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Brice Fabre

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Directeur de thèse : François Bourguignon

Composition du jury :

Rapporteurs	Sonia Paty	Professeur, Université Lumière Lyon 2 & GATE
	Albert Solé-Ollé	Professeur, Universitat de Barcelona & IEB
Directeur	François Bourguignon	Directeur d'Études, EHESS & PSE
Examinateurs	Olivier Bargain	Professeur, Aix-Marseille Université & AMSE
	Ekaterina Zhuravskaya	Directrice d'Études, EHESS & PSE

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Brice Fabre

Political Economy of Local Governments: Three Essays on French Municipalities

Thesis Advisor : François Bourguignon

Jury:

Reviewers	Sonia Paty	Professor, University Lumière Lyon 2 & GATE
	Albert Solé-Ollé	Professor, University of Barcelona & IEB
Advisor	François Bourguignon	Professor, EHESS & PSE
Examinators	Olivier Bargain	Professor, Aix-Marseille University & AMSE
	Ekaterina Zhuravskaya	Professor, EHESS & PSE

Établissement :
École des Hautes Études en Sciences Sociales
54, boulevard Raspail
75006 Paris

Laboratoire d'acceuil :
Paris-Jourdan Sciences Economiques - UMR 8545
48, boulevard Jourdan
75014 Paris

École Doctorale :
École Doctorale Économie Panthéon Sorbonne - ED465
106-112 boulevard de l'Hôpital
75013 Paris

A mes parents
A ma sœur

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Note de lecture - Note for the reader

Cette thèse est la compilation de trois chapitres, correspondant chacun à un article de recherche pouvant se lire de manière indépendante. Ces trois chapitres sont écrits en anglais. Ils sont précédés d'une introduction générale en français résumant les travaux de cette thèse.

This thesis is the compilation of three chapters. Each one corresponds to a research article, which can be read independently from the others. These three chapters are in English. They are preceded by a general introduction in French, which summarizes the research presented in this thesis.

Contents

Introduction générale

La décentralisation du pouvoir politique occupe une place importante dans le débat public, autant dans les pays développés que dans les pays en développement. Dans plusieurs pays européens, de nombreux débats ont lieu autour de réformes visant notamment à fusionner plusieurs entités locales à un échelon donné ou à modifier le nombre d'échelons territoriaux (Starck, 2012). De nombreux pays en développement, ayant connu des régimes centralisés, ont récemment adopté des réformes de décentralisation politique, en transférant à des gouvernements locaux des compétences telles que les politiques d'éducation ou de santé (Faguet, 2004; Faguet & Sánchez, 2008; Galiani et al., 2008).

Ces débats autour de la décentralisation trouvent leurs fondements dans les nombreux travaux mettant en évidence les effets potentiels du partage du pouvoir politique entre différents échelons territoriaux. Les travaux pionniers de Oates (1972) mettent en évidence un arbitrage fondamental dans le choix du niveau territorial optimal pour une compétence de politique publique donnée. Ce niveau optimal est le résultat de deux forces opposées. D'une part, un découpage fin du territoire entre plusieurs instances politiques permet de mieux prendre en compte l'hétérogénéité des préférences entre différentes zones territoriales. D'autre part, un système politique décentralisé crée des externalités entre les différentes entités territoriales, qui ne sont potentiellement pas internalisées par les agents économiques. De telles externalités sont d'autant plus grandes que la taille de chaque unité territoriale est petite.

Ces deux éléments d'arbitrage soulèvent de nombreuses questions qui illustrent la complexité de l'ensemble des éléments en jeu. Plusieurs contributions visent à caractériser les externalités horizontales entre gouvernements locaux, et mettent en avant le fait qu'un gouvernement central peut mettre en place des transferts monétaires destinés aux gouvernements locaux afin de compenser la sous-optimalité de l'allocation des ressources liée à la non-internalisation de ces externalités. Zodrow & Mieszkowski (1986) étudient le cas de gouvernements locaux décidant d'un niveau de taxation sur le capital. Les auteurs montrent que la mobilité de la base fiscale peut, dans un cadre de compétition entre collectivités territoriales, aboutir à un niveau trop faible de taxation et donc de biens publics. Un tel mécanisme émerge du fait que les gouvernements locaux ignorent l'effet positif sur les collectivités voisines d'une fuite du capital due à une taxation plus élevée. Face à ce niveau sous-optimal de bien public, Wildasin (1989) propose un système de transferts monétaires du gouvernement central vers les gouvernements locaux permettant de corriger cette inefficience. Boadway & Flatters (1982) mettent en avant une externalité de nature différente, liée au fait que les agents économiques prennent leurs décisions de localisation en

fonction des niveaux de taxation et de biens publics locaux des différentes collectivités locales. Les agents ne prenant pas en compte les effets globaux de leurs décisions de localisation, ceux ayant une préférence plus importante pour les biens publics auront tendance à ajuster leur choix de mobilité en conséquence, en créant notamment des effets de congestion dans les territoires caractérisés par une plus grande dépense publique. Les auteurs montrent que le gouvernement central peut faire face à ces comportements en allouant des transferts monétaires aux différentes collectivités visant à compenser cet effet et à tendre vers une allocation optimale des ressources.

L'argument avancé par Oates (1972) selon lequel des gouvernements locaux permettent potentiellement de prendre davantage en compte l'hétérogénéité des préférences entres territoires est également sujet à débat. La prise en compte d'une telle hétérogénéité territoriale n'appelle pas forcément à une décentralisation politique, dans la mesure où un gouvernement central peut prendre en compte cette hétérogénéité en mettant en place une décentralisation administrative consistant à créer des antennes locales sous sa responsabilité. Un tel système serait d'autant plus justifié qu'un gouvernement local bénéficie potentiellement de moins de capital humain, ou de ressources financières moindres qu'un gouvernement central pour une bonne gestion des décisions publiques.[1] Maskin et al. (2000) étudient, dans un cadre plus large que celui de la décision politique, la mise en place d'un tel système de décentralisation administrative. Les auteurs comparent un système où des antennes locales ont la responsabilité de l'ensemble des politiques mises en place dans leur territoire, avec un système où le gouvernement central est divisé en plusieurs sections ayant chacune la responsabilité d'un domaine précis de politique publique pour l'ensemble du territoire national ou fédéral. Les auteurs montrent que le premier système peut être bénéfique dans la mesure où les responsables des différentes unités territoriales peuvent être en compétition pour des considérations en termes de promotion de carrière (*yardstick competition*). Une telle compétition aboutit à une hausse de l'efficacité des décisions publiques. Néanmoins, ce résultat ne fonctionne que sous l'hypothèse de subdivisions territoriales comparables et autonomes. Plus précisément, une telle forme de décentralisation administrative peut s'avérer néfaste lorsqu'une meilleure performance d'un territoire donné peut avoir un impact négatif sur la performance des unités territoriales concurrentes, et lorsque de tels effets négatifs peuvent être exploités par les décideurs locaux pour apparaître comme plus performants que leurs concurrents (Cai & Treisman, 2004; Xu, 2011). A partir de données relatives à une importante réforme de l'organisation administrative en Union Soviétique dans les années 1950, Markevich & Zhuravskaya (2011) fournissent une validation empirique de cet effet différencié d'un système administratif décentralisé en fonction de la structure territoriale.

L'ensemble de ces contributions illustre la complexité des problématiques soulevées par la décentralisation politique, mais ignorent les effets d'ordre politique associés au fait de mettre en place des autorités publiques territoriales dont les dirigeants sont choisis via des élections locales.

[1] Même si les ressources financières peuvent faire l'objet d'une redistribution entre collectivités locales afin que les territoires les moins bien dotés puissent bénéficier d'un montant suffisant de ressources, plusieurs contributions mettent en avant le fait qu'un tel système peut inciter les gouvernements locaux à baisser leurs bases fiscales, ou les désinciter à développer l'activité économique sur leurs territoires (Smart, 1998; Smart & Bird, 1996; Baretti et al., 2002; Zhuravskaya, 2000).

Ainsi, de nombreux travaux se sont développés afin de caractériser les facteurs politiques en jeu dans un système de pouvoir public décentralisé. Cette thèse s'inscrit dans cette littérature, en contribuant à deux aspects majeurs que soulève l'évaluation de l'efficacité de la décentralisation politique. D'une part, alors que les transferts monétaires reçus par un gouvernement local d'une autorité d'échelon supérieur peuvent être un moyen d'internaliser les externalités horizontales entre gouvernement locaux, l'allocation de tels transferts peut également être influencée par des facteurs d'ordre purement politique et s'éloigner de son objectif d'atteindre une allocation optimale des ressources. D'autre part, considérer la potentielle prise en compte des gouvernements locaux de l'hétérogénéité territoriale des préférences amène à étudier précisément la manière dont les gouvernements locaux réagissent aux caractéristiques de leur population locale. Nous traitons ces deux problématiques de manière empirique, en nous concentrant sur le cas des communes françaises.

Les deux premiers chapitres de cette thèse visent à améliorer les connaissances existantes sur l'influence que peuvent avoir les facteurs politiques sur l'allocation des transferts verticaux intergouvernementaux, définis comme des transferts reçus par les gouvernements locaux de la part d'un échelon de niveau supérieur. Plusieurs contributions soulignent le fait qu'un gouvernement central peut utiliser l'allocation de ces transferts à des fins électorales. Un gouvernement central voulant maximiser l'influence de son parti politique sur le territoire et par ce biais augmenter ses chances de rester au pouvoir, peut avoir intérêt à cibler les "électeurs pivots", qui dans un contexte de décentralisation politique, correspond à cibler les territoires où l'issue des prochaines élections est incertaine au regard des précédents scrutins (Lindbeck & Weibull, 1987; Dixit & Londregan, 1998). Cox & McCubbins (1986) soulignent de leur côté l'intérêt d'un gouvernement central averse au risque de cibler les territoires où il bénéficie d'un fort soutien politique. Les contributions empiriques existantes fournissent des résultats contrastés, et ne permettent pas de trancher entre ces deux mécanismes.[2] Ceci laisse suggérer que la réponse dépend fortement du contexte étudié, mais aussi que le nombre de voix dont bénéficient les différents partis dans les différentes collectivités locales ne représente pas le seul facteur politique en jeu derrière l'allocation des transferts verticaux intergouvernementaux. Ainsi, plusieurs auteurs se sont plus récemment intéressés au rôle des partis politiques, indépendamment des résultats précis en termes de nombre de voix aux dernières élections des différentes tendances politiques. Cette littérature met en avant un *effet d'alignement*, un gouvernement local se définissant comme aligné s'il est de la même tendance politique que le pouvoir d'échelon supérieur allouant des transferts. Sous l'hypothèse qu'un gouvernement local recevant un transfert monétaire bénéficiera au moins d'une partie des rendements politiques associés à ces fonds (c'est-à-dire de l'impact de ces fonds sur l'opinion des électeurs), un gouvernement d'échelon supérieur voulant développer

[2]Plusieurs travaux empiriques étudiant différents pays plaident en faveur de la validité d'un ciblage des transferts verticaux intergouvernementaux en faveur des territoires pivot : Dahlberg & Johansson (2002) et Johansson (2003) pour la Suède, Solé-Ollé (2013) pour l'Espagne, Banful (2011) pour le Ghana, Helland & Sørensen (2009) pour la Norvège et Litschig (2012) pour le Brésil. En parallèle, Larcinese et al. (2006) et Levitt & Snyder Jr (1995) trouvent pour les États-Unis des résultats en faveur d'un ciblage vers les territoires caractérisés par un fort soutien politique du gouvernement central en place. Kauder et al. (2016) et Joanis (2011) trouvent des résultats similaires pour l'Allemagne et le Québec respectivement.

son parti politique aura un intérêt à favoriser les gouvernements locaux de son propre parti. Les nombreuses contributions empiriques à ce sujet tendent toutes à confirmer ce mécanisme, en montrant pour de nombreux pays un effet positif de l'alignement politique sur les fonds verticaux intergouvernementaux.[3] Autrement dit, un gouvernement local aligné bénéficie en moyenne de plus de transferts monétaires que les autres gouvernements locaux.

Cette littérature sur les facteurs politiques de l'allocation des transferts verticaux intergouvernementaux se centre sur l'impact des résultats électoraux et sur l'effet des partis politiques. Néanmoins, les relations politiques entre gouvernements de différents échelons renferment potentiellement une complexité qu'il est difficile d'appréhender avec ces seuls facteurs. Le but des deux premiers chapitres de cette thèse est d'aller plus loin dans cette direction, en analysant l'impact de liens plus précis existants entre décideurs politiques.

Le premier chapitre de cette thèse vise à étudier l'impact du cumul des mandats sur l'allocation des subventions d'investissement discrétionnaires distribuées par les conseils départementaux aux communes françaises. Le but est de comparer les montants de ces subventions reçus par les communes dont le maire a un mandat de conseiller départemental avec ceux reçus par les autres communes. Le cumul des mandats est une pratique relativement fréquente en France, mais existe également dans de nombreux pays développés, comme la Suède, l'Allemagne, l'Espace, l'Italie, en encore le Royaume-Uni (Bach, 2012). Ainsi, il apparait important de mesurer l'impact de cette pratique politique sur l'allocation des transferts verticaux intergouvernementaux. Notre but est d'évaluer l'impact du cumul des mandats lui-même, indépendamment de tout autre facteur corrélé avec le fait qu'une commune soit dirigée par un maire ayant un poste au conseil départemental. Or, un maire ayant également un mandat à l'échelle du département a potentiellement un niveau d'expérience et de compétences différent en moyenne de celui des autres élus municipaux. Notre stratégie consiste à nous restreindre aux communes dont le maire a été candidat aux dernières élections départementales, et à comparer les communes dont le maire a gagné de justesse ces élections avec celles dont le maire a perdu avec une faible marge. Cette stratégie revient à supposer que l'issue des élections départementales est aléatoire dans ces deux cas de figure, et que ces deux groupes de maires ont en moyenne des niveaux d'expérience et de compétences similaires. Nous introduisons également l'alignement politique dans l'analyse. Un maire aligné ayant un poste au conseil départemental signifie que cet élu, en plus d'être dans l'instance de décision départementale, fait partie du groupe politique majoritaire de cette assemblée. L'alignement politique doit par conséquent être pris en compte dans l'évaluation de l'impact du cumul des mandats. Nous trouvons qu'un maire aligné et ayant un poste au conseil départemental reçoit pour sa commune d'avantage de subventions que les autres municipalités, de l'ordre de 28 %. En revanche, les maires ayant un poste au conseil départemental, mais ne faisant pas parti de la majorité départementale, ne bénéficient pas davantage de subventions pour leur commune. Nous étudions plusieurs interprétations possibles de ces résultats, et montrons que les effets observés peuvent être la conséquence de deux mécanismes possibles.

[3]Les principales contributions sur ce sujet sont Solé-Ollé & Sorribas-Navarro (2008) et Curto-Grau et al. (2014) pour l'Espagne, Arulampalam et al. (2009) pour l'Inde, Brollo & Nannicini (2012) pour le Brésil, Migueis (2013) pour le Portugal, et Bracco et al. (2015) pour l'Italie.

Premièrement, un maire bénéficiant d'un mandat départemental peut utiliser son accès direct à l'instance départementale pour obtenir plus de fonds pour sa commune, en vue par exemple de maximiser ses chances de réélection. Deuxièmement, cet effet peut s'expliquer par des raisons relatives à l'information dont disposent les départements sur les communes candidates à de telles subventions. Une assemblée devant allouer des fonds à différents territoires détient potentiellement une information imparfaite sur les besoins de chaque commune, et sur la manière dont ces fonds départementaux seraient utilisés. Cette assemblée, dirigée par une coalition majoritaire, peut donc avoir une préférence pour allouer ces fonds à des communes dirigées par des membres de cette majorité au conseil départemental, dans la mesure où elle bénéficie d'une meilleure connaissance de ces maires, et a potentiellement un pouvoir de contrôle plus important sur leurs actions que sur celles des autres élus municipaux. Cette second explication impliquerait donc que cet effet en faveur des maires alignés ayant un poste au conseil départemental serait le résultat d'une recherche d'efficacité dans l'allocation des subventions. Ces résultats sont importants, dans la mesure où ils illustrent la possibilité que les facteurs politiques peuvent agir sur l'allocation des transferts verticaux intergouvernementaux pour des raisons liées à l'allocation efficace des ressources, plutôt que pour des raisons électoralistes.

