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ABSTRACT

# Appointed or Elected? How Mayoral Accountability Impacts the Provision of Policing*

This paper studies how the system by which mayors are elected impacts mayoral accountability and their provision of public goods. To do so, we analyze policing and crime incidence under mayors directly elected by voters and under mayors appointed by an elected body. Our identification strategy exploits a natural experiment provided by the introduction in 2005 of direct mayoral elections in the municipalities of one region of Belgium, Wallonia. Estimating a difference-in-differences model with a rich dataset registering locally-reported crimes from 2000 to 2012, our results show a post-reform decrease in overall crime between 4.9% and 5.7%, depending on the specification. Our results further suggest that more accountable mayors prefer fighting certain type of crimes more intensely, rather than increasing police efficiency overall. Lastly, our results show that the post-reform benefits we observe dissolve when the management of local police has to be coordinated among neighboring mayors, especially if they come from different political parties.

**JEL Classification:** D72, H10, K14, K40
**Keywords:** electoral accountability, crime, mayoral election, police

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# 1 Introduction

Local governance profoundly impacts the daily life of citizens and society more broadly. At the head of local governance, individual mayors control the provision of high-quality public goods. The extent to which mayors control this provision successfully can depend on the electoral system which brought them to power and holds them accountable, especially when they seek reelection. This paper tests this reality by identifying how two alternative systems of selecting mayors – one by appointment and another by direct election– impact mayoral accountability and decisions mayors make about the provision of public goods. This study emerges at a moment of particular relevance because reforms introducing directly-elected mayors have become more common over the past few decades. To cite a few examples, Italy institutionalized the direct election of mayors throughout the country in 1993; in the United Kingdom, the Greater London Authority had its first directly-elected mayor in 2000; and Croatia and Ireland introduced direct mayoral elections countrywide in 2009 and 2011, respectively. Elsewhere throughout the world, Burundi inaugurated the post-civil war democratic transition by implementing local elections in 2010 and in India citizens have been directly choosing their mayors since 2016.

With this trend and the broader relationship between mayors and the provision of public goods in mind, this paper tests whether switching to directly-elected mayors impacts the quality of safety, one particularly important public good. To do so, we exploit a 2005 reform implemented in Belgium that introduced the direct elections of mayors in one of the three federal regions, Wallonia, while mayors in the other regions (Flanders and the Greater Brussels) remained appointed by their respective city councils.[1] We use a difference-in-differences strategy to compare crime incidence in municipalities with directly-elected mayors and those with appointed mayors, before and after the 2005 reform.

There is no harmonized and complete dataset on local election outcomes and mayors in Belgium. This paper helps close this gap by building the first database of local election outcomes for all 589 Belgian municipalities between 2000 to 2012. This new dataset is then merged to implement our research design with data on local police force and crime incidence as well as municipal-level, socio-economic characteristics and public expenditures.

Overall, we find a statistically significant decrease in crime incidence of 4.6% in the municipalities impacted by the reform. The direct election of mayors seems to have a positive causal impact on the provision of safety at the local level. Looking at the impact by type of crime, we show that directly-elected mayors particularly encourage policing against violence and robbery, two of the most electorally-sensitive types of crimes and thus rule out

[1] We also rely on three central features of local government in Belgium. First, all Belgian mayors are also chiefs of their local police and are thus responsible for law enforcement in their municipalities. Second, local police officers are key to fighting criminality in Belgium. Finally, crime is a salient issue for local politicians, especially during electoral campaigns. According to the 2010 round of Eurobarometer surveys, 35% and 25% of Belgians worry about burglary and violent crime, respectively.

a general increase in police efficiency.

Our evidence is consistent with the argument that the 2005 Wallonian reform made local elections more competitive and as a consequence mayoral accountability to citizens and efforts to fight criminality increased. Starting from the first region-wide direct elections in 2006, incumbent mayors who ran for re-election faced a wider pool of potential opponents, both from other parties and from the same list. In order to stand out from the crowd of candidates and gain support, their campaigns focused on issues they could control directly – such as those related to safety. Voters were, therefore, able to acquire more information on a candidate's priorities and vote for those with a clear plan addressing criminality. Increased electoral competition, moreover, motivated incumbent mayors to tighten control over their police commissioners – the actual law enforcers. Once elected, mayors also closely monitored their police forces, especially if they were planning to pursue political careers. It is for all these reasons that the direct election of mayors created incentives for mayors to provide public goods of a better quality as highlighted in our findings.

On the basis of our main results, we also explore how coordination across municipalities could undermine the impact of this mayoral reform on the provision of safety. Police districts in Belgium usually encompass several municipalities and require several mayor-chiefs of police to coordinate law enforcement. Coordination and the associated costs and benefits could as a consequence mitigate the effect of direct elections on crime incidence. Our results show in that context that the magnitude of the treatment effect decreases when the police district covers more than one municipality and is therefore under the supervision of several mayors. We also find that this decreasing effect is particularly important when the mayors of the municipalities constituting the police district belong to different political parties. Overall, these results imply that as the number of mayor-chiefs of police in charge of a police district grows larger, individual mayors are less accountable and the differences in crime incidence between municipalities with directly elected mayors and those with appointed ones diminish. The results might suggest, moreover, that while coordination could generate economies of scale, it mainly raises costs and moral hazard issues that could lead to the under-provision of common public goods (Dixit, 2002).

Our paper contributes to the literature investigating electoral rules and their consequences for policymaking (Gaebler and Roesel, 2019).[2] Fiorina and Noll (1978) were the first to make a link between electoral competition and size as well as the efficiency of bureaucracy, but this relationship has been investigated empirically more closely only recently. Levin and Tadelis (2010) find that appointed (rather than elected) municipal leaders are more likely to privatize services than directly-elected ones. Coate and Knight (2011) show

[2] A vast political-economic literature has highlighted the role of electoral incentives in shaping politicians' decisions over fiscal variables and a broad spectrum of policy outcomes. See, among others, Alesina and Tabellini (2008), Alesina and Tabellini (2007) and Persson, Roland and Tabellini (2007). This literature focuses on national case studies, while this paper looks at local dynamics.

that spending dips following the switch to directly-elected mayors, relative to jurisdictions not changing their form of government. Enikolopov (2014) explains that since elected mayors are more likely to value patronage jobs, the number of full-time employees is significantly higher in mayor-council cities. Conversely, MacDonald (2008) argues that the form of government and the election method of city councilors (together with the size of the city council) does not have a significant impact on public expenditure.[3] All these articles use evidence from the United States, to provide insights into the mechanisms that motivate elected local politicians to provide better public services.[4] Few papers study the issue in European countries. In one of the rare exceptions, Hessami (2018) assesses the impact of the gradual introduction of mayoral elections on public choices in a German state. The present paper adds to this scarce literature by studying a similar reform and its effect on local crime incidence.

In addition, our results relate to the literature on the relationship between information about the quality of local politicians, accountability and voters' choice. During elections, voters exposed to more information may use it to vote for higher-quality politicians and to vote out lower-quality ones (Ferraz and Finan, 2008; Banerjee et al., 2011; Motolinia, 2020). Banerjee et al. (2011) documented, for example, higher vote share during the 2008 Dehli state elections for more qualified legislators in slums where residents randomly received newspapers with report cards about incumbent performance. Moreover, incumbent politicians that seek re-election tend to be more accountable when more information is available (Ferraz and Finan, 2011). In line with the above, our results could be interpreted as showing that the introduction of direct elections for mayors in Belgium increases the information available to voters by stiffening electoral competition and hence improving the provision of safety. Because of higher accountability, direct mayoral elections motivate candidates to better signal their quality, skills, and commitment towards policy issues that matter to voters.

Besides this, we contribute to the literature that studies the provision of public goods

[3]There are two primary forms of government in U.S. cities: council-manager and mayor-council. Under the council-manager, policy-making power resides within the elected city council, and the mayor, appointed by it, is therefore accountable to elected politicians. Under the mayor-council form, voters elect separately the mayor and the city council, who then have to govern together. It is our interpretation that council-manager (mayor-council) municipalities are close to those with appointed (directly elected) mayors.

[4]Regarding the effect of direct elections, a parallel literature focuses on regulators and judges. Besley and Coate (2003) find examples that elected regulators tend to be more pro-consumer candidates than appointed regulators if they seek re-election. According to them, when political bodies select regulators, regulatory polices become bundled with other policy issues for which the appointing politicians are responsible. Because voters have only one vote to cast and regulatory issues are not salient for most of them, electoral incentives will lead politicians and their pick for the regulator to respond to stakeholders' interests, rather than voters'. If regulators are elected instead, their stance on regulation is the only salient issue, and they will run as pro-consumer candidates. Huber and Gordon (2004) find that elected judges issue lengthier sentences as elections near. Choi, Gulati and Posner (2010) argue that elected judges are more productive than appointed judges but the quality of their output suffers. Besley and Payne (2003) find that elected judges tend to be more career-concerned: they file more employment discrimination charges in order to pander to voters and to secure re-election.

across jurisdictions. Estache, Garsous and Seroa da Motta (2016) and Soares and Viveiros (2010) show that interaction between elected administrators at different levels of government may affect politicians' accountability and citizens' rights to quality water and local police. Very few studies focus, however, on the interaction between elected local leaders at the same level of government. Feiock (2007) and Zeemering (2012) argue that the efficient provision of local public goods often relies on voluntary agreements between local administrations. At the same time, shared mandates over a policy can shift the political responsibility from individual mandates to "collective" ones. Local leaders may then free-ride on their neighbors, ultimately undermining the quality of the shared public good (Dell, 2015; Durante and Gutierrez, 2015). This paper joins this growing and still limited literature by investigating directly how coordination across municipalities interacts with the electoral system in the provision of safety.

Lastly, this paper contributes to the literature on the economics of crime. Since Becker (1968), economists have tested different instruments to control criminality. Dills, Miron and Summers (2010) provide a contemporary and very complete review of the effectiveness of criminal deterrence through arrest, incarceration and the size of the police force. Policies that efficiently control deterrence instruments affect criminal activity by raising the expected cost of crime or by incapacitating criminals. Few works, however, have studied how political institutions shape the management of the police force and thus the use of deterrence variables. In his seminal research, Levitt (1997), shows that the size of police forces increases disproportionately in mayoral election years. Ater, Givati and Rigbi (2014) investigate the role played by the organizational structure of law enforcement agencies in determining police activity and crime. However, neither the accountability of law enforcers nor the inter-jurisdictional coordination constitute the focus of these authors. Our paper aims to fill this gap by showing how the introduction of direct elections could decease crimes.

In sum, this paper sheds light on the complex effects of increased accountability through direct elections on crime incidence, especially in contexts that require coordination across local jurisdictions. We show that directly-elected mayors provide better quality public goods than appointed ones. Increased electoral competition motivates candidates to focus their campaign on safety-related issues. Increased accountability forces directly-elected mayors to uphold their electoral promises. However, the "accountability effect" might be diluted when many mayors, even those who are elected directly, share the provision of public goods, like when multiple municipalities share control of a police force.

The rest of the paper proceeds as follows. The next section discusses the two Belgian institutional features at the core of our empirical analysis and identification strategy. Section 3 draws from theoretical predictions of the political-economic literature to lay down the main hypothesis tested in this paper. Section 4 describes the data used in the empirical strategy, detailed in Section 5. Section 6 presents the benchmark results and discusses the

heterogeneous effects of the reform on crime incidence. Section 7 tests the robustness of the results. Section 8 provides some additional conclusions.

# 2 Institutional Framework: Mayors and Police Management in Belgium

## 2.1 Background: Local Institutions and Municipal Elections

Belgium is a decentralized country, with municipalities at the core of its multi-level governance. Below the federal level, three regional governments (Flanders, Wallonia and the Brussels capital-region) and three community governments (Flemish, German and French-speaking communities) coexist and geographically overlap.[5] At a lower level, the country is then divided into provinces, arrondissements and municipalities. Municipalities are the closest administrative level to citizens and function as the unit of analysis of this paper. Belgium has 589 municipalities: 308 in Flanders, 262 in Wallonia and 19 in the Brussels-Capital region.

Municipalities bear essential and numerous responsibilities. Between 2000 and 2012 – the period which this paper analyzes – municipalities prioritized expenses as such: public administration (17% of total expenditure), road maintenance (15%), school infrastructure (13%), social protection (10%), security and crime prevention (9%) and garbage collection (7%).[6] Given these responsibilities and the proximity of municipal representatives to voters, municipalities are crucial for national and regional parties to gain or preserve power.

In each municipality, a city council holds the legislative power, while a mayor holds the executive power. City councilors are elected every six years, and there is no term limit. They are elected according to a proportional system that accommodates both party and voters' preferences. Parties present lists of candidates, with as many candidates as the seats in the city council. Eligible citizens can vote only for a one party-list by either marking their preference for the whole list of candidates – "list vote" – or by choosing one or several candidates on the list – "preferential vote". Once ballot boxes close, votes are converted into seats in the city council based on the performance of each party-list and each candidate. First, the number of votes obtained by each party is divided by a series of divisors as determined by law. Seats are allocated to the parties that obtain the highest resulting quotients (or, the "highest average"), up to the total number of seats available (Norris et al., 2004). In the second stage, seats are assigned to candidates with the highest

[5] Regions are responsible for territorial matters - including infrastructure, industrial policy, employment and taxation. Communities are responsible for people-related matters - including education, welfare and health.

[6] Data are based on Belfius "Finances locales" database. As explained later, the provision of public utilities is often shared between municipalities, introducing an extra layer of governance, the "inter-municipalities".

electoral score in each list. The candidate with the highest number of "preferential votes" gains a seat. Additionally, the complex electoral system is such that the "head of list" is likely to be elected since she/he directly benefits from "list votes" on top of "preferential votes". In the same vein, higher-ranked candidates on the list also have a higher chance of getting elected, independent of their personal performance.[7] For this reason, while the party can shape the city council by ranking candidates strategically, voters can still reshuffle priorities using "preferential votes". Interestingly, voters often resort to "preferential votes" in local elections in Belgium, highlighting their willingness to choose their representatives and the weight, visibility and direct impact of local policymakers' decisions.[8]

The post-electoral composition of the city council determines the mayorship. Importantly for the analysis that follows, there are differences in the modalities of selection of mayors since 2005 across regions, and thus in the weight assigned to citizens' votes. While in all three regions, parties have to reach a majority at the city council to agree on a policy agenda and sign a "majority agreement", only in municipalities located in Flanders and Brussels is mayoral selection part of a process of political bargaining that does not directly depend on the mayor's preferential votes (Schamp and Devos, 2016). In these cases, any Belgian citizen – even those not elected – can become mayor if backed by a sound majority in the city council. Since 2005, the situation is different for mayors of Wallonian municipalities. The selection process there is indeed automatic insofar as it directly depends on the "preferential votes" obtained by elected councilors. The next section describes in more details the emergence of this direct election system in Wallonia and how it created an institutional discontinuity that is at the core of our analysis.[9]

## 2.2 The 2005 Reform Introducing Direct Election of Mayors in Wallonia

At the beginning of the 2000s, a major institutional reform took place in Belgium that, amongst other changes, decentralized the organization of local elections and local admin-

[7] Candidates are required to meet an "eligibility thresholds", which in turn depends on the party's overall score and seats attributed. The votes for the head of the list constitute a "common pot" which lower-ranked candidates can draw from in order to meet the "eligibility threshold". If the votes obtained by the head of the list – both "preferential" and "list" – exceed the "eligibility threshold", the difference is added to the score of the second-ranked candidate. Any further residual votes are then assigned to the third-ranked candidate, and so forth, up to the full distribution of seats obtained by the list.

[8] The share of valid ballots that cast at least one preferential vote is indeed very high. It was for example 70% in the 2000's elections and almost 85% in the 2006 one (André et al., 2014).

