International Bachelor Economics and Business Economics

The obscurities of representation: do politicians play the "transfer game"?
Major: Policy Economics

Bachelor Thesis

Abstract

A longstanding question in the political economy literature is whether politicians manipulate the allocation of funds for their own benefit. For this reason, I analyze both at the federal and regional level if manipulation by politicians is done in Belgium for 1995-2019 and 2004-2019 respectively. Belgium is chosen due to its specific institutional background which makes the analysis possible. An IV analysis with exogenous minister changes as the instrument is performed and causal estimates are found. After performing the analysis, significant results have only been found at the federal level for the years 1995-2019. The results indicate that if a minister is appointed (or resigned), less funding goes to the electoral district he/she comes from.

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"Homo sum: humani nihil a me alienum puto."

Nomenclature

Acronym	Meaning	Definition
CBI	Central Bank Independence	Ranking denoting how independent a central bank is. The higher the ranking the less independent a central bank is
FE	Fixed Effects	An econometric technique where one controls for the fixed effects i.e., certain aspect that affect a certain (sub)group in a similar way.
IV	Instrumental Variable	An econometric technique where one uses an instrument (exogenous to the error term) that affect the outcome variable only through the variable of interest to find a causal relationship between the variable of interest and the outcome variable.
OVB	Omitted Variable Bias	A bias induced by the exclusion of this variable. This is only present if the omitted variable both affects the dependent and independent variable of interest.
PBC	Political Business Cycles	An explanatory theory for the existence of business cycles. In this theory business cycles are present because political actors manipulate either monetary or fiscal policy in the years surrounding the elections.
PR	Proportional Representation	an electoral system granting every political party a number of seats in parliament that fairly reflects the strength of the party as manifested by the count of votes in favor of this party" (Pukelsheim, 2017, p. 1)
SWT	Social Welfare Transfers	Transfers to the citizens aimed at improving the overall social welfare of a country. This abbreviation is sometimes used in the paper to indicate the real social welfare transfers per 100,000 inhabitants.

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1. Introduction

A "representative democracy" denotes the modern, and complex political system ruling most of the Western world. The etymological meaning of this composition of Indo-European words is handing the power to the people[1]. The people in said democracy hand their decision power to representatives through voting based in electoral districts[2]. In turn, the magic mechanism of incentives aligns the interest of the constituents to those of the representatives, due to this exchange between voters and representatives[3].

However, as these representatives get elected by their constituents, and not the whole electorate, it could be that they solely act in their constituents' best interest. Consequently, the representatives could reward their constituents to improve their chances of re-election. Golden and Min (2013) find that "incumbent politicians are rewarded by voters for distributive allocations" (p. 84), after analysing more than 150 studies on distributive politics around the world. Therefore, a question that comes to the mind is whether these politicians enact such targeted policy. To partially provide an answer to this question, this paper will empirically analyse if politicians systematically channel certain funds towards their own constituents by means of an instrumental variable analysis. The politicians defined in this research will be the regional and federal ministers in Belgium. Moreover, the main hypothesis that I will analyse is the following: *Do politicians cater to their constituents? Secondly, if they cater towards their constituents, what is then the size of the effect*.

The ideal in a representative democracy is that the representatives embody all the values of every voter as "the president [representatives] is [are] to be the embodiment of the nation and the main custodian and definer of its interests" (O'Donell, 1994, p. 59-60). Therefore, this research is socially relevant, by analysing whether the politicians favour only a part of their electorate. Thus, not acting in the best interest of the nation. Moreover, this research is scientifically relevant as it answers the research question from a new angle. Most of the research on distributive politics is based on the role of national political institutions (Berry et al., 2010; Bertelli & Grose, 2009; Rich, 1989). Therefore, not necessarily on the impact that the regional government can have on the distributions of transfers, but rather on their role in society. Whilst this research analyses both the regional and federal government. Hence, adding an extra analysis to this large body of works is relevant from a scientific point of view.

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[1] Power in this democratic setting is referred to as the capacity to do things (Ober, 2007).
[2] Voters cast their votes and elect politicians from a certain electoral district, these districts are defined geographically. In the following paper district will always refer to electoral district.
[3] The elections in a democracy function to hold representatives accountable for their performance while in office (Warren, 2013).

Moreover, the distributive literature investigates mainly the power that politicians have on specific projects e.g., highway construction, public infrastructure etc., as these are easier for politicians to have influence over. The social welfare system is based in legislation and involves many political actors; therefore, it is assumed to be relatively "cater-free" (Jennes & Persyn, 2015). On the other hand, a politicians' reach is immense. Or it could be that the present legal system enables them to enact sub-optimal policy. Therefore, the main question remains: is this transfer system de facto cater-free?

2. Literature review

2.1 Distributive politics

Public policy academics often asked questions surrounding the incompetence and suboptimality of public decision making. One strand of literature, namely on distributive politics, is the preoccupation with the question of who profits from government policies and how the groups that do are able to secure the distributive outcomes that favour them (Kramon & Posner, 2013, p. 461).

A central component for the existence of the distributive politics literature is the work of Dixit and Londregan (1996). They set up a model with two parties (the left and the right) that have distinctive policy ideas and redistributive promises to their respective voters. The voters themselves are modelled per electoral district as a continuum over real numbers. Moreover, these voters possess ideological inclinations and gain utility from distributive transfers. In equilibrium, a political party can buy over voters by handing out transfers to the electoral district these voters belong to.

The key takeaways from this model are that voters with large party preferences need larger distributive transfers to be bought over than voters with low party preferences. Therefore, there is this competitive war between parties to gain the votes of these so called "swing voters," the median, low party preference voters. Since they are more facilely bought than voters with strong party preferences. Furthermore, because of the diminishing marginal utility of income, lower-income individuals require lower p.c. transfers than higher-income individuals. To summarize voters are bought over to increase re-election probabilities and low-income, low party preference voters are the easiest bought over. This is already a first indication that politicians would potentially influence the transfer system for their own (party) benefit.

After briefly contemplating about the occurrence (reasons) of (for) targeted transfers, one must analyse whether these transfers are timed in a way that could benefit a politicians' re-election probabilities. If a politician targets these transfers just before elections, voters actively realise this and potentially reward the politicians for their actions.

2.1.1 Political business cycles

A common explanatory factor for business cycles is that they occur because political leaders want to improve their re-election probabilities. As, their "electoral fortunes" are highly dependent on the macro-economic situation. They will manipulate the existing tools at their disposal (Schultz, 1995). These business cycles that are occurring due to the tactical manipulation of political actors are called the political business cycles (PBC). For the discussion of this theory, I will start off with the standard model and then move on to extensions of the model which are more applicable for my research.

Nordhaus (1975) pioneered the theoretical model of political business cycles (PBC). In his model, he assumed that voting is based upon I. recent economic conduct II. voters having retrospective inflationary expectations. He assumed that a politician acts strategically and can manipulate monetary policy tools. He proved that politicians maximize their utility by creating an unemployment-inflation cycle. The duration of this cycle coincides with his election terms, creating an economic upturn before the elections, and downturn just after (Nordhaus, 1975).

However, one must note that in this type of model the political actor in question controls the monetary policy in the country. Which is quite an unreasonable assumption to make as there is, in most countries, a separation between the federal bank and the government branch (Harrison, 1978). Secondly, (ir)rationality is a key explanatory factor lying at the basis of the validity of said type of model. Voters are irrational since they cannot predict the motive of the political actor, and rational since they can correctly incorporate the macroeconomic situation. Thirdly, voters do not solely cast their votes based upon these economic variables (Falck et al., 2014). Lastly, such models only look at the monetary manipulation and do not consider the fiscal manipulation that political actors can engage in.

Even though there are certain critiques to this basic model, it does possess explanatory power for the presence of business cycles. Moreover, this effect has been proved empirically (Beck, 1982; Brånnås & De Gooijer, 1994; Diebold & Rudebusch, 1996). A standard test for this theory is done by setting up a model with as dependent variable economic behaviour, proxied by important variables such as the unemployment rate, inflation etc., and as independent one a political variable. This political variable in turn significantly decreases the undefined variation of the outcome variable (McCallum, 1978).

Furthermore, there exists extensive evidence about the influence that macroeconomic conditions have on voting behaviour. Kramer (1971) finds support for the prevalence of this effect. He finds explanatory power for the seat allocation in the U.S. house of representatives using both the inflation

rate and growth rate of real income per capita as independent variables. He tested his voting behaviour model empirically using data over 1896-1964. Moreover, this effect of (subjective) economic performance on voting decisions is also confirmed by Becher and Donnelly (2013) with survey data over 18 countries. These last authors implement and extend the general mediation approach to fit their data at hand. With this analysis, they conclude that a voters' interpretation of the economic situation has a significant influence on their voting behaviour. However, these tests only explain the possible existence of PBC, what one also needs to know is whether politicians *de facto* manipulate policy and influence the business cycle. The existence of this influence is very contentious.

A plethora of studies confirm the existence of these PBC in countries with an independent central bank (Carlsen, 1997; Lohmann, 1998). Abrams and Iossifov (2006) find by means of a sophisticated GMM analysis that surrounding the election period, the Federal Reserve will enact in expansionary monetary policy. These results are generalized only if the chair of the Fed is appointed by the incumbent party. In the same view, Klose (2011) implements a two-dimensional asymmetric Taylor reaction function using a panel data set containing 18 countries. He finds that for short periods before (or after) elections inflation and unemployment is below (or above) the target potential one.

On the other hand, numerous studies concluded that these PBC are not (less) prevalent in countries with a highly independent central bank (Dubois, 2016). Alpanda and Honig (2010) construct a central bank independence (CBI) ranking using the variation in monetary policy around the election period. If there is a lot of variance during the election period, a CB is denoted more dependant. Including this CBI, they find that countries with highly dependent CBs in fact have higher average levels of inflation around elections. This could be seen as a counter argument to Abrams and Iossifov (2006), Carlsen (1997) and Lohmann (1998).

An important implication of this strand of research is that scholars observe that there is a possibility for manipulation by political actors and that it does benefit their position in office. Hence, it does prove the relevance of the topic of this research paper: does manipulation by politicians happen and how do they do it? It does potentially happen however, it takes time for policy before it is implemented and to see its effects. Therefore, it is very difficult to time the manipulation right that it improves a politicians' re-election chances.

Following from this contested field of monetary political manipulation, scholars also analysed the effect that political actors have on fiscal expenditures. It is deemed that fiscal policy is easier to

manipulate by political actors as it is the focus of government (Dubois, 2016). Therefore, I summarized the most important research in this field below.

The more recent empirical literature on strategic fiscal manipulation stemmed from the works of Persson and Tabellini (2003). With their fixed effects (FE) model they explained the governance structures and their different effects on fiscal policies around the time both before and after elections. Their extensive analysis consists of a dataset of investigating 60 countries for over 40 years. They found that taxes were decreased by 0.3% in election years and spending decreased by about 0.3% after the elections, indicating a correction of this inefficient policy. Moreover, they found a correlation between the form of government and the size of spending, indicating that countries governed with proportional representative systems spend on average more than countries ruled by majoritarian systems.

However, one caveat to this econometric technique is that election years in the US coincide with leap years. This induces a one-day shorter work year, decreasing the tax income by $\frac{1}{365} \approx 0.3\%$ during the election years and thus a 0.3% increase in the year thereafter and therefore, invalidating their analysis. Furthermore, the bulk of the literature on PBC has found inconclusive results on the presence of these macroeconomic induced cycles (Dubois, 2016). The idea that politicians enact policy that favours their constituency has been proven, however not that this induces business cycles on the macroeconomic level, as it is incredibly difficult for politicians to time these transfers correctly.

Therefore, due to these ambiguous and often unconvincing findings surrounding the existence of PBC (Political Business Cycles), I will solely look whether politicians enact rent-seeking policy instead of analysing the exact timings of these transfers.

2.1.2 Legislative malapportionment

As shown above, politicians sometimes implement sub-optimal policy. A central theory surrounding the effect that politicians could have on policy is the one of legislative malapportionment. This entails that there is "a discrepancy between the share of legislative seats and the share of population per electoral districts" (Bruhn et al., 2010, p. 4). Due to this discrepancy, electoral districts that are overrepresented are allocated more transfers than underrepresented districts.