Le deuxième chapitre de cette thèse, co-écrit avec Marc Sangnier, contribue également à la connaissance de l'impact des liens entre les différents échelons de décision publique sur les subventions verticales intergouvernementales. Nous nous concentrons dans ce travail sur les subventions d'investissement discrétionnaires que les communes reçoivent de l'État central et étudions l'impact des liens pouvant exister entre les membres du gouvernement national et les communes. Ce chapitre présente l'originalité de ne pas se limiter à des liens d'ordre purent politique, mais d'évaluer également l'effet de liens d'ordre privé pouvant exister entre une commune et une personnalité politique nationale. Une telle étude a pour but de confronter l'importance des différents types de connexion intergouvernementale sur les finances publiques locales. Après avoir construit une base de données sur le curriculum vitæ de chaque ministre en exercice entre 2000 et 2013, nous distinguons deux types de lien. D'une part, une commune est dite liée de manière privée à un membre du gouvernement si ce ministre est né ou a suivi ses études secondaires dans cette commune. D'autre part, une commune est dite liée politiquement à un membre du gouvernement si cette personnalité politique a actuellement, ou a eu par le passé, un mandat municipal dans la commune. Nous trouvons qu'une commune liée politiquement à un membre du gouvernement national reçoit en moyenne 45 % de plus de subventions que les autres communes à partir de l'année où la personnalité politique à laquelle la commune est liée est nommée au gouvernement. En revanche, nos résultats suggèrent que les liens d'ordre privé n'ont pas d'impact sur l'allocation de ces subventions. Ce contraste entre liens privés et liens politiques suggère plusieurs interprétations possibles. Il peut indiquer que cet important effet des liens politiques s'explique par des motivations électoralistes. Il peut également suggérer le fait qu'en moyenne, un ministre éprouve plus d'attachement à la commune dans laquelle il a exercé des fonctions municipales qu'à celle dont il est originaire. Ce résultat peut également signifier qu'un ministre a plus d'informations sur la commune dont il a été conseiller municipal que sur celle dont il est originaire, ou qu'il est tout simplement davantage sollicité par les élus de la commune où il

a exercé (avec parmi eux de potentiels anciens collègues) que par ceux de sa commune d'origine. Le second résultat de ce chapitre est la persistance de cet effet des liens politiques entre communes et membres du gouvernement national. Nous trouvons qu'une commune bénéficiant d'un tel lien continue de percevoir davantage de subventions de l'État une fois que la personnalité à laquelle elle est liée a quitté le gouvernement. De manière intéressante, nous trouvons que cette persistance est maintenue dans les cas où le nouveau gouvernement central n'est pas du même parti politique que l'ancien ministre. Ceci soulève des doutes sur l'explication selon laquelle un ancien ministre serait toujours à même de soutenir sa commune auprès de l'État central après la fin de ses fonctions ministérielles, et exercerait ce pouvoir d'influence. En revanche, ces résultats plaident en faveur d'un mécanisme relatif à la transmission d'information entre un ministre et la commune à laquelle il est lié. Sous l'hypothèse que les communes disposent d'une information imparfaite sur ces subventions d'investissement pour lesquelles elles doivent candidater explicitement[4], une personnalité politique au gouvernement national peut faire bénéficier à sa commune d'une meilleure information relative aux règles et procédures régissant l'allocation de ces fonds. Un tel avantage informationnel relatif au fonctionnement institutionnel des finances publiques est potentiellement conservé par les communes, y compris après que leur ministre ait quitté ses fonctions politiques nationales. Tout comme le premier chapitre de cette thèse, ce travail montre que les connexions d'ordre politique peuvent jouer un rôle significatif, sans que cela s'explique forcément par des motivations électoralistes. Les résultats de ce chapitre plaident plus précisément pour davantage de transparence sur les finances publiques et leur fonctionnement institutionnel, afin de limiter de tels effets sur l'allocation des fonds d'investissement qui impacte potentiellement de manière significative l'hétérogénéité d'accès aux infrastructures locales entre territoires.

Considérer la capacité des collectivités locales à prendre en compte l'hétérogénéité territoriale des préférences amène naturellement à étudier la manière dont les gouvernements locaux réagissent aux caractéristiques de leur territoire. De nombreux travaux ont souligné les potentielles différences de comportement à cet égard entre gouvernements centraux et locaux. Plusieurs contributions soulignent le fait qu'un gouvernement local est plus à même d'être responsable (*accountable*) vis-à-vis de ses électeurs locaux que le gouvernement central ne l'est vis-à-vis de ses propres électeurs. Seabright (1996) souligne le fait que dans un gouvernement centralisé, une subdivision territoriale donnée a un pouvoir beaucoup plus limité de sanctionner le gouvernement national en cas d'insatisfaction que dans le cadre de scrutins locaux, dans la mesure où le vote de ce territoire est englobé dans un scrutin national. Ceci tend à faire d'un gouvernement local un organe décisionnel plus réactif aux préférences de l'ensemble de ses électeurs qu'un gouvernement central. Besley & Case (1995) et Belleflamme & Hindriks (2005) soulignent quant à eux le fait que les électeurs ont une information imparfaite de l'efficacité des politiques publiques dont ils bénéficient, et peuvent adopter la stratégie de comparer leur situation avec

[4]Ces subventions d'investissement discrétionnaires correspondent à des fonds d'investissement alloués de manière totalement libre par l'État, et dont l'allocation se fait suite à des candidatures déposées par les communes dans lesquelles un projet précis d'investissement est présenté.

la situation existante dans les gouvernements voisins pour construire leur jugement. Or, il est potentiellement plus aisé pour un électeur de comparer la situation d'une entité locale voisine à sa propre situation que de comparer la situation dans son pays à celle des pays voisins. Dans un tel contexte, un gouvernement local sera soumis à plus de compétition avec ses voisins que ne l'est un gouvernement central, et aura donc plus d'incitations à répondre aux préférences et aux besoins de ses résidents. Bardhan & Mookherjee (2000) étudient quant à eux les différences de propension à la corruption entre gouvernements locaux et centraux, et montrent que malgré la plus grande proximité entre électeurs et décideurs publics dans un contexte décentralisé, le degré relatif de corruption entre gouvernements centraux et locaux dépend notamment du degré de concentration des intérêts privés sur les marchés locaux.[5]

Le troisième chapitre de cette thèse s'inscrit dans cette vaste littérature, dans la mesure où il vise à étudier la réactivité des gouvernements locaux à un facteur particulier des populations locales. Notre but est d'analyser la réponse des communes françaises aux niveaux d'inégalités municipales de revenu. Cette question de recherche s'inscrit dans une littérature plus générale en Économie Politique visant à caractériser le rôle de la distribution des revenus sur les décisions publiques. Les travaux précurseurs de Roberts (1977) et Meltzer & Richard (1981) mettent en avant le théorème de l'électeur médian, prédisant un poids décisif de l'électeur partageant en deux la population en termes de niveau de revenu. Sous l'hypothèse d'une taxation linéaire sur le revenu finançant un bien public bénéficiant de manière égalitaire à l'ensemble de la population, le niveau de biens publics et de taxation proposé par tout candidat au pouvoir public correspondra au niveau optimisant le degré de satisfaction de cet électeur. Néanmoins, ce résultats est le fruit de plusieurs hypothèses, dont celle d'une préférence pour le bien public identique pour tous les individus, faisant du niveau optimal de biens publics d'un individu une fonction décroissante de son revenu du fait de la taxation. Epple & Romano (1996) lèvent cette hypothèse et mettent en avant un niveau de demande pour les biens publics non-monotone en fonction du revenu. Les auteurs montrent que, sous certaines conditions, les individus à bas et à hauts revenus ont une demande plus faible pour le bien public que les classes moyennes, ces dernières étant par conséquent mises en minorité. De La Croix & Doepke (2009) montrent que sous l'hypothèse d'une influence politique biaisée vers les hauts revenus, une hausse des inégalités de revenu peut entraîner une baisse des dépenses publiques dans un contexte où les individus les plus aisés ont une préférence plus importante pour recourir au secteur privé. Face à cette diversité des prédictions théoriques, de nombreux travaux empiriques ont été menés afin d'estimer l'impact de la distribution des revenus sur les niveaux de dépense publique et de taxation. Certains utilisent des données au niveau national, tandis que d'autres analysent l'impact des inégalités locales de revenu sur les décisions publiques locales.[6] Ces contributions offrent une image contrastée des

[5] L'intuition est la suivante. Un territoire dont l'activité économique dépend essentiellement d'un secteur d'activité ou d'un petit nombre d'entreprises ayant des intérêts convergents peut se caractériser par un degré de corruption supérieur à celui d'un gouvernement central régissant un territoire plus vaste, où les intérêts particuliers sont plus diversifiés.

[6] Nous pouvons citer notamment Schwabish et al. (2006), Shelton (2007), Karabarbounis (2011) et Perotti (1996) qui exploitent des données au niveau des pays. Ramcharan (2010), Corcoran & Evans (2011), Boustan et al. (2013), et Kosec (2014) se concentrent quant à eux sur des données locales.

effets de la distribution des revenus sur les décisions publiques, et trouvent leurs limites dans le manque de données sur lesquelles sont basées leurs estimations. Les travaux utilisant des données au niveau national s'appuient naturellement sur peu de pays à comparer. Ceux analysant des données locales utilisent des informations peu détaillées sur les distributions locales de revenu et les décisions de politique locale.

Ce dernier chapitre vise à fournir une estimation plus précise de l'effet de la distribution locale des revenus sur les décisions de politique locale. Notre analyse se base sur des indicateurs locaux de distribution de revenus pour les communes françaises sur une période de 12 ans (2000-2011) et renseignant pour chacune d'entre elles la valeur de l'ensemble des déciles de revenu des ménages. Ces informations, produites par l'INSEE, permettent d'analyser différents indicateurs d'inégalité de revenu, mais aussi de caractériser les différentes zones de chaque distribution locale des revenus. Nous confrontons ces informations avec les comptes détaillés des communes françaises sur une période de 10 ans (2002-2011). Notre analyse de l'ensemble de ces données montre un effet positif et significatif du niveau d'inégalités de revenu sur le niveau d'infrastructures publiques municipales. Une hausse de 1 % du niveau d'inégalités de revenu des ménages au sein d'une commune entraine une hausse du niveau d'infrastructures municipales comprise entre 0.06 % et 0.18 %. Nous caractérisons dans un second temps le type d'inégalités qui conduit à une telle réaction des politiques municipales. Nous trouvons que cette relation positive entre inégalités et infrastructures publiques locales est due aux variations des bas ainsi que des hauts revenus, sans impact des classes moyennes. Enfin, une analyse des revenus municipaux montre que ces niveaux de biens publics supplémentaires associés à davantage d'inégalités sont financés par une hausse des taux de taxation locale. En résumé, une paupérisation des individus à bas revenus ainsi qu'une augmentation des revenus se situant en haut de la distribution entraîne une hausse des taxes locales décidées par les conseils municipaux, utilisées pour financer davantage d'infrastructures publiques. Ce résultat fort au regard de la littérature existante soulève plusieurs explications possibles. D'une part, une hausse des inégalités de cette nature (baisse des bas revenus ou hausse des hauts revenus) peut entraîner une demande de la part des électeurs ou des décideurs publics pour davantage de redistribution via le développement d'infrastructures financées par la fiscalité locale. D'autre part, les individus à bas et à haut revenus peuvent se caractériser par une plus grande demande de biens publics que les classes moyennes, rendant cette dernière minoritaire dans les choix collectifs. Une plus grande demande de biens publics des individus à bas revenus s'expliquerait par les gains plus importants dont ils bénéficient via le financement par la taxation. Une demande plus importante d'infrastructures publiques de la part des hauts revenus s'expliquerait par une plus grande préférence de cette population pour les biens publics gérés par les municipalités, venant compenser leur contribution financière plus importante du fait de la taxation. Le message général de ce dernier chapitre est le rôle important des parties extrêmes des distributions locales de revenu sur les décisions politiques locales.

Chapter 1

Political Colleagues Matter: The Impact of Multiple Office-Holding on Intergovernmental Grants

This paper brings new evidence on the politics of intergovernmental grants. I focus on multiple office-holding (i.e. whether a local incumbent who has concurrently a seat at an upper layer of government gets more funds from this layer). By using a new panel database on French local governments' accounts, I focus on grants counties allocate to municipalities. For identification, I rely on close electoral races. I find that aligned multiple office-holders (mayors who also have a seat in the majority group of the county council) get on average 28% more grants for their municipality than other municipal incumbents. Evidence on the heterogeneity of this effect suggests that grantors' information on potential recipients, as well as local incumbents' access to upper layers politicians, are key determinants in the allocation of intergovernmental transfers.

1.1 Introduction

Local governments play an important role in providing public goods, and rely on intergovernmental grants for their funding. Among OECD countries, decentralized spending represented between 6% and 62% of public expenditures in 2012, while intergovernmental grants represented between 11% and 71% of local revenues.[1] The importance of intergovernmental grants in the provision of public goods coexists with strong ties between governments of different tiers. In particular, it is common among developed countries that local incumbents concurrently have a seat in an upper tier of government, as documented by Bach (2012).[2] This kind of intergovernmental ties implies a direct access of local incumbents to upper councils which offer local grants. It also implies a lower asymetry of information between grantors and these local incumbents relatively to others, which may be key in the allocation of intergovernmental transfers (Besfamille, 2004).

This paper aims at investigating the impact of this multiple office-holding practice on the allocation of intergovernmental grants, by focusing on intergovernmental ties between French municipalities and counties over the period 2002-2011. French local governments offer a very appropriate setting for this purpose. First, having concurrently a municipal and a county political mandate is a common practice in France, as 25% of mayors in municipalities with more than 3,500 inhabitants also have a seat in a county council. Second, relying on ties between two local layers of government (instead of ties between the Central State and local governments) allows to investigate the heterogeneity in the effect of multiple office-holding.

Given that I focus on political ties between municipalities and counties, my dependent variable is the amount of *discretionary* investment grants per head French municipal jurisdictions receive from their county. Focusing on discretionary transfers is key, as these funds can be by definition easily manipulated by elected officials and are therefore appropriated to identify political determinants of the allocation of intergovernmental grants. For identification, I rely on Regression Discontinuity techniques in close electoral races. In order to identify the impact of multiple office-holding, I compare mayors who barely won last county elections to mayors who barely lost. Still, identifying the average effect of multiple office-holding may be not sufficient, as the multiple offices effect may be strongly linked to political alignment. In a given tier of government, the legislative body is often made of incumbents from different political affiliations, with a leading party or coalition. Then, multiple office-holders can be aligned or non-aligned (i.e. can be of the same party than the upper leading coalition or not). Because being in the upper leading group or not may impact the influence of an incumbent on the council's decisions, alignment has to be considered jointly with multiple office-holding. For this purpose, I jointly estimate the impact of multiple office-holding and political alignment by estimating for multiple office-holding the Heterogeneous Local Average Treatment Effect (HLATE) defined in Becker et al. (2013). This method consists in incorporating the interaction between multiple office-holding and political alignment in the regression discontinuity setting.

[1] See the OECD Fiscal Decentralisation Database:
http://www.oecd.org/ctp/federalism/oecdfiscaldecentralisationdatabase.htm

[2] 83% of French Members of Parliament have concurrently a local office in 2011, while this proportion is 35% in Sweden, 24% in Germany, 20% in Spain, 7% in Italy and 3% in the United-Kingdom.

Results show strong and robust evidence of a targeting in favour of *aligned* multiple office-holders. On average, mayors who have concurrently a seat in the majority coalition of the county council get on average 28% more grants than other mayors. However, non-aligned multiple office-holders (i.e. mayors who have a seat in the county council, but are not part of the county council leading coalition) do not receive significantly more grants according to my findings. This result is robust to a battery of robustness checks related to the empirical specification, or to sample splitting according to the political affiliation of the county. Evidence that aligned multiple office-holders benefit from more grants while non-aligned ones do not is key. It suggests no role of information related to grants allocation. Discretionary investment grants are allocated through calls for project. Then, it is possible that multiple office-holders simply get more grants for their municipality because they have more information on grants application processes. The absence of evidence of a targeting in favour of non-aligned multiple office-holders is in tension with this channel.

This targeting in favour of aligned multiple office-holders is of key importance, as it is related to two alternative mechanisms which have never been emphasized to my knowledge in the literature on intergovernmental transfers. First, mayors who have concurrently a seat in the majority group of the county council may take advantage of their direct access to the county council to favour their municipality, by convincing their colleague in the county majority group to give more funds to their jurisdiction. By making grants of their municipality increase, these mayors may increase their probability of reelection. Second, additive grants allocated to aligned multiple office-holders can be the result of the asymmetric information issue grantors face in their decisions. County councillors may have an imperfect knowledge about the quality of municipal incumbents. Given the collective cost of this information setting (Besfamille, 2004), county councillors of the leading group may prefer to allocate more funds to their colleague in this group, as they may have better knowledge on their quality and higher monitoring power over them. Although I cannot disentangle these two channels, I provide a test for the validity of these two stories. Since these two mechanisms are related to advantages aligned multiple office-holders benefit from their position compared to other mayors, the targeting in favour of these mayors may decrease according to the degree of competition between aligned multiple office-holders in the county. Then, I interact the effect on aligned multiple office-holders with this degree of competition, measured by the share of aligned multiple office-holders among mayors in the county. Findings are in line with these two alternative explanations, as estimates suggest a decreasing and significant effect on aligned multiple office-holders according to this interaction variable.

Favouring aligned multiple office-holders can also be a strategic behaviour for members of the county council leading group to be reelected. Helping a member of this group to keep her seat at the municipal level through more grants may help her to be reelected in the county council as well, and then to make the current leading group more likely to keep his position in the county council. Since this effect may be stronger if competition in county elections is higher, I interact the effect on aligned multiple office-holders by the share of seats held by the majority group in the county council. Results are in tension with this channel related to county

councillors vote-seeking, as there is no evidence of heterogeneous targeting in favour of aligned multiple office-holders according to electoral competition at the county level.

These results are key regarding the existing literature, as they highlight mechanisms never investigated before in the literature on the impact of intergovernmental links on intergovernmental transfers. This existing literature has focused on pork-barrel of grantors through political party considerations, by investigating the impact of political alignment per se. Grantors may favour aligned local incumbents in order to bring political capital to their party, and then to increase their probability of reelection. Such a mechanism may hold once the political credit of intergovernmental transfers is divided between aligned politicians of different tiers. Main contributions on this issue are Solé-Ollé & Sorribas-Navarro (2008) and Curto-Grau et al. (2014) for Spain, Arulampalam et al. (2009) for India, Brollo & Nannicini (2012) for Brazil, Migueis (2013) for Portugal and Bracco et al. (2015) for Italy. They all find a positive and significant alignment effect. However, political alignment may not capture the whole complexity of intergovernmental links. In a context of multi-tiers of government, incumbents in a given layer may have more direct links with other layers of government than through their political affiliation. This paper aims at going further in this sense, and show that focusing on direct links between politicians of different governmental tiers reveals other mechanisms underlying the politics of intergovernmental grants.