[9] The direct election of mayors was not the only novelty of the 2006 municipal elections in Wallonia. In all three regions, non-European citizens were allowed to vote (but not to compete) conditionally on their residence period in the country and their pledged to the Constitution, the laws and the European Convention on Human Rights. Regional parliaments tightened rules to exclude candidates with racist behavior from the competition and to impose gender balance in the lists. In Wallonia, members of national, regional and European parliaments were not allowed to run for municipal elections (Blaise, de Coorebyter and Faniel, 2006). Importantly for this paper and its identification strategy, we assume that these measures do not question the exogeneity of the 2005 reform or affect local crime incidence.

istrative functions from the federal government to the regions i.e. Flanders, Wallonia and Brussels. In doing so, this transfer of power gave regional governments the option to modify the mayoral election system in place on their territory. The beginning of the 2000s coincided with a time when a growing number of Belgians demanded the switch to a (more) direct election system for mayors. Polls published in the newspapers during this period even indicated that the support was equally widespread across regions with around 70% of the respondents in favor of directly elected mayors (Pilet, 2007). The arguments put forward then included the need for a more transparent and accountable system that would broaden mayors' capabilities and make their choices more obvious to voters (Pilet, 2007). This line of argument was not unique to the Belgian case then and now. It rather follows a still ongoing debate on the advantages and disadvantages of such a system. On the one hand, the direct election of mayors can be seen as a key to strengthening local democracy. It could create a "chain of delegation" that runs linearly from voters to candidates and push the politicians to behave in the interest of their voters (Persson and Tabellini, 2005). Citizens' willingness to finance certain public expenditure is also more likely to shape decisions of directly elected mayors than those of mayors appointed by the city council (Frey, 1994). The consequences of the direct elections of community leaders should nonetheless be considered with caution. Political confrontation may, for example, shift from the contents of a given platform towards individual characteristics, as the personality of candidates becomes louder than their messages. Moreover, the overall benefits of the direct election – such as increasing accountability and discouraging the misbehavior of local politicians – may strongly depend on local capabilities (Henderson and Kuncoro, 2011). If mayorship were just a mere step in a candidates' political career, directly elected local politicians might still deviate from their voters' mandate and use their popularity and visibility to climb up regional and national institutions (Micozzi, 2012). As mentioned above, these different arguments echo discussions that took place in Belgium at the beginning of the 2000s. Interestingly, they were at the forefront of the public debates in all three regions even if only Wallonia implemented a reform of its municipal electoral system and switched to a more direct system.[10]

[10]In Flanders for example, the parliament discussed in 2002 an ambitious reform that would have introduced a "presidential-type" system of local government. Pushed by the Flemish liberals, the proposal was to dissociate elections of city councils from elections of mayors. Seats in the city council would have still be distributed proportionally, while voters would have had the possibility to vote directly for a candidate-mayor "ticket". The second member of the ticket would have stepped in if the first member happened to be ineligible or was impeded from taking up the mayorship. The proposal reform envisaged a voting runoff: if no "ticket" received the required number of votes on the first ballot, candidates with the largest share of votes would compete in a second round. The reform however lacked the support of most Flemish parties. The principal concern was that combining a proportionally elected city council with a two-round mayoral election system would lead to divided local governments, where executive and legislative power refer to two different political dynamics. Most parties were also concerned that the new system would result in inefficient divided governments as well as in the personalization of the political system (Schamp and Devos, 2016). Eventually, the reform did not pass, and the existing system prevailed i.e. city councilors name mayors, usually after post-electoral political bargaining.

The vote on the Wallonian reform took place in December 2005[11] and was implemented for the first time at the 2006 municipal elections. It was the result of discussions that started in 2002 involving both the regional parliament and representatives of municipalities. While a vast majority of the municipal elected officials supported the idea of a reform, a political consensus around the actual content of the reform was hard to reach for quite some time.[12] A series of local scandals were, however, a game-changer and resulted in widespread outrage that made proponents of direct election more vocal and pushed the parties in the regional parliament to find a legislative compromise.[13] Political forces advocating for a majoritarian system and those leaning more towards a proportional system reached an agreement and passed the reform at the end of 2005 (Matagne, Radoux and Verjans, 2011). The timeline in Figure 1 summarizes the chain of events that lead to the 2005 reform in Wallonia and how it relates to the subsequent municipal elections.

[Figure 1 here]

Overall, the 2005 reform in Wallonia introduced elections of mayors that are more automatic and direct than in Flanders and Brussels - where mayors remain appointed by the city council independent from personal electoral performance. More precisely, since this reform the election of a mayoral candidate in Wallonia is conditional on the performance of the candidate and of her party. While the electoral law regulating the distribution of seats in the city council remains proportional, once polls close and seats are redistributed, a candidate to the city council becomes mayor automatically under three conditions. First, she must belong to the coalition of parties – or "majority agreement" – with the highest share of votes. Second, she must come from the best performing list within the "majority agreement". Third, she must obtain the highest share of votes within the list (Blaise, de Coorebyter and Faniel, 2006). A mayor who resigns becomes no longer eligible to sit on the city council. She is replaced by the candidate who belongs to the best-performing party in the "majority agreement" and has the second highest share of votes.

The fundamental hypothesis of this paper states that this reform increased the accountability of local mayors because of increased competition between and within lists as well as a greater personalization on the campaign trails. Prior to the reform, the political destiny of candidates to Wallonian city councils and mayorships principally responded to party logic. The directly elected system changed that power dynamic and made virtually any candidate a potential mayor as long as she was able to maximize her electoral score (pending the performance of the list as a whole). As a result, since 2005, candidates have been

[11] Decree of 8 December 2005 that modified the *Code de la démocratie locale et de la décentralisation*, art. 14, section 1. The decree is publicly available on *Moniteur belge* of 2 January 2006.

[12] For example, within the regional government coalition, the liberals, were strong advocates of a reform, but were opposed by the Socialist Party, which traditionally leaned more towards representative democracy. The Green Party stood halfway between the two (Steyvers et al., 2004).

[13] A major scandal was related to the Carroloregienne, a public housing project in Charleroi.

participating more actively in capturing preferential votes (Matagne, Radoux and Verjans, 2011).[14] Competition within lists has therefore become fiercer, placing candidates under more intense scrutiny and thereby increasing the elected mayors' accountability to voters, rather than to the city council (Ferraz and Finan, 2011).

Interestingly, the directly elected system might also have increased mayor's accountability by intensifying electoral competition between parties. Before the reform, the proportional character of local electoral law encouraged parties to form alliances only at the end of the electoral process and the redistribution of seats in the council. Mayors usually sealed the "majority pact" between the ruling parties – a pact that was not validated by popular vote. Consequently, mayors' decisions were, in most cases, accountable to the contractors of the pact rather than to voters. Following the reform, parties had to start strategizing more before the elections about potential alliances in order to anticipate the expected binding performances of other lists' candidates. In other words, the automatic selection of the mayor amongst the newly formed municipal majority might have increased the incentives to form alliances around popular champions before the elections to win. This new dynamic may have been particularly relevant where small parties were trying to break the hegemony of the traditional parties. Hence, parties have since converged into cartel-like entities to either consolidate or seize power, polarizing the local political arena and increasing electoral competition. This polarization has further encouraged the preferential vote and thus direct mayoral accountability to the voters (Matagne, Radoux and Verjans, 2011).

## 2.3 The Governance of Local Police

Local police constitute the main arm of law enforcement in Belgium. This entity is organized into police districts that operate their own force and cover the territory of one or more municipalities. There are overall 195 police districts with 43 covering the territory of one municipality and 152 that cover more than one and up to ten. The size of a police district depends on municipality population, its density, the rate of urbanization, and socioeconomic conditions. On average, there are four municipalities in a police district. Within each police district, the local force is in charge of first responsiveness and intervention as well as maintaining public safety and conducting criminal investigations.[15]

[14] To validate this hypothesis, between June and September 2017 we interviewed several Flemish, Brussels and Wallonian mayors covering the whole political spectrum. We met administrators from Gosselies, Namur, Neupré and Tintigny in Wallonia, Genk in Flanders, and Anderlecht in Brussels. In some cases, police chiefs attended the meeting as well. Interviews lasted on average one hour and aimed at understanding the impact of the 2005 reform, and mayors' role in the management of local police and other local affairs. The guideline questions used are listed in Appendix A.1.

[15] Beside the local police, Belgium also has a federal police force. The federal police guarantees safety on motorways, on waterways, at railways and stations, and at airports. they also in charge of protecting the royal family. They deal with criminal activity that transcends the boundaries of a police district or the country, such as economic crimes, drug-related crimes and terrorism. The federal police also coordinates and supports the local police. Local police can at any time request the intervention of the federal police when specialized personnel and equipment are needed. Finally, the federal police are responsible for non-

Mayors are responsible for overall safety in their municipalities and coordination of law enforcement. It is within this framework that mayors act as the chief of local police and can steer police activity.[16] As chiefs of police, mayors directly liaise with the police commissioners to draft and implement long-term crime plans. The police commissioners are designated for five-year terms by the Ministry of Interior under the proposal of the mayor-chief of police. They are responsible for the organization and the redistribution of tasks within the police force, and broadly for the management of the police force. The police council – made up of a group of city councilors – validates crime-fighting plans. Figure 2 illustrates this operating mode. In practice, daily actions that fight crime require timely decisions, jointly taken by the mayor and the commissioner. The close relationship that necessarily develops leaves the chief of police and the police commissioner enough discretionary power to contribute to the consolidation of power for the former, and the career of the latter.[17] All in all, policing is one of the few policies that mayors can shape directly and use to consolidate their own popularity.[18]

[Figure 2 here]

Governance of local police grows more complex when a police district covers more than one municipality. In that case, all the mayors are chiefs of police and form with the district police commissioner a "police board" that take decisions unanimously and whose main role is to coordinate law enforcement on the district territory. Consequently, mayors in that setting share their law enforcement mandate with their colleagues and it is more difficult for voters to attribute actions to individuals and make them accountable. This could generate a free-riding effect on mayors and ultimately affect crime incidence. Moreover, when police districts are especially large, and coordination costs are particularly high, mayors can completely delegate the management to the commissioner, thereby further diminishing accountability

operational matters such as human resources, logistics and information technology, and the training of personnel. Mayors do not have any role in the management of the federal police.

[16]The importance of this function can be illustrated by the number of hours spent per day dealing with crime-related issues: between one to four hours according to the mayors interviewed in the context of this paper (see Appendix A.1).

[17]The crucial role of local police together with the steering power of mayors is unique in Europe and resembles law enforcement in the United States. In Germany and France, the establishment of local police is an option left to local authorities. In Germany, the law entrusts states with the organization of security and police services. In France, mayors can establish a local police force that nonetheless complements (and sometimes overlaps with) the state police and does not monopolize local law enforcement. Belgium has a setup similar to the United States, where local police account for the majority of police services (Seron, 2004).

[18]Other municipal policies like waste management, water supply or social services are indeed often managed by public "inter-municipalities" enterprises or ad-hoc municipal institutions that are far less accountable to individual mayors. Waste management and water supply are managed in Belgium by a few public "inter-municipalities" firms that cover nearly a dozen municipalities. For instance, only 31 of these firms operate waste management across the country: 5 in Wallonia (one every 52 municipalities), 26 in Flanders (one every 12 municipalities) and 1 for the 19 municipalities in the Brussels region. (For more details, see Goethals (2017) "La physionomie des intercommunales en Belgique". *Mimeo.*). They are, moreover, formally independent from any mayoral power and have their own council - appointed by city councils.

to voters. For all these reasons, the shared provision of policing may ultimately interfere with the impact of a more direct electoral system. Hence, the second part of this paper investigates the interaction between the governance of local police and the 2005 reform.

# 3 Conceptual Framework

This paper tests whether the modality used to select mayors for office affects the supply of a specific public good: safety. It, moreover, investigates how this effect varies when the mandate over the provision of that public good is shared between a number of municipalities.

To answer these questions, we exploit the 2005 reform that introduced direct election of mayors only in municipalities located in Wallonia and compare trends in crime incidences before and after the reform in those municipalities to the ones that did not experience this change and are still ruled by appointed mayors. Using a classical principal agent model, we predict that after the 2005 reform, crime incidence would decrease faster in municipalities where mayors became directly elected (Hypothesis 1) and that the beneficial effect of the direct election of mayors on crime incidence is diluted when several mayors need to coordinate local policing (Hypothesis 2). The rest of the section describes in more detail the model and the mechanisms behind our predictions.

## 3.1 The Effect of the Reform on Crime Incidence in Police Districts with One Municipality

We consider a two-period model in a municipality with an incumbent mayor-chief of police (*she*) and a police commissioner (*he*). We start by considering a "single-municipality" police district (we will relax this assumption later and account for districts that encompass more than one municipality and several mayor-chiefs of police). The mayor and the commissioner gather at the beginning of the first period to outline a "crime plan" for the two periods. The commissioner enacts the plan, while the mayor oversees the best implementation. Both the mayor's and the commissioner's mandate last one period and can seek reconfirmation for the second. For the mayor, it implies facing elections at the end of the first period. For the commissioner, it implies a reappointment based on the mayor's recommendation. During the second period, the performance of both the mayor and the commissioner contributes to determining their future career and income.

Within this framework, we now assume that between the first and the second period, electoral rules suddenly change and therefore competition for mayorship increases. In the context of this paper, it implies that after the 2005 reform, Wallonian mayors started to face more external and internal competition during the elections (as described in details in Section 2). We therefore predict the following:

**Hypothesis 1** *After the 2005 reform, crime incidence decreased faster in municipalities where mayors became directly elected than in other municipalities where mayors remained appointed by the city council.*

### Mechanism 1: Tighter electoral competition increases the accountability of mayors to voters

As illustrated in Figure 3, two complementary mechanisms support Hypothesis 1. First, because of tighter competition, candidates running for office would design their campaign around specific issues to change voters' sense of priorities. The incumbent mayor running for re-election would specialize on issue over which she can have direct control, such as criminality and the need for tougher law enforcement (Aragonès, Castanheira and Giani, 2015). For that reason, mayors would have a tendency to steer local police more incisively to tackle crime incidence and thereby achieve electoral gains. In the same way, opponents may also decide to run on safety-related issues, suggesting alternative solutions to those proposed by the incumbent mayor.

[Figure 3 here]

Overall, more competitive elections would narrow information asymmetries and favor candidates with stronger policy messages. Voters would also have more incentive to scrutinize the candidates' platforms and would be exposed to clearer signals regarding their overall skills. Ultimately, tighter electoral competition keeps mayors more accountable and pushes them to fight criminality more effectively. Moreover, after the elections, winning candidates would also come under more intense scrutiny, given the importance they gave to crime prevention during their campaign. Consequently, mayors would have to uphold their promise and meet voters' expectations in order to build a reliable reputation that would determine their personal future.

It is important to note that Mechanism 1 does not predict any increase in accountability in Flanders or Brussels. The 2005 reforms did not affect these two regions, where the political destiny of mayoral candidates remained in the city councilors' hands. There is less incentives for candidates to court voters like in Wallonia because electoral competition between candidates is less prominent. Without personalization of the campaign, safety remains bundled with other topics in campaigning platforms (Besley and Coate, 2003). Mayors therefore remain much less accountable than in Wallonia, and the effects of their counter-criminal policies less tangible.

**Mechanism 2: Tighter electoral competition motivates mayors to monitor police commissioner's activities more closely**

The second mechanism behind Hypothesis 1 focuses on the relationship between an incumbent mayor seeking re-election and the police commissioner. In doing so, it examines a "black box" that the political-economic literature has only recently addressed: the interaction between politicians and bureaucrats.

Within the theoretical framework described above, a given mayor's payoff increases with the probability of being re-elected and retaining power after the first period, and with the legacy left at the end of the second period. Re-election and legacy depend on perceived safety. Although random components are often embedded in criminal events, the mayor can still minimize crime incidence or signal their stand against criminality by increasing, for instance, the police forces patrolling the streets. To achieve that goal, however, she must rely on a network of bureaucrats – the police force – and its head – the police commissioner. Coordination efforts with the police commissioner are thus fundamental to making the network of bureaucrats more efficient and leading to effective law enforcement.

On top of the mayor, the police commissioner also tries to maximize his payoff function. With this aim in mind, he works toward keeping his position during the second period and aims at cashing in a rent at the end. Both of these objectives depend on the mayor's support and recommendation.[19] Achieving these objectives, however, entails also costs related to the coordination of the police force that the commissioner will try to minimize. The commissioner can solve this trade-off by adopting two different strategies. He could either commit to the crime plan agreed upon with the mayor at the beginning of the first period or decide to shirk his responsibilities and thus minimize coordination costs. Eventually, the commissioner's strategy will affect crime incidence and thereby impact the mayor's re-election (at the end of the first period) or legacy (at the end of the second period).

Ideally, the mayor would need to monitor the implementation of the crime plan to prevent the commissioner from shirking. Monitoring generates, however, another cost-opportunity tradeoff. The mayor could, indeed, spend time and energy on other projects that could create new opportunities to also increase her popularity instead of monitoring the commissioner. Alternatively, the mayor can audit the commissioner's activity and reward the commissioner if she finds that he has committed to the plan or dismiss him if he has been shirking.

The credibility of rewarding the commissioner depends, however, on the re-election of the incumbent mayor. One way for the commissioner to consider the credibility level and future rewards is by assessing the intensity of the electoral competition. The more competitive the local elections, the higher would be the commissioner's incentives not to pursue the agreed-upon crime plan since tight elections would decrease the probability of re-electing

[19] For example, the police commissioner could seek a promotion to another administrative level at the end of the second period that would guarantee him a higher income in the future.

the incumbent mayor and undermine any promotion or any punishment for misbehavior. Interestingly, at the same time, intense electoral competition may also motivate the mayor to exert tighter control over the commissioner's performance and thus increase the credibility level of any promotion or punishment after the elections.

