italian context, counterfeiting might also be a crucial disruptive element to business development that puts at risk the important economic achievements that thousands of firms have contributed to.

By determining the impact of both the volume and profitability of counterfeiting on outward trade capacity, we have been able to capture Italy's unique position as a country that produces and exchanges large quantities of both fake and authentic products, thanks to tolerant public policies towards this type of economic crime, often considered more unethical than illegal. We have found both that trade increases with the volume of counterfeiting and that profitable counterfeiting activities, which target high-value/high-quality goods, challenge business innovation and firms' competitiveness with a depressing impact on trade indicators. Most importantly, we have found that the net effect is negative.

In conclusion, Northern regions' strong economic systems might limit the damages, whereas in Southern regions counterfeiting contributes to inhibiting economic development and perpetuating stagnation. Therefore, tolerance of counterfeiting activities, in the hope of beneficial effects on the local economy, actually generates a net damage to Italian exchanges, which are at the core of the country's economic strength.

Declaration of competing interest

The authors declare that there are no conflicts of interest.

Acknowledgements

The authors are indebted for very constructive comments to Arye Hillman, Thomas Stratmann, two anonymous referees and all

participants to the 2nd Ariel Conference on The Political Economy of Public Policy. The usual disclaimer applies. Financial support by the Italian National School of Administration (SNA) is gratefully acknowledged.