One of the main problems regarding the empirical analyses on legislative malapportionment is the presence of reverse causality that confounds the results. As political representation for most countries

results from bargaining between the federal government, but mainly the provinces, it could be that these transfers and the political representation are simultaneously influenced by other determinants of a province in a certain nation.

Acknowledging these problems, Pitlik et al. (2006) empirically found by means of a fixed effects analysis for Germany that in fact overrepresented districts receive larger per capita intergovernmental transfers than underrepresented ones. Corroborating the general idea that legislative malapportionment is present in the world.

In line with these findings Dragu and Rodden (2011), using a panel data set of 9 federations, analysed the effect of political representation on the distributions going to provinces. In their fixed effects analysis, they controlled for province and country fixed effects as well as a set of observable factors. They found that for their data set, the overrepresented provinces do receive larger transfers than the underrepresented districts.

However, a fixed effects analysis only accounts for all time invariant unobserved factors and not for the time-varying ones. Dragu and Rodden (2011) did control for a variety of time-varying factors, but it could very well be that for historical reasons a subset of the population has been marginalized and that they therefore are less represented and receive lower transfers. Thus, these types of models likely suffer from endogeneity bias.

On the other hand, it does present some confirmative evidence that representation does matter in intergovernmental transfers. More representation is related to higher district funding. Thus, it is important to analyse whether politicians themselves can influence these transfers or whether it just comes due to a stronger bargaining position they have as there are more representatives from one district.

2.1.3   Tactical fiscal manipulation

Most of the literature on rent-seeking behaviour by politicians focusses on targeted programs that could be influenced by politicians. The reason behind this is that politicians could easily manipulate and distribute discretionary funds[4] (John & Ward, 2001). It is *de facto* assumed more challenging for politicians to change rule-based transfers. Due to the nature of these transfers. Politicians need to

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[4] These funds are meant for specific projects such as highways, schools, hospitals etc.

present a case for changing these rule-based transfers while they get allocated a budget which they can use for specific projects that they themselves can allocate to certain districts.

Rodden and Wilkinson (2005) evaluate whether political parties in India tactically distribute grants and transfers to certain states where they have a higher probability of being re-elected. Their political variable relates to the incumbent party in power. They hypothesize that incumbent leaders fund money towards districts where the incumbent's party rules and/or to swing states. After performing their FE analysis, they find confirmative evidence for their hypothesis.

Apart from the re-election goal, parties or governments could also distribute targeted funds towards legislators that have strong influence and power (Diamond, 2021). This could then explain differences in transfers going to electoral districts. There is a plethora of work in this area analysing the effects that prominent legislators, and or specific regions with important committee members have on the distributions going to said districts/ regions (Bloom & Petrova, 2013; Evans, 2011; Golden, Miriam & Picci, 2008; Lancaster, 1986; Milligan & Smart, 2005a). Oftentimes, these types of studies calculate a political variable denoting the "prominence" that a certain political actor has, hence how "marginal" said actor is. The theory suggests that the increased marginality[5] of legislators decreases the probability that a legislator can make an impact in a district with funding as they possess less power in the district. Therefore, the "pork" is allocated by the federal government to strong politicians as these can make an influential impact in the districts.

However, the abovementioned studies only use targeted programs to explain the differences in allocations towards electoral districts. On the other hand, I contemplate that rule-based transfers can also be influenced by politicians.

This hypothesis is corroborated by Litschig (2012), who analyses revenue-sharing grants in Brazil between the regional and the federal government. This program was formula-based. In Brazil, grants were allocated to regional governments based upon the predicted population in the region. Using past census data information, the current population was predicted with variables including emigration, birth rates, death rates etc. In the first year the policy was implemented a smooth density function presented itself. However, for the proceeding years, "the estimates actually understate the discontinuity of the density around the cutoffs because the spikes occur at specific points on the

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[5] Marginality refers to the probability of a politician winning the elections. A more marginal politician has a lower provability of winning an election.

support." (Litschig, 2012, p. 5). This induces support for the hypothesis that the government manipulated the population count to increase (decrease) funding towards certain districts. Moreover, the visual analysis was extended with an empirical one, confirming their hypothesis.

After presenting evidence for reasons why and how politicians can influence inflation, budgets, grants and transfers, I want to analyse whether this manipulation is also present in Belgium. Moreover, I come to my main hypothesis: *in Belgium, political representation to a certain electoral district is positively related to the transfers going to said electoral district*.

The reason for investigating Belgium is two-folded: I. Due to the nature of the elections II. Belgium itself is governed by proportional representation (PR). For Belgium, federal and regional ministers are not directly elected by the public but appointed by the ruling coalition (cf*. Institutional background*). Due to the nature of this electoral system, an exogenous instrument can be set-up to find a causal relationship between transfers and political appointment. Therefore, overcoming the discussed problems of reverse causality and to find a causal relationship (cf. *Identification strategy*)

Furthermore, proportional representation can be defined as "an electoral system granting every political party a number of seats in parliament that fairly reflects the strength of the party as manifested by the count of votes in favor of this party" (Pukelsheim, 2017, p. 1). In this type of electoral system, politicians are more inclined to transfer funds in a programmatic political way (Persson & Tabellini, 1999). Milesi-Ferretti et al. (2002) find with a theoretical model supplemented by empirical analyses that PR systems target their transfers more to electoral districts (i.e., larger groups) and do not favor specific people of interest. The programmatic part entails that PR systems focus more on specific transfers i.e., pensions, unemployment benefits and not so much on the provision of public goods, supporting my hypothesis even further.

The paper that is most closely related to this is one Jennes and Persyn (2015). They investigate for Belgium the influence that political representation has on the social welfare transfers (SWT) for 1995-2010. This is done with an IV regression where the exogenous changes of federal ministers are used as an instrument for the ministers per 100,000 inhabitants. After performing their analysis, they find that political representation is positively related to the transfers going to a district.

In the next part, I explain the institutional background of Belgium to give a broad overview of the influence that ministers have on SWT.

3. Institutional background

To better understand the kind of power positions that politicians in Belgium have, I briefly discuss the institutional background of Belgium. It also improves one's understanding of the institutional changes that happened over time and the differences between the federal and regional government in Belgium.

Belgium was founded in 1830 after the Belgian Revolution. It was a composition of several communities, which caused tensions to arise. According to Huyse (1983) there were three conflict-laden fracture lines in the political landscape dividing Belgium I. social economical, the capital owners against the workers II. ideological, Catholics against the atheists III. linguistic opposition, French against Flemish. Prior to 1970, there was one central government which ruled the unitary state of Belgium. This oftentimes created tensions between the two language communities (Hooghe, 2004). As, there was a "lack of social, economic and linguistic homogeneity which was the impetus for the unionization process" (Popelier & Cantillon, 2013, p. 629). As the Dutch-speaking, Flemish community wanted more cultural autonomy and the French-speaking, Walloon community demanded economic autonomy (Dumont, H. et al., 2006).

Therefore, the governing body had to accompany for these diverging needs of the different communities. An answer to improve the cooperation and decrease the tensions created by these diverging ideas is federalism. The appeal of this state formation is that it can reconcile diverging views under one political system (Watts, 2011). Aspiring to this ideal, Belgium became a federal state from 1993 onwards (Swenden & Jans, 2006).

Specifically for Belgium, the operationalization of this federalist state is a complex two-layered system consisting of a central government and regional, sub-national government entities. Moreover, these sub-national federal units consist of communities and regions which coexist and have sometimes overlapping responsibilities (Romainville, 2015).

Belgium has three communitarian governing bodies, i.e., the German, Flemish and French, and three regional entities i.e., the Walloon, French and Brussels-Capital region (Hendriks, 2001). The regions possess the legislative power over housing, environment, planning, industrial and economic activities in their region, while the communities reside over the cultural, educational, and linguistic matters (Lenaerts, 2017). In Flanders, the community and regional institutions were merged (D'Haese & Van Den Driessche, 1991). Meaning that there is only one parliament and one government. The elected

representatives of the Walloon Parliament are also members of the French Community Parliament, therefore these ministers can also be ministers in the government of the French community. Hence, for this analysis I will not only focus on the federal government but also on the regions with their regional ministers. In the following paragraph I will elaborate on and give a brief history of the different social welfare spending powers of the federal and regional government in Belgium.

Between 1970 and 2002 there were five "state reforms"[6], changing the structure of the government units. In turn, these reforms increased the power and resources of the regional[7] government entities, thus decreasing the federal government's powers (Coppens & Financiën, 2012). The Special Law[8] of 8 August 1980 (Special Law) transferred the legislative authority of certain social welfare securities from the federal towards the communal and or regional government entities (Belgische Staat, 2021).

However, this legislative authority was overruled with the 3rd State Reform of 1988, when the federal government became the only entity allowed to handle the matter of the social welfare securities. Notably, this complete legislative authority was overruled by the decree of the Constitutional Court, 1998. Due to this decree, the regional and communal bodies were once again allowed to handle the social welfare securities regarding economic situations (i.e., worker's compensation, healthcare benefits, etc.) and the federal government became responsible for the classic social welfare security (Dumont, 2015).

Furthermore, the 6th State Reform, enacted in 2014 increased the overall responsibilities of the regional government regarding social welfare securities. Moreover, this State Reform transferred partially the following responsibilities to the regional government entity: family benefits, healthcare, employment activation, unemployment insurance, allowances, and assistance for persons with disabilities (Cantillon, 2012). There was an overall transfer of €20 billion to the regions and communities and the regions were allocated another €12 billion in fiscal autonomy power to fund these reforms (Vlaanderen, 2022).

Moreover, one other difference between the federal and regional government is the system of electoral districts. There are different electoral districts for the federal and regional government. *Annexes 1 and 3* give an overview of the electoral districts and how they changed over time. These

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[6] FR: Réforme de l'état. NL: Staatshervorming
[7] As well as the communal.
[8] FR: Loi Spéciale. NL: Bijzondere Wet

changes were made due to I. state reforms II. interregional disputes. Note that the electoral districts of the regional and federal government do not coincide.

In the following section the data will be explained in detail.

4. Data

4.1 Description

The data for the social welfare transfers per district will be gathered from the National Bank of Belgium[9]. This institution is independent of the influence of political actors and has the main goal to I. stabilize the prices II. determine the monetary policy III. ensure the financial stability of the banking system in Belgium, as well as providing open data and analyses (Nationale Bank van België, 2022). The data are presented in a panel data set and the period of interest is 1995-2019 for the federal level and for the regional level from 2004-2019. The reasons for choosing these time periods are I. to try to replicate Jennes and Persyn (2015) II. that there is no earlier data available III. to limit the scope of this paper.

These social welfare transfers are aggregated at the electoral district level corrected for the CPI and size of the electoral district and shown in 1000 euros. For each type of transfer, it mentions per district how much euros are allocated over the years. As the electoral districts in Belgium do not coincide with the geographical districts, I aggregate the district level data to the electoral district level[10]. Moreover, the transfers I investigate are at the social benefits, income taxes and social contributions. I calculate the transfer variable in the following way:

$$Transfer_{it} = Social\ benefits_{it} - (Income\ taxes_{it} + Social\ contributions_{it}) \tag{1}$$

And then I transform this variable to get the real SWT per 100,000:

$$Real\ SWT\ per\ 100{,}000_{it} = \frac{(Transfer_{it} * \frac{100{,}000}{Inhabitants_{it}} * \frac{CPI_t}{100})}{1000} \tag{2}$$

Where, $Transfer_{it}$, $Social\ benefits_{it}$, $Income\ taxes_{it}$, $Social\ contributions_{it}$, $Inhabitants_{it}$ and CPI are the social welfare transfers, the social benefits, the income taxes, social contributions, inhabitants, CPI going (living) to (in) district i at year t respectively.

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[9] This is the National Bank of Belgium is part of the network of National Banks set up by the European Union.
[10] Each electoral district consists of several districts, the electoral districts do change over time due to the state reforms cf. *Annex 1* and *3*.

The reason for calculating the transfers variable in *Equation 1* is because politicians can influence the transfers in 3 ways. Firstly, they can increase the benefits going to the electorate. Secondly, they can decrease the income taxes and lastly, they can decrease the contributions that their constituents have to pay. Additionally, I correct for the size of electoral district and CPI to make comparisons possible between electoral districts and over years.