All in all, the commissioner's effort and commitment to the crime plan, the mayor's intensity of monitoring and ultimately the level of crime incidence in equilibrium all depend on the degree of electoral competitiveness. There is no consensus on the circumstances that would make tighter mayoral control prevail over the commissioner's incentive to shirk (and *vice-versa*). On the one hand, the performance of bureaucrats would decrease in tightly contested districts because as re-election becomes less secure, bureaucrats would estimate that rewards and promotion are less likely (Nath, 2015). On the other hand, candidates running in highly competitive elections might look for quick results in order to pander to voters. They may, therefore, put extra pressure on bureaucrats to improve their productivity (Bloom et al., 2015). Furthermore, bureaucrats may also speed up the implementation of local projects, perhaps at the cost of decreasing quality and the misuse of resources (Rogger, 2018). This paper argues that the dominant effect of the increase in electoral competition that followed the 2005 reform in Wallonia has been to motivate career-oriented mayors to more closely control local police commissioners' records and thereby contribute to decreasing crime incidence.[20]

## 3.2 The Effect of the Reform on Crime Incidence in Police Districts with more than One Municipality

The predictions of the conceptual framework may differ for large and politically heterogeneous police districts. To illustrate Mechanism 1 and 2, we, indeed, considered a "one-city" police district, where only one mayor oversees the police commissioner. Section 2 shows that on average four mayoral chiefs of police share the mandate over the local police. When multiple principals are involved, the outcomes of both mechanisms may change (Dixit, 2002). In the context of this paper, we thus argue the following:

**Hypothesis 2** *The beneficial effect of the direct election of mayors on crime incidence is diluted when several mayors need to coordinate local policing, mainly because of the increasing costs of coordination and political heterogeneity.*

Sharing mandates may be an obstacle to mayoral accountability. The larger the police district, the easier it is for a mayor to blame her peers for unexpected spikes in crime

[20] Measuring the performance of bureaucrats in the political economy literature is controversial. Usually, performance is measured *vis-à-vis* the achievement of predetermined and transparent targets. As noted by Bloom et al. (2015), in that case, there is always a risk that managers may game the system by meeting formal targets without improving clinical outcomes. In our case, it would imply that a lower crime incidence may be the results of commissioners hiding crime reports in order to overestimate their performance or cover their failures. This measurement challenge is however endemic to any study relying on reported crimes.

incidence. She can also free-ride on neighbors' policing efforts and campaign on others' performance. Widespread free-riding would ultimately lead to high crime rates (Gailmard, 2009). In Wallonia, voters would not be able to keep mayors accountable, since they would receive only imprecise (or "blurred") information about their performance in fighting criminality. Despite the 2005 reform, information asymmetries in large Wallonian police districts would remain significant. Because of incentives to free-ride and decreasing accountability, Mechanism 1 would suggest that post-reform crime incidence in Wallonia decreases less in municipalities within larger police districts than in municipalities within "mono-city" districts.

Sharing mandates undermine the oversight of the commissioner's activity as well. On the one hand, systematic coordination among all mayors involved in the management of a police district can make monitoring of the police commissioner more effective. However, coordination entails costs that in turn depend on the different political allegiance of mayors, due to tighter personal connections, shared views regarding crime prevention strategies and priorities, or party discipline (Durante and Gutierrez, 2015). We argue that coordination costs increase with political fractionalization and the polarization of mayorships. Increasing coordination costs makes monitoring less effectives and decrease the individual police commissioner's incentives to commit to the crime plan. So, despite the reform, Mechanism 2 predicts that there would be no differences in post-reform crime incidence between Wallonian municipalities in politically heterogeneous districts, and Flemish or Brussels municipalities.

# 4 Data Sources and Descriptive Statistics

To perform our analysis, we first collected the following information corresponding to the municipal level in Belgium from a variety of sources: crime incidence, social and economic characteristics, public expenditure and the size of the police force. Second, we compiled the first dataset to evidence the following for all Belgian mayors: identity, political affiliation and results in local elections over the 2000 to 2012 period[21]. Combined with the information on municipal characteristics, this forms a unique dataset identifying crime incidence, local electoral results as well as socioeconomic and fiscal information across all 589 Belgian municipalities between 2000 and 2012. In the remainder of this section, we describe in more detail the main variables.

**Crime incidence.** We define crime incidence as the number of crime events per 1,000 inhabitants in a municipality. Our sample consists of 7,644 crime events reported in 589 Belgian municipalities between 2000 and 2012. The Belgian Federal Police ("Police fédérale - Direction de l'information policiére et des moyens ICT - service Politique et gestion") pro-

[21] See Annex A.2 describing the variables and coverage of this novel dataset.

vided detailed information about the types of crime. Each entry in the database represents a criminal act that was either attempted or realized and was registered by officers of the local police through a report. All reports are then transmitted to a federal database (*Banque de données nationale générale*) within three weeks of acknowledging the criminal act. The federal police classifies each criminal act according to pre-defined categories. When multiple offenses occur in the perpetration of a single crime event, the agent records the most serious of them.[22]

[Table 1 here]

Table 1 presents descriptive statistics for crime incidence by region and type of crimes. The five main types of crimes (hereafter, MCE) are drug, fraud, robbery, vandalism and violence.[23] Together, they represent more than 70% of the total number of crimes reported in each region.[24] The empirical analysis relies mostly on crime incidence for these 5 types of crime simultaneously. As we can see in column "MCE" in Table 1, the average crime incidence for this aggregate indicator is 49.6 for Belgium and varies between 43.8 in Flanders, 52.2 in Wallonia and 107.7 in Brussels. Although very different on average, the three regions do have, however, a very similar crime composition. In all three cases, robbery incidence is the highest throughout the reference period, followed by vandalism, violence, fraud and drug-related offenses.

[Figure 4 here]

Figure 4 complements this description by showing great intra-regional variation. The municipalities with the highest average crime incidence over the 2000-2012 period are, for example, Liège (183 episodes per 1,000 inhabitants), Charleroi (126) and Visé (122) in Wallonia; Fourons (183), Blankenberge (125) and Antwerpen (124) in Flanders; and Brussels (286), Saint-Gilles (221) and Saint-Josse-ten-Noode (123) in the Brussels region.[25]

**Social and economic variables.** Data on density, income per declaration, employment and the percentage of foreign residents are available from StatBel, "Federal Public Service

[22] Crime data usually suffers from two limitations. First, it reports only criminal acts that are known to the police. Second, the number of reported crime events might depend on the effort of local officers (Police Fédérale, 2015). Most importantly for this research, we do not believe that these limitations affect crime incidence heterogeneously across Belgian regions and municipalities. The federal police database provides no information about the identity of criminals, their socio-economic and demographic characteristics.

[23] Violent crimes imply offences that result in physical violence (homicide, etc.).

[24] To have a better sense of what each type includes, we looked more closely at the crime records and noticed that while half of the drug-related crime episodes concern usage, the most recurrent fraudulent crimes are embezzlement, scams, and misappropriation. We also observed that robbery mostly corresponds with incidents of pickpocketing and is usually committed without aggravating circumstances. Finally, vandalism mostly consists of deliberate property destruction and arson.

[25] Visé and Fourons are two municipalities on the border with the Netherlands. According to some mayors and police officers interviewed in the context of this paper, they are gateways for drug and goods smugglers.

Economy, SMEs, Self-Employed and Energy" department. Table 2 presents the descriptive statistics of these social and economic characteristics for all the municipalities covered by our dataset. On average, Flanders seems to be the richest region with, for example, the highest income and employment rate. On the other hand, Brussels, as the only city-region, has the highest density rate and percentage of foreigners. Wallonia appears from socio-economic point of view to lie between the two other regions.

**Public expenditure and the size of the police force.** We retrieved information on public expenditure at the municipal level from 2000 to 2012 from the Belfius database.[26] In particular, we extracted information concerning expenditures for local administration, garbage collection, social assistance, as well as safety and crime prevention. Table 2 shows the average expenditure for each selected spending category for the entire country and by region. Over the sampled period, municipalities spent the highest share of total expenditures on public administration. It was 12.8%, 16.9%, and 19.5% in Brussels, Flanders and Wallonia respectively. Concerning local police management, the share is the highest in Brussels (17.3% - €243 per capita) and amounts to around 8% in Flanders and Wallonia (€80 per capita and €72 per capita, respectively). In Section 6, we also study how the treatment effect varies with the size of the police force. We were able to gather information from the Ministry of Interior about the number of officials in the force across each of the police districts from 2002 to 2012.[27] The number of police officers in each police district depends on a federal rule that takes into account 75 indicators from each police district.[28] As shown in Table 2, the size of the police force varies between 11 officers per 1,000 inhabitants in Flanders and 16 in Brussels (it is 14 in Wallonia). In each police district, officers are allocated across municipalities according to local agreements between mayors.

[Table 2 here]

**Political landscape.** There is no harmonized and complete dataset on local election outcomes and mayors in Belgium. This paper contributes to closing this gap by building the first database of such nature for the 2000 to 2012 period. The identities of most of the mayors come from a registry of positions and assets self-declared by each Belgian public officer - at both the national and local level - to the Court of Auditors. The registry is

[26] Selected information is however partial or non-existent throughout the reference period for 74 municipalities (out of 589). When including local public spending in the analysis, we will therefore use a restricted sample of 515 municipalities (259 in Flanders, 237 in Wallonia and all the 19 municipalities in the Brussels Region) for which we have complete budgetary information.

[27] Since the police districts of Lanaken and Maasmechelen, in Flanders, were merged in 2011, these municipalities are coherently excluded by any specification including the size of the police force as covariate. Moreover, data do not exist for the years 2000 and 2001.

[28] These indicators account for the size of the municipality (area and population), degree of urbanization, income, employment, unemployment, school-age population, enrollment rate, age and household structure, nationality, migration inflows, housing characteristics, cadastral income, crime, road accidents, frequency of football matches and the prison population.

then made public through the "Belgian official journal" and information was re-organized and made more accessible to the public by the website *Cumuleo*. We complemented the registry with information from other sources (e.g. local and national newspapers, and official websites of local administrations) when the registry was not complete.[29] We then matched the list of mayors with their electoral performance during two rounds of local elections, in 2006 and 2012. We scrapped this information from websites dedicated to local elections.[30] The created dataset thus contains information for all the 939 mayors who were in office in all 589 municipalities between 2000 and 2012. It includes for each mayor his/her political affiliation, score in local elections as well as the duration of his/her mandate between 2000 to 2012.

A significant share of these mayors did not hold the position long enough to significantly affect crime prevention. Between 2000 and 2012, around 18% of them resigned, in most cases because they became part of the national or regional governments after their election to mayorship (such accumulation of mandates is prohibited by law). Mayors who stayed in charge for only a short portion of their mandate arguably do not have the capacity to effectively control local police - where by capacity, we mean here the knowledge of both local crime patterns and the functioning of the local police, the personal relationship with the police commissioner, as well as the authority to impose her own decisions.

Whenever information on mayors is included in the analysis, we will restrict the sample to municipalities in which mayors served for more than half of their mandates, between 2000 and 2006, and between 2007 and 2012. This restricted sample counts 533 municipalities (out of 589) distributed as follows: 235 municipalities in Wallonia, 282 in Flanders, 16 in the Brussels region. Since there are no term limits for mayorship, mayors often aim at re-election. In 2006, virtually all mayors were actively campaigning with a share of 93.1% seeking a new term. In 2012, the share was still high but was closer to 85% (Table 2).

As explained above, the new dataset contains also the political affiliation of the mayors. From that information, we can observe how mayoral party affiliation differs across regions. During the period under investigation, three parties shared power in the Wallonian political arena almost equally: the Social-Democratic Party (which controlled 36.82% municipalities), the Liberal Party (32.70% municipalities) and the Christian-Democrats (24.78% municipalities). In Flanders, half of the mayors were from the Christian-Democratic party, followed by the liberals (24.82% municipalities) and the Social-Democratic Party (11.16% municipalities). In Brussels, 40% of the mayors in the sampled period were from the Social-Democratic

[29] *Le Dico des communes* published by the Belgian newspaper *La Libre* on 3 October 2006 was particularly useful in closing some knowledge gaps concerning the 2006 elections.

[30] For the 2006 elections, the websites are: http://electionslocales.wallonie.be/2006/ (Wallonia), http://elections2006.brussels/ (Brussels), https://www.vlaanderenkiest.be/verkiezingen2006/ (Flanders). For the 2012 elections, the websites are: http://electionslocales.wallonie.be/2012 (Wallonia), http://bruxelleselections2012.irisnet.be/ (Brussels), https://www.vlaanderenkiest.be/verkiezingen2012/ (Flanders).

Party. The other two largest parties in the capital-region were of liberal origin.

Beside these regional differences, our data allows us to observe the political heterogeneity within police districts. This information allows us to study in the empirical section how coordination amongst mayors could play a role in explaining differences in crime incidence across municipalities. We argue that political affiliations could explain mayors' willingness to coordinate crime prevention policies across municipalities of the same police district. In order to quantify the political heterogeneity within a police district, we propose two indicators. The first one measures political fractionalization. Following Alesina, Baqir and Easterly (1999), it is defined as:

$$ELF = 1 - \sum_{k=1}^{K} \pi_k^2 \tag{1}$$

where $\pi$ is the proportion of mayors within the same police district belonging to party $k$. In other words, the index measures the probability that two randomly selected mayors from a police district belong to different political parties. The indicator increases with the political fractionalization of the police district. Following Montalvo and Reynal-Querol (2005), we also construct an index that captures political polarization:

$$pola = 1 - \sum_{k=1}^{K} \pi_k \left( \frac{0.5 - \pi_k}{0.5} \right)^2 \tag{2}$$

where, again, $\pi$ is the proportion of mayors within the same police district belonging to party $k$. The index captures how far the political landscape within a police district is from being bipolar, with $pola = 1$ indicating a bipolar political scenario. Table 2 provides some descriptive statistics about these two indicators across regions for the two mandates under observation.

# 5 Empirical Strategy

We are interested in determining the causal effect of the 2005 municipal election reform on crime incidence. Ideally, we would compare crime incidence in the municipalities where the reform occurred to those very same administrative units had the reform never taken place. Since this counterfactual is impossible to observe, we need to identify municipalities that are similar to the ones in the treatment group across both their observed and unobserved characteristics but that were unaffected by the reform. If we could rely on a randomized control trial, we would have randomly assigned the method of mayoral selection across treatment and control groups, and then compare their average criminal outcomes. Instead, we rely on a different identification strategy based on the limited implementation of the

2005 reform to create two comparable groups of municipalities and compare them in order to capture the causality. As discussed in Section 2, Wallonia was indeed the only region to switch to directly-elected mayors in 2005. Mayors in Flanders and the Brussels region were not affected and their respective city councils their respective city councils kept appointing them. We define Wallonian municipalities as being part of the "treatment group" and the others as constituting the "control group". The main identification assumption is that Flemish and Brussels municipalities mimic what would have happened to Wallonia if the 2005 reform had not taken place. In other words, we assume that the selection into the treatment group is not correlated with crime incidence. Hence, comparison of the differences in crime incidence between these two groups before and after the reform would provide the causal estimation we seek.[31] Formally, we test a difference-in-differences model, hereafter specified as a two-way fixed-effect linear regression model:

$$y_{it} = \alpha + \beta_0 WAL_i + \beta_1 d_t + \beta_2 D_{it} + \mathbf{\Gamma}'\mathbf{X}_{it} + \delta_i + \zeta_t + \epsilon_{it} \tag{3}$$

where $y_{it}$ is the logarithm of the crime incidence[32] in municipality $i$ and year $t$; $WAL_i$ is a dummy equal to 1 if a municipality is in Wallonia; and $d_t$ is a dummy equal to 1 if a crime episode was observed at time $t$ after 2005 (it takes the value of 0 before 2005). $D_{it}$ captures the treatment effect. It is equal to $WAL_i \times d_t$ and takes the value 1 if there was a crime observed at time $t$ after 2005 in a municipality $i$ located in Wallonia. $\mathbf{X_{it}}$ is a set of time-varying (observable) municipal characteristics that includes socio-economic features[33] and local public expenditures.[34] Finally, $(\delta_i)$ is a municipal fixed-effect and $(\zeta_t)$ a year fixed-effect. In some benchmark specifications, we consider instead a trend variable that increments every year across all municipalities. In all cases, the error $\epsilon_{it}$ is a municipality time-varying error independently distributed for every municipality and year. A common problem with panel data is that $\epsilon_{it}$ might be correlated across time and space. Some municipality characteristics correlated with crime incidence (e.g. being a tourist

[31] As discussed in Section 2, the 2005 reform did not apply to municipalities in Flanders and the Brussels regions because of the objections raised by parties in the respective regional parliaments. There is no reason to believe that the behavior of politicians, parties and voters in those municipalities has changed as a consequence of the 2005 Wallonian reform. Hence, parties in these regions remain the power-makers and determine the mayorship, without necessarily accounting for the preferential votes of candidates. Electoral law does not create incentives to form cartels around popular candidates before the elections, and political fragmentation remains a dominant feature of this political process. Mayors in these regions still seal the majority pact, and their policies fall under the scrutiny of the parties in the coalition, rather than being directly accountable to voters. Moreover, in these regions, any candidate can be appointed to office, irrespective of their personal electability and their actual participation in local elections (Matagne, Radoux and Verjans, 2011).

[32] Crime incidence equals the number of crime episodes per 1,000 inhabitants

[33] The socio-economic characteristics include the logarithm values of density and its squared value, mean income and median income; and the proportions of inhabitants unemployed, employed and foreigners. The quadratic term of the logarithm of density is included in order to consider the possibility that crime incidence evolves exponentially with population concentration.