Still, in order to provide a benchmark regarding this existing literature and to provide a complete picture of political forces underlying intergovernmental grants allocation, I also estimate the impact of political alignment per se. For identification, I follow Brollo & Nannicini (2012), Migueis (2013), Bracco et al. (2015), and Curto-Grau et al. (2014) by applying a Regression Discontinuity Design (RDD) which consists in comparing municipalities where the first aligned candidate won in last municipal elections with municipalities where she barely lost. Findings do not suggest any average impact of political alignment. This result is in tension with all previous empirical findings. However, they have to be considered with caution, as the French political context constraints to consider alignment in terms of broad political affiliation instead of political parties. Despite this limitation, this evidence highlights some doubts on the key role of political alignment, and put direct links between politicians of different tiers at the center of the politics of intergovernmental grants.

This paper follows a large literature on the politics of intergovernmental grants. An important strand of research investigates the targeting of vote-seeking grantors according to local political support. Lindbeck & Weibull (1987) and Dixit & Londregan (1998) provide theoretical models where such grantors target jurisdictions with a high proportion of "swing-voters", while Cox & McCubbins (1986) predict that risk-averse grantors tend to favour core supporters. These two mechanisms claimed for empirical investigations, which provide a mixed picture.[3] This paper brings new knowledge in this literature, by showing that in addition to local political

[3]Evidence in favour of the swing voter hypothesis was highlighted by Dahlberg & Johansson (2002) and Johansson (2003) for Sweden, Solé-Ollé (2013) for Spain, Banful (2011) for Ghana, Helland & Sørensen (2009) for Norway and Litschig (2012) for Brazil. On the other hand, findings in line with the core supporter hypothesis are emphasized in Larcinese et al. (2006) and Levitt & Snyder Jr (1995) for the United States, Kauder et al. (2016) for Germany and Joanis (2011) for Québec.

support, direct links between politicians of different tiers of government matter.

This paper also brings new insight into the literature on the politics of the allocation of federal or central grants between electoral constituencies. A first set of papers investigates the impact of Congress committees membership on the allocation of grants, and consists in looking at whether members of Congress who have a seat in a committee which makes proposals on the allocation of federal funds manage to favour their electoral constituency. Knight (2005) and Knight (2008) provide evidence of such an impact, contrary to Berry et al. (2010). This strand of research is to some extent close to the investigation of the impact of multiple office-holding, since the idea is to analyse the influence of politicians who have a beneficial position in the grants allocation process. Another set of papers investigates the impact of the majority party in the US Congress on the allocation of federal funds. Albouy (2013) finds that electoral constituencies represented by the majority party at Congress get significantly more grants than others. Berry et al. (2010) find that electoral constituencies represented by legislators from the President's party receive more funds on average. These papers are also related to the present work, in the sense that they investigate the impact of alignment in terms of political affiliation. However, these two literatures do not include different tiers of government in the analysis: they consist in looking at the allocation of *federal* grants according to criteria related to *federal* elections. By contrast, this paper investigates political links between two different layers of government. The allocation of intergovernmental transfers needs specific investigation, as it has an impact on elections at different tiers simultaneously. Since a share of the political credit of these grants may go to local incumbents, these grants may be targeted through other channels than reelection concerns of grantors. Results of this paper illustrate this point.

This paper also contributes to the more specific literature on multiple office-holding. The main concern related to this practice is that multiple office-holders may not have enough time to take on all their responsibilities. In addition, multiple office-holding may be a way for politicians to decrease their probability to have no term in the future. In coherence with this debate, scholars have mainly focused on the impact of multiple office-holding on incumbents' attendance and their probability of being reelected. Bach (2011) shows for France that Members of Parliament who have a seat in a municipal council reduce by one third their attendance in parliamentarian committees. However, he finds no higher probability for municipal incumbents of running for or winning legislative elections. Consistently with this last finding, Foucault (2006) finds for France that Members of Parliament who also have a seat in a municipal council are not more likely to win next legislative elections. However, no research in this previous literature investigates the impact of multiple office-holding on intergovernmental grants. This paper aims at filling this gap. From this perspective, the closest contribution to mine is François (2006). He shows that multiple office-holders raise more money for their electoral campaign. However, his identification strategy uses simple OLS and may not get rid of endogeneity issues, contrary to this paper which relies on close electoral races through regression discontinuity techniques.

Finally, this paper brings new insight on the politics of intergovernmental transfers among developed countries, by adding a country in the scope of this literature. France has not been the object of any paper on this research topic. Cadot et al. (2006) is the only paper on distributive

politics in France. However, they focus on the allocation of national investment across different regions, and not on grants which are allocated to lower tiers of government.

This paper proceeds as follows. Section 1.2 describes the French institutional background. Section 1.3 presents the identification strategy. Data and the sample are presented in Section 1.4. Section 1.5 presents main findings, robustness and validity checks, as well as investigation of alternative mechanisms underlying main results. Section 1.6 concludes.

1.2 Institutional background

The French decentralization architecture is made of three tiers of local government: the territory is divided into 36,688 municipalities (*les communes*), 100 counties (*les départements*) and 26 provinces (*les régions*). Municipalities are in charge of primary schools, land use policy, and local facilities (municipal roads, cultural and sport infrastructures, retirement houses). Counties have the responsibility of main social services, disabled and elderly people policies, intermediate roads and secondary schooling. Finally, provinces are in charge of economic development, labour training programs, and aid to firms. In most of the territory, there are inter-municipal communities (*intercommunalités*), which constitute an intermediate tier between municipalities and counties. These are groups of municipalities which decided to cooperate and merge for the provision of public goods for which there are potential economies of scale.[4] While municipal expenditures account for 4.6% of French GDP in 2011, the analogous shares for counties and provinces are respectively 3.4% and 1.3%. As for inter-municipal communities, their expenditures account for 1.8% of GDP. Then, by investigating the impact of political links between municipalities and counties, I focus on the two most important tiers of local government in terms of total spending.

[4] Although being in such a community has been mandatory for every municipality since 2013, this was not the case during the period covered by data used in this paper (the share of municipalities which are in a community moves from 73.3% in 2002 to 95.5% in 2011.). Municipalities which decided to cooperate had to choose between different status of inter-municipal cooperation, which differ in the number of competencies municipalities delegate to the community. These different status of cooperation are important for the investigation of the allocation of investment grants received by municipalities, as the degree of cooperation may be an important factor of investment expenditures municipalities keep in their scope. The higher the degree of cooperation of a status (i.e. the number of delegated competencies), the higher the requested degree of urbanisation of the group of municipalities to benefit from this status. During the period of analysis of this paper, there were four status of inter-municipal community. They can be listed from the lowest to the highest degree of cooperation as follows: *communauté de communes* (CC), *communauté d'agglomération* (CA), *communauté urbaine* (CU), and *syndicats d'agglomération nouvelle* (SAN). Requests on the degree of urbanisation are defined according to population. For instance, to cooperate through a CA, a group of municipalities has to count at least 50,000 inhabitants, and to be organized around one or more center-municipalities with more than 15,000 inhabitants.

1.2.1 Municipal investment revenues

French local governments have to decompose their budget into two sections: the operating section and the investment one. As this paper investigates the allocation of discretionary investment grants received by municipalities, Table 1.1 shows macro data on revenues of the investment section of municipal accounts for all French municipal jurisdictions in 2011. A picture of both sections is provided in Appendix (Table 1.D.1). Discretionary investment grants represent 57 euros per head at the national level in 2011, which is equivalent to 11.8% of municipal investment revenues. Counties are the main providers of these funds. Grants from this tier account for 18 euros per head, and 3.8% of total municipal investment revenues. There is no official rule for the way of allocating these grants. They are usually allocated through calls for projects. Municipalities have to send to grantors an application with their financial accounts of previous years and a description of a specific project. These amounts related to discretionary investment grants have to be considered as a lower bound, since "Formula-based investment grants", which account for 13.6% of municipal investment revenues, include funds for which eligibility depends on a formula, but the allocation between eligible jurisdictions is subject to discretion.[5] 42.4% of municipal investment expenditures are funded by surplus from the operating budget.[6] The remaining share of municipal investment expenditures is funded by loans and assets transfers.[7]

1.2.2 Elections of local incumbents

This subsection presents briefly electoral rules for municipal and county elections. The municipal ballot is a two-rounds list system. It consists in electing members of the municipal council (*le conseil municipal*). Then, the mayor is elected by and among municipal councillors. Each list has an official leader called "the head of the list" (*la tête de liste*). In towns with more than 3,500 inhabitants, the winning list is attributed half of the seats in the municipal council. The remaining half is attributed in a proportional way among all lists (including the winning one).[8] Therefore, there is always a list which is assigned the absolute majority of seats, and the elected mayor is most of the time the head of the winning list. Municipal elections take place every 6 years (with no term-limit). In the sample period, municipal incumbents come from two elections : one in 2001 and another in 2008.[9]

[5]For instance, the *Dotation Globale d'Équipement* (DGE) is an investment grant whose eligibility depends on total municipal population and the municipal fiscal potential. Then, the allocation between eligible municipalities is decided by the Central State, after consultation of a committee composed by local elected incumbents. Since this grant allocation involves different decision makers, it is better not to consider this grant and to focus on funds whose allocation is decided by one well-identified organisation, without any ambiguity.

[6]French local governments are not allowed to fund operating expenditures through loans. The operating section has to be either in equilibrium, or in surplus. In case of a surplus, it can be used to fund investment spending.

[7]Assets transfers represent transfers of capital assets from other tiers of government due to transfers of competencies.

[8]Smaller municipalities have different municipal electoral rules. Since these jurisdictions often do not have any official political affiliation, it is not possible to infer information on alignment for these observations. Therefore, they are excluded from the analysis. They represent 33,866 jurisdictions over 36,688 in 2011, but only 65% of total French population.

[9]The 2008 elections took place 7 years after the previous ones in order not to have municipal elections during the same year as the presidential and the legislative ballots.

Table 1.1: Investment revenues of French municipalities in 2011

Category of revenue	Amounts (in € per head)	Share in investment revenues
Operating section surplus[a]	203	42.4%
Loans	100	20.9%
Formula-based investment grants	65	13.6%
Discretionary investment grants	57	11.8%
from counties	*18*	*3.8%*
from provinces	*9*	*1.8%*
from the Central State	*11*	*2.2%*
from others[b]	*19*	*4.0%*
Assets transfers[c]	54	11.3%
TOTAL	479	100.0%

Source: DGFiP (French Ministry of Economy and Finance).
The first column of this table represents the sum of each category of investment revenue over all French municipalities in 2011, divided by the total French population of this same year. The second column represents for each category of revenue the ratio between the amount of the first column and the sum of investment revenues at the national level (represented in the last line).
[a] The budget of each municipality is made of an operating section and an investment one. The national law requires the operating section to be either in equilibrium, or in surplus. In case of a surplus, it can be used to fund investment spending. The item *operating section surplus* refers to this category of investment revenue.
[b] These are grants from inter-municipal communities and the European Union.
[c] This item represents transfers of capital assets due to transfers of competencies.

In county elections, citizens vote for members of their county council (*conseil général*). Then, county councillors vote for their executive chief. Each county is divided into different constituencies (*cantons*). There is a first-past-the-post vote in each constituency, with two rounds. In 2011, there were 4,046 county councillors for 100 counties over the national territory. County incumbents have a 6-years term (with no term-limit). County elections take place every three years. Each of these ballots consists in renewing half of county councillors in each county. In the sample period, county incumbents come from four elections: 1998, 2001, 2004 and 2008.[10] This voting system is such that all county incumbents in a given county do not have the same political affiliation. That is why county councillors who have concurrently a municipal office can be aligned or non-aligned with the county.

It is possible that no political party or coalition benefits from the absolute majority of seats in the county council. Therefore, I attribute to a county council the political affiliation of its executive chief. This assumption is not too strong for two reasons. First, the executive chief of the council may have an additive power on the council's policy. Secondly, she can be considered as being representative of the majority of county incumbents, as she is elected by councillors.

[10]The last county elections in the sample period were organized in 2008 instead of 2007 in order not to have county elections during the same year as the presidential and the legislative ballots.

1.2.3 Multiple office-holding

Multiple office-holding (*le cumul des mandats*) is a common practice in France. This paper focuses on the impact of being concurrently a mayor and a county councillor. This is the most frequent case of multiple office-holding for mayors: 25% of mayors of municipalities with more than 3,500 inhabitants are county councillors, while the analogous share for province councillors and Members of National Parliament is respectively 7% and 11.3%. The French Law imposes some restrictions on multiple office-holding. Applicable restrictions during the period covered in this paper can be summed up as follows: (i) a politician cannot be councillor at the three local tiers of government; (ii) a politician cannot be the executive chief at two or more tiers of government; (iii) a Member of National Parliament cannot hold more than one local office at the same time; (iv) a Member of National Parliament cannot be a deputy at the European Parliament. Regarding these rules, mayors who have concurrently an office in a county council cannot have any other political responsibility. Moreover, they cannot be the executive chief of both councils.

Multiple office-holding is subject of a recurrent debate in France, which highlights pros and cons of this practice. Supporters' main argument is related to political skills. In county councils, as well as in province councils and the National Parliament, each incumbent has to represent a specific subdivision of the territory managed by the assembly, through electoral constituencies. Then, a politician who has concurrently a seat at a lower tier of government is likely to have better insight on the constituency she has to represent. However, having different responsibilities at the same time may prevent multiple office-holders to devote enough time to each of them (see Bach (2011) and François & Weill (2016) for recent empirical investigations on this issue).

1.2.4 French political parties

During the period covered by electoral data I rely on (1998-2011 for county elections, and 2001-2011 for municipal ones), the French political landscape was dominated by two political parties: the Socialist Party (PS), which is left-wing, and a right-wing party, represented by the *Rassemblement pour la République* (RPR) until 2002 and then by the *Union pour un Mouvement Populaire* (UMP). These two political parties frequently make coalitions with smaller left-wing or right-wing organizations. Municipal elections also count an important share of candidates with no official party, but claiming themselves as being left-wing or right-wing (they are called "other left-wing candidates" and "other right-wing candidates" from now on). The French political landscape also counts centrists organizations, far-right and far-left parties. Finally, some political organisations are related to specific issues, and do not claim any position in the political spectrum (e.g. regionalist parties, some green organisations). See Section 1.A in Appendix for more details.

This political background is key to choose the set of political affiliations from which political alignment will be defined. Since a high share of elected officials come from coalitions between different parties, electoral data do not allow to define accurately alignment with respect to political parties. Moreover, being left-wing or right-wing without any official party seems to be

a reporting specific to local ballots.[11] Therefore, municipal and county councils are classified into five categories of political affiliation:

- *Right-wing councils*: this group is made of the main right-wing party, smaller right-wing organisations, as well as other right-wing candidates.
- *Left-wing councils*: this group is analogous to the first one. It is made of the PS, smaller left-wing parties, as well as other left-wing candidates.
- *Far-right councils.*
- *Far-left councils.*
- *"Other councils"*: this group is made of all incumbents which cannot be classified on the left or on the right of the political spectrum.

1.3 Identification

The identification of the multiple offices effect is subject to strong endogeneity issues. Mayors who also have an office in a county council may have more experience in the management of a local jurisdiction, as having responsibilities at the county level is usually a more advanced stage in political career processes than having only a municipal office. This endogeneity issue related to experience can bias estimates in both directions. On the one hand, mayors with more experience may have better skills to manage their municipal budget, without any need for external fundings. On the other hand, more experienced politicians may have better information on grant's application and the ways to get successfull in these processes. Moreover, politicians who managed to get a seat of county councillor in addition to their municipal office may have got such a position through more skills to win elections (e.g. the ability to convince people). These skills can also be used to get more grants.

To deal with this issue, I apply a RDD which consists in comparing municipalities whose mayor barely won last county elections with those whose mayor barely lost. For this, the sample has to be restricted to municipalities whose mayor was candidate in the last county elections which took place in the municipality. The assignment variable is the margin of victory of mayors in these last county elections. This margin is defined as the difference between the mayor's share of votes in the last round and the share of votes got by her first challenger (the second candidate if the mayor won, or the winner if she lost). This empirical strategy implicitly assumes that this margin of victory is a good proxy for unobservable factors responsible for endogeneity issues. This assumption seems reasonable. As county ballots are first-past-the-post votes, the assignment variable is the *individual* margin of victory of the mayor, and not the margin related to a list of candidates. Then, this variable is a good way to capture mayors' characteristics: mayors who barely won and mayors who barely lost last county elections are

[11] Section 1.A in Appendix illustrates these points, by providing a detailed description of political parties in France, as well as descriptive statistics related to candidates in municipal and county ballots.

assumed to be comparable. This setting consists in exploiting quasi-experimental variations in the multiple office-holding status under the assumption that county elections are subject to some randomness (Lee & Lemieux, 2010).

The equation associated to this regression discontinuity setting can be written as follows:

$$ln\left(G_{it}\right) = \left[\alpha_1 g\left(MV_{it}\right)\right] + MO_{it} * \left[\alpha_2 g\left(MV_{it}\right)\right] + \delta X_{ie-1} + \mu_c + \rho_t + \epsilon_{it} \tag{1.1}$$

G_{it} is the amount of discretionary investment grants per capita received by municipality i from its county during year t. MO_{it} is the multiple office-holding dummy. μ_c denotes county council fixed effects (a county council being represented by a given county between two years of county elections). This term captures all unobservable factors related to the grants policy of each county council and which have the same effect on each municipality of a same county during the whole term of county councillors. ρ_t represents year fixed effects. This term captures all factors affecting the amount of grants of every municipality in the same way during a given year (e.g. macroeconomic shocks which have a national impact on public finance and then on intergovernmental grants during a specific year).[12] $g\left(.\right)$ denotes a polynomial function of the margin MV_{it}. This function aims at providing enough flexibility in order to estimate accurately the impact of the margin of victory of mayors in last county elections on both sides of the cut-off. Then, α_1 and α_2 denote vectors containing coefficients on each polynomial term. The coefficient on MO_{it} is estimated through the constant term of the polynomial function. This equation can be estimated either through polynomial specification, or through local linear regressions.