Furthermore, for my instrumental variable, I will manually compile the changing ministers to add to my panel data set. For this variable, I will only include changes in ministers of a certain district that are exogenous to the transfer system. This entails analysing changes of ministers due to scandals or appointments to other posts that have nothing to do with the "fiscal transfer game". If a minister of a certain electoral district added (leaves) it is coded as $(-)x$ with x the number of ministers that left for a certain electoral district at a certain year and 0 if no change happened.

Moreover, the independent variable "ministers per 100,000 inhabitants" that is presented in the full model in the *Identification strategy,* will also manually be compiled from the websites of the Flemish and Walloon regional parliament, and of the federal parliament. Germany is excluded due to the limited changes that happened there. The data set consists of the data when a minister was part of the government, and to which electoral district he/she belongs to. To correct for the size of an electoral district, I multiply said district by 100,000 and divide by the inhabitants of the electoral district.

The number of inhabitants per electoral district is taken from Statistics Belgium, the Federal Institute for Statistics. For completeness during the election years, I took the ministers of the outgoing cabinet. The reason for this, is that the elections took mainly place in June and it takes time for a new government to get acquainted with the system. Therefore, I assume that it is more likely that the potential manipulation happening in an election year, was done by the old cabinet and not the new.

For the control variables, I take the lagged SWT and real income p.c. The lagged transfers are equal to the SWT in *Equation 2,* however not for the current year but for the year $t-1$. Moreover, the gross income per electoral district is also extracted from Statistics Belgium and transformed in the following way:

$$Income\ per\ 100,000._{it} = log(\frac{Gross\ income_{it} * \frac{100,000}{Inhabitants_{it}} * \frac{CPI_t}{100}}{1000}) \tag{3}$$

The definitions of the key variables are similar than under *Equation 1-2*. $Income\ per\ 100,000_{it}$ is the real logarithm of income per 100,000 inhabitants (in €1000) for electoral district i at year t and the $Gross\ income_{it}$ is the gross income (extracted from Statistics Belgium) for electoral district I, year t.

As there is much variation and outliers in the income per 100,000, the logarithm of this variable was taken. This decreases the skewness of the data and controls for the outliers.

4.2 Descriptive statistics

Table 1 presents the descriptive statistics for the key variables included in the analysis of the federal government over all the federal electoral districts and *Table 2* for the analysis of the regional government. The means of *Table 1* and *Table 2* diverge due to the different electoral districts at the federal and regional level and the different time period analysed[11].

From the standard deviation of the p.c. ministers variable, in *Table 1 and Table 2,* one can infer that there is a change in the number of ministers per 100,000 over the years and from the minimum and maximum that there also exist differences over electoral districts. This change is also shown in *figure 2 and figure 4*. In one year, there were maximum 3 ministers exogenously added to the federal government and 1 to the regional government. There exited maximally 2 ministers the federal and regional ministers in one year. Due to the coding of the real SWT per 100,000, it is always negative as the transfers to the federal/ regional government are larger than the transfers to the electoral districts. This arises because at the income side for the electoral districts only one variable was taken, whilst for the expenditures both the contributions and income taxes were taken. Furthermore, the difference between the minimum and maximum for the logarithm of income per 100,000 may not seem like much variation. However, one must consider that a logarithmic scale is convex in the first quadrant, therefore a 1 unit increase on the x-axis, increases the y-axis by more than 1 unit. Furthermore, one needs to remove the logarithm by raising it both the power of the x and y coordinate. Hence, if one transforms the logarithm back to a linear scale, the large inter-electoral district differences would visualise.

Table 1: *Descriptive statistics for the federal government*

Variable	N	Mean	SD	Min	Max
Ministers per 100,000	356	0.156	0.170	0	1.126
Changes in ministers	356	-0.00562	0.318	-2	3
Real SWT per 100,000	356	-5.016	2.399	-12.63	-0.352
Income per 100,000	356	3.012	0.224	2.445	3.533

Notes: N, SD, Min, Max are the number of observations, the standard deviation the minimum and maximum respectively

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[11] Federal analysis: 1995-2019; Regional analysis 2004-2019.

Table 2: *Descriptive statistics for the regional government*

Variable	N	Mean	SD	Min	Max
Ministers per 100,000	302	0.231	0.310	0	2.197
Changes in ministers	302	-0.0232	0.287	-2	1
Real SWT per 100,000	302	-5.470	2.554	-12.63	0.779
Income per 100,000	302	3.056	0.258	2.053	3.533

Notes: N, SD, Min, Max are the number of observations, the standard deviation the minimum and maximum respectively

Figures 1 and 2 display the real SWT per 100,000 over time (1995-2019; 2004-2019) for the federal and regional government respectively per capita (in €1000) corrected for the CPI. Both figures are separated by region. As explained in the *Institutional background*, Belgium consists of 2 regions: Flanders and Wallonia. It is clear from looking at the graph that the electoral districts are net paying to the federal government. The reason for this is that the measure used does not contain all the social welfare payments. It comprises on the benefits side of the social benefits in cash, social insurance, and social assistance in cash and on the cost side the income taxes and social contributions.

To better understand these graphs, it is important to know that Flanders is more affluent and economically active than Wallonia (Cantillon et al., 2006). Therefore, to the transfers going to Wallonia are higher to compensate this effect. This is represented by either higher social benefits or lower contributions and/or income taxes. Looking at *Equation 2*, this would result in higher SWT (less negative).

Moreover, due to the state reforms, the responsibilities of the federal and/or regional government have changed throughout the time. This explains the increased trend of payments towards the regional government. Furthermore, due to the redrawing of the electoral districts, there are gaps in the data. As the data have been gathered on an annual basis, it cannot be the case that 2 years overlap. If a district changes at the beginning of the year, the SWT cannot overlap[12].

One more observation is the decrease in Thuin in 2015. A potential explanation for this increase in social contributions is the change to the tax system in 2015. After the 6th state reform, the tax system in the agricultural sector changed, Thuin itself is highly active in this sector. Firstly, there was a maximum number of days worked allowed for temporary workers and the taxes had to be paid based upon the calculated hours worked and not the real (Social Security Belgium, 2015). Therefore, firms adapted to these new rules, and we see a decline in the contributions paid in 2016. Furthermore, as Thuin is a small electoral district, changes can have a large impact per 100,000 inhabitants

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[12] C.f. *Annex 1* and *3* for an overview of the electoral districts

Figure 1. A and B: Evolution (1995-2019) of the fiscal social welfare transfers per federal electoral district in real 1000 euros per capita terms, for Flanders and Wallonia respectively.

A)

B)
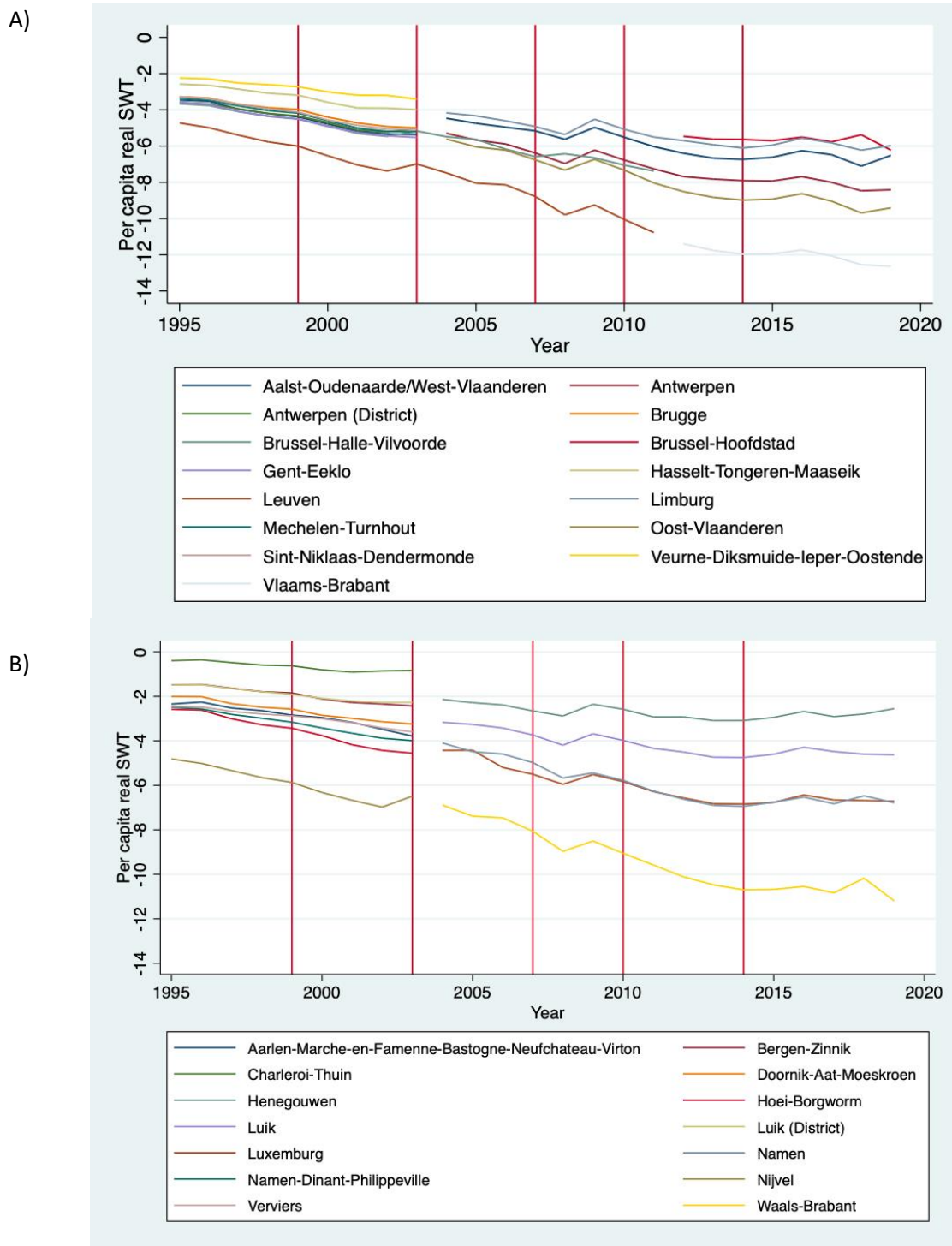
Notes: For both panel A and B the number of ministers is given per federal electoral district. The vertical lines indicate the elections. Panel A is for Flanders and B for Wallonia. As the electoral districts have been redrawn in 2004 there is a gap in the data present. New districts are taken for the year 2004 and the old ones for the year 2003. Furthermore, Brussel-Halle Vilvoorde was split into Brussel-Hoofdstad and Vlaams-Brabant in 2012. New districts are taken for the year 2013 and the old ones for the year 2012, inducing a gap
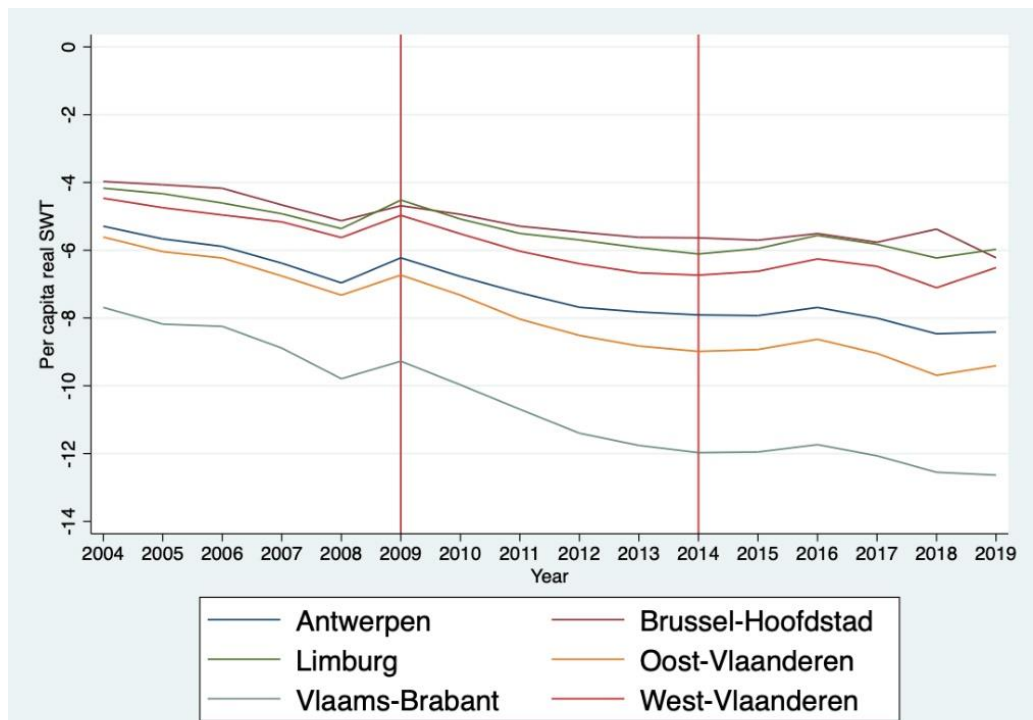
Figure 2. A and B: Evolution (2004-2019) of the fiscal social welfare transfers per regional electoral district in real 1000 euros per capita terms. For Flanders and Wallonia respectively.