[34] The public expenditures vector covers expenditure in public administration, garbage collection, social assistance, and safety and crime prevention.

locality) might be endemic and could thereby induce time-series correlation at the municipal level. Furthermore, the same characteristics could also affect neighboring municipalities. To minimize these problems, we cluster the standard errors at the municipality level to allow for an arbitrary covariance structure within municipalities over time (Galiani, Gertler and Schargrodsky, 2005).

On the basis of the foregoing information, $\beta_0$ informs the extent to which there are more crimes in the treatment group (Wallonia) than in the control group (Flanders and Brussels); $\beta_1$ indicates the incidence of criminality after 2005 with respect to incidence of criminality before that year; the coefficient associated to $D_{it}$, $\beta_2$, captures the effect of the reform. In particular, it functions as a difference-in-differences estimator of the average impact of the 2005 reform on crime incidence. Formally:

$$\begin{aligned}\hat{\beta_2} = (E\left[y_{it}|d_t = 1, WAL_s = 1\right]) - E\left[y_{it}|d_t = 1, WAL_s = 0\right]) \\ - (E\left[y_{it}|d_t = 0, WAL_s = 1\right] - E\left[y_{it}|d_t = 0, WAL_s = 0\right])\end{aligned} \tag{4}$$

where the first and the second differences compare the change in crime incidence between treatment and control groups, after and before the reform, respectively. A negative value of the coefficient of interest would validate Hypothesis 1 that post-reform crime incidence is lower under directly elected mayors (in Wallonia, the treatment group) than elsewhere (Flanders and the Brussels region, the control group). The identification assumption holds if the pre-reform trend of crime incidence is comparable between treatment and control groups. As shown in Figure 5, a simple graphical inspection suggests that trends were indeed parallel before the approval of the 2005 Wallonian reform. The trend for the control group remains substantially unaltered, whereas the evolution of crime incidence in Wallonia diverges after the reform. This would seem to validate the identification assumption.[35]

[Figure 5 here]

[Table 3 here]

Following Abramitzky and Lavy (2014), we also formally estimate differential time trends in the dependent variable for treated and control municipalities. First, we use pre-reform

[35]Moreover, the identification assumption holds if the reform affects only the treatment group. Crime incidence after the reform should deviate from the pre-reform trend in Wallonia only. A potential source of concern in Figure 5 is the discrete jump in crime incidence during the year of the reform involving not only the treatment group but the control group as well. There might be unobserved explanations for a change in crime incidence in both the treatment and control group that could threaten the identification assumption. If this jump were significant, we would not be able to disentangle the effect of the reform on crime incidence from other endogenous explanations correlated with crime in the control group. A standard t-test shows that the mean difference in crime incidence in the control group one and two years before and after the reform is not significant. The jump is instead significant in the treatment group. Hence, we believe that the identification assumption is valid.

data from 2000 to 2004 to interact the dummy $WAL_i$ with a constant linear trend. If the pre-treatment trend were not parallel between the two groups, the difference captured by the interaction would be significantly different from zero. Panel A of Table 3 reports the results. Whether control variables are included (column 1) or not (columns 2 and 3), the mean trend is not significantly different from zero. The estimated coefficient on the interaction of the constant trend with the treatment indicator is also not statistically significant, suggesting that there is no difference in the pre-treatment trend of crime incidences across treatment and control groups. Finally, we also interact $WAL_i$ with a series of year dummies in order to detect potential differences in trends for each of the pre-treatment years (Autor, 2003). Panel B of Table 3 displays the results of the estimation of these two models. Before 2005, all the interaction terms of the treatment indicator with the year dummies are not significant, no matter the specification chosen. Once again, these tests prove the validity of the identification strategy and of the results presented in the next section.

# 6 Results

This section presents first the results from the benchmark model – detailed in Equation (3). We then try to reconcile the results with the conceptual framework presented earlier and examine the heterogeneous effects of direct mayoral elections. In the next section, we test the robustness of the results using alternative specifications.

## 6.1 Benchmark Results

Table 4 presents the estimated treatment effects for crime incidence in the 8 years following the mayoral election reform. All specifications include a municipality fixed effect and a year fixed effect or a time trend. Column 1 presents the results without any controls. Columns 2 and 3 show the results adding socio-economic controls, while specifications presented in column 4 and 5 include also controls for public expenditures.[36] We find statistically significant evidence that crime incidence decreases as a result of the municipal election reform that introduced directly elected mayors. The results are coherent and statistically significant across all specifications. We find an average decease ranging between 3.7% and 5.7% in crime incidence in municipalities located in Wallonia compared to the rest of the country after the reform. A back-of-the-envelope calculation suggests that this represents a decrease of between 2.1 to 3.2 crimes per 1,000 inhabitants in the 8 years that followed the reform. Adding more controls or using a time trend instead of a year fixed effect only slightly modifies the size of the treatment effect. All in all, safety – or the quality of the

[36]For the specifications (4) and (5), which include public expenditure covariates, we considered in the analysis only those municipalities for which we have information for the whole period of interest (2000-2012). See Section 4 for more details.

public good – has increased because of the 2005 reform validating hypothesis 1.[37]

[Table 4 here]

Table 5 reports how the average treatment effect that we have identified varies by type of crime. It shows the impact on crime incidence for violence, robbery, fraud, vandalism and drugs separately. The results suggest heterogeneous effects across crime. The majority of the decrease in crime incidence is concentrated in the cases of violence and robbery. The post-reform incidence of these types of crime decreases on average by 4.4% and 9.8%, respectively. The estimated treatment effect on drug-related crime and vandalism is, by contrast, not significant. A possible explanation for this result is that directly-elected mayors have an incentive to focus on crimes that impact people more directly and thus to gain credit more quickly for their capacity to fight crime.

[Table 5 here]

The results presented so far capture the aggregate effect over the 8 years following the reform of the electoral system. Our setting allows us to also identify the treatment effect of the mayoral selection process on an annual basis. Figure 6 shows these dynamic results by plotting the time-varying treatment effects for crime incidence by year.[38] Focusing on the post-reform years, three important results emerge. First, the swift decline in crime incidence in Wallonian municipalities occurred the year the reform was implemented. Since the vote on the reform took place at the end of 2005, it is even likely that certain mayors started to modify their behavior before the reform became law. Second, crime incidence in Wallonia kept decreasing in a significant way for five to six years after the reform depending on the specification. Third, after 2010 the effects of the reform started to fade away. In the next section, we discuss these different results in detail and try to reconcile them with the hypothesis set in the conceptual framework.

[Figure 6 here]

## 6.2 Reconciling the Results with the First Hypothesis

The results presented above seem to confirm the first hypothesis that *after the 2005 reform, crime incidence decreased faster in municipalities where mayors became directly elected than*

[37] Table A1 in the Appendix presents the results including all the controls. It is interesting to notice that crime incidence increases significantly with the median income corresponding with existing crime literature. The variable of interest increases also exponentially with municipal density and in municipalities with higher per capita expenditure in garbage collections – which are usually wealthier. Finally, increasing or decreasing expenditure on police and crime prevention does not seem to play a role in explaining crime incidence over time.

[38] Panel B of Table 3 provides the associated coefficients with this Figure.

*in other municipalities where mayors remained appointed by the city council.* As discussed in Section 3, two mechanisms could explain this result.

Based on the first mechanism, this link between direct elections and lower crime incidence ensue from tighter electoral competition in cases of direct elections that increase mayoral accountability. More specifically in our case, it would mean that the 2005 reform in Wallonia would have increased competition for mayors running for elections by making them defend their seat not only against opponents from other party-lists but also against rivals from their own party-list. Consequently, to attract more voters to their name on the ballot, these mayors would have campaigned on issues that they directly control, and for which the results of their policy are highly visible. Since safety is an issue that is highly visible and directly managed by mayors in Belgium, this is the reason why mayors who are strongly committed to fight crime would have had a higher likelihood to win elections under a direct electoral system like the one implemented in Wallonia in 2005.[39]

The results of our estimation are in line with the predictions of this first mechanism, especially when we look at the results by year. Indeed, results in Table 4 and Figure 6 show that as soon as the reform was implemented, crime incidence started to decease sharply in Wallonia compared to the rest of the country. Since virtually all mayors ran for re-election in 2006 (as shown in Table 2), they all acted accordingly and started to tackle criminality to use the visible outcome of their policy to pander voters. Once re-elected, the consequences of their commitment and campaign platform persisted overtime.

Intriguingly, as the term in government comes to an end, Figure 6 shows that the effects of the reform on crime incidence seems to fade away. We interpret this result from the fact that about 16% of mayors in Wallonia did not run for re-election in 2012. Under these circumstances, "lame-duck" mayors were probably able to focus on issues that are less visible and electorally appealing than policing. As a consequence, the level of criminality started to converge to the local equilibrium determined by municipal structural characteristics in those municipalities. This explanation is confirmed by the results presented in Table 6 in which we exclude the "lame-ducks" from the benchmark analysis. We indeed find that the drop-in crime rates in Wallonia stays negative and significant also on the eve of the 2012 election. It confirms that where mayors sought (direct) re-election in 2012, they also kept leveraging on "law-and-order" policies and thus pandering to voters.

[Table 6 here]

The second mechanism that could explain our results relates to the control that a mayor exerts on a police commissioner's work. Here, the negative impact on crime incidence we

[39]Interestingly, the same mechanism would also apply after the elections since directly elected mayors face increased scrutiny from their constituents to uphold their campaign promises. As for the non-incumbent candidates, the same mechanism again also applies since they have more incentive to send voters clearer signals about their priorities and offer alternative solutions on a highly visible issue like crime.

find in our results would be related to the tighter control over the police that direct mayoral elections generate. Mayors face more scrutiny and thus they would monitor commissioners more intensely. As a result the commissioners would enact the anti-crime policy designed by the mayors more carefully and exert more effort fighting crime. The results presented in Table 4 do not allow us to test this mechanism directly. To do so, we try to measure how the treatment effect would vary with the size of the police force or the expenditure dedicated to activities related to crime-prevention. If our intuition is correct, we should expect the effect of the reform to not change as these two indicators increase since mayors who fight criminality by tightening control over the police do not need to increase spending or the size of the police. Interviews conducted in the context of this paper suggest that a mayor can strengthen control over local police by either meeting or following up with commissioners more regularly.

To realize these estimations, we augment Equation (3) first with an interaction variable between the treatment and the size of the local police force (measured as the log number of officers per 1,000 inhabitants), and then between the treatment and the (log) expenditure in activities related to crime-prevention. In both cases, the interactions validate the predictions of the second mechanism from the conceptual framework. We find that the treatment effect does not seem to change both with the size of the police force (Table 7) and local spending on crime prevention (Table 8).[40]

[Table 7 here]

[Table 8 here]

### 6.3 Reconciling the Results with the Second Hypothesis

In this section, we discuss our main results that crime incidence decreased faster in municipalities where mayors became directly elected in light of Hypothesis 2 in the conceptual framework. In other words, we discuss how coordination across municipalities could alter the effect of direct election on crime incidence. This discussion stems from the fact that municipalities in Belgium are organized in police districts that vary in size across the country.[41] Consequently, most mayors share their mandate over the chief of police with other mayors and any change in the electoral system could have different repercussions depending on the size of the police district and the associated coordination costs.

There are at least two reasons why the reform would have different effects in police districts where mayors share their mandates with at least one other mayor. First, as argued in Section 3, the oversight effect instigated by direct elections could also spur mayors

[40] A detailed investigation of the marginal effects for the two specifications in Figure A1 and Figure A2 confirms this finding.

[41] See Section 2 for a full description of the governance of local police in Belgium.

who share a police district to indirectly benefit from decisions made by other mayors to tighten supervision over the police force. In that context, despite the reform, voters cannot easily identify the mayors that contributed the most to safety in their policy district and award/punish them for their action at the elections. Therefore, there is a possibility that the impact of increased accountability on crime incidence through direct elections would decrease with the size of the police district and the number of mayors involved. Hence, we expect the post-2005 reform difference in crime incidence between treatment and control groups to narrow with the size of the police districts

The second reason is more directly related to the costs that any coordination between policymakers would generate alongside its benefits. In our case, it implies that notwithstanding the size of the police district, the benefits from the introduction of direct elections would depend on the costs of coordination between neighboring mayors. These costs could be particularly high when mayors from different political parties would have to supervise together the police commissioner active in their district. As a consequence, districts that are politically more fractionalized and/or polarized could end up with more crime even when direct elections are in place. Hence in that case, we expect the post-2005 reform difference in crime incidence between treatment and control groups to narrow in police districts that are more politically fractionalized.

We test these predictions regarding how coordination across municipalities could alter the effect of direct election on crime incidence from the model used to estimate the main benchmark specification (Equation (3)). To look first at the size of the police district, we introduce in Equation (3) the interaction between the treatment effect and the size of the police district. The interaction term will capture potential variation in the impact of the reform on crime incidence along with the varying size of police districts. Note that due to the unequal distribution of the number of municipalities belonging to the same police district, we reclassified the latter into "single-city" districts (composed of only one municipality), "small" districts (with two to three municipalities), "average" districts (with four to five municipalities), "large" districts (with six to seven municipalities), and "very large" districts (with more than seven municipalities).

[Table 9 here]

Table 9 shows the marginal treatment effect by the size of police district. It highlights more specifically how post-reform crime incidence decreases in treated municipalities by comparing police districts by size. The results show that while the incidence rate is around 10 percentage point lower in "single-city" district where mayors have been elected directly, it does not seem to be that different in bigger police districts. Indeed, the marginal effect of the direct election of mayors seems to decrease with the size of the police district. This result suggests that the larger the police district and the larger the number of mayors sharing the mandate over the chief of police, the more difficult it is for the voters to keep these mayors

accountable for their performance even with a more direct electoral system. Overall, this finding that could also be observed graphically in Figure 7 seems to validate Hypothesis 2 in the conceptual framework.

[Figure 7 here]

Next, we test the interaction between the treatment effect and political diversities amongst mayors in a police district. As detailed in Section 4, we proxy political diversity with two different indicators: the Herfindahl index of political fractionalization – as specified in Equation (1) – and an index of political polarization – as specified in Equation (2) –. Using these two indicators, we analyze how the impact of direct mayoral elections on crime incidence would vary with the cost associated with a more politically polarized police district. This effect is captured by adding to Equation 3 an interaction variable between the treatment effect and the index of polarization or fractionalization amongst mayors managing the same police district. Table 10 displays the estimated treatment effects and their interactions with the fractionalization index (column 2) and the polarization index (column 3). Figure 9 and Figure 8 present these results graphically. Across all specifications, we find that the negative effect of direct mayoral election on crime incidence is mitigated when mayors supervising a police district are from different political parties. The overall marginal effect of the reform of the electoral system is between 6.5 and 8.9 percentage points lower in more politically diversified police district suggesting that when political heterogeneity increases, the beneficial impact of the 2005 reform on crime incidence fades away. Overall, these results imply that the lack of cooperation between mayors from different parties undermines any reform that aims at increasing the transparency of service provision through a more direct electoral system.

[Table 10 here]

[Figure 8 here]

[Figure 9 here]

# 7 Robustness Tests

In this section we discuss the robustness of our results to a set of alternative specifications, including varying the municipality sample, changing the type of clustering and adding local-specific trends. We first address the robustness of our results with respect to the sample size and the municipalities covered. Although the parallel trend assumption seems valid in our main setting, it could be argued that the introduction of the new mayoral election system in Wallonia might have been endogenous to changes in other confounds that have only

affected that region in the past. Consequently, our results that directly rely on regional-level variation could be biased. In other words, if such differences were significantly correlated with crime incidence, and at the same time made the reform more likely in Wallonia than anywhere else, estimations in Table 4 might suffer from endogeneity issues.

In order to address these points, we look at two new specifications, one in which Brussels is excluded and another where only municipalities across regional borders are considered. The exclusion of Brussels allows us to dismiss a region that has two particularities: it is a city and the federal capital of the country. For both these reasons, Brussels could exhibit unique patterns in terms of criminality. In the second new specification, we only rely on municipalities that are adjacent to each other along the regional boarder to focus on municipalities that are more likely to experience similar local trends and hence be more comparable in terms of observed and unobserved characteristics (Dube, Lester and Reich, 2010).[42] Moreover, policy differences across the regional border are less likely to be directly related to the characteristics of the municipalities in these areas since there were decided at the regional level.

Table A3 in the Appendix reports the results for the two new specifications. Columns 1 and 2 report regression outcomes where we exclude Brussels from the analysis controlling for year-fixed effects and time-trend respectively. The effect of the reform on crime incidence remains both qualitatively and quantitatively like our baseline results. Directly elected mayors are associated with a significant lower level of crime. In columns 3 and 4, we consider the 152 municipalities along regional borders. Despite a smaller sample size, the coefficient of interest remains negative and significant both with fixed-effects (column 3) and with time-trend variables (column 4). Overall, these different results display the robustness of our findings.[43]

Next, we discuss the sensitivity of our findings related to the types of clustering used in the different regressions. It is well known that difference-in-differences estimations may suffer from serial correlation problems (Bertrand, Duflo and Mullainathan, 2004). It is common practice to cluster errors at the level of the treatment. In our case, although the treatment is formally assigned at the regional level, we nonetheless cluster the standard errors in our main specification at the municipal level. We justify that choice by the fact

[42] Balance tests in Table A2 in the Appendix show that municipalities along regional borders are noticeably more identical than the municipalities taken all together in each region.