References

Aitken, B., Hanson, G.H., Harrison, A.E., 1997. Spillovers, foreign investment, and export behavior. J. Int. Econ. 43 (1–2), 103–132.
Anderson, J.E., 2006. Commercial Policy in a Predatory World. NBER Working Paper N, p. 12576.
Anderson, D.A., 2011. The costs of crime. Found. Trends® Microecon. 7 (3), 209–265.
Anderson, J.E., Bandiera, O., 2005. Private enforcement and social efficiency. J. Dev. Econ. 77 (2), 341–366.
Anderson, T.W., Hsiao, C., 1982. Formulation and estimation of dynamic models using panel data. J. Econom. 18 (1), 47–82.
Anderson, J.E., Marcouiller, D., 2002. Insecurity and the pattern of trade: an empirical investigation. Rev. Econ. Stat. 84 (2), 342–352.
Anderson, J.E., van Wincoop, E., 2003. Gravity and gravitas: a solution to the border puzzle. Am. Econ. Rev. 93 (1), 170–192.
Anderson, J.E., van Wincoop, E., 2004. Trade costs. J. Econ. Lit. 42 (3), 691–751.
Antweiler, W., Trefler, D., 2002. Increasing returns and all that: a view from trade. Am. Econ. Rev. 92 (1), 93–119.
Arellano, M., Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Rev. Econ. Stud. 58, 277–297.
Arellano, M., Bover, O., 1995. Another look at the instrumental variable estimation of error-components models. J. Econom. 68, 29–51.
Baier, S.L., Bergstrand, J.H., 2001. The growth of world trade: tariffs, transport costs, and income similarity. J. Int. Econ. 53 (1), 1–27.
Baldwin, R., Taglioni, D., 2007. Trade effects of the euro: a comparison of estimators. J. Econ. Integrat. 22 (4), 780–818.
Banerjee, D.S., 2006. Lobbying and commercial software piracy. Eur. J. Polit. Econ. 22 (1), 139–155.
Bank of Italy, 2014. L'economia Delle Regioni Italiane Nel 2013, vol. 21. Economie Regionali, Rome.
Baum, C.F., Schaffer, M.E., Stillman, S., 2007. Enhanced routines for instrumental variables/generalized method of moments estimation and testing. STATA J. 7 (4), 465–506.
Baxter, M., Kouparitsas, M.A., 2006. What determines bilateral trade flows? NBER Working Papers No 12188.
Bazzi, S., Clemens, M., 2013. Blunt instruments: avoiding common pitfalls in identifying the causes of economic growth. Am. Econ. J. Macroecon. 5 (2), 152–186.
Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. J. Econom. 87, 115–143.
Bond, S.R., Höffler, A., Temple, J.R., 2001. GMM Estimation of Empirical Growth Models (CEPR Discussion Papers/Centre for Economic Policy Research Discussion Papers).
Bourguignon, F., 1999. Crime, violence, and inequitable development. In: Pleskovic, B., Stiglitz, J. (Eds.), Annual World Bank Conference on Development Economics. World Bank, Washington, DC, pp. 199–220.
Camerini, D., Favarin, S., Dugato, M., 2015. *Estimating The Counterfeit Markets in Europe*, Transcrime Research in Brief - N.3/2015. Università degli Studi di Trento.
CEBR, 2000. The Impact of Counterfeiting on Four Key Sectors in the. European Union, London.
Censis-Uibm, 2018. Il valore economico e l'impatto fiscale della contraffazione (Rome).
Cesareo, L., 2015. Counterfeiting and Piracy: A Comprehensive Literature Review. Springer, Cham: Switzerland.
Chalfin, A., 2016. Economic costs of crime. In: Jennings, W.G. (Ed.), The Encyclopedia of Crime and Punishment. John Wiley & Sons, Inc. https://doi.org/10.1002/9781118519639.wbecpx193.
Chaudhry, P.E., Zimmerman, A., 2009. The Economics of Counterfeit Trade. Governments, Consumers, Pirates and Intellectual Property Rights. Springer, Berlin.
Clark, D., 2006. Counterfeiting in China: a blueprint for change. China Bus. Rev. 33 (1), 14–49.
Confcommercio, 2019. Indagine su illegalità, contraffazione. e abusivismo, Rome.
Daniele, V., Marani, U., 2011. Organized crime, the quality of local institutions and FDI in Italy: a panel data analysis. Eur. J. Polit. Econ. 27 (1), 132–142.
Davis, D., Weinstein, D., 2001. An account of global factor trade. Am. Econ. Rev. 91 (5), 1423–1453.
De Simone, M.V., 2016. Audizione sui rapporti tra criminalità organizzata e contraffazione. Italian Parliament, Rome.
dei Deputati, Camera, 2013. *Relazione sui rapporti tra criminalità organizzata e contraffazione*, Commissione Parlamentare di inchiesta sui fenomeni della contraffazione, della pirateria in campo commerciale e del commercio abusivo (Roma).
dei Deputati, Camera, 2017. *Relazione sui rapporti tra criminalità organizzata e contraffazione*, Commissione Parlamentare di inchiesta sui fenomeni della contraffazione, della pirateria in campo commerciale e del commercio abusivo (Roma).
Dills, A.K., Miron, J.A., Summers, J., 2008. What Do Economists Know about Crime. NBER Working Paper No.13759.
Dominguez-Rivera, P., Raphael, S., 2015. The role of the costs-of-crime literature in bridging the gap between social science research and policy-making: potentials and limitations. Criminol. Publ. Pol. 14 (4), 589–632.
Douhou, S., Magnus, J.R., van Soest, A., 2011. The perception of small crime. Eur. J. Polit. Econ. 27 (4), 749–763.
Europol-Ohim, 2015. Situation Report on Counterfeiting in the European Union. EUROPOL & Office for Harmonisation in the Internal Market, The Hague.
Fedeli, S., Mariella, V., Onofri, M., 2018. Determinants of joblessness during the economic crisis: impact of criminality in the Italian labour market. Soc. Indicat. Res. 139 (2), 559–588.
Feenstra, R.C., 1998. Integration of trade and disintegration of production in the global economy. J. Econ. Perspect. 12 (4), 31–50.
Feinberg, R., Rousslang, D.J., 1990. The economic effects of intellectual property right infringements. J. Bus. 63 (1), 79–90.
Frontier Economics, 2016. The Economic Impacts of Counterfeiting and Piracy. Frontier Economics Ltd, London.
Gao, 2010. Observations on Efforts to Quantify the Economic Effects of Counterfeit and Pirated Goods. US General Accountability Office, Washington, D.C.
Garfinkel, M.,R., Skaperdas, S., Syropoulos, C., 2009. International Trade and Transnational Insecurity: How Comparative Advantage and Power Are Jointly Determined. CESifo Working Paper. No.2680.
Glick, R., Rose, A.K., 2002. Does a currency union affect trade? The time-series evidence. Eur. Econ. Rev. 46 (6), 1125-51.
Green, R.T., Smith, T., 2002. Executive insights: countering brand counterfeiters. J. Int. Market. 10 (4), 89–106.
Grossman, G.M., Shapiro, C.L., 1988. Counterfeit-Product trade. Am. Econ. Rev. 78 (1), 59–75.
Hayashi, F., 2000. Econometrics. Princeton University Press, Princeton.
Hendry, D.F., 1983. Econometric modelling: the 'consumption function' in retrospect. Scot. J. Polit. Econ. 30 (3), 193–220.
Hetzler, W., 2002. Godfathers and pirates: counterfeiting and organized crime. *Eur. J. Crime Crim. Law Crim. Justic*e 10 (4), 303–320.
Hoover, K.D., Perez, S.J., 1999. Reply to our discussants. Econom. J. 2 (2), 244–247.
IPERICO, 2012. La Contraffazione in Cifre. Ministry of Economic Development, Rome.
Lorentzen, P., McMillan, J., Wacziarg, R., 2007. Death and development. J. Econ. Growth 13 (2), 81–124.
Marcoullier, D., 2000. Hijacking, Hold-Up, and International Trade, Boston College Working Papers in Economics 477. Boston College Department of Economics.
Maskus, K.E., Penubarti, M., 1995. How trade-related are intellectual property rights? J. Int. Econ. 39 (3–4), 227–248.
Nickell, S., 1981. Biases in dynamic models with fixed effects. Econometrica 49 (6), 1417–1426.
OECD, 2008. The Economic Impact of Counterfeiting and Piracy. OECD Publishing, Paris.
OECD, 2009. Magnitude of Counterfeiting and Piracy of Tangible Products: an Update. OECD Publishing, Paris.
OECD, 2013. New Sources of Growth: Knowledge-Based Capital, Synthesis Report. OECD Publishing, Paris.
OECD, 2016. Trade in Counterfeit and Pirated Goods: Mapping the Economic Impact. OECD Publishing, Paris.
OECD, 2018. Trade in Counterfeit Goods and the Italian Economy: Protecting Italy's Intellectual Property. OECD Publishing, Paris.
OECD, 2019. Trade in Counterfeit and Pirated Goods: Mapping the Economic Impact. OECD Publishing, Paris.