A)

B)

Notes: For both panel A and B the number of ministers is given per regional electoral district. Panel A is for Flanders and B for Wallonia. The vertical lines indicate the elections. As the electoral districts have been redrawn in 2018 there is a gap in the data present. New districts are taken for the year 2019 and the old ones for the year 2018, therefore, the data for some districts end in 2018.

Furthermore, *Figures 3 and 4* display the data on the variable of interest, the number of ministers per 100,000 inhabitants. In both figures, variation in ministers is present, which is what one needs for the following analysis. If there was no variation present, it entails that there were no exogenous changes. Hence, the analysis could not be performed.

Moreover, most of the variation is happening around the elections. However, as argued above, this will not be considered due to problems of endogeneity. On the other hand, one can also see that there is variation in periods when there are no elections. Some politicians exit and new ones enter government. When it can be reasonably argued that this exit or entering effect is exogenous to the transfer game, this change will be used as an instrument.

It is worth mentioning that there is a large variance between Flanders and Wallonia. The reason for this is the population differences between both regions. Whilst the regions are both similar in surface area, in Flanders live ±54% more people than in Wallonia (Statistics Belgium, 2022). Therefore, if a minister comes from a Walloon electoral district, the ministers per 100,000 will in turn be much higher than in Flanders.

Figure 3. A and B: Evolution (1995-2019) of the federal ministers per 100,000 inhabitants per federal electoral district. For Flanders and Wallonia respectively.
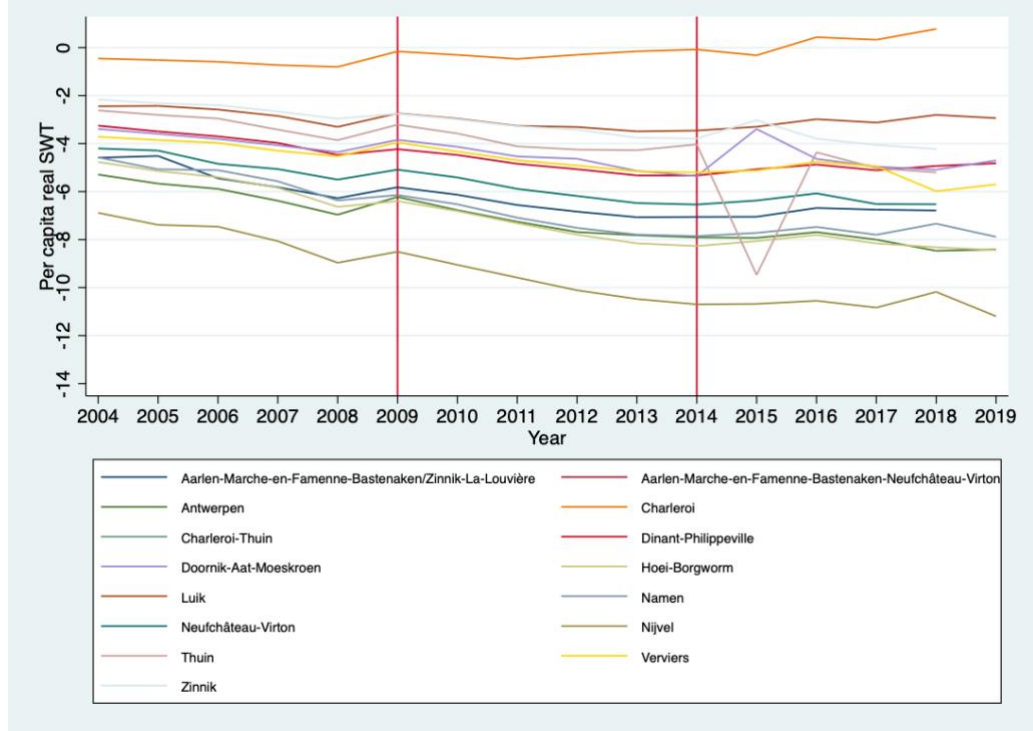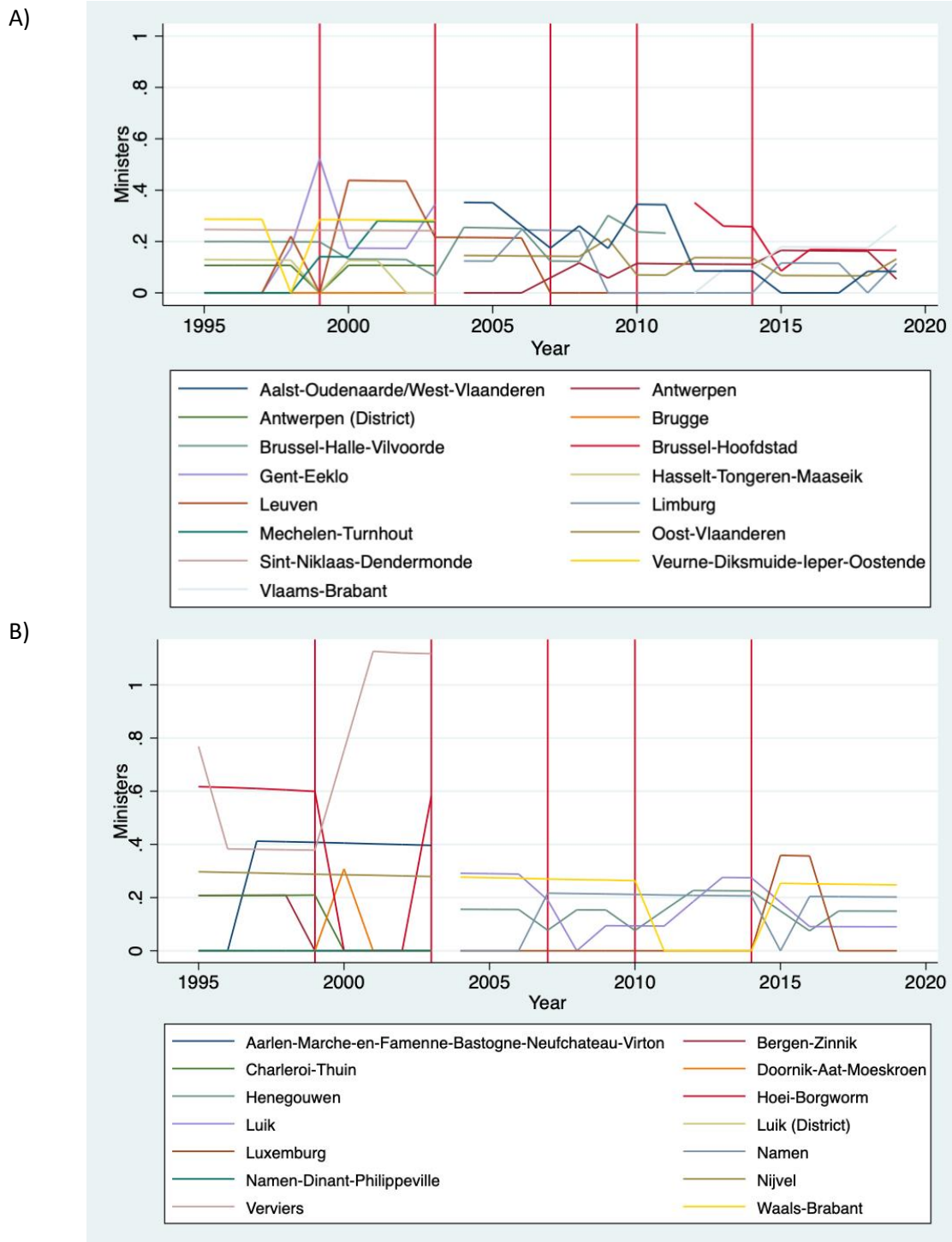
A)

B)

Notes: For both panel A and B the number of ministers is given per federal electoral districts. The vertical lines indicate the elections. Panel A is for Flanders and B Wallonia. As the electoral districts have been redrawn in 2004 there is a gap in the data present. New districts are taken for the year 2004 and the old ones for the year 2003. Furthermore, Brussel-Halle Vilvoorde was split into Brussel-Hoofdstad and Vlaams-Brabant in 2012. New districts are taken for the year 2013 and the old ones for the year 2012, inducing a gap.

Figure 4. A and B: Evolution (2004-2019) of the regional ministers per 100,000 inhabitants per regional electoral district. For Flanders and Wallonia respectively.
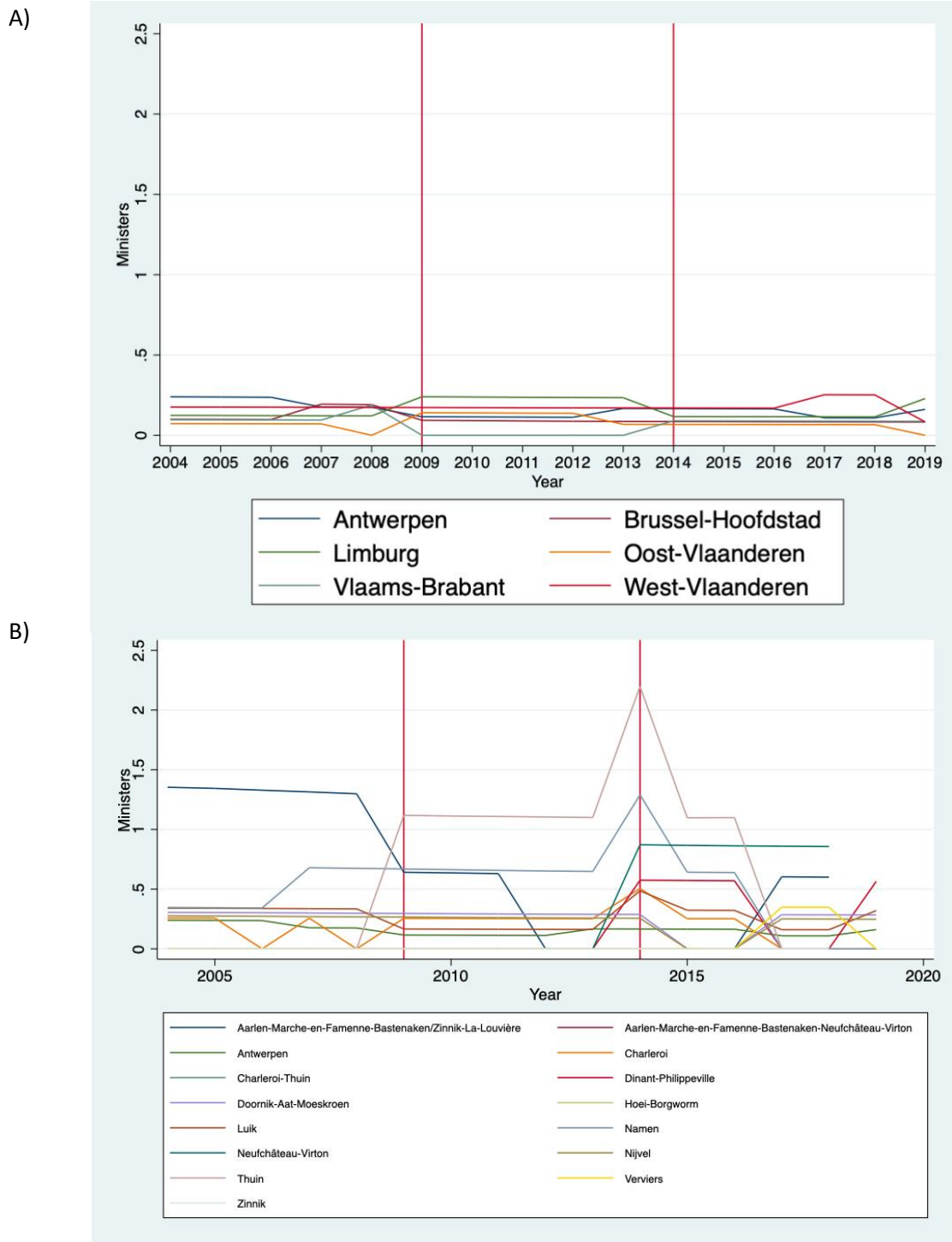
A)

B)

Notes: For both panel A and B the number of ministers is given per regional electoral districts. Panel A is for Flanders and B for Wallonia. The vertical lines indicate the elections. As the electoral districts have been redrawn in 2018 there is a gap in the data present. New districts are taken for the year 2019 and the old ones for the year 2018, therefore, the data for some districts end in 2018.