[43] In the same vain, we also check whether municipal observable characteristics might have sharply changed around the implementation of the reform making it harder to identify the direct effect of the reform on crime incidence. Figure A4 plots the evolution of the main covariates considered in Equation (3) by treatment and control group. They reveal a sharp drop in income in the treatment group around 2003 and a faster growth in the proportion of foreigners in the control group. In the first case, the recorded difference is due to the digitalization of the submission of personal income tax reports in Wallonia that resulted in the automatic inclusion of low or no income earners. There is no evidence suggesting that this reform had an impact on crime incidence since it did not affect the actual taxable income of citizens, but rather the value registered by tax authorities. In the second case, most of the variation in the control group is captured by the region of Brussels (Figure A3). The robust results obtained by excluding Brussels from the analysis (columns 1 and 2 of Table A3) therefore also address that issue.

that both the elections selecting the main actors involved in fighting crime and all the policy decisions that affect it are at the municipality level and not at the regional one. In addition, given that there are only three regions in Belgium, standard errors would be unnecessarily conservative with standard errors clustered at the regional level (Abadie et al., 2017). In Table A4 in the Appendix, we, nonetheless, display results with standard errors clustered at the police district-, arrondissement-, and province- level respectively. As expected, standard errors become conservative but the impact of the reform on crime incidence is still significant at a confidence level between 5% and 10%.

Following Conley (1999), we also account for the possible serial correlation of errors across space. We control for the correlation within 5 km, 15 km, and 25 km from the geographical centroid of each municipality. We also test for the serial correlation of errors across time, with three-years lags. Results in Table A5 show that the coefficient of measuring the effect of the reform remains statistically significant.

Lastly, heterogenous geographical trends in observable and unobservable characteristics could persist over time and endogenously shape crime.[44] To rule out this possibility, we estimate our preferred specification with local-specific linear trends and quadratic trends at the municipal level, police district level and regional level (Autor, 2003). Table A6 in the Appendix display the results for specification controlling for trends at the municipal, police district and regional levels respectively. In all cases, the coefficient capturing the impact of the 2005 reform on local crime incidence is negative and significant.

# 8 Conclusion

We show that post-reform crime incidence decreases by 3.7% in municipalities where the mayor became directly elected. We argue that the introduction of direct elections tightened electoral competition and, consequently, candidates campaigned to the electorate on issues they could more directly control – such as safety. This change led voters to have access to more information on different candidates and to vote for those who took a clear stand on fighting criminality. The increased electoral competition also pushed mayors to monitor more tightly their police force which resulted in a reduction in crime. Overall, our results suggest that the method of selecting local public officials impacts local policy making and its outcomes.

Our analysis draws from a rich and unique dataset on reported crime (disentangled by type) in all 589 Belgian municipalities from 2000 to 2012, a period spanning over two full legislatures. It relies on a difference-in-difference strategy that uses the introduction of direct

[44] Allegretto, Dube and Reich (2011), for instance, accounts for spatial heterogeneity when assessing the impact of minimum wage on teen employment. Allegretto, Dube and Reich (2011) main argument concerns the possible correlation between heterogeneous patterns in low-wage employment across the United States and the decision by some individual states to implement minimum wage increases.

mayoral elections in 2005 in Wallonia to identify the treatment effect. Since mayors elsewhere in Belgium were still appointed, we argue that depending on their location Belgian mayors started to face different electoral incentives in 2005 that might have ultimately affected their commitment to fighting crime.

Based on our main results, we also explore how the level of coordination across municipalities could undermine the impact of this mayoral reform on the provision of safety. We find that the treatment effect decreases with the number of mayors sharing a mandate over the police force across one police district. Shared mandates seem to create free-riding incentives that ultimately impact the effectiveness of the local police force and the extent to which mayors are held accountable by their voters. Moreover, shared mandates also increase the cost of coordination among mayors, especially in large police districts and very politically diverse ones.

All in all, our findings contribute to the literature in at least four different ways. First, we are amongst the first to show how the procedure for filling executive positions (like mayors) impacts the policies pursued. In that regard, we also provide new evidence that when a candidate signals his or her commitment to provide quality public goods (i.e. lower crime incidence here) – he or she will increase their own likelihood to be in office and to commit to their electoral promises once elected. Second, we contribute to the literature on the economics of crime by highlighting how political institutions impact police management and crime incidence. Third, we contribute to a growing literature that investigates accountability and local public service provisions in the presence of horizontal agreements between local politicians. Finally, drawing on the Belgian case, we contribute to studies that consider the interaction between electoral cycles and the management of local public services where coordination across jurisdictions is implied. We also provide input for the debate taking place in several European countries (e.g. France, Scotland and England) on the decentralization of police management and its potential impact on local criminality.

Finally, because of data limitations we were not able to distinguish properly the intensive margin of the reform from the extensive one. Future research should address more directly, for example, how mayors could influence the effort of police commissioners or how commissioners could be incentivized to prioritize crime fighting. We leave investigation of these questions for future scholars contributing to the expanding and promising literature on the relationship between politicians and bureaucrats.

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# Tables

Table 1: Descriptive Statistics for Main Crime Episodes (MCE) and all Crime Episodes by Region (2000-2012)

| | MCE | All | Vandalism | Robbery | Violence | Fraud | Drug |
|---|---|---|---|---|---|---|---|
| Wallonia | 52.15 | 73.60 | 9.75 | 27.34 | 6.83 | 4.30 | 3.92 |
| | (22.27) | (29.05) | (4.00) | (13.63) | (2.92) | (4.39) | (7.81) |
| Flanders | 43.77 | 60.20 | 7.99 | 23.04 | 4.50 | 4.20 | 4.04 |
| | (22.84) | (28.69) | (3.55) | (13.40) | (2.28) | (4.65) | (10.34) |
| Brussels | 107.68 | 140.06 | 11.68 | 76.89 | 8.55 | 6.70 | 3.86 |
| | (55.72) | (68.88) | (3.27) | (45.29) | (3.41) | (4.85) | (3.01) |
| Total | 49.56 | 68.73 | 8.89 | 26.69 | 5.67 | 4.33 | 3.99 |
| | (26.88) | (34.22) | (3.88) | (18.19) | (2.91) | (4.56) | (9.13) |

Notes: MCE (Main Crime Episodes) is the dependent variable of interest, as defined in section 4. Column (1) reports the summary statistics for all main crime episodes, confounded. Column (2) reports the summary statistics of all types of crimes (including MCE), confounded.Source: Crime statistics 2000-2012; Police féderale - Direction de l'information policiére et des moyens ICT (DRI). Service Politique et gestion (BIPOL). Partly available at: www.stat.policefederale.be

Table 2: Descriptive Statistics for Social, Economic and Political Municipal Characteristics (2000-2012)

| | Wallonia | Flanders | Brussels-Region | Total |
|---|---|---|---|---|
| **Social and economic variables** | | | | |
| Density | 307.30 | 523.29 | 9,278.13 | 709.63 |
| | (429.12) | (449.27) | (5,332.34) | (1,886.77) |
| Population | 13,077.45 | 19,829.24 | 54,313.16 | 17,938.28 |
| | (20,514.23) | (31,730.12) | (34,912.94) | (28,422.06) |
| Mean income | 25,355.74 | 27,747.08 | 24,417.86 | 26,575.96 |
| | (4,183.49) | (4,000.51) | (4,584.86) | (4,284.52) |
| Median income | 19,449.06 | 21,269.50 | 17,755.26 | 20,346.37 |
| | (2,618.06) | (2,243.) | (2,469.74) | (2,625.91) |
| Foreigners (%) | 6.34 | 4.16 | 26.30 | 5.85 |
| | (5.73) | (5.41) | (8.77) | (6.89) |
| Employment | 59.64 | 66.24 | 55.88 | 62.97 |
| | (5.42) | (3.85) | (5.23) | (5.82) |
| Unemployment | 8.48 | 3.83 | 14.91 | 6.26 |
| | (3.54) | (1.4) | (5.52) | (3.91) |
| No. of municipalities (sample size) | 262 | 308 | 19 | 589 |
| **Public expenditure (% of overall local expenditure)** | | | | |
| Social assistance | 11.13 | 10.29 | 14.84 | 10.84 |
| | (3.69) | (3.51) | (3.00) | (3.68) |
| Garbage collection | 6.13 | 7.93 | 1.20 | 6.85 |
| | (1.74) | (2.01) | (1.34) | (2.34) |
| Public admin | 19.45 | 16.91 | 12.78 | 17.93 |
| | (4.38) | (4.36) | (6.17) | (4.73) |
| Police | 7.97 | 8.83 | 17.28 | 8.75 |
| | (2.67) | (2.12) | (3.25) | (2.99) |
| No. of municipalities (sample size) | 237 | 259 | 19 | 515 |
| **Size of the police force** | | | | |
| No. officers per 1,000 inhabitants | 14.3 | 11.37 | 16.31 | 12.86 |
| | (12.06) | (50.38) | (8.57) | (37.32) |
| No. of municipalities (sample size) | 262 | 306 | 19 | 587 |
| **Political landscape** | | | | |
| Fractionalization index within police districts | 0.53 | 0.44 | 0.56 | 0.48 |
| | (0.24) | (0.27) | (0.25) | (0.26) |
| Polarization index within police districts | 0.75 | 0.68 | 0.81 | 0.72 |
| | (0.31) | (0.38) | (0.28) | (0.35) |
| No. of municipalities (sample size) | 235 | 282 | 16 | 533 |
| No. of municipalities which mayors ran for re-election in 2006 | 212 | 268 | 16 | 496 |
| No. of municipalities which mayors ran for re-election in 2012 | 200 | 235 | 16 | 451 |

Source: StatBel and Belfius for "Social and economic variables" and for "Public expenditure". Data describing the "Political landscape" have been collected as described in Annex A.2 and are available upon request.

Table 3: Testing the Pre-treatment Parallel Assumption

| | (1) | (2) | (3) |
|---|---|---|---|
| **Panel A** | | | |
| Trend | -0.006 | 0.002 | -0.000 |
| | (0.004) | (0.005) | (0.006) |
| WAL × Trend | -0.006 | -0.006 | -0.006 |
| | (0.006) | (0.007) | (0.008) |
| **Panel B** | | | |
| WAL × year=2001 | -0.016 | -0.014 | -0.022 |
| | (0.015) | (0.015) | (0.016) |
| WAL × year=2002 | -0.032* | -0.024 | -0.032 |
| | (0.018) | (0.019) | (0.020) |
| WAL × year=2003 | -0.032 | -0.025 | -0.032 |
| | (0.021) | (0.021) | (0.022) |
| WAL × year=2004 | -0.023 | -0.014 | -0.018 |
| | (0.023) | (0.024) | (0.026) |
| WAL × year=2005 | -0.083*** | -0.073*** | -0.074*** |
| | (0.021) | (0.022) | (0.025) |
| WAL × year=2006 | -0.086*** | -0.079*** | -0.074*** |
| | (0.022) | (0.023) | (0.026) |
| WAL × year=2007 | -0.070*** | -0.059** | -0.052** |
| | (0.023) | (0.025) | (0.026) |
| WAL × year=2008 | -0.099*** | -0.087*** | -0.082*** |
| | (0.023) | (0.025) | (0.027) |
| WAL × year=2009 | -0.069*** | -0.060** | -0.055* |
| | (0.024) | (0.027) | (0.029) |
| WAL × year=2010 | -0.056** | -0.047* | -0.036 |
| | (0.023) | (0.027) | (0.029) |
| WAL × year=2011 | -0.042* | -0.026 | -0.020 |
| | (0.023) | (0.027) | (0.029) |
| WAL × year=2012 | -0.051** | -0.036 | -0.036 |
| | (0.024) | (0.028) | (0.030) |
| Municipality FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |
| Socio-economic controls | No | Yes | Yes |
| Public expenditure controls | No | No | Yes |
| Observations | 7654 | 7654 | 6565 |

Notes: Ordinary least squares estimates based on Equation 3 are given. The dependent variable is the log incidence of main crime events, as defined in section 4. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012, as discussed in Section 4. $WAL$ is a dummy variable that is equal to 1 for all municipalities in Wallonia, where the 2005 reform is implemented. The specifications in columns (2) to (5) include socio-economic covariates. Columns (4) and (5) include public expenditure variable and analysis is restricted only to those municipalities for which we have information for the whole period of interest (2000-2012). Clustered standard errors at the municipality level are in parenthesis and allow for arbitrary correlation of residuals within each municipality. Significance levels are denoted as follows: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 4: Benchmark Results

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Treatment | -0.049*** | -0.046*** | -0.057*** | -0.037** | -0.053*** |
| | (0.013) | (0.014) | (0.011) | (0.015) | (0.012) |
| Socio-economic controls | No | Yes | Yes | Yes | Yes |
| Public expenditure controls | No | No | No | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | No | Yes | No |
| Trend | No | No | Yes | No | Yes |
| Observations | 7654 | 7654 | 7654 | 6565 | 6565 |

Notes: Ordinary least squares estimates based on Equation 3 are given. The dependent variable is the log incidence of main crime events, as defined in section 4. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012. Socio-economic covariates are included in columns (2) to (4). Columns (4) and (5) includes public expenditure variable; analysis is restricted only to those municipalities for which we have information for the whole period of interest (2000-2012), as discussed in section 4. Coefficients for all control variables are reported in Table A1. All specifications include municipal effects. Columns (3) and (5) include linear time trends. All the others include year fixed effects. Clustered standard errors at the municipality level are in parenthesis and allow for arbitrary correlation of residuals within each municipality.
Significance levels are denoted as follows: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 5: Benchmark Results by Type of Crime

| | Violence | Robbery | Fraud | Vandalism | Drug |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Treatment | -0.044*** | -0.066*** | -0.098** | 0.022 | -0.074 |
| | (0.016) | (0.014) | (0.049) | (0.018) | (0.052) |
| Socio-economic controls | Yes | Yes | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 7645 | 7652 | 7637 | 7643 | 7471 |

Notes: Ordinary least squares estimates based on Equation 3 are given. The dependent variable is the log incidence of each type of main crime event, as defined in section 4. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012. All specifications include socio-economic controls, as well as municipal and year fixed effects. Clustered standard errors at the municipality level in parenthesis allow for arbitrary correlation of residuals within each municipality.
Significance levels are denoted as follows: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 6: Interaction $WAL_i \times$ *year dummy only for sample without "lame-duck" mayors in 2012*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| WAL x year=2001 | -0.014 | -0.022 | -0.021 | -0.024 |
| | (0.015) | (0.016) | (0.017) | (0.018) |
| WAL x year=2002 | -0.024 | -0.032 | -0.030 | -0.032 |
| | (0.019) | (0.020) | (0.021) | (0.023) |
| WAL x year=2003 | -0.025 | -0.032 | -0.047* | -0.046* |
| | (0.021) | (0.022) | (0.024) | (0.026) |
| WAL x year=2004 | -0.014 | -0.018 | -0.042 | -0.040 |
| | (0.024) | (0.026) | (0.027) | (0.030) |
| WAL x year=2005 | -0.073*** | -0.074*** | -0.099*** | -0.095*** |
| | (0.022) | (0.025) | (0.025) | (0.028) |
| WAL x year=2006 | -0.079*** | -0.074*** | -0.104*** | -0.094*** |
| | (0.023) | (0.026) | (0.026) | (0.029) |
| WAL x year=2007 | -0.059** | -0.052** | -0.089*** | -0.074** |
| | (0.025) | (0.026) | (0.028) | (0.030) |
| WAL x year=2008 | -0.087*** | -0.082*** | -0.120*** | -0.110*** |
| | (0.025) | (0.027) | (0.028) | (0.030) |
| WAL x year=2009 | -0.060** | -0.055* | -0.085*** | -0.072** |
| | (0.027) | (0.029) | (0.031) | (0.033) |
| WAL x year=2010 | -0.047* | -0.036 | -0.081*** | -0.064* |
| | (0.027) | (0.029) | (0.031) | (0.033) |
| WAL x year=2011 | -0.026 | -0.020 | -0.056* | -0.044 |
| | (0.027) | (0.029) | (0.031) | (0.033) |
| WAL x year=2012 | -0.036 | -0.036 | -0.077** | -0.072** |
| | (0.028) | (0.030) | (0.032) | (0.035) |
| Constant | 5.771*** | 5.113** | 2.477 | 2.181 |
| | (2.169) | (2.463) | (2.709) | (3.095) |
| Socio-economic controls | Yes | Yes | Yes | Yes |
| Public expenditure controls | No | Yes | No | Yes |
| Municipality FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| No. of observations | 7654 | 6565 | 5860 | 5034 |