X_{ie-1} is a vector of control variables. The subscript $e-1$ means that I take for a given year the value of covariates during the year before last elections (municipal or county ones).[13] These lagged terms prevent to have covariates affected by the multiple office-holding dummy.[14] Covariates include variables related to total population, its age structure, as well as municipal area. They also include variables related to population income and individuals' employment. Finally, they include variables related to political affiliation of the municipality, local taxation and inter-municipal cooperation. See Section 1.B in Appendix for a complete description of these variables. Since intergovernmental transfers allocated to the different municipalities in a given county may not be independent, standard errors are clustered at the county council level (one cluster per county per period between two county elections).

Still, the multiple office-holding effect may have not the same effect according to alignment, since a mayor who has concurrently a seat at the county level may not have the same influence depending on whether she is part or not of the majority group in the county council. Although it is possible to estimate Equation (1.1) after splitting the sample according to political alignment,

[12] I do not include municipal fixed effects, since 80% of municipalities have a constant status regarding multiple office-holding over the whole period of the panel

[13] For example, I take for the year 2005 the value of covariates in year 2003. See Figure 1.1 for a picture of the timing between municipal and county elections.

[14] Even if the RDD gives consistent estimates without any additive controls (as it consists in exploiting quasi-experimental variations), including covariates allows to increase the precision of the estimation. This is especially relevant in this case, where covariates are defined before the random assignment, and may be correlated with G_{it} after this assignment (Lee & Lemieux, 2010).

such separate regressions on different sub-samples may induce a loss of efficiency. A solution is to estimate the Heterogeneous Local Average Treatment Effect (HLATE) of multiple office-holding according to alignment, following the methodology proposed by Becker et al. (2013). This method aims at estimating heterogeneous average treatment effects in a Regression Discontinuity setting. In the present parametric framework, it simply consists in estimating the polynomial specification of Equation (1.1) after adding to the specification the alignment dummy as well as the interaction between alignment and multiple office-holding. Then, the HLATE is estimated through the following equation:

$$ln\left(G_{it}\right) = \left[\alpha_1 g\left(MV_{it}\right) + \beta AL_{it}\right] + MO_{it} * \left[\alpha_2 g\left(MV_{it}\right) + \gamma AL_{it}\right] + \delta X_{ie-1} + \mu_c + \rho_t + \epsilon_{it} \quad (1.2)$$

AL_{it} is the alignment dummy of municipality i in year t. This equation is estimated using cubic polynomial functions.[15] As Becker et al. (2013) point out, adding this heterogeneity in this Regression Discontinuity setting is valid under two conditions. First, the alignment dummy has to be continuous at the cut-off. Given the quasi-experimental setting of a RDD, this assumption has to be filled if the empirical model is well-specified. Second, the alignment dummy has to be randomly assigned conditional on MV_{it}. This second assumption is more challenging. The margin of victory of a candidate in county elections may be correlated with voters' support in the county for her political affiliation. Then, a high margin of victory may be correlated with political alignment.

To deal with this issue, I add to the HLATE equation a second regression discontinuity setting, related to political alignment. The main issue for the estimation of the alignment effect is that the alignment dummy may capture both the effect of alignment per se and a core supporter effect.[16] Then, I follow Brollo & Nannicini (2012), Migueis (2013), Bracco et al. (2015) and Curto-Grau et al. (2014), by taking as an assignment variable the *margin of alignment*, defined as the difference between the share of votes obtained by the first aligned candidate in the last round of last municipal elections and the share of votes of the first non-aligned candidate.[17] This strategy consists in comparing municipalities in which the first aligned candidate barely won in last municipal elections to those in which she barely lost.[18] Adding this regression

[15] Following Lee & Lemieux (2010), I choose the best polynomial order between the first and the third by applying a goodness-of-fit test. Higher polynomial orders are not considered, since results with such parametric functions may be highly sensitive to outliers. This test consists in adding on the right-hand-side of Equation (1.2) (with no covariate) dummies for each bin in the assignment variable. Then, the joint significance of these dummies is tested. The idea is to add a higher polynomial order until bin dummies are no longer jointly significant. The bin width I use is 1.25. Although this width is relatively small in size, each resulting bin is related to a non-negligible amount of observations. Figures 1.C.1a to 1.C.1c show the number of observations in each of these bins. Because these bins are always jointly statistically significant for every polynomial order between the first and the third, cubic polynomial functions are considered as the best choice.

[16] Because of risk-aversion, county councils may allocate more funds to jurisdictions where their political affiliation benefits from high support (Cox & McCubbins (1986)).

[17] A low and positive (respectively negative) value of this margin means that the first aligned candidate barely won (respectively barely lost) in last municipal elections.

[18] The intuition underlying this strategy is the following. If the average effect of political alignment is driven by the core supporter story, then one should observe a positive relationship between the amount of grants and the alignment margin, without any discontinuity at the cut-off. A discontinuity at this point would correspond

discontinuity setting related to alignment enforces the variable AL_{it} to be randomly assigned whatever the value of MV_{it} (and so, conditional on it). If MA_{it} denotes the margin of alignment of municipality i in year t, this leads to the following *joint RDD* equation:

$$\begin{aligned} ln\left(G_{it}\right) = &\left[\alpha_1 g\left(MV_{it}\right)\right] + MO_{it} * \left[\alpha_2 g\left(MV_{it}\right)\right] + \left[\beta_1 f\left(MA_{it}\right)\right] + AL_{it} * \left[\beta_2 f\left(MA_{it}\right)\right] \\ &+ \gamma MO_{it} * AL_{it} + \delta X_{ie-1} + \mu_c + \rho_t + \epsilon_{it} \end{aligned} \tag{1.3}$$

Finally, in order to provide a complete picture of the politics of intergovernmental grants counties allocate to municipalities, the effect of political alignment per se is also estimated. This effect is of different nature than the multiple office-holding impact, since it is underlain by political party considerations. To identify the effect of alignment per se, the previous regression discontinuity setting related to alignment is estimated separately. This gives the following equation:

$$ln\left(G_{it}\right) = \left[\beta_1 f\left(MA_{it}\right)\right] + AL_{it} * \left[\beta_2 f\left(MA_{it}\right)\right] + \delta X_{ie-1} + \mu_c + \rho_t + \epsilon_{it} \tag{1.4}$$

1.4 Data and sample

Information on discretionary investment grants municipalities receive from counties comes from a new dataset on detailed financial accounts of all French local governments over the period 2002-2011. This dataset is provided by the General Broad of Public Finance (DGFiP, French Ministry of Economy and Finance). It contains for each year and each local government a detailed decomposition of their revenues and expenditures, as well as all municipal decisions and characteristics regarding local taxation.[19]

Information on multiple office-holding and political alignment comes from electoral data provided by the French Home Office. Data on municipal elections cover the 2001 and 2008 ballots, for municipalities over 3,500 inhabitants. This database provides for each municipal ballot the score of each list, its political affiliation, as well as names (first name and surname) of the head of each list and the mayor. Data on county elections cover all ballots between 1998 and 2008. They give for each electoral constituency the score of each candidate, her political affiliation and her names. These data also provide the political affiliation of the executive chief of the county council. From these databases, I define a multiple office-holding dummy equal to one if the mayor of the municipality, or the head of the winning list in last municipal elections is concurrently a county councillor. Since data on elections do not directly contain information on multiple office-holding, I do a matching between names of municipal incumbents and names of county councillors. To be considered as a multiple office-holder, the mayor or the head of the winning list must have the same identity as the county incumbent who was elected in the

to the effect of alignment per se.

[19]The amount of discretionary investment grants, as well as all variables in euros are deflated using the consumption price index with base 2010 provided by the French National Institute of Statistics and Economic Studies (INSEE).

constituency in which the municipality is located.[20] For brevity, mayors and heads of the winning list are referred to the unique denomination of "mayors" from now on. For political alignment, I define a dummy equal to one if the political affiliation of the winning list in last municipal elections is the same as the one of the county council's executive chief. I consider the categories of political affiliation defined in Section 1.2.

Other datasources are used in order to have a complete set of control variables. The French census, provided by the French National Institute of Statistics and Economic Studies (INSEE), gives for each municipality information on total population, its age structure, and its characteristics regarding employment over the period 2000-2011. The "RFL" dataset (*dispositif Revenus Fiscaux Localisés des ménages*) gives information on the residents' income distribution of each municipal jurisdiction for each year between 2000 and 2011. Each variable in euros are deflated using the consumption price index with base 2010 provided by INSEE.

Different sample restrictions are made. Over the sample period, all county councils are either right-wing or left-wing, except four over 300 whose executive chief is centrist. As for municipalities, only 3.7% of them have a majority affiliation other than the two main ones. Given the low number of observations associated to counties and municipalities other than right-wing and left-wing, they are dropped from the sample. Two reasons support this choice. First, political alignment would be hard to define in centrist counties. Second, keeping municipalities other than left-wing or right-wing ones would give to non-alignment an ambiguous meaning from a political point of view.[21] I also drop years of municipal and county elections from the sample, since it is not possible to know for these years whether a given grant is related to the former or the new local council.[22]

Figure 1.1 describes the timing between the two kinds of elections of interest. The continuous line represents the period covered by data on intergovernmental grants and the dashed line represents the period out of these data but during which there were elections in which some incumbents of the sample period were elected. Years in bold and brackets are those I keep in the sample. Each bracket represents a "political cycle", defined as a period between two elections (municipal *or* county ones). This figure illustrates the fact that a politician can get in a situation of multiple office-holding through three different timings. County elections in which a mayor was elected can be before last municipal elections, after, or at the same time. Multiple office-holding is defined without disentangling between these different kinds of timing. The timing through which a politician gets a multiple office-holder position may capture some

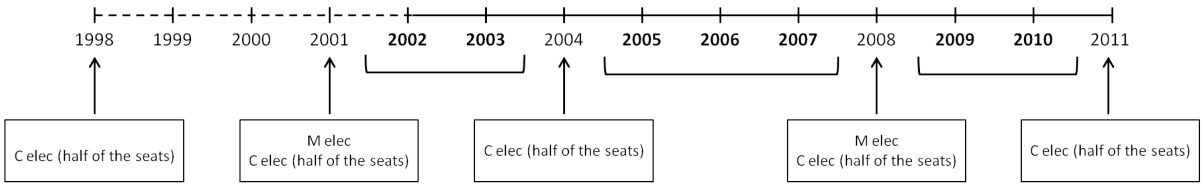
[20] While data on 2008 municipal elections provide the names of mayors and heads of winning lists with no missing value, information related to the 2001 municipal ballot only contains names of mayors, with some missing cases. Municipalities with no information on names for any municipal incumbent are excluded from the analysis. These municipal jurisdictions represent 2.7% of the initial sample.

[21] For instance, in a left-wing county council, a non-aligned municipality could be right-wing, far-right, far-left or in "other affiliations".

[22] Municipal and county elections occur in March. During years of elections, the budget of local governments is usually voted before the ballot (although the deadline imposed by the law for voting the budget is always after it). However, the new council can make modifications on the voted budget during the whole year. Since the database on grants only gives the aggregate amount of transfers received by a municipality during a given year, it is not possible to decompose grants allocated during years of elections between those received under the former council, and those received under the new one.

information on her characteristics. For instance, a politician elected at the county level before being elected in a municipal council may have higher experience than a mayor who runs for municipal and county elections at the same time. However, the regression discontinuity setting allows to control for such unobservable factors, as it consists in comparing municipal incumbents whose success in getting a seat at the county level is random. Then, not distinguishing between the different timings is not an issue in this empirical framework.

Figure 1.1: The timing between municipal and county elections



This figure shows the timing of municipal elections (denoted "M elec") and county elections (denoted "C elec"). As explained in Section 1.2, each county election consists in renewing half of the seats. The dashed line represents years out of the sample period but during which there were elections in which some incumbents of the sample were elected. Years in bold and brackets are those included in the baseline sample.

After all sample restrictions mentioned above, the baseline sample is made of 14,824 observations, which correspond to 2,118 municipalities per year on average. This sample is described in Column (1) of Table 1.2. Municipalities receive on average 21 euros per head of discretionary investment grants from the county, while they spend on average 518 euros per head each year for their investment. Standard deviations suggest high variability in the amount of discretionary investment grants from the county. 25% of mayors of the baseline sample are multiple office-holders, 60% are aligned and 17% are aligned multiple office-holders. This illustrates the high heterogeneity in the joint status of multiple office-holding and alignment. This feature is key if one wants to identify the heterogeneous effect of multiple office-holding according to political alignment.

Columns (2) to (7) of Table 1.2 provide descriptive statistics after the different sample restrictions to make for the RDD related to multiple office-holding, an for the RDD on alignment added in the joint RDD specification.[23] The RDD related to multiple office-holding (Equations (1.1) and (1.2)) needs to consider only municipalities whose mayor was candidate in last county elections. Column (2) describes this sample, and Column (3) presents descriptive statistics when one focuses on observations whose assignment variable MV_{it} is lower than two percentage points in absolute value. Focusing on municipalities whose mayor was candidate in last county elections gives a sample of 4,492 observations. This sample restriction leads mechanically to an increase in the share of multiple office-holders, compared to the baseline sample. 72% of mayors who are candidates in county elections are successful in this ballot. However, when one moves close to the cut-off, this proportion gets close to 50 percentage points. This comforts the validity of

[23]For each of these samples, I drop observations with extreme values of the assignment variable for which the dispersion in terms of grants is very high and may influence substantially the shape of the estimated polynomial functions. For both assignment variables (MV_{it} and MA_{it}), I drop observations with an absolute value of these variables higher than 40 percentage points. See Figures 1.C.1a and 1.C.2 which show respectively for MV_{it} and MA_{it} the number of observations in each bin of 1.25 percentage points of the corresponding assignment variable. However, the optimal bandwidth defined by Imbens & Kalyanaraman (2012) and used for local linear regressions is computed using the whole support of the assignment variables.

the RDD. Importantly, the average of the alignment dummy also gets close to 50 percentage points when the sample is restricted to municipalities close to the cut-off. This may suggest a random assignment of the alignment variable for small absolute values of mayors' margin of victory in county elections. This evidence is comforting for the validity of the HLATE estimation. Columns (4) and (5) present an analogous description for the regression discontinuity setting related to political alignment. This setting needs to focus on municipalities in which the second candidate in last municipal elections was right-wing if the winner was left-wing, and left-wing if the winner was right-wing.[24] This restriction consists in keeping 9,108 observations over 14,824. Dropped jurisdictions are characterized by a lower political competition in terms of political affiliation. This higher average political competition in the remaining sample is an explanation for the lower proportion of aligned municipalities with respect to the baseline sample. As one moves close from the cut-off, the proportion of aligned municipalities gets close to 50 percentage points. Similarly to columns (2) and (3), this comforts the validity of the regression discontinuity setting related to alignment. Finally, Column (6) presents descriptive statistics on the intersection of the two RDD samples, used for joint RDD. Column (7) focuses on observations where both assignment variables (MV_{it} and MA_{it}) are lower than two percentage points in absolute value. By construction, the comparison between Columns (1) and (6) is a mix of the comparison between Columns (1) and (2), and the one between Columns (1) and (4). However, Column (7) shows that there are only 14 observations for which $|MV_{it}|$ and $|MA_{it}|$ are both lower than two percentage points. In this context, the distributions of the multiple office-holding and the alignment dummies are not balanced, contrary to previous samples. Although the joint RDD allows to ensure that multiple office-holding and political alignment are both randomly assigned, this specification has to be manipulated with caution as it relies on few observations close to both cut-offs. Then, it can only be used as a robustness check, instead of the key specification of the paper. Finally, Table 1.2 reveals differences in terms of covariates between the different RDD samples and the baseline one. This is not an issue for identification. What is needed for regression discontinuity settings is the similarity of municipalities close to the cut-off.[25]

[24]More precisely, two sample restrictions are needed. First, the sample has to be restricted to municipalities whose alignment status would have changed if the second candidate had won. Then, the first challenger in last municipal elections has to be non-aligned (respectively aligned) if the municipality is aligned (respectively non-aligned). This restriction also consists in dropping municipalities in which there was only one running list in last municipal elections. Second, as the baseline sample is restricted to right-wing and left-wing municipalities, the same restriction has to be made on the first challenger in last municipal elections in order to have a valid RDD. Not making this last restriction would bring heterogeneity between both sides of the cut-off in an artificial way. These two restrictions consist in keeping only municipalities in which the second candidate in last municipal elections was right-wing if the winner was left-wing, and left-wing if the winner was right-wing.

[25]If no differences in covariates between the different samples and the different restrictions on assignment variables were observed, it would mean that assignment variables, as well as criteria to enter in samples for RDDs are uncorrelated with other municipal characteristics. Such evidence would be surprising.