In the next part I explain my identification strategy, problems to internal validity and I discuss how I will test the assumptions underlying the validity of my model.

5. Identification strategy

5.1 The econometric model

The following method builds on and extends the framework of Jennes and Persyn (2015) who analyse the social welfare transfer system in Belgium with an instrumental variable (IV) regression, using data from 1995-2010. This paper builds on their framework by I. using the same instrument II. analyzing the same country III. looking at similar time periods. It diverges in the following ways: First, they argue that politicians would cater towards their own (old) districts even though from 2002 onwards electoral districts changed, merged (cf. *Institutional background*). I disagree with this assumption and argue that from 2002 they will cater towards their new districts. Secondly, they are not too clear about their SWT data, therefore I replicate this to the best of my abilities. Thirdly, for the control variables they use (number of unemployed and pensioners) I could not find data from the period before 2010. However, this should not make a difference because if the IV method is valid, it isolates the effect that the controls have. Lastly, I use the current representation as the variable of interest and not last years' representation.

Furthermore, I extend their analysis by investigating a longer time period (1995-2019) and I also look at the regional ministers. The reason for this is that after the Sixth Belgian State Reform enacted in 2014, more budgetary power has shifted from the federal towards the regional ministers (Vlaamse Overheid, 2022) and thereby extending the decision power that regional ministers have on policy choices. Thus, I want to analyse if there is a shift from federal manipulation to manipulation at the regional level.

The relationship of the political representation on the transfer system that I want to represent has the following format:

$$Real\ SWT\ per\ 100,000_{it} \qquad\qquad (4)$$
$$= \alpha_{0,it} + \alpha_1 * Minister_{it} * \frac{100,000}{Inhabitants_{it}} + \alpha_2$$
$$* Real\ SWT\ per\ 100,000_{it-1} + \alpha_3 * Income_{it} + \alpha_4 * District + \alpha_5$$
$$* Year + \varepsilon_{it}$$

Where $Real\ SWT\ per\ 100,000_{it}$ is the per capita fiscal transfers at year t to district i[13], $Minister_{it}$ is the independent variable of interest: the regional or federal minister for district i at year t. It is corrected for $Inhabitants_{it}$ which are the inhabitants for district i at year t per 100,000, $Real\ SWT\ per\ 100,000_{it-1}$ are the transfers of last year (as the current ones are dependent on

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[13] C.f. *Equation 2* for a broader explanation

those), $\alpha_{0,it}$ the district specific constant term at year t, α_1 the effect that the variable of interest has on the outcome variable, α_2 the effect that the past transfers have on the current ones, $Income_{it}$ is the logarithm of income per 100,000 for district i at year t[14], District is a district dummy and Year a year dummy, therefore α_4 and α_5 and will take out district and time trend respectively and ε_{it} the error term for district i at year t, which captures the unobserved characteristics of a district influencing the transfers received for said district.

However, if in this model the $Minister_{it}$ and the ε_{it} are correlated then the estimator (α_1) will be biased. This bias is more commonly known as the omitted variable bias (OVB). This bias exists if there are variables (not in the model) that correlate to the variable of interest and influences the outcome variable. If one does not add these to the model, they are in the error term. Intuitively, if these variables are omitted, the effect of this variable is (partially) reflected in the variable of interest, hence the coefficient of the variable of interest (α_1) will be biased (Kippersluis, 2022). A potential omitted variable is the number of parliamentary seats awarded to the governing coalition. If a coalition gets rewarded many seats by a certain district, then that certain district could be rewarded by the coalition by giving more seats to representatives from that district. Which in turn could influence the transfers handed to said district. Thus, this variable can influence political representation and potentially influences the transfers.

To overcome this potential source of bias a the Two-stage least squares (2SLS) IV regression will be performed.

The first stage of the IV analysis looks as follows:

$$\widehat{Ministers}_{it} * \frac{100,000}{Inhabitants_{it}} = \varphi_{it} + \gamma * Change_{it} + \delta * District + \theta * Year + \varpi_{it} \qquad (5)$$

Where $\widehat{Ministers}_{it}$ are the predicted total number of ministers per 100,000 inhabitants at year t in district i based on the instrument $Change_{it}$, denotes the changes in ministers due to certain scandals or changing positions of ministers unrelated to the fiscal transfer game in a certain district, φ_{it} is the intercept and ϖ_{it} the district specific error term at year t. γ, δ, θ are the effect that the changes, district and year dummies at year t, district i have on the ministers per 100,000 inhabitants.

These predicted values will then be used to calculate the transfers themselves in the second stage:

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[14] C.f. *Equation 3* for more information

$$Real\ SWT\ per\ 100{,}000_{it} \tag{6}$$
$$= \beta_{0,it} + \beta_1 * \widehat{Ministers}_{it} * \frac{100{,}000}{Inhabitants_{it}} + \beta_1$$
$$* Real\ SWT\ per\ 100{,}000_{it-1} + \beta_3 * Income_{it} + \beta_4 District$$
$$+ \beta_5 Year + \eta_{it}$$

Where β_1, β_2, β_3, β_4, β_5 the effect that the ministers per 100,000 inhabitants, the past transfers, the logarithm of income per 100,000, the district dummies, and year dummies have on the current transfer at year t in district i. $\beta_{0,it}$ is the district specific intercept at year t. Definitions of other variables are the same as under *Equation 4*.

To overcome the problems of reverse causality and to have an exogenous instrument, the instrument used in the presented IV analysis are the exogenous changes in ministers to the transfer game, as a proxy for ministerial representation. It is not because the transfers are increased that ministers change, it is because of scandals, mental health problems etc. Therefore, this instrument is not impacted by reverse causality and the direction of the effect runs only in one way, from the instrument to the outcome. Otherwise, the effect would be biased.

The reason for this instrument is that one could argue that ministers transfer funds towards their constituents, which in turn helps them to get re-elected. Otherwise formulated: preferential votes to ministers could also induce ministers to transfer funds towards their constituents. Hence, problems of reverse causality occur.

However, there is one main caveat to this hypothesis: a strong party system minimizes these problems of endogeneity (Milligan & Smart, 2005b). Belgium has a strong party system, where the regional ministers are chosen by the negotiators of the parties that are forming the government (Vlaams Parlement, 2022) and not by the voters themselves. On the other hand, the party negotiators could be put under pressure to elect certain individuals as ministers if they have a lot of preferential votes (Jennes & Persyn, 2015).

Therefore, there still exist some correlation between votes and representation. Hence, to isolate the causal effect of ministers' catering towards their constituents and to reduce the potential bias in the estimator, changes of ministers are used as an IV. These changes of ministers are thought to induce changes in the allocation of transfers but are not directly related to them. A change of a minister can either increase and/or decrease the number of ministers. Only changes that are exogenous to this transfer game will be used (cf. *Annex 2* and *4*).

If all the assumptions of the IV model hold, omitted variable bias (OVB) is not a cause of concern in an IV model. However, as I start off with a simple OLS model and improve the model, I will include district and year dummies, these take away time specific trends as well as district trends i.e., trends that affect all districts over time in a similar way and trends of specific districts. Moreover, I will also add the past transfers and income p.c. The reason for this is that the past transfers are highly correlated with the current ones. If a district received high (low) transfers in the past, it is highly likely that it will do now as well. Furthermore, income p.c. is a proxy for the welfare of a district, low (high) income p.c. is correlated low (high) levels of welfare and low (high) levels of welfare induce high (low) welfare transfers.

5.2 Validifying the assumptions of the IV

The first assumption for a valid instrument is that it needs to have a strong first stage. Meaning, that the instrument needs to possess adequate explanatory power over the variable of interest. Staiger and Stock (1997) find that to have a strong first stage, the F statistic needs to be large than 10. The test for the full model at the federal level shows that the instrument is valid $F_{(1, 30)} = 12.40$, *p<0.05*. The restricted model, 1995-2010 shows the presence of a weaker instrument $F_{(1, 28)} = 6.72$, *p<0.05*. Which could invalidate the results of this model. The first stage of the model at the regional level is also weaker than the minimal point of 10 $F_{(1, 18)} = 7.14$, *p<0.05*.

The second assumption that I argue is valid is the independence one i.e., the instrument is uncorrelated to the error term. As there does not exist a formal test for this assumption, I will reason why the instrument cannot be correlated to the error term. The instrument can only be correlated if there are variables, not included in the model that both affect the exogenous changes and the transfers going to a district. However, these minister changes are exogenous to these SWT, i.e., only ministers that change due to scandals, emotional strain etc. Therefore, there can *de facto* not be any variable that is related to both, since the instrument and outcome variable are not directly related to each other. Hence, I deem this instrument to be uncorrelated to the error term and believe the independence assumption holds.

As an unofficial test, I will use these control variables to try to validify the independence assumption. This is done by regressing the instrument, exogenous changes on all the observable control variables. With:

$$Change_{it} = \kappa_{0,it} + \kappa_1 * Income_{it} + \kappa_2 * Transfers_{it-1} + \kappa_3 * District + \kappa_4 * Year \qquad (7)$$
$$+ \varsigma_{it}$$

Where, $Change_{it}$ are the exogenous changes at year t for district I, $Income_{it}$ the p.c. income at year t for district i, $Transfers_{it-1}$ the SWT at year t-1 for district i, district and year the district and year dummies. $\kappa_{0,it}$ the district specific intercept, $\kappa_1, \kappa_2, \kappa_3, \kappa_4$ the effect of the income p.c., the transfers at year t-1, and the district and year dummies for district i, year t (apart from the transfers) on the exogenous changes at year t, district i. ς_{it} is the district specific error term.

For the three models, I. at the federal level 1995-2010, II. at the federal level, 1995-2019 and III. at the regional level 2004-2019 these regressions are insignificant, *p>0.1*. This gives some evidence that at least for the observable characteristics, the instrument is uncorrelated with them.

The third assumption that will argue for is the exclusion one. It states that the instrument, in my case exogenous changes in ministers has no direct effect on the outcome. Concretely, this direct effect would entail that due to a change in a minister the transfer system would be changed as well. However, as I only look at minister changes that come forth from scandals (not related to the social welfare system), or elections, I do not deem this assumption to be violated. This assumption relates to the previous one. Since there is not direct relationship between the instrument and outcome variable, the exclusion assumption holds.

In conclusion, one can say that only for the full model at the federal level all three assumptions hold. Therefore, this model is the only one that gives a causal interpretation. The other models represent only represent a relationship.

6. Results

Firstly, the results for the federal government for both the OLS and IV models will be discussed. This discussion is two-folded. On the one hand, I will discuss the restricted model from 1995-2010 to see whether my results are in line with Jennes and Persyn (2015). On the other hand, this analysis is extended to 1995-2019 to see whether manipulation is also happening on a longer time frame. Secondly, the OLS and IV results for the regional government are discussed.