Notes: Ordinary least squares estimates based on Equation (3) are given. The dependent variable is the log incidence of main crime events, as defined in Section 4. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012, as discussed in Section 4. $WAL$ is a dummy variable that is equal to 1 for all municipalities in Wallonia, where the 2005 reform is implemented. The specifications in columns (1) to (2) are the same as the one reported in Table 3 (columns 2 and 3). The results reported in columns (3) and (4) refer to a dataset that is restricted to those municipalities which incumbent mayors ran for re-election in 2012. Column (2) and (4) further restrict the analysis to only to those municipalities for which we have information for the whole period of interest (2000-2012). Clustered standard errors at the municipality level are in parenthesis and allow for arbitrary correlation of residuals within each municipality. Significance levels are denoted as follows: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 7: Interaction between Treatment and Size of the Local Police Force

| | (1) | (2) |
|---|---|---|
| Treatment | -0.039*** | -0.059** |
| | (0.013) | (0.030) |
| Size local police (log) | | 0.044 |
| | | (0.028) |
| Treatment × Size local police | | 0.009 |
| | | (0.013) |
| Socio-economic controls | Yes | Yes |
| Municipality FE | Yes | Yes |
| Year FE | Yes | Yes |
| Observations | 6454 | 6454 |

Notes: Ordinary least squares estimates are given. The analysis is restricted only to the period 2002-2012 and excludes two municipalities that merged in a new police district in 2011, as discussed in section 4. The dependent variable is the log incidence of main crime events, as defined in section 4. Values are taken from official crime statistics, as reported by the local police, from 2002 to 2012. All specifications include socio-economic covariates and year fixed effects. Standard errors are clustered at the municipal level. Significance levels are denoted as follows: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 8: Interaction between Treatment and Local Spending in Crime Prevention

| | (1) | (2) |
|---|---|---|
| Treatment | -0.036 | 0.066 |
| | (0.015) | (0.126) |
| Spending in crime prevention (log) | | -0.021 |
| | | (0.018) |
| Treatment × Spending in crime prevention | | -0.008 |
| | | (0.009) |
| Socio-economic controls | Yes | Yes |
| Public expenditure controls | No | Yes |
| Municipality FE | Yes | Yes |
| Year FE | Yes | Yes |
| Observations | 6695 | 6695 |

Notes: Ordinary least squares estimates are given. The analysis is restricted only to those municipalities for which we have budgetary information for the whole period of interest (2000-2012), as discussed in section 4. The dependent variable is the log incidence of main crime events, as defined in section 4. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012. The specification in column (1) includes only socio-economic controls, while all specifications include municipality and year fixed effects. The specification in column (2) includes socio-economic controls and selected spending variables, as described in section 4. Standard errors are clustered at the municipal level. Significance levels are denoted as follows: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 9: Interaction of the Treatment Effect with the Size of Police Districts

| | (1) | (2) | (3) |
|---|---|---|---|
| Treatment | -0.083*** | -0.097*** | -0.104*** |
| | (0.025) | (0.026) | (0.025) |
| Size PD: Small | -0.417*** | -0.342*** | -0.346*** |
| | (0.062) | (0.028) | (0.053) |
| Size PD: Medium | -0.543*** | -0.378*** | -0.379*** |
| | (0.064) | (0.028) | (0.059) |
| Size PD: Large | -0.510*** | -0.414*** | -0.407*** |
| | (0.072) | (0.028) | (0.061) |
| Size PD: Very large | -0.552*** | -0.346*** | -0.342*** |
| | (0.063) | (0.028) | (0.064) |
| Treatment× Size PD: Small | 0.048* | 0.059** | 0.066** |
| | (0.028) | (0.029) | (0.028) |
| Treatment× Size PD: Medium | 0.066** | 0.076** | 0.080*** |
| | (0.031) | (0.031) | (0.031) |
| Treatment× Size PD: Large | 0.024 | 0.043 | 0.048 |
| | (0.032) | (0.032) | (0.031) |
| Treatment× Size PD: Very large | 0.066** | 0.076** | 0.083*** |
| | (0.030) | (0.030) | (0.030) |
| Socio-economic controls | Yes | Yes | Yes |
| Municipal RE | Yes | Yes | Yes |
| Year FE | No | Yes | No |
| Trend | No | No | Yes |
| Observations | 6476 | 6476 | 6476 |

Notes: Ordinary least squares estimates are given. The analysis is restricted only to the period 2002-2012 and excludes two municipalities that merged in a new police district in 2011, as discussed in section 4. The dependent variable is the log incidence of main crime events, as defined in section 4. Values are taken from official crime statistics, as reported by the local police, from 2002 to 2012. "Small" police districts (PD) count 2 to 3 municipalities; "medium" PD have 4 to 5 municipalities; "large" PD count 6 to 7 municipalities; "very large" PD have more than 7 municipalities and up to 10. All specifications include socio-economic controls and municipality random effects. Random effects are used here to solve for the small size of the sample in some of the treated groups of municipalities. Column (2) includes year fixed effects, while column (3) includes linear time trends. Clustered standard errors at the municipality level in parenthesis allow for arbitrary correlation of residuals within each municipality.
Significance levels are denoted as follows: $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

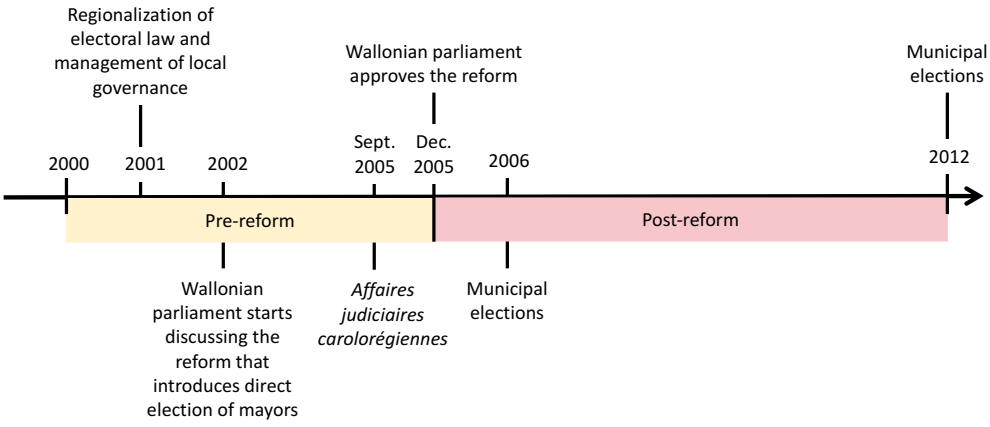
Table 10: Interaction of the Treatment Effect with Indexes of Political Diversity

| | (1) | (2) | (3) |
|---|---|---|---|
| Treatment | -0.053*** | -0.090*** | -0.093*** |
| | (0.014) | (0.019) | (0.019) |
| Fractionalization index | | -0.026 | |
| | | (0.035) | |
| Treatment × Fractionalization index | | 0.089*** | |
| | | (0.030) | |
| Polarization index | | | -0.023 |
| | | | (0.023) |
| Treatment × Polarization index | | | 0.065*** |
| | | | (0.023) |
| Socio-economic controls | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |
| No. of observations | 5860 | 5860 | 5860 |

Notes: Ordinary least squares estimates are given. The analysis is restricted only to those municipalities which mayors ruled for more than half of the mandate, between 2000 and 2006, and between 2007 and 2012, as discussed in section 4. The dependent variable is the log incidence of main crime events, as defined in section 4. The fractionalization and polarization indexes are defined by equations 1 and 2 in section 4. All specifications include socio-economic controls, municipal and year fixed effects. All models include municipality and year fixed effects. Clustered standard errors at the municipality level in parenthesis allow for arbitrary correlation of residuals within each municipality.
Significance levels are denoted as follows: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

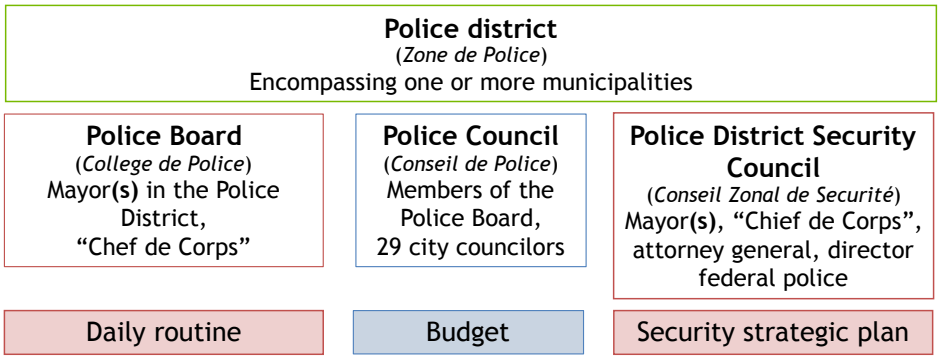
# Figures

Figure 1: Timeline of the 2005 Reform Introducing the Direct Election of Mayors



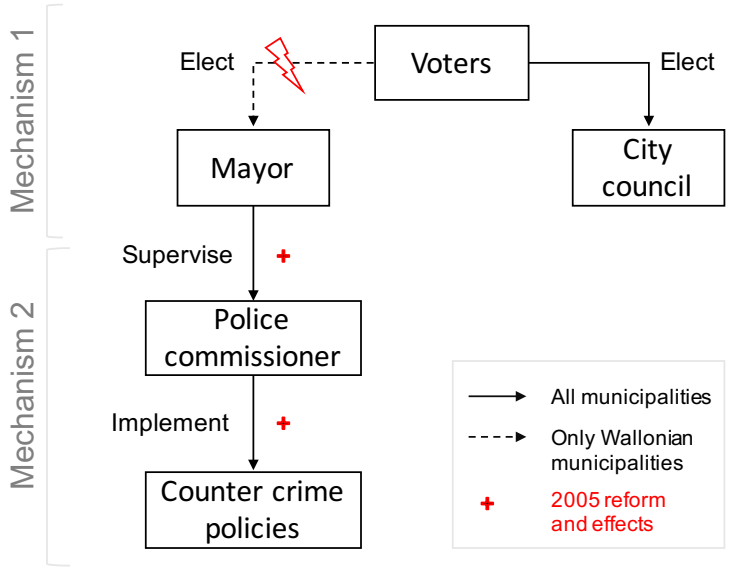

Notes: Authors' representation based on Blaise, de Coorebyter and Faniel (2006) and Matagne, Radoux and Verjans (2011)

Figure 2: Police District: Governance Framework



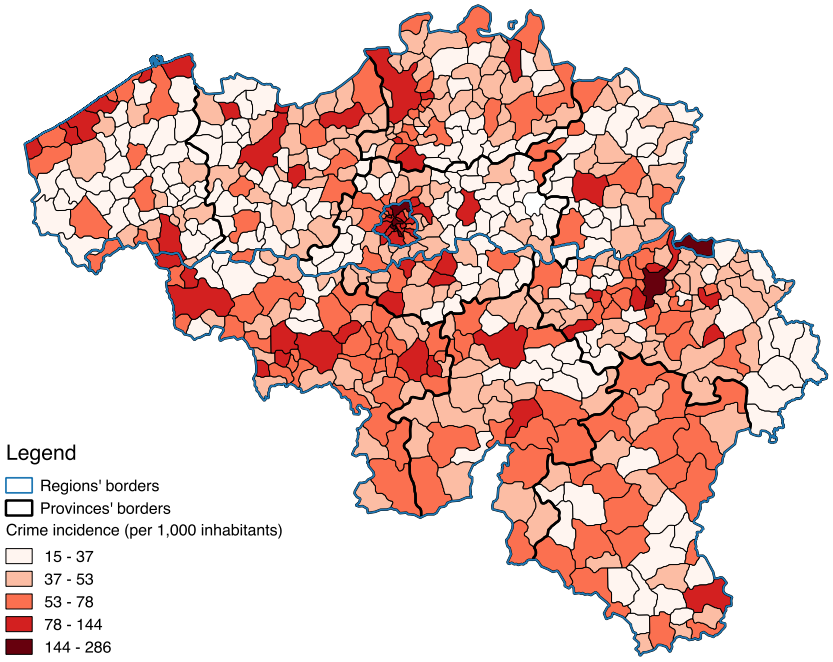

Notes: Police districts have their own governance framework which requires mayors to interact when several municipalities are involved Authors' representation. Based on interviews to Alexia Jonckheere (Police Féderale) and Sybille Smeets (Université libre de Bruxelles).

Figure 3: The two Mechanisms Behind Hypothesis 1



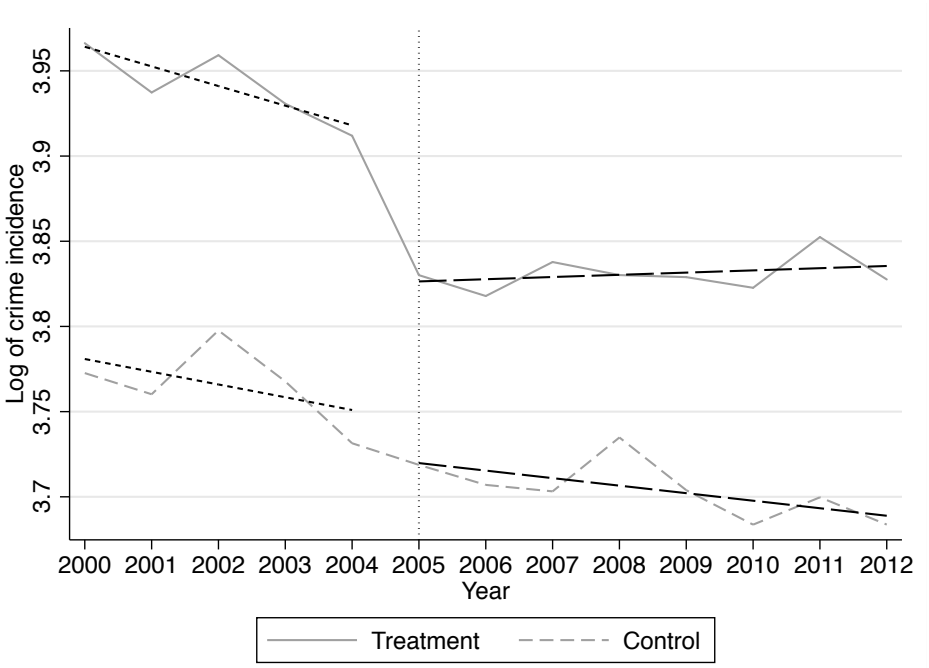

Notes: The positive effect of direct election on crime incidence (hypothesis 1) can be explained through two mechanisms, both of which draw from the principal-agent framework.

Figure 4: Spatial distribution of crime incidence by municipality, average 2000-2012



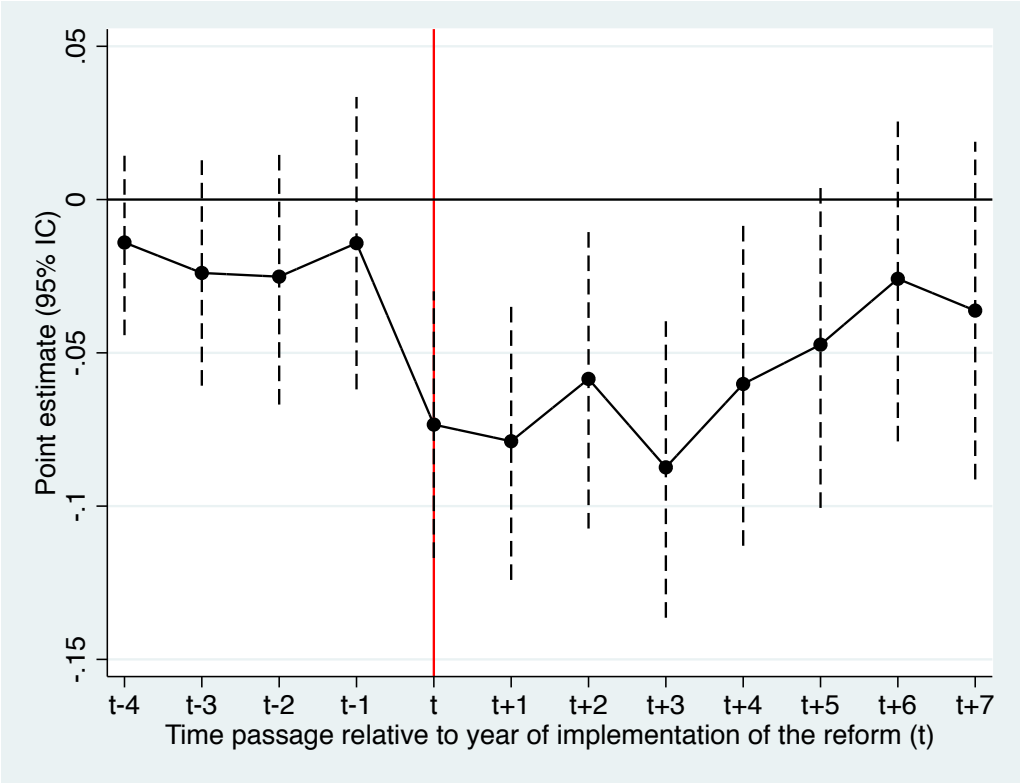

Notes: This figure shows crime incidence by municipality. The darker a municipality, the higher its crime incidence. Municipalities with the highest average crime incidence over the 2000-2012 period are, for example, Liege (183 episodes per 1,000 inhabitants), Charleroi (126) and Vise (122) in Wallonia; Fourons (183), Blankenberge (125) and Antwerpen (124) in Flanders; and Brussels (286), Saint-Gilles (221) and Saint-Josse-ten-Noode (123) in the Brussels region.