Table 1.2: Descriptive statistics

	Baseline sample	*Sample for RDD on multiple office-holding and HLATE*		*Sample for RDD on alignment*		*Sample for joint RDD*	
	Whole sample	Whole sample	$\lvert MV_{it}\rvert \leq 2$	Whole sample	$\lvert MA_{it}\rvert \leq 2$	Whole sample	$\lvert MV_{it}\rvert \leq 2$ and $\lvert MA_{it}\rvert \leq 2$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Discretionary investment grants per head from counties (in euros)	20.65	21.06	18.74	19.50	18.10	20.06	45.93
	(32.05)	(31.57)	(25.02)	(29.86)	(26.37)	(28.59)	(60.41)
Total municipal investment spending per head (in euros)	517.52	525.84	487.67	519.59	504.12	532.23	479.42
	(381.42)	(359.21)	(319.76)	(377.16)	(498.70)	(355.58)	(254.96)
Multiple office-holding	0.25	0.72	0.56	0.23	0.14	0.68	0.71
	(0.43)	(0.45)	(0.50)	(0.42)	(0.35)	(0.47)	(0.47)
Alignment	0.60	0.59	0.52	0.55	0.51	0.56	0.64
	(0.49)	(0.49)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
(Alignment)*(Multiple office-holding)	0.17	0.47	0.32	0.15	0.10	0.43	0.50
	(0.37)	(0.50)	(0.47)	(0.36)	(0.30)	(0.50)	(0.52)
Municipal surface (in km^2)	21.67	22.90	25.30	22.92	24.59	23.90	37.62
	(22.76)	(24.43)	(23.51)	(23.03)	(28.00)	(24.92)	(22.72)
Total population (in thousands of inhab.)	13.59	12.95	11.21	15.55	13.73	14.37	18.05
	(21.70)	(18.35)	(10.73)	(24.89)	(18.15)	(21.40)	(11.34)
% pop <=14 (in percentage point)	18.63	18.37	18.97	18.52	18.29	18.34	19.46
	(2.92)	(2.81)	(2.79)	(2.92)	(2.72)	(2.72)	(1.80)
% pop >=65 (in percentage point)	17.06	17.71	16.81	17.16	17.93	17.76	15.80
	(5.50)	(5.57)	(5.17)	(5.56)	(5.32)	(5.46)	(2.09)
Median income of residents per UC[a] (in thousands of euros)	18.65	18.40	18.35	18.51	18.19	18.32	19.09
	(4.01)	(3.63)	(3.71)	(3.67)	(3.50)	(3.47)	(1.61)
Unemployment rate (in percentage point)	10.41	10.49	10.62	10.46	10.70	10.61	9.51
	(4.14)	(3.96)	(4.18)	(4.00)	(4.11)	(3.80)	(2.90)
Left-wing municipality	0.48	0.47	0.43	0.45	0.54	0.46	0.64
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
Nb. observations	14824	4492	324	9108	540	2969	14

Each column of this table is related to a specific sample. For each of these samples, the table provides means of different variables, with standard errors in parentheses. For each RDD sample (see the text for a definition of each of them), these descriptive statistics are presented for the whole sample and for the sample restricted to observations with an absolute value of the assignment variable (MV_{it} or MA_{it}) lower or equal than two percentage points. For the sample used for the joint RDD, this restriction is applied to both assignment variables.
[a] UC : unit of consumption. It is a measure of household size: one unit for the first adult, 0.5 unit per other individual who is 14 or more and 0.3 unit per child below 14.

1.5 Results

1.5.1 Main results

Figures 1.2a and 1.2b present a graphical picture of the regression discontinuity setting related to multiple office-holding. They represent the fitted curve of the estimation of Equation (1.1) with no covariate and fixed effect. Figure 1.2a represents estimations through cubic polynomial estimation, while Figure 1.2b represents local linear regression results. In both figures, there is a positive jump of grants once one moves from the left to the right-hand side of the cut-off. Figures 1.2c and 1.2d (respectively 1.2e and 1.2f) provide the fitted curve from the same specifications when the sample is restricted to aligned (respectively non-aligned) municipalities. While a positive jump is still observed for aligned municipalities, there is no such evidence when the sample is restricted to non-aligned jurisdictions. These figures suggest a positive and significant effect of multiple office-holding which is concentrated on aligned municipalities.

Table 1.3: The heterogeneous effect of multiple office-holding according to alignment

	Dependent variable: discretionary investment grants per head from counties (log of)					
	OLS (1)	*OLS* (2)	*HLATE* (3)	*HLATE* (4)	*Joint RDD* (5)	*Joint RDD* (6)
Multiple office-holding	-0.00	0.07	0.34*	0.29*	0.22	0.02
	(0.06)	(0.05)	(0.18)	(0.16)	(0.20)	(0.19)
Alignment	0.04	0.07**	0.10	0.03	0.08	0.12
	(0.04)	(0.03)	(0.12)	(0.10)	(0.23)	(0.20)
(Alignment)*(Multiple office-holding)	0.33***	0.21***	0.32**	0.28**	0.35**	0.24*
	(0.07)	(0.06)	(0.14)	(0.11)	(0.15)	(0.14)
Fixed effects and covariates[a]	No	Yes	No	Yes	No	Yes
Adjusted R-squared	0.01	0.27	0.03	0.28	0.03	0.30
Nb. Obs	14824	14824	4492	4492	2969	2969

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses are clustered at the county council level (one cluster per county per period between two county elections).
The two first columns show results from a simple OLS specification, without any regression discontinuity setting. The two following columns show results from the HLATE estimation (Equation (1.2)), while the two last ones come from the estimation of the joint RDD (Equation (1.3)). Estimations through regression discontinuity are made by using cubic polynomial functions in the assignment variables.
[a] Fixed effects and covariates include year fixed effects (ρ_t), county council fixed effects (μ_c), and covariates represented by the vector X_{ie-1}.

This evidence is comforted through point estimates presented in Table 1.3. Columns (1) and (2) come from the estimation of a simple OLS specification, without any regression discontinuity design. Columns (3) and (4) present results from the HLATE estimation, while Columns (5) and (6) present point estimates from the joint RDD specification.[26] These results suggest robust evidence of a positive and significant impact of being aligned and a multiple office-holder. In other words, mayors who have concurrently a seat in the county council and are part of the leading group of this upper political assembly get on average more grants than other mayors. However, the coefficient on the multiple office-holding dummy is positive but has no robust significance. Finally, alignment per se, represented through the alignment dummy, has a positive but insignificant impact. The estimated elasticity of grants according to the interaction between multiple office-holding and alignment varies from 0.21 to 0.35 across the different specifications of Table 1.3. If one considers regressions which include covariates and fixed effects, results of Table 1.3 suggests that the simple OLS specification slightly underestimates the impact related to aligned multiple office-holders. This is consistent with aligned multiple office-holders having more experience and a higher ability to raise public funds by their own for municipal investment. By considering the HLATE estimation with the inclusion of all fixed effects and covariates, aligned multiple office-holders receive on average 28% more grants for their municipalities than other municipal incumbents.[27]

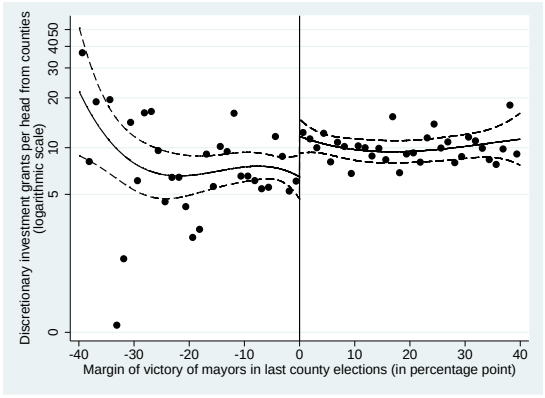
This evidence of a targeting in favour of aligned multiple office-holders suggests an important role of direct ties between incumbents of different layers of government. However, evidence of an insignificant impact of alignment per se is in tension with political party considerations highlighted in the previous literature. To provide a complete picture on this issue, the regression discontinuity setting on political alignment represented by Equation (1.4) is estimated. Figure 1.3 provides a graphical picture of this estimation, and suggests only weak evidence of a positive and significant impact of alignment per se. Point estimates are presented in Table 1.4. The first two columns (respectively the two last ones) present results from cubic polynomial estimations (respectively local linear regressions). In line with Figure 1.3, there is only weak evidence of a positive impact of alignment per se according to these results. Significance reaches a level lower than 10% only for local linear regressions.[28] This lack of evidence of a positive alignment has to be considered with caution, since the French political context constraints to consider aggregated political affiliations rather than political parties for the definition of alignment (see Section 1.2). However, these results on political alignment, combined with strong evidence of a targeting in favour of aligned multiple office-holders, give a novel picture of the politics of intergovernmental grants. They highlight the important role of direct ties between incumbents of different layers of jurisdiction, with other mechanisms to be considered in addition to grantors' pork-barrel through party favoritism.

[26] Coefficients on covariates through simple OLS are presented in Table 1.D.2 in Appendix.

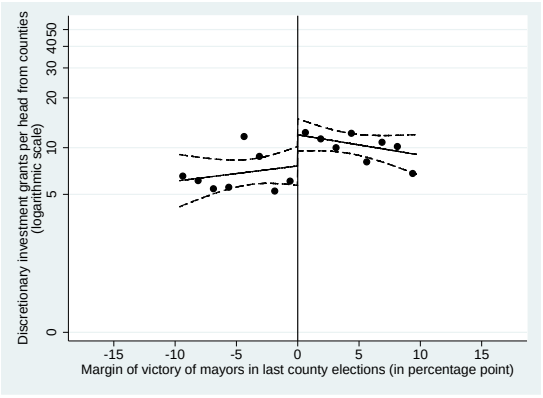
[27] The HLATE estimation is considered instead of the joint RDD because of the high demanding feature of this last identification strategy. See Section 1.4 for more details.

[28] As this can reveal weaknesses in the cubic polynomial specification, Table 1.D.5 in Appendix shows point estimates for alternative polynomial orders and alternative bandwidths. This table confirms the non-robust significance, both for the polynomial specification and the local linear regression.

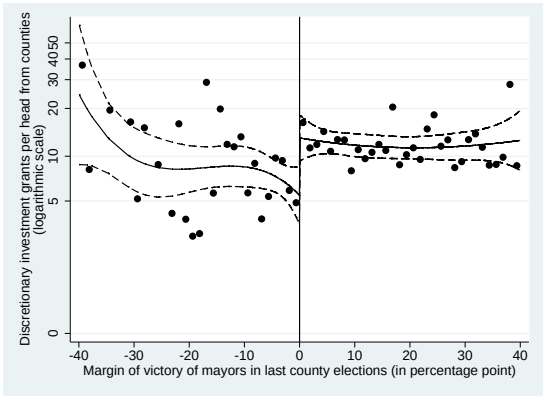
Figure 1.2: Fitted curves - Regression discontinuity on multiple office-holding



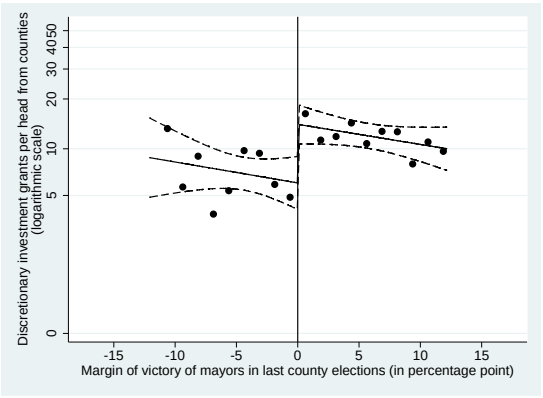
(a) *Whole Sample*
(cubic polynomial)



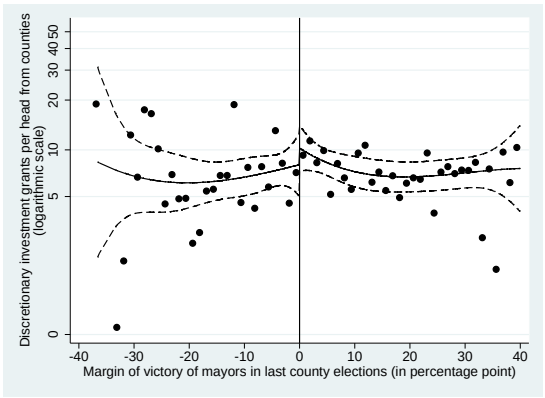
(b) *Whole Sample*
(local linear regression)



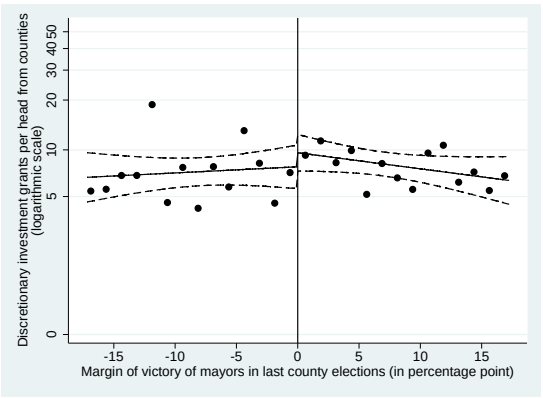
(c) *Aligned municipalities*
(cubic polynomial)



(d) *Aligned municipalities*
(local linear regression)



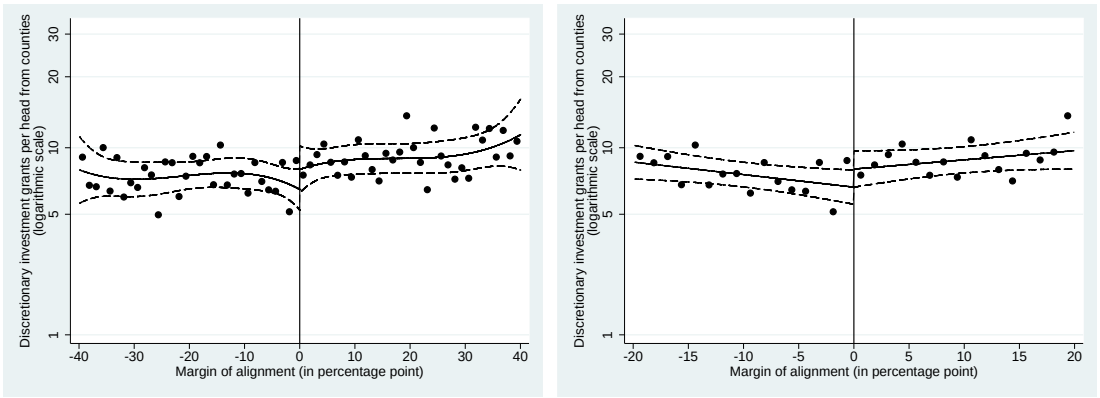
(e) *Non-aligned municipalities*
(cubic polynomial)



(f) *Non-aligned municipalities*
(local linear regression)

These figures show fitted curves from Equation (1.1) (with no covariate and fixed effect). Figures on the left come from cubic polynomial estimations, while figures on the right come from local linear regressions. The bandwidth used in local linear regressions is the optimal one as defined by Imbens & Kalyanaraman (2012). Figures 1.2a and 1.2b come from estimation on the whole sample (i.e. the sample described in Column (2) of Table 1.2). Figures 1.2c and 1.2d come from estimation on the same sample restricted to aligned municipalities, while Figures 1.2e and 1.2f focus on non-aligned municipalities. The vertical axis represents the logarithm scale of the amount of discretionary investment grants received from the county. Labels on this axis are in euros. Dashed lines represent 95% confidence intervals. Each dot represents the average amount of grants in each bin of the margin of victory of mayors in last county elections, with a bin width of 1.25. See Figures 1.C.1a, 1.C.1b and 1.C.1c which show the number of observations in each bin for each of the three investigated samples.

Figure 1.3: Fitted curves - Regression discontinuity on political alignment



(a) *Whole Sample* (cubic polynomial)

(b) *Whole Sample* (local linear regression)

These figures show fitted curves from Equation (1.4) (with no covariate and fixed effect) on the sample described in Column (4) of Table 1.2. Figure 1.3a comes from a cubic polynomial estimation, while Figure 1.3b comes from a local linear regression, by taking the optimal bandwidth defined by Imbens & Kalyanaraman (2012). The vertical axis represents the logarithm scale of the amount of discretionary investment grants received from the county. Labels on this axis are in euros. Dashed lines represent 95% confidence intervals. Each dot represents the average amount of grants in each bin of the margin of alignment, with a bin width of 1.25. See Figure 1.C.2 which shows the number of observations in each of these bins.

1.5.2 Robustness and validity checks

A battery of checks regarding the empirical specification are made. Estimates on the multiple offices effect presented in Table 1.3 are obtained by considering $g(.)$ as a cubic polynomial function. It is important to ensure that findings are robust to alternative choices regarding the polynomial order of this function. Table 1.D.3 in Appendix provides such robustness checks. The first two columns present point estimates of the HLATE specification with a first and a second order polynomial respectively. The two last columns are analogous for the joint RDD. This table suggests that evidence on the impact of multiple office-holding and alignment is robust to the choice of the polynomial order. Whatever this choice and the specification, the only significant coefficient is the one on the interaction between multiple office-holding and alignment. The size of this coefficient is stable relatively to cubic-polynomial estimates. While evidence of a significant effect of multiple office-holding independently from alignment is non-robust in Table 1.3, significance at conventional levels is never reached for first and second polynomial order specifications. Another check to do in order to ensure that main findings are not specific to the HLATE or the joint RDD specification is to see whether they still hold in a simple regression discontinuity setting, without any heterogeneous effect of multiple office holding included in the regression. Table 1.D.4 in Appendix shows estimates from Equation (1.1). The multiple offices effect is estimated on the whole sample, and on the sub-samples of aligned and non-aligned municipalities. For robustness issues, this table shows for each of these samples polynomial estimations for each order between one and three. It also shows estimates from local linear regressions with three alternative bandwidths. Consistently with previous evidence, there is strong and robust evidence of a multiple offices effect, driven by aligned municipalities.[29]

[29] Coefficients on multiple office-holding estimated on the sub-sample of aligned municipalities are much higher than previous coefficients on the interaction between multiple office-holding and alignment, since they correspond

Table 1.4: The effect of political alignment

	Dependent variable: discretionary investment grants per head from counties (log of)			
	Cubic polynomial	Cubic polynomial	Local linear regression	Local linear regression
Alignment	0.19	0.16	0.17*	0.16*
	(0.13)	(0.13)	(0.09)	(0.09)
Bandwidth			19.89	19.89
Fixed effects and covariates[a]	No	Yes	No	Yes
Adjusted R-squared	0.00	0.25	0.00	0.25
Nb. Obs	9108	9108	5268	5268

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses are clustered at the county council level (one cluster per county per period between two county elections).
These results come from the estimation of the RDD on political alignment (Equation (1.4)). The bandwidth used in local linear regressions is the optimal one, as defined by Imbens & Kalyanaraman (2012).
[a] Fixed effects and covariates include year fixed effects (ρ_t), county council fixed effects (μ_c), and covariates represented by the vector X_{ie-1}.