Peri, G., 2004. Social Variables and Economic Success: the Case of Italian Industrial Development. Department of Economics, Davis. Working Papers 95, University of California.
Pinotti, P., 2015. The economic costs of organised crime: evidence from southern Italy. Econ. J. 125 (586), 203–232.
Powell, B., Manish, G.P., Nair, M., 2010. Corruption, crime, and economic growth. In: Benson, B., Zimmerman, P. (Eds.), *Handbook On the Economics Of Crime*. E. Elgar Publishing, Cheltenham, UK, pp. 328–341.
Primo Braga, C.A., Fink, C., 1998. The relationship between intellectual property rights and foreign direct investment. Duke J. Comp. Int. Law 9 (1), 163–188.
Priporas, C.V., Kamenidou, I., Kapoulas, A., Papadopoulou, F., 2015. Counterfeit purchase typologies during an economic crisis. Eur. Bus. Rev. 27 (1), 2–16.
Qian, Y., 2008. Impacts of entry by counterfeiters. Q. J. Econ. 123 (4), 1577–1609.
Qian, Y., 2011. Counterfeiters: Foes or Friends? How Do Counterfeits Affect Different Product Quality Tiers? NBER Working Paper No. 16785.
Qian, Y., 2014. Brand management and strategies against counterfeits. J. Econ. Manag. Strat. 23 (2), 317–343.
Roodman, D., 2009a. How to do xtabond2: an introduction to difference and system GMM in Stata. STATA J. 9 (1), 86–136.
Roodman, D., 2009b. A note on the theme of too many instruments. Oxf. Bull. Econ. Stat. 71 (1), 135–158.
Organized crime infiltration of legitimate businesses in europe: a pilot project in five European countries. In: Savona, E.U., Berlusconi, G. (Eds.), 2015. Final Report of Project ARIEL. Transcrime – Università degli Studi di Trento.
Scaglione, A., 2016. Cosa Nostra and Camorra: illegal activities and organisational structures. Global Crime 17 (1), 60–78.
Scognamiglio, A., 2018. When the mafia comes to town. Eur. J. Polit. Econ. 55, 573–590.
Silvestrelli, P., 2018. Problematiche socio-economiche dei processi produttivi e distributivi di beni contraffatti. *Economia e diritto del terziario*-Open Access, 3.
Skaperdas, S., 2001. The political economy of organized crime: providing protection when the state does not. Econ. Govern. 2 (3), 173–202.
Smith, P.J., 2001. How do foreign patent rights affect U.S. exports, affiliate sales and licenses? J. Int. Econ. 55 (2), 411–439.
Soares, R., 2009. Welfare costs of crime and common violence: a critical review. In: Skaperdas, S., et al. (Eds.), The Costs of Violence. The World Bank, Washington, DC, pp. 27–47.
Staake, T., Thiesse, F., Fleisch, E., 2009. The emergence of counterfeit trade: a literature review. Eur. J. Market. 43 (3/4), 320–349.
Staake, T., Thiesse, F., Fleisch, E., 2012. Business strategies in the counterfeit market. J. Bus. Res. 65 (5), 658–665.
VanDijk, J., 2007. Mafia Markers: assessing organized crime and its impact upon societies. Trends Organ. Crime 10 (4), 39–56.
Watt, A., Janssen, R., 2003. Unemployment and labour market institutions: why reforms pay off. In: IMF World Economic Outlook (Chapter IV).
Wickramasekera, N., Wright, J., Elsey, H., Murray, J., Tubeu, S., 2015. Cost of crime: a systematic review. J. Crim. Justice.
Windmeijer, F., 2005. A finite sample correction for the variance of linear efficient two-step GMM estimators. J. Econom. 126 (1), 25–51.
Yamarik, S., Ghosh, S., 2005. A sensitivity analysis of the gravity model. Int. Trade J. 19 (1), 83–126.
Yao, J.T., 2005. How a luxury monopolist might benefit from a stringent counterfeit monitoring regime. Int. J. Bus. Econ. 4 (3), 177–192.