Figure 5: Trend in Average Crime Incidence



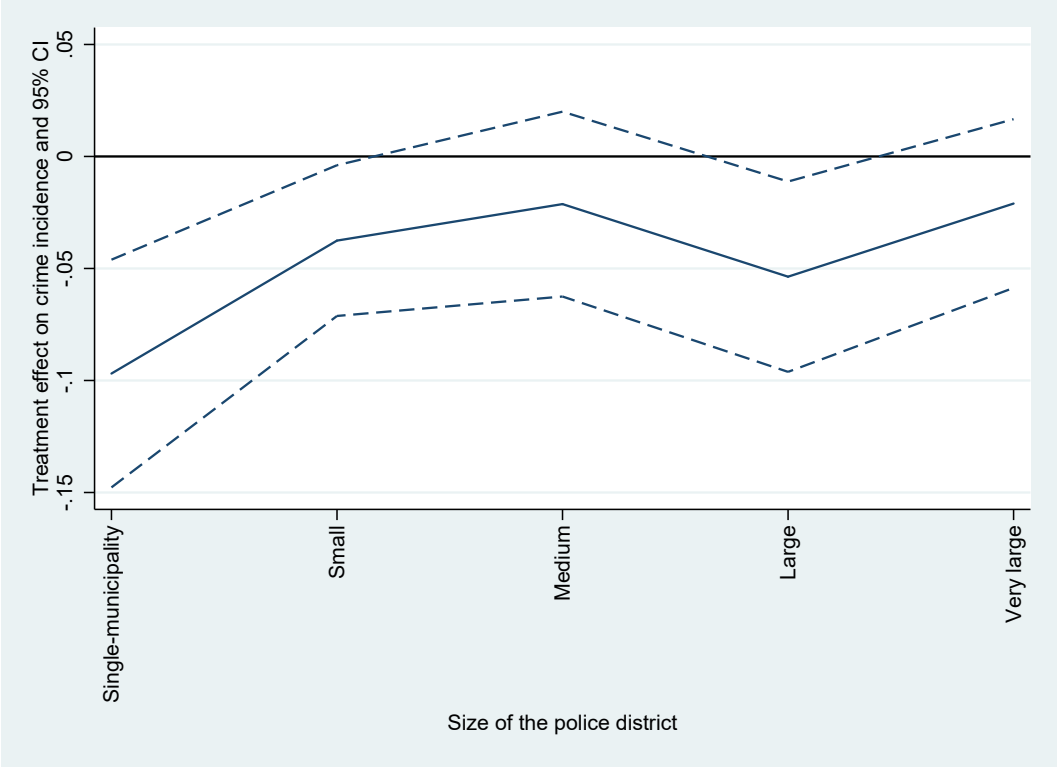

Notes: The Figures displays the trends in average crime incidence before and after the reform and between treatment and control groups. "Crime incidence" is measured as the aggregate value of the five main crime events (as defined in section 4 divided by 1,000 inhabitants. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012. The treatment group includes 262 municipalities in Wallonia, where the 2005 reform took place. The control group is made of 308 municipalities in Flanders and 19 municipalities in the Brussels region, where the reform did not take place.

Figure 6: Treatment Effect by Year (2000-2012)



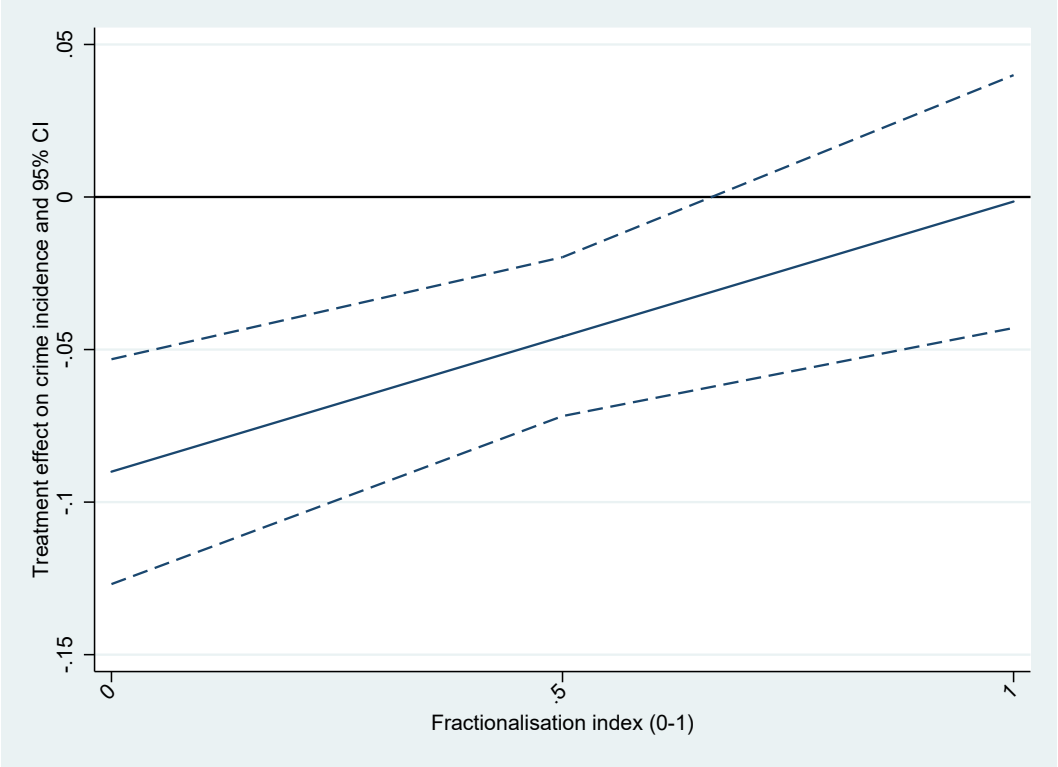

Notes: The graph represents the ordinary least squares estimated coefficients and the respective 5% coefficient intervals presented in Table 3, Panel B, column (2). The dependent variable is regressed on the interaction between *WAL* (which is equal to 1 for all municipalities in Wallonia, the treatment group) and a dummy for each year in the period of interest (2000-2012). The dependent variable is the log incidence of main crime events, as defined in section 4. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012. Standard errors are clustered at the municipal level and allow for arbitrary correlation of residuals within each municipality.

Figure 7: Marginal effects of the interaction between treatment effects and the size of police districts



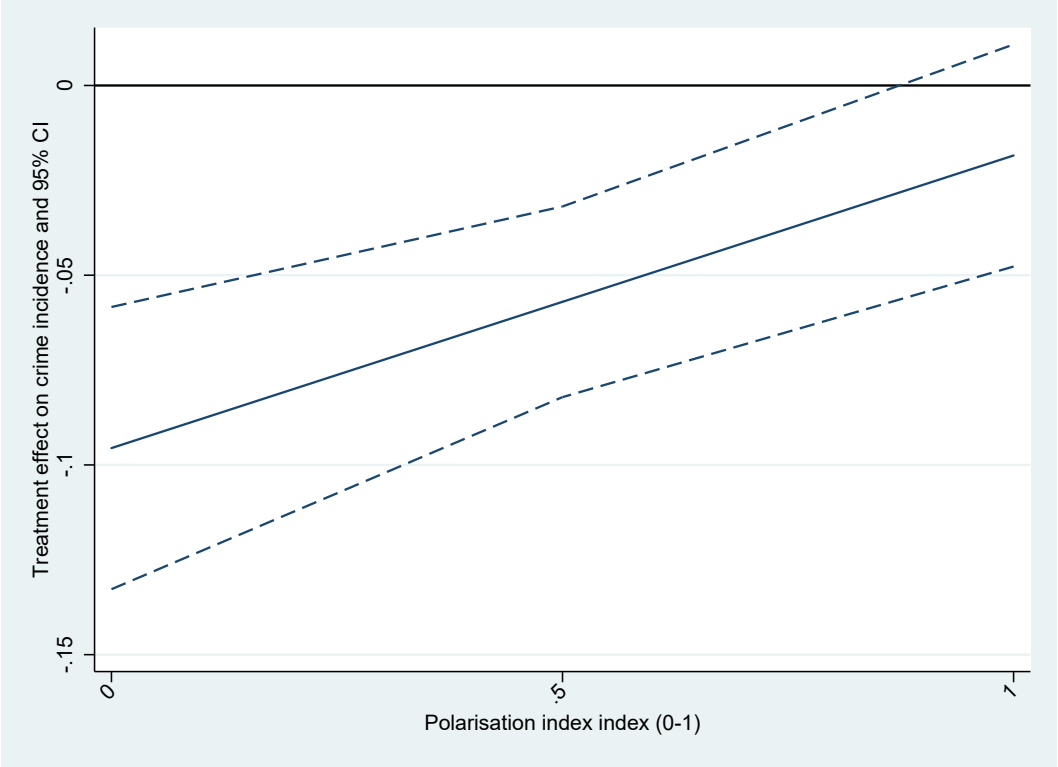

Notes: The graph represents the marginal effects of the interaction between the treatment variable and the size of the police districts, presented in Table 9, column (2). The analysis is restricted only to the period 2002-2012 and excludes two municipalities that merged in a new police district in 2011, as discussed in section 4. The dependent variable is the log incidence of main crime events, as defined in section 4. "Single-municipality" police districts (PD) have only one municipality. Small" police districts (PD) count 2 to 3 municipalities; "medium" PD have 4 to 5 municipalities; "large" PD count 6 to 7 municipalities; "very large" PD have more than 7 municipalities and up to 10.

Figure 8: Marginal effects of the interaction between treatment effects and indexes of political diversity - Fractionalization




Notes: The graph represents the marginal effects of the interaction between the treatment variable and the size of the police districts, presented in Table 10, column (2). The analysis is restricted only to those municipalities which mayors ruled for more than half of the mandate, between 2000 and 2006, and between 2007 and 2012, as discussed in section 4. The dependent variable is the log incidence of main crime events, as defined in section 4. The fractionalization index is defined by equation 1 in section 4. The index can take values between 0 and 1. Fractionalization increases with the value of the index.

Figure 9: Marginal effects of the interaction between treatment effects and indexes of political diversity - Polarization




Notes: The graph represents the marginal effects of the interaction between the treatment variable and the size of the police districts, presented in Table 10, column (3). The analysis is restricted only to those municipalities which mayors ruled for more than half of the mandate, between 2000 and 2006, and between 2007 and 2012, as discussed in section 4. The dependent variable is the log incidence of main crime events, as defined in section 4. The polarization index is defined by equation 2 in section 4. The index can take values between 0 and 1. Polarization increases with the value of the index.

# Appendix

## A.1 Survey Questions to Mayors and Heads of Police District

Interviews were conducted between August and September 2017, usually in the mayoral office, in either French or English. They lasted between 1 and 2 hours.

### Contact component

Interviewee:
Municipality:
Party:
Police District:

### Importance of safety issues in mayor's agenda and effort in fighting crime

1. How much time do you dedicate to police management every day/week? (quantify in terms of hour and %)
2. How importance do you think your voters give to safety?
3. To what extent do voters recognize you as chief of police?
4. How much importance did you give to safety issues during your last electoral campaign?
   (a) Does your effort to fight crime change during the legislature?
   (b) Is there a particular period where you maximize your effort in fighting crime?
5. What do you usually do when it comes to fighting crime? What are the policy instruments in your hands?
6. Is there any specific type of crime you spend more time to fight against? Among: violence, robbery, drugs, fraud, vandalism.

### The mayor and the governance of local police

1. How would you define your relationship with the head of police? (How often do you talk to each other? For what reasons?...)
2. How are the decisions taken in the College de Police, Conseil de Police, Conseil Zonal de Securité? - Especially when governance is shared among several mayors
   (a) How do you coordinate with other mayors?
   (b) Is coordination more difficult when your peers come from different parties?
   (c) Does someone have a final word when there are too many divergent opinions and agendas?
   (d) How do you decide to redistribute police within the police district?
3. What factors determine the shape of the police district in which your municipality is located?

### The 2005 reform in Wallonia

The reform in 2005 in Wallonia aimed at making the election of mayors more direct.[45]

1. Would you consider yourself (and your peers in Flanders) less directly elected than in Wallonia?
   (a) If yes: how does this affect your policies and work as a mayor?
   (b) If no: do you think the reform has brought about any relevant change in Wallonia? If not, why was the reform implemented in the first place?
2. Has the reform changed the way electoral campaigns are conducted?

## A.2 Belgian Mayors Database, 2004-2012

This dataset was assembled to support the analysis of "Public goods under appointed versus elected mayors: Evidence from policing and crime prevention". It gathers information about Belgian mayors in charge from 2004 to 2006, and from 2006 to 2012, and their electoral performance in 2006 and 2012. The dataset can be made available upon request (ilan.tojerow@ulb.be).

## Codebook

- *Candlist06*: Elected mayor's rank before the 2006 elections within the electoral list.
- *Candrank06*: Elected mayor's rank at the 2006 elections, cross-party ranking.
- *ID*: Code attributed to the mayor composed of his/her name and the INS reference.
- *INS*: Geographical 5-digit reference code attributed to each municipality; 11001 – 93090.
- *INSregio*: Unique code attributed to each region that composes Belgium; Flanders, Wallonia and Brussels-Capital.
- *Last06*: Binary variable, equal to 1 when the mayor served between 2004 and 2006.
- *Last12*: Binary variable, equal to 1 when the mayor served between 2006 and 2012.
- *Legi*: Single digit variable indicating the mayor's legislative tenures, legislative periods for Belgian mayors last 6 years. The variable is equal to 1 when the mayor occupied tenure only during the 2004 - 2006 legislative period, equal to 2 only in 2006 - 2012 and 3 if the mayor remained in tenure for both legislative periods.
- *Llegi1*: Overall length of the 2004-2006 legislature in months.
- *Llegi2*: Overall length of the 2006-2012 legislature in months.
- *Ltot*: Sum of the following variables; (*ltotnoimp*) and (*ltotimp*). Length expressed in months, both as impeded and current mayor.
- *Ltot2*: Sum of the following variables; (*ltotnoimp2*) and (*ltotimp2*). Length expressed in months, both as impeded and current mayor.

[45] The following questions were asked to mayors or local administrators that were not affected by the reform. The goal was to understand how representatives from municipalities in the "control" group perceived the reform.

- *Ltotimp*: Length expressed in months as impeded mayor during the 2004-2006 legislature. (Equal to 0 means the mayor was not impeded.)
- *Ltotimp2*: Length expressed in months as impeded mayor during the 2006-2012 legislature. (Equal to 0 means the mayor was not impeded.)
- *Ltotnoimp*: Length expressed in months when the mayor was not impeded during the 2004-2006 legislature.
- *Ltotnoimp2*: Length expressed in months when the mayor was not impeded during the 2006-2012 legislature.
- *Municipality*: Name of given municipality.
- *Name*: Name of given mayor
- *Party*: Party of given mayor. Thirteen different parties are active in the Belgian municipality elections: CD&V, Defi, Ecolo, BGL-Bekkevoort, Independent, LDD, MR, N-VA, Open-VLD, PS, ProDG, CdH and the Sp.a.
- *Run06*: Binary variable indicating whether the mayor ran in the 2006 elections, yes= 1, no=0.
- *Run12*: Binary variable indicating whether the mayor ran in the 2012 elections, yes= 1, no=0.
- *Shcand06*: Percentage of preferential votes obtained by a mayor in the 2006 elections within electoral list.
- *Shnoimp1*: Ratio of variables, *(ltot)/(llegi)*, indicating in percentage the duration of mayor when not impeded during the 2004-2006 legislature.
- *Shnoimp2*: Ratio of the following variables, *(ltot2)/(llegi2)*, indicating in percentage the duration of mayor when not impeded during the 2006-2012 legislature.
- *Shparty06*: Share of votes obtained by the party of the elected mayor in the 2006 elections.
- Surname: Surname given of mayor.