It is key to check whether other municipal revenues which must not be driven by politics are not impacted by multiple office-holding according to the applied empirical strategy. As a placebo test, the dependent variable is replaced by the per capita *Dotation Globale de Fonctionnement* (DGF), which is the main formula-based intergovernmental transfer received by municipalities.[30] Table 1.5 presents results of this test from the HLATE estimation. Whatever the set of controls, the three coefficients of interest related to multiple office-holding and alignment are non-significant and have low size. This comforts the validity of the empirical strategy of this paper.

Table 1.6 presents point estimates from separate estimations for left-wing and right-wing counties. This check aims at knowing whether grants targeting according to multiple office-holding and alignment is specific to a county political affiliation, or whether this evidence is independent from the political affiliation of the grantor. This check is in favour of this second scenario. The first and the second columns of Table 1.6 present for right-wing and left-wing counties respectively results from the HLATE estimation after the inclusion of covariates and fixed effects. The coefficient on the interaction between multiple office-holding and alignment is positive and significant for both county political affiliations. The size of this effect is highly similar with respect to estimations with the whole sample.

Finally, conventional validity checks for regression discontinuity settings are implemented. For a given RDD, two validity conditions have to be filled. First, the density of the assignment

by construction to the sum of the effect of MO_{it} and $MO_{it} * AL_{it}$.

[30] This transfer is allocated by the Central State. It accounts on average for 237 euros per head in the baseline sample (i.e. 16.5% of total municipal revenues). It mainly depends on municipal population and its age structure, municipal area, fiscal potential of the municipality, average income of residents, and the share of inhabitants who rely on social benefits.

Table 1.5: Placebo test - impact on the DGF

	Dependent variable: DGF per head (log of)	
	(1)	(2)
Multiple office-holding	-0.09	-0.04
	(0.06)	(0.05)
Alignment	-0.01	-0.01
	(0.04)	(0.03)
(Alignment)*(Multiple office-holding)	0.00	0.03
	(0.04)	(0.03)
Fixed effects and covariates[a]	No	Yes
Adjusted R-squared	0.00	0.50
Nb. Obs	4492	4492

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses are clustered at the county council level (one cluster per county per period between two county elections).
This table shows estimations from the *HLATE* estimation (Equation (1.2)), where the dependent variable is the logarithm of the amount of *Dotation Globale de Fonctionnement* (DGF) per head. The DGF is the main formula-based intergovernmental transfer received by municipalities (see the text for more details). These results come from estimations with cubic polynomial functions of the assignment variable.
[a] Fixed effects and covariates include year fixed effects (ρ_t), county council fixed effects (μ_c), and covariates represented by the vector X_{ie-1}.

Table 1.6: Separate regressions for municipalities in right-wing and left-wing counties

	Dependent variable: discretionary investment grants per head from counties (log of)	
	Right-wing counties	Left-wing counties
Multiple office-holding	0.40	0.20
	(0.24)	(0.21)
Alignment	-0.04	0.11
	(0.13)	(0.14)
(Alignment)*(Multiple office-holding)	0.28*	0.27*
	(0.15)	(0.16)
Fixed effects and covariates[a]	Yes	Yes
Adjusted R-squared	0.24	0.31
Nb. Obs	2085	2407

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses are clustered at the county council level (one cluster per county per period between two county elections).
This table shows results from separate estimations of the *HLATE* (Equation (1.2)) for municipalities in right-wing counties, and those in left-wing ones. These results come from estimations with cubic polynomial functions of the assignment variable.
[a] Fixed effects and covariates include year fixed effects (ρ_t), county council fixed effects (μ_c), and covariates represented by the vector X_{ie-1}.

variable has to be continuous at the cut-off. A discontinuity would mean that the assignment variable can be manipulated. This condition is tested by using the procedure defined by McCrary (2008).[31] Figure 1.C.3a in Appendix shows the density of the margin of victory of mayors in county elections. According to this figure, the null hypothesis of zero discontinuity at the cut-off cannot be rejected. Evidence is similar for the margin of alignment, as shown in Figure 1.C.3b. Second, municipalities just below and above the cut-off have to be similar. One way to test for this is to check whether there is no discontinuity in some covariates at the cut-off. As suggested in Lee & Lemieux (2010), this test is done for all covariates in X_{ie-1} simultaneously, by estimating a Seemingly Unrelated Regression (SUR).[32] Then, a Chi-Square test for no discontinuity at the cut-off in all equations is implemented.[33] Table 1.D.6 in Appendix shows the p-value of this Chi-Square test for the RDD on multiple office-holding with no heterogeneous effect (Equation (1.1)), as well as for the RDD on alignment (Equation (1.4)). These two specifications are the only ones which need to be tested in order to check for the validity of the HLATE estimation and the joint RDD.[34] For each of these two investigated RDDs, the test is implemented for every polynomial order between the first and the third, and for local linear regressions using the optimal bandwidth defined by Imbens & Kalyanaraman (2012), as well as half and double this bandwidth. For the RDD on multiple office-holding, the null hypothesis of no discontinuity in all covariates cannot be rejected, except for the local linear regression with half the optimal bandwidth. For the RDD on alignment, the conclusion is the same, except for the first-order polynomial estimation, and the local linear regression with double the optimal bandwidth.[35]

The correct identification of the HLATE needs an additive validity test. The political alignment dummy has to be continuous at the cut-off related to the margin of victory of mayors in county elections (see Section 1.3). Figure 1.C.4 in Appendix provides a test of this condition. It shows the fitted cubic polynomial estimation of Equation (1.1) where the dependent variable is the alignment dummy. This figure highlights no evidence of a discontinuity in the alignment status at the cut-off. This comforts the validity of the HLATE estimation.

[31] Both assignment variables (the margin of victory of mayors in county elections and the margin of alignment) are constant over a political cycle for a given municipality. In order not to have the same observation several times, only one observation per municipality per political cycle is used for this test.

[32] The estimated system is composed by one equation per covariate. Each equation of this system is the same as the tested RDD specification (without fixed effects and other controls), where the dependent variable is replaced by the covariate.

[33] Since covariates in X_{ie-1} take the same value over a political cycle for a given municipality, only one observation per municipality per political cycle is used to run this test.

[34] The test for the HLATE estimation would be exactly the same as the one for the RDD on multiple office-holding without heterogeneity. Moreover, the validity of two tested RDDs implies the validity of the joint RDD.

[35] This illustrates the non-randomness of the treatment assignment when one moves far from the cut-off. This is why it is necessary to include a sufficiently high polynomial order to capture these non-random components, or to rely on a small enough bandwidth for local linear regressions.

1.5.3 Mechanisms

There is strong evidence that mayors who have concurrently a seat at the county level, and are part of the leading group in the county council get on average significantly more grants for their municipalities than other mayors. However, there is no similar evidence for non-aligned multiple office-holders. This heterogeneity is not in line with a significant role of a common feature of multiple office-holding (e.g. the better knowledge multiple office-holders may have on grants allocation procedures). Instead, it claims for mechanisms leading to a targeting in favour of a specific kind of multiple office-holders (those in the county's majority group).

These mechanisms can be of different natures. First, multiple office-holders may take advantage of their seat at the county level to convince the majority of councillors to accept the municipal project they apply for (*Story I*). This effect may hold especially for aligned multiple office-holders, since they have better access to members of the county council leading group than non-aligned multiple office-holders. Second, county councillors have to face a problem of asymmetric information for the allocation of intergovernmental transfers. They may have an imperfect knowledge on mayors' skills to manage an investment project, and on real municipal needs for new infrastructures. Mayors may have an incentive to take advantage of this situation, by exaggerating their needs or their municipaly's preferences for the investment project they apply for. Although some incentive devices can emerge from this setting, it has a collective cost, since some projects with low benefits may be accepted while some others with high benefits may be rejected (Besfamille, 2004). In this context, it may be optimal for county councillors to allocate more funds to their colleagues at the county council (*Story II*). Indeed, they may have a good knowledge on their skills. Moreover, they may have more monitoring power over them. Such an effect is likely to be concentrated on aligned multiple office-holders, since county councillors of the leading group (who may have greater power on grants than other county councillors) may benefit from better knowledge and higher monitoring power especially on their colleague of the same political group.

These two mechanisms bring new and interesting insight, as the existing empirical literature on the politics of intergovernmental grants has focused on political party considerations and grantors' vote-seeking behaviours through the alignment effect. *Story I* and *Story II* both support the fact that aligned multiple office-holders would be favoured as a result of an advantage they have on other mayors to get more grants, regardless of political interests of county councillors. Such an advantage may decrease with the degree of competition between aligned multiple office-holders in a given county. Then, in order to test for *Story I* and *Story II*, I interact coefficients related to multiple office-holding and alignment with this degree of competition, proxied by the share of aligned multiple office-holders among mayors in the county. This share has sufficient variability to identify heterogeneous effects: its standard deviation is equal to 8.8 percentage points, for a mean of 16.5. Although *Story I* and *Story II* are not disentangled through this specification, a result in favour of at least one of these two channels would bring interesting evidence in favour of other mechanisms than those linked to political parties and grantor's pork-barrel.

Still, a targeting in favour of aligned multiple office-holders can also be driven by vote-seeking behaviours of county councillors. If county incumbents of the leading group want to be reelected and to keep their leading position in the county council, they may have an incentive to help their colleagues in the county leading group to keep their municipal office (*Story III*). Indeed, an aligned mayor who has a seat in the county council may provide a strong support at the local level during next county elections. Moreover, higher grants may help aligned multiple office-holders to be reelected at the county level as well. A reelection of an aligned incumbent in the county council increases the probability that the current county leading group keeps his leading position. Since such an effect may be stronger when political competition in county elections is higher, I interact coefficients related to multiple office-holding and alignment with the share of seats held by the county majority in the county council. This share has a mean of 64.9 percentage points, with a standard deviation of 10.4, which illustrates the high variability of this variable.

For each of these two additive heterogeneity dimensions (the degree of competition among aligned multiple office-holders, and competition in county elections), the variable defining the investigated heterogeneity, as well as the interaction between this variable and each coefficient of interest are added in the HLATE equation. In order to get more interpretable coefficients, I take the deviation from the mean of variables defining heterogeneity, instead of the variables themselves. As pointed out by Becker et al. (2013), the two variables included as factors of heterogeneity (the share of seats held by the county majority in the county council and the share of aligned multiple office-holders among mayors of the county) have to be continuous at the cut-off of the regression discontinuity setting. Figures 1.C.5a and 1.C.5b in Appendix show for each of these two variables the fitted curve from this validity test, with 95% confidence intervals. For both variables, these figures show no evidence of a discontinuity at the cut-off, which comforts the validity of the HLATE estimation when these two heterogeneity dimensions are added.

Table 1.7 shows results from these heterogeneous effects estimations. Columns (1) to (3) show point estimates when the share of aligned multiple office-holders among mayors in the county is the only included dimension of heterogeneity. These three columns differ in the set of controls included in the regression: Column (1) does not include any control, Column (2) includes covariates, while Column (3) presents point estimates after the inclusion of covariates, year fixed effects and county council fixed effects. Columns (4) to (6) show results where coefficients of interest are interacted only with the share of seats held by the county majority group in the county council, while columns (7) to (9) show point estimates where both dimensions of heterogeneity are simultaneously included.

Table 1.7: Investigation of mechanisms

	Dependent variable: discretionary investment grants per head from counties (log of)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Multiple office-holding	0.405**	0.359**	0.326**	0.338*	0.262	0.301*	0.383**	0.330**	0.320*
	(0.175)	(0.161)	(0.163)	(0.178)	(0.160)	(0.161)	(0.172)	(0.158)	(0.163)
Alignment	0.149	0.117	0.077	0.126	0.074	0.048	0.152	0.117	0.075
	(0.121)	(0.110)	(0.107)	(0.120)	(0.102)	(0.099)	(0.119)	(0.108)	(0.107)
(Alignment)*(Multiple office-holding)	0.246	0.258*	0.245**	0.312**	0.337***	0.260**	0.259*	0.280**	0.246**
	(0.152)	(0.131)	(0.119)	(0.140)	(0.120)	(0.110)	(0.150)	(0.130)	(0.120)
Multiple office-holding*($dmShALMO^{a}$)	0.006	0.012	0.002				0.005	0.009	-0.001
	(0.012)	(0.010)	(0.010)				(0.013)	(0.011)	(0.011)
Alignment*($dmShALMO^{a}$)	0.022	0.028**	0.022*				0.015	0.022	0.016
	(0.016)	(0.014)	(0.012)				(0.017)	(0.014)	(0.013)
(Alignment)*(Multiple office-holding)*($dmShALMO^{a}$)	-0.023	-0.034**	-0.023				-0.018	-0.028*	-0.018
	(0.019)	(0.016)	(0.015)				(0.020)	(0.017)	(0.016)
$dmShALMO^{a}$	-0.001	-0.007					0.002	-0.003	
	(0.013)	(0.011)					(0.014)	(0.012)	
Multiple office-holding*($dmShCounty^{b}$)				0.001	0.002	0.007	0.001	0.001	0.007
				(0.009)	(0.009)	(0.008)	(0.010)	(0.009)	(0.009)
Alignment*($dmShCounty^{b}$)				0.023**	0.024**	0.016*	0.021*	0.021**	0.014
				(0.011)	(0.010)	(0.009)	(0.011)	(0.010)	(0.010)
(Alignment)*(Multiple office-holding)*($dmShCounty^{b}$)				-0.016	-0.018	-0.017	-0.014	-0.014	-0.014
				(0.013)	(0.012)	(0.010)	(0.013)	(0.012)	(0.011)
$dmShCounty^{b}$				-0.008	-0.011		-0.008	-0.010	
				(0.008)	(0.009)		(0.009)	(0.009)	
Covariates	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Fixed effects[c]	No	No	Yes	No	No	Yes	No	No	Yes
Adjusted R-squared	0.03	0.08	0.28	0.03	0.09	0.28	0.03	0.09	0.28
Nb. Obs	4492	4492	4492	4492	4492	4492	4492	4492	4492

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses are clustered at the county council level (one cluster per county per period between two county elections).
This table shows results from the *HLATE* estimation (Equation (1.2)) where heterogeneity dimensions of average treatment effects of interest are included. This consists in adding in Equation (1.2) variables defining these heterogeneity dimensions, as well as the interaction between these variables and dummies related to multiple office-holding and political alignment. These results come from estimations with cubic polynomial functions of the assignment variable.
[a] *dmShALMO* denotes the deviation from the mean of the share of aligned multiple office-holders among mayors in the county (in percentage point).
[b] *dmShCounty* denotes the deviation from the mean of the share of seats the county's majority coalition holds in the county council (in percentage point).
[c] Fixed effects include year fixed effects (ρ_t) and county council fixed effects (μ_c).

Columns (1) to (3) suggest evidence that the targeting in favour of aligned multiple office-holders decreases with the share of these mayors in the county. Point estimates related to this heterogeneity are negative. Significance at 5% level is reached after the inclusion of covariates, while the significance level is barely higher than 10% when county council and year fixed effects are included. When one moves to Columns (4) to (6), there is no evidence according to conventional significance level that the targeting towards aligned multiple office-holders significantly varies with the degree of competition in county elections. Both evidence hold in Columns (7) to (9), where the two heterogeneity dimensions are included. However, standard errors increase and may suggest a limited statistical power given the high number of regressors included in these three last columns. According to results in column (3), when all covariates and fixed effects are included and when the share of aligned multiple office-holders in the county is the only included heterogeneity dimension, an increase in this share by one standard deviation (i.e. 8.8 percentage points) leads to a decrease in the coefficient on aligned multiple office-holders by 0.202. This effect is important regarding the average coefficient without interaction.

Although these results do not allow to reject *Story III* and put *Story I* and *Story II* at the center, they give new insight on the mechanisms underlying the politics of intergovernmental grants.[36] They show that what matters is not only pork-barrel politics from the grantor. First, local incumbents directly linked to an upper council may exploit this tie to favour their jurisdiction. Second, the asymmetry of information problem faced by grantors may give strong advantages to jurisdictions whose elected officials are connected with the upper council responsible for grants allocation.

Finally, although there is no evidence of a positive and significant average impact of alignment per se, the effect of political alignment seems to decrease significantly with electoral competition in county elections.[37] This result is in line with Curto-Grau et al. (2014). It suggests that a targeting in favour of aligned municipalities is applied in counties where the majority coalition has few political constraints and is free to favour incumbents of its political affiliation. In case of a balanced composition of the county council, incumbents in the county majority group may have no incentive to favour political allies if they want to be reelected, or if they are constrained to bargain with the other political groups of the county council.

1.6 Conclusion

This paper brings new evidence on the politics of intergovernmental grants, by estimating the impact of multiple office-holding. Politicians having concurrently different seats in different tiers of government represent a common practice among developed countries. It may reveal key features of intergovernmental grants allocation, like the ability of some local incumbents

[36] Although the interaction term between multiple office-holding, alignment and electoral competition in county elections is not significant regarding conventional thresholds, the significance level is close to 10% in Columns (5) and (6).

[37] Columns (1) to (3) also suggest that the alignment effect significantly increases with the share of aligned multiple office-holders in the county. However, Columns (7) to (9) suggest that this evidence is the result of a correlation between the share of aligned multiple office-holders in the county and the degree of competition in county elections.

to benefit from their direct access to upper councillors, or concerns regarding asymmetry of information.

Using a new database on French local public accounts, I study this issue in the context of French municipalities and counties over the period 2002-2011. The aim is to estimate whether mayors who have concurrently a seat in a county council receive more grants from counties than other mayors. For identification, I rely on close electoral races through regression discontinuity techniques. The sample is restricted to mayors who were candidate in last county elections. Mayors who barely won in these upper elections are compared to mayors who barely lost. Since a mayor who has a seat in the county council may have different degrees of influence depending on whether she is in the leading political group of the county council, I estimate the heterogeneous effect of multiple office-holding according to political alignment of the mayor. In order to estimate this heterogeneous effect in a regression discontinuity setting, I rely on the HLATE identification proposed by Becker et al. (2013).