6.1 Federal government
6.1.1 Ordinary least squares regression
Table 3 presents the results of the OLS regressions for the federal government. This framework is in line with Jennes and Persyn (2015), who analyse the effects of political representation on the transfer system from 1995-2010. However, as mentioned in the *Identification strategy*, it slightly diverges in the methodology implemented.

Table 3 presents the comprehensive analysis of the effect that representation has on the real SWT per 100,000. In *Column (1)* of *Table 3,* the logarithm of income per 100,000 inhabitants and district and year dummies are added as control variables. After including these variables, significant results are found, *p<0.05*. Increasing the ministers per 100,000 inhabitants by 1, decreases the real SWT per 100,000 inhabitants by €132 per year, on average. This entails that the benefits were decreased and/ or the income taxes increased and/or the contributions increased (cf. *Equation 2*).

Moreover, Real SWT per $100,000_{it-1}$ are significant and have a positive effect on current transfer, *p<0.01*. Increasing last year SWT by €1000, increases the current ones by €716 per 100,000. It is reasonably that the transfers in the year $t-1$, are predictors for the transfers in year t. An electoral district that receives high transfers last year will receive these high transfers in the current year as well. These high transfers arise due to an aging population, high unemployment etc. In the short term these factors are sticky and do not change much. Hence there is a positive effect.

Additionally, the logarithm of income per 100,000 is significant and negatively related to the current transfers, *p<0.01*. Increasing the income by 1%, increases the real SWT per 100,000 by €59,41. The reason for this effect is opposite than for the Real SWT per $100,000_{it-1}$. Income per 100,000 is a proxy for the welfare level in a district and welfare is negatively related to the SWT. If a district has a high level of welfare, the number of unemployed, sick people etc. is likely to be lower as they do not receive a high wage.

These results are in contrast with the analysis of Jennes and Persyn (2015), who find a large positive effect of representation on the SWT to electoral districts. However, one should note that there are major differences between my model and theirs. As mentioned in the *Identification strategy,* I use different: electoral districts, minister variable and SWT variable. This could be an explanation for the diverging results.

Column (2) of *Table 3* extends the analysis to 1995-2019. However, with this model, the effect of ministers per 100,000 is insignificant. A reason for this could be that there are other variables related to both the ministers per 100,000 and the real SWT per 100,000 that are not included in the model. As there is too much variation present in the SWT variable, that cannot be explained by the ministers variable, this variable becomes insignificant. These problems will be reduced with the IV analysis.

Real SWT per $100,000_{it-1}$ and the logarithm of income per 100,000 are significant, *p<0.01* and these variables have the same sign but a larger effect than in the reduced model (1995-2010).

Table 3: *OLS estimates for the federal government*

	(1)	(2)
	Real SWT per 100,000	Real SWT per 100,000
Ministers per 100,000	-0.132**	-0.0736
	(0.0580)	(0.0623)
Real SWT per $100,000_{it-1}$	0.716***	0.805***
	(0.0569)	(0.0445)
$Income\ per\ 100,000_{it}$	-5.941***	-4.608***
	(1.492)	(1.494)
Constant	15.84***	12.35***
	(4.187)	(4.213)
District dummies	Yes	Yes
Year dummies	Yes	Yes
Controls	Yes	Yes
Observations	228	325

Notes: *Table 3* presents a model with the independent variable ministers per capita and dependent variable the Real SWT per 100,000 inhabitants (in €1000). *Column (1)* presents the short model 1995-2010 and includes district and year dummies and controls, namely the transfers in the year before and the logarithm of p.c. income (in €1000). Column (2) uses the same model for the years 1995-2019. The standard errors are clustered per electoral district. For definitions, see the data and identification part. Standard errors in parentheses. * p < .10, ** p < .05, *** p < 0.01.

6.1.2   Instrumental variable analysis

Column (1) Table 4 shows the results of the IV analysis for the federal government over 1995-2010 with the dependent variable the SWT per 100,00 inhabitants and the instrument exogenous changes with control variables and *Column (2)* the same model over 1995-2019. The variable of interest in *Column (1)* is insignificant and has thus no interpretation. On the other hand, the variable Real SWT per $100,000_{it-1}$ has a significant positive effect, *p<0.01*. An increase of the Real SWT per $100,000_{it-1}$ by €1000, increases the real SWT per 100,000 inhabitants by €721. Additionally, the logarithm of income per 100,000 has a negative significant effect, *p<0.01*. For an increase in the income per 100,000 by 1%, the SWT decrease with €67,52, on average, per year.

Column (2) of *Table 4* displays the IV analysis for the federal government over 1995-2019. The model in *Column (2)* does give significant negative effects, *p<0.1,* for the variable of interest. One minister added to the government induces a decrease in the real SWT per 100,000 by €1,205, on average.

An effect much larger than seen than the OLS estimates. This indicates that there was a positive bias present in the results of the OLS analysis. Due to the exclusion of certain variables the estimates of

Table 3 did not represent the real effect of the changes on the transfer system. Resulting in a biased estimator. However, with to the implementation of the IV analysis, the estimator is not biased anymore and represents the true effect.

Moreover, the Real SWT per $100,000_{it-1}$ has a significant positive effect on the real SWT per 100,000 inhabitants, *p<0.01*. An increase in the Real SWT per $100,000_{it-1}$ by €1000, increases the real SWT per 100,000 inhabitants by €815. Furthermore, the logarithm of income per 100,000 has a significant negative effect on the real SWT per 100,000, *p<0.01*. An electoral district that is has a higher income per 100,000 (i.e., is richer), needs to receive lower SWT. Hence, an increase in the income by 1%, decreases the real SWT per 100,000 inhabitants by €59.66.

The sign of the control variables is once again similar than under the OLS estimation. Real SWT per $100,000_{it-1}$ is positively related to the current SWT. If the transfers in year t-1 are positive than the current ones are positive as well. Income per 100,000 has a positive relationship with the welfare level of an electoral district and therefore a negative relationship with the social welfare payments.

Table 4: *Instrumental variable analysis for the federal government*

	(1) Real SWT per 100,000	(2) Real SWT per 100,000
Exogenous changes	-0.989	-1.205*
	(0.747)	(0.726)
Real SWT per $100,000_{it-1}$	0.721***	0.815***
	(0.0609)	(0.0542)
Income per $100,000_{it}$	-6.752***	-5.966***
	(1.917)	(2.062)
Constant	18.15***	16.25***
	(5.565)	(5.916)
District dummies	Yes	Yes
Year dummies	Yes	Yes
Controls	Yes	Yes
Observations	228	325

Notes: This table presents the IV analysis with the SWT as dependent variable and using the exogenous changes in ministers as an instrument for the ministers per 100,000 *Column (1)* presents the model with year and district dummies and controls, namely the logarithm of p.c. income and the lagged transfers for the federal government for 1995-2010 and *Column (2)* for the federal government for 1995-2019. Std. errors are clustered at the district level. Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

After trying to recreate and extend the analysis of Jennes and Persyn (2015) to the best of my abilities, I find that an increase in ministers causally decreases the transfers going to an electoral district. I will continue to investigate whether there also exists such a relationship at the regional level. As explained in *the Identification strategy*, the latter study is the same as the former one, however, it differs in the data used.

6.2 Regional government

6.2.1 Ordinary Least Squared analysis

Table 5 recreates this OLS analysis of Table 3 for the regional government. There is only 1 column as I solely look at the time period 2004-2019. *Column (1)* of *Table 5* presents the model with control variables and district and year dummies. However, it does not produce significant results for the variable of interest, *p>0.1,* but it does for the control variables, *p<0.05*. The sign and interpretation of these variables is once again similar as seen with the federal government. If Real SWT per $100,000_{it-1}$ increases by €1000, then the real SWT per 100,000 increases €530. Furthermore, the logarithm of income per 100,000 is significant, *p<0.05*. Therefore, if the income increases by 1%, the real SWT per 100,000 decreases by €175.1.

Table 5: *OLS estimates for the regional government 2004-2019*

	(1) Real SWT per 100,000
Ministers per 100,000	0.244
	(0.254)
Real SWT per $100,000_{it-1}$	0.530**
	(0.209)
Income per $100,000_{it}$	-17.51**
	(8.403)
Constant	49.23**
	(24.03)
District dummies	Yes
Year dummies	Yes
Controls	Yes
Observations	280

Notes: *Column (1)*-(4) present the OLS model for the regional government from 2004-2019. *Column (1)* presents a model with the independent variable ministers per capita and dependent variable the Real SWT per 100,000 and control variables such at the last years' transfers and income per 100,000 inhabitants at year t for district i. The standard errors are clustered per electoral district. For definitions, see the data part. Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < 0.01$.

6.2.2 Instrumental variable analysis

Table 6 shows the results of the IV analysis for the regional government over 2004-2019. The model provides insignificant results for the variable of interest, the exogenous changes on the real SWT per 100,000, *p>0.1*.

The question rests if these are true null effects, or just there due to the imprecise measurement of the variables, i.e., presence of large standard errors. An incomplete (non-statistical) analysis can be performed to test this. Specifically, this entails investigating the standard errors under this model and comparing them to the ones for the federal government.

After comparing the standard errors of *Table 6* with the ones of *Table 4*, I don't find many differences between both. Using the full data available for the federal government (cf. *Columns (2)* of *Table 4*) the standard errors in *Column (1)* of *Table 6* are similar to those of *Column (2)* of *Table 4*. Due to this, I conclude that these are real null effects and not driven by an incorrect measure. Therefore, at the regional level no fiscal transfer manipulation took place. Lastly, as seen before, the control variables in the full model are statistically significant. The sign and interpretation are the same as before, hence I will not elaborate on them.

Table 6: *Instrumental variable analysis for the regional government 2004-2019*

	(1) Real SWT per 100,000
Exogenous changes	0.464
	(0.787)
Real SWT per $100,000_{it-1}$	0.528**
	(0.206)
Income per $100,000_{it}$	-18.35*
	(9.457)
Constant	51.58*
	(27.03)
District dummies	Yes
Year dummies	Yes
Controls	Yes
Observations	280

Notes: This table presents the IV analysis with the SWT as dependent variable and using the exogenous changes in ministers as an instrument for the ministers per 100,000 *Column (1)* presents the full model with district and year dummies and control variables, namely the income p.c. and las years' transfers. Std. errors are clustered at the district level. Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

However, note that It could still be that these results are driven due to the weak instrument F(1, 18) = 7.14. As (Staiger & Stock, 1997) found, a weak instrument i.e., with an F test lower than 10, could potentially present biased estimators. Therefore, it could be that investigating a longer time period could enhance the power of this instrument and in turn one could find significant results at the regional level.

6.3 Robustness

After analysing the coefficients of both the IV and OLS estimates, one can conclude that the sign of the coefficients does not change. Only the magnitude changes slightly. An increase in electoral representation at the federal level, decreases the SWT. An increase in last years' transfers increases the current SWT and an increase in p.c. income, decreases the SWT. Both the full OLS model as well as the IV model suggest that these relationships hold.

Apart from including time and district dummies, there could still be omitted time-invariant variables that influence the dependent variable and the independent variable of interest. If there exist any, then omitting them from the model induces a bias. Therefore, capturing these time-invariant variables improves the model. For this reason, I include a model that eliminates this bias as a robustness check to see whether the results change.

However, the inclusion of the lagged outcome variable as an estimator includes the whole past of the outcome variable, making it difficult to correctly estimate the model. Furthermore, any effect that the variable of interest has on the outcome variable is completely calculated by this exact history. Therefore, there exists a correlation between the lagged outcome variable as a regressor and the error term (Das, 2019).

One way to overcome this bias is to use the Anderson and Hsiao (AH) first difference IV model. By taking the first difference of all variables, one eliminates the time invariant fixed effects (intercept). The regression equation looks as follows:

$$
\begin{aligned}
Real\ SWT\ per\ &100{,}000_{it} - Real\ SWT\ per\ 100{,}000_{it-1} \qquad (8)\\
&= +\beta_1 * \frac{(\widehat{Ministers}_{it} - \widehat{Ministers}_{it-1}) * 100{,}000}{Inhabitants_{it}} + \beta_2 \\
&\quad * (Real\ SWT\ per\ 100{,}000_{it-1} - Real\ SWT\ per\ 100{,}000_{it-2}) \\
&\quad + \beta_3 * (Income_{it} - Income_{it-1}) + (\eta_{it} - \eta_{it-1})
\end{aligned}
$$

Where *Equation 8* is equal to *Equation 6* minus the first lag of *Equation 6*. Expectedly, the intercept (fixed effects) drops out of the equation. Moreover, all the other variables are similar to *Equation 6*, however some have now an indication t-1 and t-2, which denotes the first or second lag of the variable.