## A.3 Additional Tables and Figures

Table A1: Benchmark Results, All Coefficients

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Treatment | -0.049*** | -0.046*** | -0.057*** | -0.037** | -0.053*** |
| | (0.013) | (0.014) | (0.011) | (0.015) | (0.012) |
| Density (hab./km$^2$, in log) | | -0.243 | -0.226 | 0.094 | 0.160 |
| | | (0.506) | (0.499) | (0.653) | (0.652) |
| Density$^2$ (in log) | | -0.049 | -0.045 | -0.091* | -0.093* |
| | | (0.035) | (0.035) | (0.051) | (0.052) |
| Employment (%) | | -0.001 | -0.005 | 0.004 | -0.001 |
| | | (0.004) | (0.003) | (0.004) | (0.003) |
| Unemployment (%) | | 0.006 | -0.002 | 0.007 | -0.003 |
| | | (0.007) | (0.004) | (0.007) | (0.005) |
| Foreigners (%) | | 0.003 | 0.003 | 0.005 | 0.005 |
| | | (0.004) | (0.004) | (0.005) | (0.005) |
| Median income (in log) | | 0.340** | 0.378** | 0.295 | 0.393** |
| | | (0.159) | (0.148) | (0.181) | (0.167) |
| Mean income (in log) | | -0.178 | -0.150 | -0.217 | -0.212 |
| | | (0.181) | (0.170) | (0.206) | (0.197) |
| Social assistance (in log) | | | | 0.015 | 0.019* |
| | | | | (0.010) | (0.010) |
| Garbage collection (in log) | | | | 0.053** | 0.064*** |
| | | | | (0.023) | (0.023) |
| Public administration (in log) | | | | -0.004 | -0.007 |
| | | | | (0.019) | (0.018) |
| Safety and crime prevention (in log) | | | | -0.020 | -0.010 |
| | | | | (0.018) | (0.017) |
| Constant | 3.858*** | 5.349** | 4.735** | 4.623* | 3.458 |
| | (0.008) | (2.115) | (1.992) | (2.385) | (2.269) |
| Municipality FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | No | Yes | No |
| Trend | No | No | Yes | No | Yes |
| Observations | 7654 | 7654 | 7654 | 6565 | 6565 |

Notes: Ordinary least squares estimates based on Equation 3 are given. The dependent variable is the log incidence of main crime events, as defined in section 4. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012. Socio-economic covariates are included in columns (2) to (4). Columns (4) and (5) includes public expenditure variable; analysis is restricted only to those municipalities for which we have information for the whole period of interest (2000-2012), as discussed in section 4. All specifications include municipal effects. Columns (3) and (5) include linear time trends. All the others include year fixed effects. Clustered standard errors at the municipality level are in parenthesis and allow for arbitrary correlation of residuals within each municipality. Significance levels are denoted as follows: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A2: Robustness Test - Balancing Test for Subsamples

| | All sample (1) | Border+ (2) |
|---|---|---|
| Density (log) | -1.06 | -0.19 |
| | (0.09)*** | (0.13) |
| Employment (%) | -5.56 | -5.00 |
| | (0.40)*** | (0.60)*** |
| Unemployment (%) | 3.92 | 3.50 |
| | (0.27)*** | (0.32)*** |
| Foreign (%) | 1.40 | 3.09 |
| | (0.54)*** | (0.99)*** |
| Mean income (log) | -0.09 | -0.01 |
| | (0.01)*** | (0.02) |
| Median income (log) | -0.08 | -0.01 |
| | (0.01)*** | (0.01) |
| Social assistance (log) | -0.56 | -0.12 |
| | (0.09)*** | (0.19) |
| Garbage collection (log) | -0.78 | -0.43 |
| | (0.08)*** | (0.18)** |
| Public administration (log) | -0.42 | -0.04 |
| | (0.07)*** | (0.14) |
| Safety and crime prevention (log) | -0.73 | -0.14 |
| | (0.10)*** | (0.20) |
| No. municipalities | 589 | 152 |

Notes: Each coefficient is the result of the regression on each of the control variables on *WAL*. A significant coefficient indicate that the treatment and control group are significantly different with respect to the control variable of interest. Ordinary least squares estimates are given. Sample was restricted to all municipalities but those in the Brussels regions to obtain the results in columns (1) and (2). Results in columns (3) and (4), instead, refer to a sample of only municipalities at the border between Wallonia and Flanders, and their immediate neighbors. Clustered standard errors at the municipality level are in parenthesis and allow for arbitrary correlation of residuals within each municipality.
Significance levels are denoted as follows: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A3: Robustness test - Benchmarking Results with Restricted Samples

| | No Brussels | | Border+ | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Treatment | -0.047*** | -0.058*** | -0.055* | -0.077*** |
| | (0.014) | (0.011) | (0.031) | (0.024) |
| Density (hab./sq.km, in log) | 0.337 | 0.536 | 1.827 | 1.949 |
| | (0.786) | (0.781) | (2.097) | (2.132) |
| Density$^2$ (in log) | -0.114 | -0.130* | -0.272 | -0.272 |
| | (0.070) | (0.070) | (0.195) | (0.199) |
| Employment (%) | -0.002 | -0.005 | -0.009 | -0.015* |
| | (0.005) | (0.003) | (0.011) | (0.008) |
| Unemployment (%) | 0.002 | -0.004 | -0.030 | -0.032*** |
| | (0.008) | (0.005) | (0.019) | (0.011) |
| Foreigners (%) | 0.005 | 0.004 | -0.006 | -0.006 |
| | (0.005) | (0.005) | (0.011) | (0.011) |
| Median income (in log) | 0.370** | 0.418*** | 0.210 | 0.476* |
| | (0.162) | (0.151) | (0.276) | (0.267) |
| Mean income (in log) | -0.181 | -0.185 | -0.331 | -0.419 |
| | (0.182) | (0.171) | (0.304) | (0.289) |
| Constant | 3.900 | 3.078 | 4.333 | 2.240 |
| | (2.604) | (2.465) | (5.912) | (5.781) |
| Municipality FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | No | Yes | No |
| Trend | No | Yes | No | Yes |
| Observations | 7407 | 7407 | 1973 | 1973 |

Notes: Ordinary least squares estimates based on Equation 3 are given. The dependent variable is the log incidence of MCE, measured as the aggregate value of the five main episodes of crime divided by 1,000 inhabitants. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012. Sample was restricted to all municipalities but those in the Brussels regions to obtain the results in columns (1) and (2). Results in columns (3) and (4), instead, refer to a sample of only municipalities at the border between Wallonia and Flanders, and their immediate neighbors. All specifications include municipal effects. Columns (2) and (4) include linear time trends. All the others include year fixed effects. Clustered standard errors at the municipality level are in parenthesis and allow for arbitrary correlation of residuals within each municipality.
Significance levels are denoted as follows: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A4: Robustness Test - Clustering Standard Errors at Different Administrative Levels

| | (1) | (2) | (3) |
|---|---|---|---|
| Treatment | -0.046** | -0.046** | -0.046* |
| | (0.018) | (0.022) | (0.023) |
| Socio-economic controls | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |
| Cluster level | PD | Arrondissement | Province |
| Observations | 7654 | 7654 | 7654 |

Notes: Ordinary least squares estimates are given. The dependent variable is the log incidence of MCE, measured as the aggregate value of the five main episodes of crime divided by 1,000 inhabitants. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012. All specifications include municipalities and year fixed effects. Standard errors in columns (1) are clustered at the police district level and allow for arbitrary correlation of residuals within each police district. Likewise, standard errors are clustered at the Arrondissement level in column (2), and at the provincial level in columns (3).
Significance levels are denoted as follows: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A5: Robustness Test - Spatially Clustered Standard Errors

| | (1) 5km | (2) 15km | (3) 25km |
|---|---|---|---|
| Treatment | -0.086*** | -0.086*** | -0.086*** |
| | (0.007) | (0.013) | (0.017) |
| Socio-economic controls | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |
| Observations | 7654 | 7654 | 7654 |

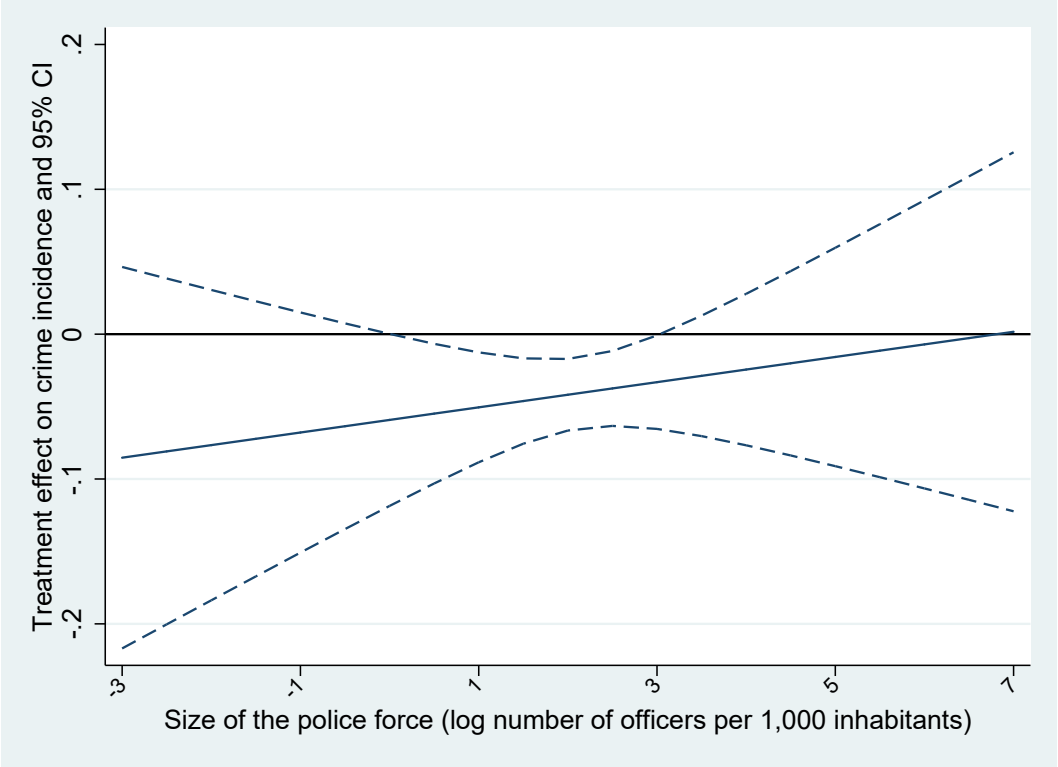
Notes: Ordinary least squares estimates are given. The dependent variable is the log incidence of MCE, measured as the aggregate value of the five main episodes of crime divided by 1,000 inhabitants. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012. All specifications include municipalities and year fixed effects. Standard errors of the OLS model are adjusted for spatial correlation following Conley (1999), for different distance cutoffs. A three-year lag is also included in all three specifications in order to take into account the spatial nature of data. Standard errors are in presented parentheses.
Significance levels are denoted as follows: $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

Table A6: Robustness Test - Trends at the Municipal, Police District and Regional Levels

| | Municipal trend | | Police district trend | | Regional trend | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Treatment | -0.075*** | -0.071*** | -0.140*** | -0.149*** | -0.110*** | -0.116*** |
| | (0.013) | (0.012) | (0.016) | (0.016) | (0.020) | (0.020) |
| Socio-economic controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Trend | Linear | Quadratic | Linear | Quadratic | Linear | Quadratic |
| Observations | 7654 | 7654 | 7654 | 7654 | 7654 | 7654 |

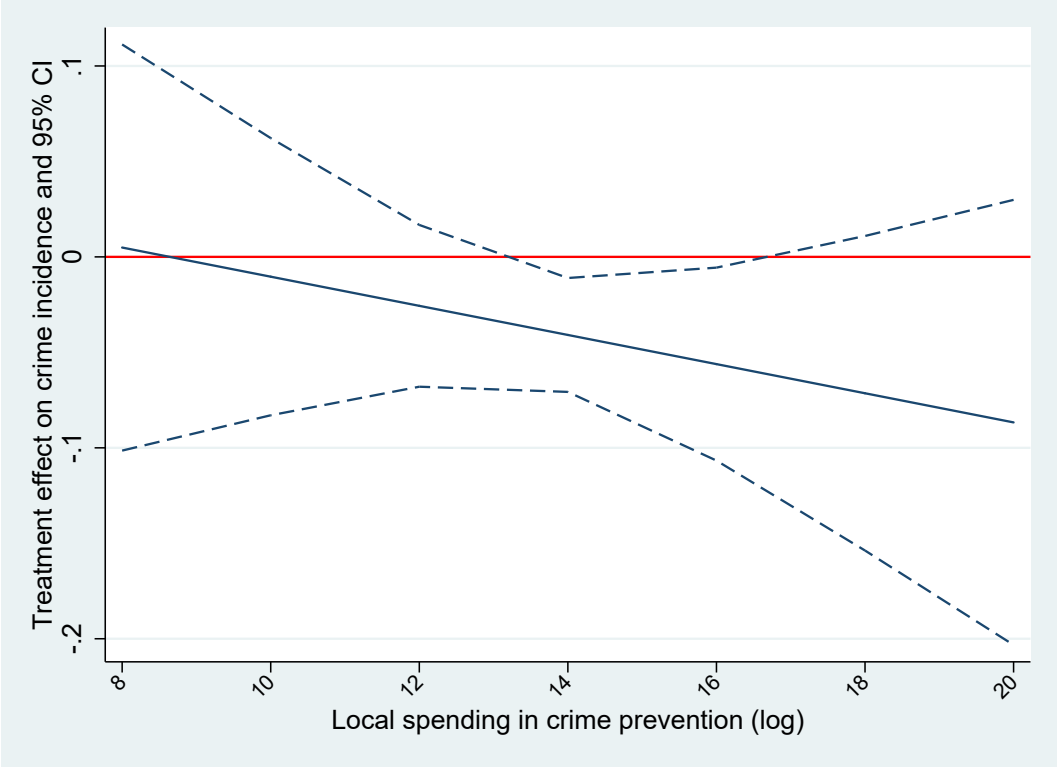
Notes: Ordinary least squares estimates are given. The dependent variable is the log incidence of MCE, measured as the aggregate value of the five main episodes of crime divided by 1,000 inhabitants. Values are taken from official crime statistics, as reported by the local police, from 2000 to 2012. Columns (1), (3) and (5) reports results for a specification that includes linear time trends. Columns (2), (4) and (6) reports results with quadratic linear trends. Clustered standard errors at the municipality level are in parenthesis and allow for arbitrary correlation of residuals within each municipality.
Significance levels are denoted as follows: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Figure A1: Marginal Effects of the Interaction between Treatment Effects and the Size of the Local Police Force




Notes: The graph represents the marginal effects of the interaction between the treatment variable and the size of the local police force, presented in Table 7, column (2). The analysis is restricted only to the period 2002-2012 and excludes two municipalities that merged in a new police district in 2011, as discussed in section 4. The dependent variable is the log incidence of main crime events, as defined in section 4. Values are taken from official crime statistics, as reported by the local police, from 2002 to 2012.

Figure A2: Marginal Effects of the Interaction between Treatment Effects and the Local Spending in Crime Prevention




Notes: The graph represents the marginal effects of the interaction between the treatment variable and the size of the police districts, presented in Table 8, column (2). The analysis is restricted only to those municipalities for which we have budgetary information for the whole period of interest (2000-2012), as discussed in section 4. The dependent variable is the log incidence of main crime events, as defined in section 4.

Figure A3: Evolution of the Local Proportion of Non-Belgian Residents (2000-2012), by region

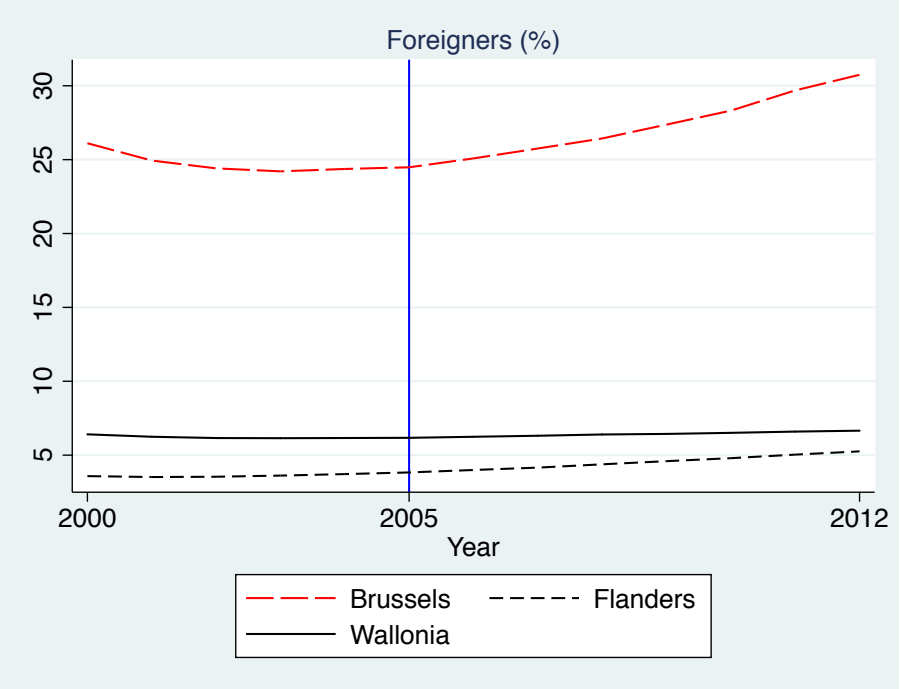


Figure A4: Evolution of Covariates (2000-2012), by Treatment and Control Groups