There is strong and robust evidence of a targeting in favour of aligned multiple office-holders. Mayors who have a seat at the county level and are in the county council leading group get on average 28% more grants than other mayors. However, there is no evidence that non-aligned multiple office-holders get on average more grants than other municipal incumbents. This heterogeneous finding according to alignment suggests that there is no effect linked to a common feature of multiple office-holding, like the better information multiple office-holders may have on grants application procedures. Instead, having a seat in an upper council seems to be useful only for mayors who are in the majority political group at the county level.

This finding is key, as it suggests mechanisms of different natures than those investigated in the previous literature on the politics of intergovernmental grants. First, aligned multiple office-holders can benefit for their direct position in the leading team of the county council to favour their local jurisdiction. Second, a targeting of grants towards aligned multiple office-holders may be explained by efficiency considerations, as asymmetry of information between the municipality and the county council is likely to be lower when the municipality is leaded by a member of the county council majority. Since this twofold advantage of aligned multiple office-holders may decrease with the share of these mayors in the county for concerns of competition, the coefficient of interest is interacted with this variable. Although such a specification is highly demanding, evidence do not allow to reject these two stories.

The previous literature on the distributive politics of intergovernmental grants pointed out the key role of pork-barrel behaviours of grantors. A targeting in favour of aligned multiple office-holders can also be explained by such behaviours, since county councillors may have an interest to help their colleague in the county council. Although it is not possible to properly discriminate between this channel and the two first ones, this paper clearly shows that grantors' pork-barrel behaviours is at best only one part of the story. Direct ties between mayors and upper councils play an important role, independently from political interests of grantors.

This targeting of grants towards aligned multiple office-holders may have an impact on the allocation of local infrastructures over the national territory. Through this channel, political links between the different tiers of government may have longer-term effects on agents mobility

and the geographical allocation of economic activity. Given that these phenomena are subject to important externalities between jurisdictions, this potential indirect impact of politics on efficiency is of key importance and calls for further research.

Appendix

1.A Political parties

During the period covered by electoral data (1998-2011 for county elections, and 2001-2011 for municipal ones), the French political debate was dominated by two political parties: the Socialist Party (PS), which is left-wing, and a right-wing party, represented by the *Rassemblement pour la République* (RPR) until 2002 and then by the *Union pour un Mouvement Populaire* (UMP). Apart from these two main organisations, there are smaller left-wing parties which frequently make coalitions with the PS for elections.[38] The picture has been different for the right-wing side since the UMP founding in 2002. Before this year, the RPR frequently made coalitions with smaller right-wing parties for elections. In 2002, the UMP founding consisted in merging the RPR with the main part of these smaller right-wing organisations, but the few number of parties out of this merge continued to frequently make coalitions with the main right-wing organisation.

Between left-wing and right-wing political parties, the French political landscape also counts some centrist organisations. The main one is the *Union pour la Démocratie Française* (UDF), which is center-right. Until 2007, this party frequently made coalitions with the RPR and then the UMP. This centrist party got divided between two organisations after the 2007 presidential elections: the *Mouvement Démocrate* (MODEM), which decided to get closer to the center of the political spectrum and not to make coalitions with the UMP anymore, and the Nouveau Centre (NC), which stayed at the center-right and carried out making coalitions with the main right-wing organisation.

The French political landscape also counts far-right and far-left parties. The far-right politics is dominated by the National Front (FN). Far-left politics is more divided, with two main organisations during the investigated period.[39] Finally, some political organisations are related to specific issues, and do not claim any position in the political spectrum (e.g. regionalist parties, some green organisations).

In practice, some candidates do not report any official party of affiliation. Some of them define their candidacy as being independent from any political orientation. However, the main part of these candidates with no party call themselves as being left-wing or right-wing (they are called "other left-wing candidates" and "other right-wing candidates" from now on). This is a

[38]The main ones are the Communist Party (PC), *Europe Ecologie les Verts* (EELV) - the main green French party -, and the *Parti Radical de Gauche* (PRG).

[39]These two parties are the *Nouveau Parti Anticapitaliste* (NPA) and *Lutte Ouvrière* (LO).

common practice in local elections. It allows candidates to still claim their political affiliation, and at the same time to fit a context of local ballots where voters may be less partisan than for other elections. However, this does not necessarily mean that they are unconnected to political parties associated to their political orientations.

Table 1.A.1 provides a picture of political affiliations of all running lists in municipal elections covered by this paper. It gives for each kind of affiliation its share among these lists. This table gives a good illustration of the above description of the French political landscape. The main right-wing party (the UMP or the RPR) and the PS manage only 9.74% and 5.49% of the running lists respectively. Lists leaded by smaller left-wing parties represent only 2.34% of municipal candidacies, while no running list is registered as being entirely managed by a smaller right-wing organisation. At the same time, 23.85% of lists correspond to left-wing coalitions and 11.45% to right-wing ones. These statistics illustrate the importance of coalitions between main political organisations and smaller parties. This table also confirms the importance of "other right-wing candidates" and "other left-wing candidates". Finally, centrist lists, independent candidates, far-right and far-left parties take up few space in municipal elections.

Table 1.A.2 describes the distribution of political affiliations of county executive chiefs over my period of analysis. It illustrates the importance of the PS and the main right-wing party (the UMP and the RPR), despite coalitions which can be made at the municipal level. 42.11% of counties' executive chiefs are members of the PS, while 26.32% of them are members of the UMP or the RPR. Smaller left-wing parties represent only 5.61% of county leaders. As for smaller right-wing ones, they represent 15.44% of them. This share is almost entirely driven by the UDF before 2007, which was the most important party among those who frequently made coalitions with the UMP or the RPR. The main contrast with Table 1.A.1 is the relatively low share of other right-wing candidates and other left-wing ones. This illustrates the fact that this reporting is more specific to local ballots. It also appears that no county executive chiefs are far-right or far-left.

Regarding this political landscape, municipal and county councils are classified into five categories of political affiliation:

- *Right-wing councils*: this group is made of the main right-wing party, smaller right-wing organisations, as well as other right-wing candidates. Grouping all these incumbents together is consistent with the above description of the French political context, since coalitions between right-wing parties is a frequent practice, and reporting to be right-wing without any party of affiliation seems to be specific to local ballots but may not be a sign of independence from political organisations.

- *Left-wing councils*: this group is analogous to the first one. It is made of the PS, smaller left-wing parties, as well as other left-wing candidates.

- *Far-right councils.*

- *Far-left councils.*

- *"Other councils"*: this group is made of all incumbents which cannot be classified on the left or on the right of the political spectrum. This is the case of the MODEM, other specific parties as well as candidates who report neither a party of affiliation, nor a political orientation.

Table 1.A.1: Political affiliations - running lists in municipal elections

UMP/RPR	9.74%
PS	5.49%
Right-wing coalition	11.45%
Left-wing coalition	23.85%
Small right-wing parties	0.00%
Small left-wing parties	2.34%
Other right-wing candidates	22.48%
Other left-wing candidates	13.74%
Centrists[a]	4.32%
Far-right	1.91%
Far-left	1.77%
Independent candidates	2.91%
TOTAL	100.00%

Source: French Home Office.
This table represents the share of each kind of political affiliation among all running lists in municipal elections of 2001 and 2008 for municipalities over 3,500 inhabitants. See the text (Section 1.A) for a definition of the different political affiliations mentioned in this table.
[a] This category corresponds to the Modem and running lists associated to UDF after 2007.

Table 1.A.2: Political affiliations - executive chiefs of county councils

UMP/RPR	26.32%
PS	42.11%
Small right-wing parties	15.44%
Small left-wing parties	5.61%
Other right-wing candidates	8.42%
Other left-wing candidates	0.70%
Centrists[a]	1.40%
TOTAL	100.00%

This table represents the share of each political affiliation among all county executive chiefs over the period 2002-2011. See the text (Section 1.A) for a definition of the different political affiliations mentioned in this table.
[a] This category includes executive chiefs reported as being member of UDF after 2007.

1.B Control variables

Covariates included in regressions are the following. First, I control for total municipal population (in logarithm). Some municipal investments may need a critical size in terms of inhabitants to be funded. In such cases, counties may allocate more investment grants to smaller municipalities. This is why one can expect a negative sign of the coefficient on total municipal population. Second, I control for municipal area (in logarithm). Given the inclusion of total municipal population, this is equivalent to control for population density. Municipal area may increase the cost per inhabitant of transportation facilities. Since municipalities are in charge of local roads, one can expect that municipal jurisdictions with a higher area given their population receive more investment grants. Third, I control for the share of people aged 14 and less in the municipal population and the share of people aged 65 and over. As an important part of municipal facilities are intended to young people (e.g. primary schools, cultural activities) and elderly people (e.g. retirement houses), one can expect a positive sign on these two variables. The vector X_{ie-1} also includes the median inhabitants' income per unit of consumption (in logarithm).[40] As one of the competencies of counties is social policy, one can expect that county councillors will decide to allocate more grants to lower income municipalities. I take the median instead of the mean, since this last indicator is by definition highly impacted by extreme values in the distribution of income. Still regarding the responsibility of counties in social policy, coefficients of interest are estimated after controlling for the municipal unemployment rate, as

[40]The number of consumption units is a measure of households size used by INSEE. It takes into account economies of scale in consumption needs according to household's size. The rule is the following: one unit for the first adult, 0.5 unit per other individual who is 14 or more and 0.3 unit per child below 14.

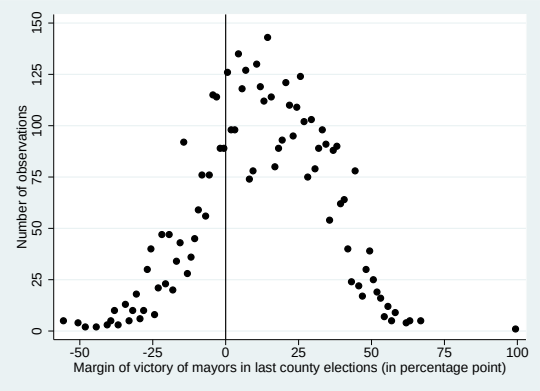
well as the log of fiscal potential per capita of the municipality.[41] I also control for the share of self-employed among the population in employment, as well as the share of high-skilled workers (used as a proxy for higher education). These two variables aim at capturing local preferences of voters for redistribution. They may have explanatory power on discretionary investment grants, since public investment corresponds to future in-kind redistribution.[42] Control variables also include a dummy equal to one for left-wing municipalities. Although there is mixed evidence on whether political parties per se matter on local policies (Ferreira & Gyourko (2009), Solé-Ollé & Viladecans-Marsal (2013)), this dummy can in any case be useful since some components of voters preferences for public investment may be correlated with the political affiliation of the mayor. Finally, covariates include a dummy for each status of inter-municipal cooperation (see Section 1.2), the reference group being municipalities which are not in an inter-municipal community. Although there is mixed evidence on the impact of inter-municipal cooperation on municipal spending (Frère et al. (2013), Guengant & Leprince (2006), Leprince & Guengant (2002)), one could expect that municipalities with a higher degree of cooperation will undertake less investment, as a result of the delegation to the community.

[41] The fiscal potential of a municipality is the sum of all its local tax bases multiplied by the average tax rate over the French territory. In other words, it is the amount of fiscal revenues a municipality could get if it applies tax rates municipalities decide on average. This variable could be seen as being redundant with median income. However, French local taxes are mainly based on real estate, with tax reductions and exemptions for low-income households. Then, municipalities with the same median income can have different values of fiscal potential. Table 1.D.1 in Appendix gives a description of municipal taxes.

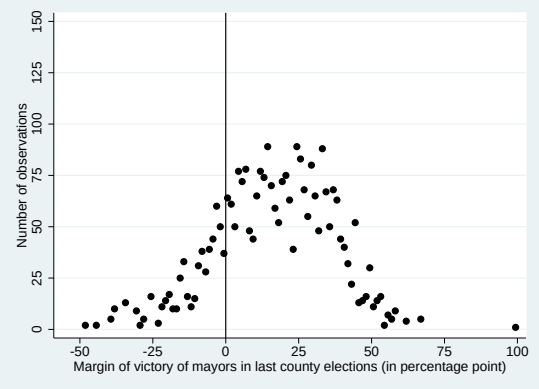
[42] Alesina & Ferrara (2005) show that self-employed have a lower preference for redistribution, which could be explained by a lower risk-aversion or a more "individualistic behaviour" of this category of worker. Moreover, Alesina & Giuliano (2011) show that higher education has a negative impact on preferences for redistribution, which can be interpreted as the result of expectations of social mobility due to higher education.

1.C Additional figures

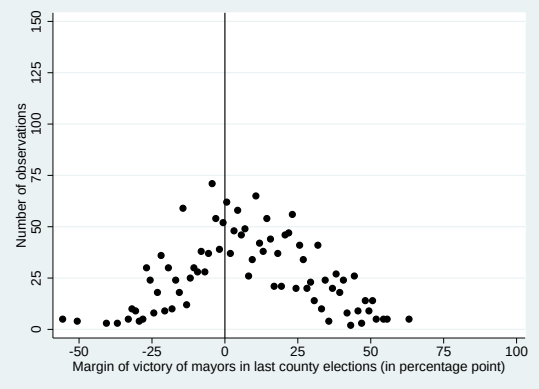
Figure 1.C.1: Number of observations per bin of the margin of victory of mayors in last county elections



(a) *Whole sample*



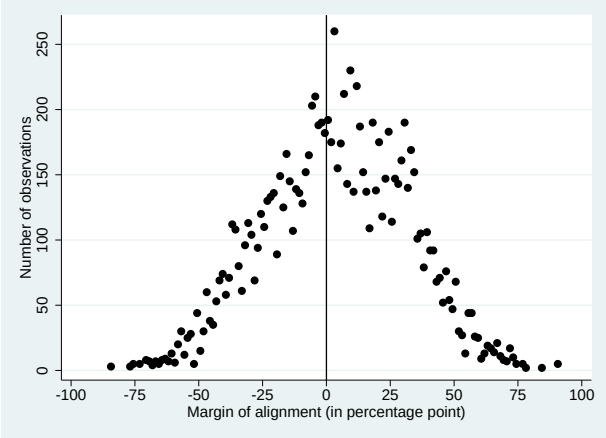
(b) *Aligned municipalities*



(c) *Non-aligned municipalities*

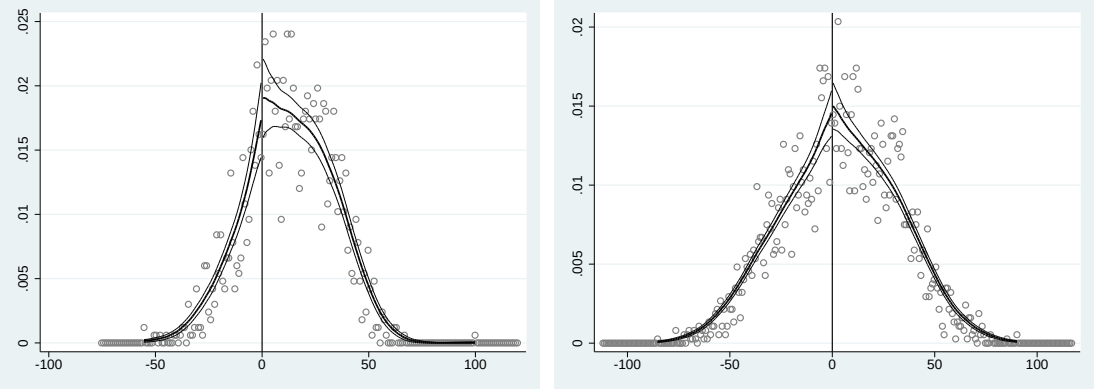
These figures show for the sample used for the RDD on multiple office-holding (described in Column (2) of Table 1.2), and for the two resulting split samples according to alignment, the number of observations in each bin of the margin of victory of mayors in last county elections, with a bin width of 1.25 percentage point.

Figure 1.C.2: Number of observations per bin of the margin of alignment



This figure shows for the sample used for the RDD on alignment (described in Column (4) of Table 1.2) the number of observations in each bin of the margin of alignment, with a bin width of 1.25 percentage point.

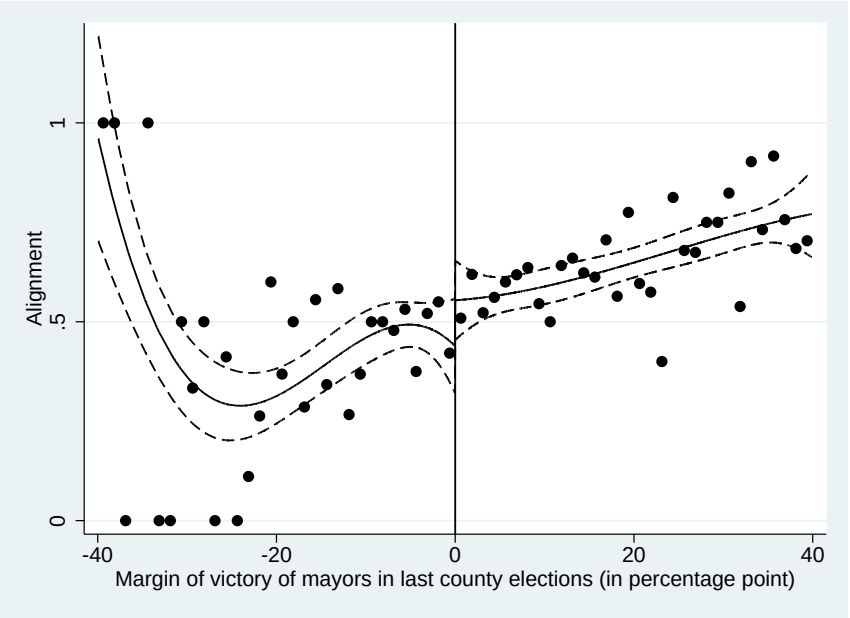
Figure 1.C.3: McCrary test for no discontinuity at the cut-off



(a) *Margin of victory of mayors in county elections* (b) *Margin of alignment*

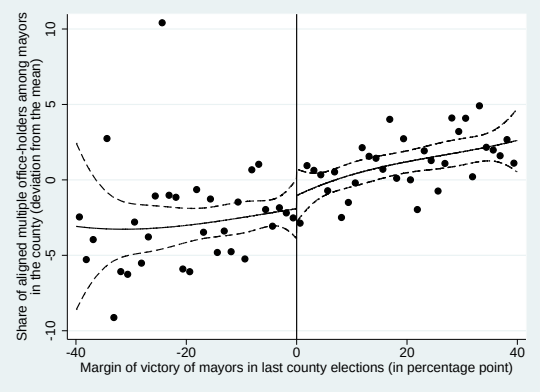
These two figures show the density of assignment variables, and show 95% confidence intervals from the test of no discontinuity at the cut-off, following McCrary (2008). The figure on the left shows this test for the margin of victory of mayors in last county elections (MV_{it}), while the figure on the right shows the analogous picture for the margin of alignment (MA_{it}).