The interpretation of this model is slightly different, as we are looking at changes in the outcome variable related to changes in the explanatory variables. This will be made clear in the interpretation of the results.

Table 7 repeats the IV analyses performed under *Table 4* and *6,* using the Anderson and Hsiao (AH) first difference model. The first difference model in *Column (1)* of *Table 7* presents the AH model at the federal level for 1995-2010. The minister changes have a significant negative effect on the SWT, *p<0.10*. Hence, an exogenous change happening relative to last year, decreases the SWT by €746 per 100,000 inhabitants relative to last year, on average. Furthermore, the difference 1st lag of the SWT variable is significant and has a negative effect, *p<0.01*. At first sight this might look unintuitive having the IV analysis in mind. However, if one contemplates about this difference 1st lag transfer variable further it does make sense. The difference 1st lag of transfers is equal to:

$$Real\ SWT\ per\ 100{,}000_{it-1} - Real\ SWT\ per\ 100{,}000_{it-2} \tag{9}$$

Moreover, the first difference of transfer is equal to:

$$Real\ SWT\ per\ 100{,}000_{it} - Real\ SWT\ per\ 100{,}000_{it-1} \tag{10}$$

The total effect analyzed has the form of *Equation 8.* Underneath I will give an intuitive explanation where the negative difference 1st lag of the transfer effect could result from. The interpretation of the variable is similar as seen before: how does the y variable respond if the x variable is increased by 1 unit.

Assume this difference 1st lag transfer variable (x variable) is increased by one unit. This is the case only if $Real\ SWT\ per\ 100{,}000_{it-1}$ is increased or $Real\ SWT\ per\ 100{,}000_{it-2}$ is decreased (or a combination). Let us assume it is due to an increase in $Real\ SWT\ per\ 100{,}000_{it-1}$ by 1 unit. Then by construct, the difference 1st lag transfer variable will decrease by 1 unit (cf. *Equation 10*). Therefore, it is not illogical that the effect of this variable is negative. However, the effect is only equal to a decrease €258 in the p.c. SWT and not €1000. This results from the fact that the effect is not only driven by an increase in $Real\ SWT\ per\ 100{,}000_{it-1}$ by 1 unit, but it could also be that $Real\ SWT\ per\ 100{,}000_{it-2}$ decreases by a certain unit z. On top of that the first difference of the logarithm of income also has a negative significant effect on the SWT, *p<0.01*. Therefore, if the change of income is increased by 1%, then the first differenced SWT decreases by €780.7 per 100,000 inhabitants, on average.

Moreover, *Column (2)* of *Table 7* presents the AH model at the federal level for 1995-2019. The minister changes have once again a significant negative effect, *p<0.05*. A minister change induces a decrease of the SWT by €969 per 100,000 inhabitants. A lower effect observed than the full IV model at the federal level (cf. *Table 4 Column (2)*). Additionally, the control variables are significant as well, *p<0.01*. An increase in $\Delta Real\ SWT\ per\ 100{,}000_{it-1}$ by €1000, decreases the first difference real SWT per 100,000 by €969. The same reasoning holds, if the change in last years' transfers increase, i.e., the second difference increases, then the first difference decreases. Lastly, if the income per 100,000 increases by 1% to last year, then the real SWT decreases by €810.

Furthermore, the variable of interest at the regional level for the years 2004-2019 is not significant, *p>0.1* (cf. *Column (3)* of *Table 7*). However, as found in the IV regression at the regional level the control variables remain significant, *p<0.01*. The sign and the interpretation are similar than observed before.

Table 7: First difference model for the federal and regional government.

	(1) Real SWT per 100,000	(2) Real SWT per 100,000	(3) Real SWT per 100,000
D.Exogenous changes	-0.746*	-0.969**	-0.295
	(0.407)	(0.469)	(0.486)
D. $Real\ SWT\ per\ 100{,}000_{it-1}$	-0.258***	-0.096***	-0.248***
	(0.407)	(0.037)	(0.047)
D.Income per 100,000	-7.807***	-8.100***	-14.02***
	(0.515)	(0.576)	(3.570)
Constant	-0.055	-0.00884	0.081
	(0.017)	(0.0159)	(0.067)
District dummies	No	No	No
Year dummies	No	No	No
Controls	Yes	Yes	Yes
First differences	Yes	Yes	Yes
Observations	228	325	280

Notes: This table presents the IV analysis with the SWT as dependent variable and using the exogenous changes in ministers as an instrument for the ministers per 100,000 *Column (1)* presents first difference model at the federal level for 1995-2010 with controls. *Column (2)* presents first difference model at the federal level for 1995-2019 with controls. *Column (3)* presents first difference model at the regional level for 2004-2019 with controls. Std. errors are clustered at the district level. Standard errors in parentheses * *p* < 0.1, ** *p* < 0.05, *** *p* < 0.01.

This first difference model shows that the sign similar is than with the normal IV regression. One fact is observed, the effect of the variable of interest, the minister changes at the federal level for the years 1995-2010 is significant *p<0.1*. This is contrary to the insignificant effect observed with the standard IV model. However, even though this effect now seems significant, the instrument still remains weak $F(1,28) = 6.72$. Therefore, these significant results are still biased.

Moreover, I do not present this model ideal because there are several downturns of using it. Firstly, the adjusted IV regressor does not look at the formation of the error term. Moreover, the IV estimates are rather non-consistent if there are other estimators that are correlated and due to the autocorrelation of the first difference errors (Múck, 2022). Therefore, I use this model for a robustness check and does not include it in the result section.

Another concern could be that the results were overestimated due to the presence of outliers. These outliers are defined as a small set of districts were the SWT were either extremely high or low. Therefore, as another robustness check I firstly deleted all the observations with the real SWT per 100,000 above (below) the inner fence and rerun the analysis, with:

$$Inner\ fence = Q3 \pm 1.5 * IQ \qquad (11)$$

Where:
Q3 = Quantile 3
IQ = Interquartile range, also equal to quantile 3 – quantile 1

For the full model (1995-2019) at the federal level, as well as the one at the regional level, similar results were found than under *Table 4 and Table 6.* For the full model at the federal level the same significant results were found, and the regional model remains insignificant. However, as expected these results are less negative than under *Table 4 and 6*. This is reasonable, as I deleted the outliers, which are the much lower transfers and deleted them, the effect is decreased. As the majority of outliers are at the lower bound (more negative), deleting them would result the effect of representation on the SWT to increase.

For the federal level from 1995-2010, I used my own definition of between fence, which lies between the outer and inner fence. This was done because otherwise I deleted too many observations and the explanatory power of the instrument was too much reduced hence being left over with insignificant results, with:

$$Between\ fence = \ Q3 \pm 2.25 * IQ \qquad\qquad (12)$$

Where:

Q3 = Quantile 3

IQ = Interquartile range, also equal to quantile 3 – quantile 1

Apart from relatively small differences, the outcomes were qualitatively the same as the ones shown in *Table 4 and 6.* With both the first difference analysis and the deletion of outliers, I do believe that my results are not just driven by luck and/or outliers, but rather represent correct effects.

7. Discussion & conclusion

This paper examined the causal effect of political representation on specific social welfare transfers (SWT) going to electoral districts. The key underlying theory suggests that a politicians' goal is to improve their re-election probabilities and therefore they manipulate the allocations going to their constituents. However, after performing the empirical analysis I found significant negative results at the federal level for 1995-2019. Once a politician from a certain electoral district has been appointed as a federal minister, he/she will fund less money towards this district. Concretely, one minister added to the government induces, on average, a decrease in the real SWT per 100,000 by €1,205. This finding disproves the main hypothesis of this paper. Furthermore, this is in contrast with Jennes and Persyn (2015), who found with a similar analysis a positive effect. Below, several possible explanations will be presented, linking both theory and empirical results together.

A first explanation for the negative results stems from a large turnover of ministers in addition to a large overall number of ministers in Belgium. This makes for a diminished accountability per minister. For example, in Flanders, after the right wing National Flemish Alliance won the regional elections in 2012, they blamed the Socialist Party for many years of bad policy. They used this rhetoric for many years after they were the ruling party in Flanders, even though they were the party in power and they were themselves to blame for the policy implemented (De Standaard, 2014; Knack, 2015).

One aspect to note is that a decrease of €1,205 per 100,000 inhabitants is a relatively small part of the overall federal budget that politicians have access to. To put it into perspective, using the federal budget available from FPS Finance (2022), this translates to 0,0002% of the overall federal budget.

While this is a small effect, it is not negligible as a federal budget includes a lot of fixed, predetermined costs[15]. Therefore, ministers can only influence a small part of the budget.

A reason for diverging results with Jennes and Persyn (2015) is explainable by the composition of a different data set. The electoral districts in Belgium for both the federal and regional level changed throughout the year. Jennes and Persyn (2015) argued that, even though the electoral districts were redrawn, politicians will continue favouring their old districts. This is an assumption I completely disagree with. As the politicians want to maximize their re-election probabilities, it is to be expected that they favour their new electoral district instead of their older, smaller one. Therefore, after the redrawing of the districts I took the new ones and not the old districts. As a result of this decision, a possibility for the negative results found arises from the fact that it is more difficult for politicians to influence the transfers going towards these new, larger districts. Hence engaging less in the manipulation of said transfers.

Moreover, as the districts are larger, it is more difficult to manipulate the transfer system and the chances of getting caught are increased. This reasoning can be best understood using a simple microeconomic crime model à la Freeman (1999), one would engage in crime only if:
$$(1-p)U(W_c) - pU(S) > U(W) \qquad\qquad (13)$$
Where:

P   = Probability of being caught

$U(W_c)$ = Utility gain from successfully committing a crime

S   = Punishment when caught

U(W)   = Utility gain from not committing a crime

This condition tells us that one engages in criminal behavior if the benefits of not getting caught minus the costs of getting caught are higher than the benefits one reaps when not committing this criminal behavior. Thus, after redrawing of the electoral districts i.e., they get larger, the effective probability of getting caught increases. If districts are larger, then it would be easier for an independent oversight body to see this manipulation happening, hence the probability of getting caught increases. Therefore, politicians would engage less in these rent-seeking activities.

Furthermore, it could be that Jennes and Persyn (2015) used different data for the SWT. Possibly including more or less parts of the overall SWT. However, as explained in *the Identification strategy,*

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[15] E.g., loan interest, building maintenance, leasing costs etc. are all fixed.

my data do seem to correspond to theirs. Another possibility is that the National Bank of Belgium retrospectively changes its data. Although I do not find this argument convincing, it is one that the authors of the paper pointed out to me after I emailed them to confirm my results.

One limitation of Jennes and Persyn (2015) is that they did not explain the strength of their instrument. After trying to re-create their analysis, I did find for their model that the strength of the instrument was low $F(1, 28) = 6.72$. As this is lower than the suggested power of the F test > 10 of Staiger and Stock (1997), I do believe this to be a cause of concern.

One thing to note with my research is that both the signs of the OLS and IV estimators for the federal level produced similar results. This is an indication of robust results. Moreover, a potential reason for not finding significant results at the regional level could lie in the regional government's budgetary power. As seen in *the Institutional background,* their budgetary power only significantly increased after 2014. It could therefore be that they only influenced the SWT after 2014. However, as there is only data until 2019, the absence of any significant result is not surprising.

Moreover, solely specific social contributions, income taxes and certain social benefits were investigated. This does not consider the possible overall effect that politicians can have on the budget. This research does not exclude the possibility that politicians engage in fiscal manipulation. It is possible that they enact sub-optimal policy in other areas than the one's analysed in this paper.

As a fully informed reader, one should be knowledgeable about the limitations of this research. Firstly, as it does not cover the overall transfer system it cannot be extrapolated to other parts of this system. It could be that politicians engage in budgetary manipulation, i.e., fund specific projects such as highways, subways, libraries etc. to specific electoral districts. However, as the scope of this paper is limited, this does not show up in the result section. Furthermore, each government has its own goal and vision it wants to achieve. Therefore, it could be expected that some governments and/ or specific politicians engage more in manipulation than others. Be that as it may, this is not shown in the result section, it averages out the overall effect and does not account for political affinity or government. Thus, the effect found is an average of the overall effect over all politicians and over all governments. Additionally, the external validity of this model is rather low, due to the limitations just mentioned and due to the specific institutional structure Belgium has. There are not many countries like Belgium, where one can take an exogenous instrument and analyse the effect causally.

Even though there are caveats to this research, the underlying method of this paper is valid. As I first tested the assumptions of the IV model and validified them to the best of my abilities, I do deem the full model at the federal level to present valid and causal results. Hence, the internal validity of the model is high. Moreover, the robustness checks once more confirm that the results were not influenced by outliers and the first difference model shows that with another method the results still hold. Lastly, only the results shown in the complete model at the federal level give causal estimates as the underlying assumptions hold. The other models do not represent true casual relationships.

Furthermore, this analysis does add to the existing branch of literature on distributive politics in addition to having several policy implications. Firstly, the goal of these SWT is to increase the overall welfare of the population according to the governments' objective function. Furthermore, it is a cause of concern that political actors can influence the SWT as this would potentially lead to sub-optimal scenarios from a social welfare perspective. A solution to this problem is the creation of a robust legal framework ensuring these transfers can only be changed with enough coordination between social partners, politicians, and experts in a country. Second, there could also be an independent board of directors appointed that oversee these SWT and acts in the benevolence of the citizens.

A realistic path to future research is to extend the analysis in three ways. First, one can increase the timeline analysed and inspect whether these negative results stay robust and significant. Increasing the timeline at the regional level could very well make for a strong instrument and significant results. Second, one could also extend the transfers analysed. With the current data set it is not too difficult to add other transfers, funds, projects etc. and see if politicians influence those. As it is always important to keep check and balances present to detect and counteract manipulation. Lastly, other methods could also be implemented to confirm the results. If in Wallonia a strict legal framework is set up to prevent this manipulation from happening and in Flanders not, one could analyse by means of a difference-in-difference method whether there are differences in transfers between the two regions. The differences present are then evidence of manipulation.

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Annex 1: Federal electoral districts of Belgium

Year	Electoral District	Region
2012-Present	Antwerpen	Flanders
2012-Present	Brussel-Hoofdstad	Flanders
2012-Present	Henegouwen	Flanders
2012-Present	Limburg	Flanders
2012-Present	Luik	Wallonia
2012-Present	Luxemburg	Wallonia
2012-Present	Namen	Wallonia
2012-Present	Oost-Vlaanderen	Flanders
2012-Present	Vlaams-Brabant	Flanders
2012-Present	Waals-Brabant	Wallonia
2012-Present	West-Vlaanderen	Flanders
2002-2011	Antwerpen	Flanders
2002-2011	Brussel-Halle-Vilvoorde	Flanders
2002-2011	Henegouwen	Wallonia
2002-2011	Leuven	Flanders
2002-2011	Limburg	Flanders
2002-2011	Luik	Wallonia
2002-2011	Luxemburg	Wallonia
2002-2011	Namen	Wallonia
2002-2011	Oost-Vlaanderen	Flanders
2002-2011	Waals-Brabant	Wallonia
2002-2011	West-Vlaanderen	Flanders
1995-2003	Aalst-Oudenaarde	Flanders
1995-2003	Antwerpen	Flanders
1995-2003	Brugge	Flanders
1995-2003	Charleroi-Thuin	Wallonia
1995-2003	Gent-Eeklo	Flanders
1995-2003	Hoei-Borgworm	Wallonia
1995-2003	Leuven	Flanders
1995-2003	Mechelen-Turnhout	Flanders
1995-2003	Nijvel	Wallonia
1995-2003	Verviers	Wallonia
1995-2003	Aarlen-Marche-en-Famenne-Bastogne-Neufchateau-Virton	Wallonia
1995-2003	Bergen-Zinnik	Wallonia
1995-2003	Brussel-Halle-Vilvoorde	Flanders
1995-2003	Doornik-Aat-Moeskroen	Wallonia
1995-2003	Hasselt-Tongeren-Maaseik	Flanders
1995-2003	Kortrijk-Roeselare-Tielt	Flanders
1995-2003	Luik	Wallonia
1995-2003	Namen-Dinant-Philippeville	Wallonia
1995-2003	Sint-Niklaas-Dendermonde	Flanders
1995-2003	Veurne-Diksmuide-Ieper-Oostende	Flanders

Annex 2: Federal exogenous changes

Year	Electoral District	Minister	Exogenous resignation	Followed up by	Electoral district
2019	Brussel-Hoofdstad	Reynders	Quit after being appointed as EU Commissioner for Justice.	Wilmes	Brussel-Hoofdstad
2018	Antwerpen	Jambon	Right-wing party N-VA quit the government after there were diverging views on the vote of the UN migration pact.	N/A	N/A
2018	Antwerpen	Van Overtveldt	Right-wing party N-VA quit the government after there were diverging views on the vote of the UN migration pact.	N/A	N/A
2018	West-Vlaanderen	Loones	Right-wing party N-VA quit the government after there were diverging views on the vote of the UN migration pact.	N/A	N/A
2016	Henegouwen	Galant	Resigned after a devastating EU report came out on the security of Belgian airports.	Bellot	Namen
2009	West-Vlaanderen	Leterme	Bankruptcy of the Fortis bank due to mismanagement, hence there had to be political responsibility.	Van Rompuy	Brussel-Halle-Vilvoorde
2009	Antwerpen	Vervotte	Bankruptcy of the Fortis bank due to mismanagement, hence there had to be political responsibility.	Vanackere	Brussel-Halle-Vilvoorde
2009	Limburg	Vandeurzen	Bankruptcy of the Fortis bank due to mismanagement, hence there had to be political responsibility.	De Clerck	West-Vlaanderen
2009	Limburg	Dewael	Resigned after the internal investigation about his alleged appointment of high-ranking federal police officers.	De Padt	Oost-Vlaanderen
2009	Oost-Vlaanderen	De Padt	Also, part of the internal investigation with the same allegations regarding the appointment of high-ranking officials.	Turtelboom	Antwerpen
2003	Leuven	Aelvoet	She oversaw an arms deal with Nepal when there was an instable government and civil war at the time.	Tavernier	Gent-Eeklo
2003	Brussel-Halle-Vilvoorde	Durant	Durant prohibited night flights over Brussels to limit noise pollution. However, this was in contrast with the parties' views and had to resign	Ylieff	Hoei-Borgworm
1999	Hasselt-Tongeren-Maaseik	Pinxten	Large fraud with state owned Fortis bank.	Van Rompuy	Brussel-Halle-Vilvoorde

1999	Antwerpen (District)	Colla	This scandal let to the fall of the government. Large fraud with state owned Fortis bank.	Peeters	Mechelen-Turnhout
1999	Leuven	Tobback	This scandal let to the fall of the government. Large fraud with state owned Fortis bank.	Van Den Bossche	Gent-Eeklo
1998	Veurne-Diksmuide-Ieper-Oostende	Vande Lanotte	This scandal let to the fall of the government. As minister of interior affairs, he had the end responsibility after the escape of one of the biggest serial rapists in Belgium. Therefore, he had to resign.	Tobback	Leuven
1998	Kortrijk-Roeselare-Tielt	Declerck	As minister of justice, he had the end responsibility after the escape of one of the biggest serial rapists in Belgium. Therefore, he had to resign.	Van Parys	Gent-Eeklo
1996	Verviers	Wathelet	He became judge for the Justice Cours of the European Union.	Poncelet	Aarlen-Marche-en-Famenne-Bastogne-Neufchâteau-Virton

Annex 3: Regional electoral districts

Year	Electoral District	Region
2019-Present	Aarlen-Marche-en-Famenne-Bastenaken-Neufchâteau-Virton	Wallonia
2019-Present	Bergen	Wallonia
2019-Present	Charleroi-Thuin	Wallonia
2019-Present	Dinant-Philippeville	Wallonia
2019-Present	Doornik-Aat-Moeskroen	Wallonia
2019-Present	Hoei-Borgworm	Wallonia
2019-Present	Luik	Wallonia
2019-Present	Namen	Wallonia
2019-Present	Nijvel	Wallonia
2019-Present	Verviers	Wallonia
2019-Present	Zinnik-La-Louvière	Wallonia
2019-Present	Antwerpen	Flanders
2019-Present	Brussel-Hoofdstad	Flanders
2019-Present	Limburg	Flanders
2019-Present	Oost-Vlaanderen	Flanders
2019-Present	Vlaams-Brabant	Flanders
2019-Present	West-Vlaanderen	Flanders
2004-2018	Aarlen-Marche-en-Famenne-Bastenaken	Wallonia
2004-2018	Bergen	Wallonia
2004-2018	Charleroi	Wallonia
2004-2018	Dinant-Philipeville	Wallonia
2004-2018	Doornik-Aat-Moeskroen	Wallonia
2004-2018	Hoei-Borgworm	Wallonia
2004-2018	Luik	Wallonia
2004-2018	Namen	Wallonia
2004-2018	Neufchâteau-Virton	Wallonia
2004-2018	Nijvel	Wallonia
2004-2018	Thuin	Wallonia
2004-2018	Verviers	Wallonia
2004-2018	Zinnik	Wallonia
2004-2018	Antwerpen	Flanders
2004-2018	Brussel-Hoofdstad	Flanders
2004-2018	Limburg	Flanders
2004-2018	Oost-Vlaanderen	Flanders
2004-2018	Vlaams-Brabant	Flanders
2004-2018	West-Vlaanderen	Flanders

Annex 4: Regional exogenous changes

Year	Electoral District	Minister	Exogenous resignation	Followed up by	Electoral district
2019	Oost-Vlaanderen	Schauwvlieghe	Emotional stress, her minister tasks became too much	Van Den Heuvel	Antwerpen
2019	West-Vlaanderen	Tommelein	Left his position as a mayor of Oostende to become a Flemish minister, however after some time he decided to go back	Peeters	Antwerpen
2016	Antwerpen	Turtelboom	Problems with her policy, introduced an extra energy tax creating a lot of turmoil	Tommelein	West-Vlaanderen
2016	Thuin	Furlan	Vote of incompetence after the Publifin scandal. Fall of the government	Dermagne	Dinant-Philippeville
2016	Charleroi	Magnette	Vote of incompetence after the Publifin and samusocial scandal. Fall of the government	Borsus	Aarlen-Marche-en-Famenne-Bastenaken
2016	Namen	Prévot	Vote of incompetence after the Publifin and samusocial scandal. Fall of the government	Greoli	Luik
2016	Luik	Marcourt	Vote of incompetence after the Publifin and samusocial scandal. Fall of the government	Jeholet	Verviers
2016	Dinant-Philippeville	Dermagne	Vote of incompetence after the Publifin and samusocial scandal. Fall of the government	De Bue	Nijvel
2016	Luik	Lacroix	Vote of incompetence after the Publifin and samusocial scandal. Fall of the government	Crucke	Doornik-Aat-Moeskroen
2016	Namen	Tillieux	Vote of incompetence after the Publifin and samusocial scandal. Fall of the government	Jeholet	Verviers
2009	Bergen	Donfut	While being an energy minister he was a consultant as well. Which was clearly a conflit of interest	Demotte	Doornik-Aat-Moeskroen
2008	Oost-Vlaanderen	Moerman	Quit after a devastating report surrounding the irregularities of Public Business Services came out. Her cabinet unlawfully handed out a government contract to a private firm.	Ceysens	Vlaams-Brabant
2008	West-Vlaanderen	Bourgeois	Exited the Flemish government because he did not agree with the planned state reforms at the federal governemnt	Peeters	Antwerpen
2007	Antwerpen	Vervotte	Fortis scandal	Vanackere	Brussel-Hoofdstad
2007			Crevits takes up Peeters' responsibilities	Crevits	West-Vlaanderen
2006	Charleroi	Van Cauwenberghe	Affaire La Carolorégienne	Di Rupo	Bergen