Figure 1.C.4: Validity test of the *HLATE* estimation - Political alignment according to the margin of victory of mayors in last county elections

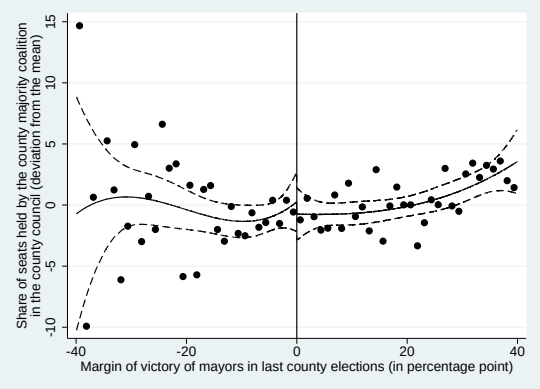


This figure shows the fitted curve from the estimation of Equation (1.1) (with no covariate and fixed effect) where the dependent variable is the alignment dummy. As the alignment dummy and the margin of victory in last county elections are constant for a given municipality over a political cycle, this estimation is run by keeping only one observation per municipality per political cycle. The point estimate on the multiple office-holding dummy from the represented regression (i.e. the effect at the cut-off) is 0.12, with a robust standard error of 0.08. Dashed lines represent 95% confidence intervals. Each dot represents the average of the alignment dummy in each bin of the margin of victory of mayors in last county elections, with a bin width of 1.25. See Figure 1.C.1a which shows the number of observations in each bin.

Figure 1.C.5: Validity tests for the investigation of mechanisms - Variables of interaction according to the margin of victory of mayors in last county elections



(a) *The share of aligned multiple office-holders among mayors in the county (deviation from the mean) - in percentage point*



(b) *The share of seats held by the county majority coalition in the county council (deviation from the mean) - in percentage point*

These figures show the fitted curve from the estimation of Equation (1.1) (with no covariate and fixed effect) where the dependent variable is an interaction variable used for the investigation of mechanisms underlying baseline findings on the effect of multiple office-holding. As these variables and the margin of victory in last county elections are constant for a given municipality over a political cycle, these estimations are run by keeping only one observation per municipality per political cycle. For the share of aligned multiple office-holders among mayors in the county, the point estimate on the multiple office-holding dummy from the represented regression (i.e. the effect at the cut-off) is 0.88, with a robust standard error of 1.36. For the share of seats held by the county majority coalition in the county council, these two statistics are respectively -1.02 and 1.66. Dashed lines represent 95% confidence intervals. Each dot represents the average of the dependent variable in each bin of the margin of victory of mayors in last county elections, with a bin width of 1.25. See Figure 1.C.1a which shows the number of observations in each bin.

1.D Additional tables

Table 1.D.1: Revenues of French municipalities in 2011

Category of revenue	Amounts (in € per head)	Share in operating revenues	Share in investment revenues	Share in total revenues
Operating section				
Local taxes[a]	713	60.1%	.	48.8%
Formula-based operating grants	300	25.3%	.	20.5%
Other operating revenues[b]	173	14.6%	.	11.8%
TOTAL operating revenues (1)	1186	100.0%	.	81.1%
Investment section				
Surplus of the operating section[c] (2)	203	.	42.4%	13.9%
Loans	100	.	20.9%	6.9%
Formula-based investment grants	65	.	13.6%	4.4%
Discretionary investment grants	57	.	11.8%	3.9%
from counties	*18*	.	*3.8%*	*1.2%*
from provinces	*9*	.	*1.8%*	*0.6%*
from the Central State	*11*	.	*2.2%*	*0.8%*
from others[d]	*19*	.	*4.0%*	*1.3%*
Assets transfers[e]	54	.	11.3%	3.7%
TOTAL investment revenues (3)	479	.	100.0%	32.8%
TOTAL municipal revenues : (1)+(3)-(2)	1462	.	.	100.0%
Used for operating spending : (1)-(2)	*983*	.	.	*67.2%*
Used for investment spending : (3)	*479*	.	.	*32.8%*

Source: DGFiP (French Ministry of Economy and Finance).

The first column of this table represents the sum of each category of investment revenue over all French municipalities in 2011, divided by the total French population of this same year. The second (respectively the third) column represents for each category of revenue the ratio between the amount of the first column and the sum of operating revenues (respectively the sum of investment revenues) at the national level. The last column represents for each category of revenue its sum at the national level over the total national amount of municipal revenues.

[a] There are three municipal taxes in France. The housing tax (*la taxe d'habitation*) is paid by residents on the cadastral value of their accommodation. The property tax (*la taxe foncière*) is paid by owners on the cadastral value of their real estate. The local business tax (*la taxe professionnelle*) is paid by firms on their real estate and their production facilities. Municipalities decide tax rates and some tax base reductions for these three taxes.

[b] "Other operating revenues" mainly contain fees and sales.

[c] The budget of each municipality is made of an operating section and an investment one. The national law requires the operating section to be either in equilibrium, or in surplus. In case of a surplus, it can be used to fund investment spending. The item *operating section surplus* refers to this category of investment revenue.

[d] These are grants from inter-municipal communities and the European Union.

[e] This item represents transfers of capital assets due to transfers of competencies.

Table 1.D.2: OLS regressions

	Dependent variable: discretionary investment grants per head from counties (log of)	
	(1)	(2)
Multiple office-holding	-0.00	0.07
	(0.06)	(0.05)
Alignment	0.04	0.07**
	(0.04)	(0.03)
(Alignment)*(Multiple office-holding)	0.33***	0.21***
	(0.07)	(0.06)
log(Municipal surface in km^2)		0.12***
		(0.02)
log(Total population)		-0.11***
		(0.02)
% pop <=14 (in percentage point)		0.01
		(0.01)
% pop >=65 (in percentage point)		0.01**
		(0.00)
log(Median income of residents per UC[a])		-0.61***
		(0.22)
Unemployment rate (in percentage point)		-0.01
		(0.01)
Share of self-employed (in percentage point)		0.02**
		(0.01)
Share of high-skilled workers (in percentage point)		0.00
		(0.00)
log(Fiscal potential per capita)		-0.02
		(0.04)
Left-wing municipality		0.07**
		(0.03)
CC[b]		-0.01
		(0.05)
CA[b]		-0.22***
		(0.05)
CU or SAN[b]		-0.47***
		(0.08)
Fixed effects and covariates[c]	No	Yes
Adjusted R-squared	0.01	0.27
Nb. Obs	14824	14824

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses are clustered at the county council level (one cluster per county per period between two county elections).
This table shows estimations from a baseline OLS specification, with no regression discontinuity setting.
[a] UC : unit of consumption. It is a measure of household size: one unit for the first adult, 0.5 unit per other individual who is 14 or more and 0.3 unit per child below 14.
[b] These variables are dummies for each status of inter-municipal cooperation. See Section 1.2 for a description of these status.
[c] Fixed effects and covariates include year fixed effects (ρ_t), county council fixed effects (μ_c), and covariates represented by the vector X_{ie-1}.

Table 1.D.3: Robustness checks - The heterogeneous effect of multiple office-holding according to alignment with alternative polynomial orders

	Dependent variable: discretionary investment grants per head from counties (log of)			
	HLATE 1st order polynomial	*HLATE* 2nd order polynomial	*Joint RDD* 1st order polynomial	*Joint RDD* 2nd order polynomial
Multiple office-holding	0.17	0.18	0.09	0.19
	(0.12)	(0.14)	(0.13)	(0.15)
Alignment	0.14	0.12	-0.12	0.01
	(0.12)	(0.12)	(0.13)	(0.18)
(Alignment)*(Multiple office-holding)	0.28*	0.30**	0.33**	0.34**
	(0.15)	(0.14)	(0.14)	(0.14)
Fixed effects and covariates[a]	No	No	No	No
Adjusted R-squared	0.02	0.03	0.03	0.03
Nb. Obs	4492	4492	2969	2969
Multiple office-holding	0.09	0.16	0.04	0.17
	(0.11)	(0.13)	(0.13)	(0.16)
Alignment	0.05	0.05	-0.07	0.07
	(0.10)	(0.10)	(0.14)	(0.17)
(Alignment)*(Multiple office-holding)	0.26**	0.26**	0.27**	0.27**
	(0.11)	(0.11)	(0.13)	(0.13)
Fixed effects and covariates[a]	Yes	Yes	Yes	Yes
Adjusted R-squared	0.28	0.28	0.30	0.30
Nb. Obs	4492	4492	2969	2969

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the county council level (one cluster per county per period between two county elections).
The two first columns show results from the *HLATE* estimation (Equation (1.2)), while the two last ones come from the estimation of the joint RDD (Equation (1.3)).
[a] Fixed effects and covariates include year fixed effects (ρ_t), county council fixed effects (μ_c), and covariates represented by the vector X_{ie-1}.

Table 1.D.4: Robustness checks - The average effect of multiple office-holding in different samples

	Dependent variable: discretionary investment grants per head from counties (log of)					
	Polynomial specifications			Local linear regressions		
	1st order	2nd order	3rd order	Opt bwth	0.5*(Opt bwth)	2*(Opt bwth)
				Whole sample		
Multiple office-holding	0.33***	0.34***	0.53***	0.40***	0.76***	0.36***
	(0.10)	(0.12)	(0.17)	(0.15)	(0.23)	(0.12)
Bandwidth				9.66	4.83	19.33
Fixed effects and covariates[a]	No	No	No	No	No	No
Adjusted R-squared	0.01	0.01	0.01	0.02	0.03	0.01
Nb. Obs	4492	4492	4492	1503	834	2684
Multiple office-holding	0.24**	0.30**	0.45***	0.26	0.58*	0.27**
	(0.10)	(0.12)	(0.16)	(0.16)	(0.33)	(0.12)
Bandwidth				9.66	4.83	19.33
Fixed effects and covariates[a]	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.28	0.28	0.28	0.27	0.26	0.27
Nb. Obs	4492	4492	4492	1503	834	2684
				Aligned municipalities		
Multiple office-holding	0.56***	0.59***	0.78***	0.76***	0.83***	0.52***
	(0.15)	(0.20)	(0.25)	(0.21)	(0.30)	(0.18)
Bandwidth				12.12	6.06	24.25
Fixed effects and covariates[a]	No	No	No	No	No	No
Adjusted R-squared	0.01	0.01	0.01	0.03	0.04	0.02
Nb. Obs	2649	2649	2649	969	543	1754
Multiple office-holding	0.45***	0.52***	0.69***	0.63**	0.66	0.39**
	(0.15)	(0.20)	(0.26)	(0.27)	(0.46)	(0.19)
Bandwidth				12.12	6.06	24.25
Fixed effects and covariates[a]	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.30	0.30	0.30	0.33	0.33	0.29
Nb. Obs	2649	2649	2649	969	543	1754
				Non-aligned municipalities		
Multiple office-holding	0.09	0.14	0.21	0.18	0.25	0.11
	(0.14)	(0.19)	(0.24)	(0.17)	(0.23)	(0.14)
Bandwidth				17.18	8.59	34.37
Fixed effects and covariates[a]	No	No	No	No	No	No
Adjusted R-squared	0.00	0.00	0.00	0.00	0.00	0.00
Nb. Obs	1843	1843	1843	1131	636	1758
Multiple office-holding	0.02	-0.01	0.13	0.16	0.35	-0.02
	(0.13)	(0.18)	(0.25)	(0.20)	(0.33)	(0.13)
Bandwidth				17.18	8.59	34.37
Fixed effects and covariates[a]	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.29	0.29	0.29	0.29	0.31	0.29
Nb. Obs	1843	1843	1843	1131	636	1758

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses are clustered at the county council level (one cluster per county per period between two county elections).
These results come from the estimation of the regression discontinuity setting on multiple office-holding, without any heterogeneity according to alignment (Equation (1.1)). This specification is estimated on the whole sample (described in Column (2) of Table 1.2), as well as on the sub-samples of aligned and non-aligned municipalities. For each of these samples, this table shows the estimated multiple offices effect with and without the inclusion of covariates and fixed effects. For robustness concerns, six estimations are run for each sample and each set of controls: polynomial regressions with orders going from one to three, and local linear regressions by considering the optimal bandwith defined by Imbens & Kalyanaraman (2012) as well as half and double this optimal bandwidth.
[a] Fixed effects and covariates include year fixed effects (ρ_t), county council fixed effects (μ_c), and covariates represented by the vector X_{ie-1}.

Table 1.D.5: Robustness checks - The average effect of alignment with alternative regression discontinuity specifications

	Dependent variable: discretionary investment grants per head from counties			
	Polynomial specifications		Local linear regressions	
	1st order	2nd order	0.5*(Opt bwth)	2*(Opt bwth)
Alignment	0.12*	0.18	0.19	0.11*
	(0.07)	(0.11)	(0.12)	(0.07)
Bandwidth			9.95	39.79
Fixed effects and covariates[a]	No	No	No	No
Adjusted R-squared	0.00	0.00	0.00	0.01
Nb. Obs	9108	9108	2949	9088
Alignment	0.10	0.17*	0.18	0.10
	(0.06)	(0.10)	(0.13)	(0.06)
Bandwidth			9.95	39.79
Fixed effects and covariates[a]	Yes	Yes	Yes	Yes
Adjusted R-squared	0.25	0.25	0.28	0.25
Nb. Obs	9108	9108	2949	9088

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses are clustered at the county council level (one cluster per county per period between two county elections).
These results come from the estimation of the RDD on alignment (Equation (1.4)). The first and the second columns show point estimates from first and second order polynomial specifications, while the third and the last ones show results from local linear regressions, by using respectively half and double the optimal bandwidth defined by Imbens & Kalyanaraman (2012). For each of these columns, this table shows results from two regressions: one which includes no additive control, and another one which includes covariates as well as year and county councils fixed effects.
[a] Fixed effects and covariates include year fixed effects (ρ_t), county council fixed effects (μ_c), and covariates represented by the vector X_{ie-1}.

Table 1.D.6: Test for no discontinuity in covariates at the cut-off - P-values of the Chi-Square test performed from the SUR model

	Polynomial specifications			Local linear regressions		
	1st order	*2nd order*	*3rd order*	*Opt bwth*	*0.5*(Opt bwth)*	*2*(Opt bwth)*
RDD on multiple office-holding	0.190	0.199	0.143	0.322	0.044	0.176
RDD on alignment	0.000	0.365	0.103	0.168	0.374	0.000

For each RDD, the implemented SUR model contains one equation per covariate of the vector X_{ie-1} (see Section 1.B for a description of this set of covariates). Each equation of the system consists in replacing the dependent variable in the tested RDD by a different covariate. See the text (Section 1.5.2) for more details on this procedure.

Chapter 2

The Returns from Private and Political Connections: New Evidence from French Municipalities

This paper uses the detailed curricula of French ministers and the detailed accounts of French municipalities to identify governmental investment grants targeted to specific jurisdictions. We distinguish between municipalities in which a politician held office before being appointed as a government's member and those in which current ministers lived during their childhood. We provide evidence that municipalities in which a minister held office during her career experience a 45% increase in the amount of discretionary investment subsidies they receive during the time the politician they are linked to serves as minister. In contrast, we do not find any evidence that subsidies flow to municipalities from which ministers originate. Additional evidence highlights a persistence of the impact of intergovernmental ties, suggesting a key role of information transmission through connections.

2.1 Introduction

Economic agents can get returns from connections. Recent contributions raised the importance of connections in local favoritism. Hodler & Raschky (2014) and Carozzi & Repetto (2016) provided empirical evidence that regions of birth of politicians are favored in terms of economic development or public funds. Jennes & Persyn (2015) provide evidence that members of government tend to favor their electoral district. These contributions highlight the impact of both private and political connections. However, these ties are of different nature, and are plausibly related to different mechanisms.

This paper investigates in a single framework the impact of different kinds of connections on the allocation of governmental subsidies. To this end, we use an original data set that contains the detailed curricula of all French ministers that held office between 2000 and 2013. Together with ministers' terms and municipalities detailed accounts, these data help us to identify governmental subsidies targeted to specific municipalities and to distinguish between different kinds of connections between ministers and municipalities. We achieve this by constructing two types of links through which a municipality might be connected to a minister. Namely, we distinguish between municipalities in which a politician held office before being appointed as a government's member and those in which current ministers lived during their childhood (proxied by the birth town and the municipality in which the minister attended high school).

Municipality fixed effects regressions allow us to provide evidence that municipalities in which a minister held office during her career experience a 45% increase in the amount of discretionary investment subsidies they receive from the central state by the time the politician they are linked to serves as a minister. In contrast, we do not find any evidence that subsidies flow to municipalities from which ministers originate. These findings are robust to a variety of tests such as a placebo test using formula-based municipalities' transfers or explicitly accounting for the potential inertia of investment grants. They are effectively related to a targeting to politically connected jurisdictions, as there is no evidence that neighboring municipalities also receive larger grants.

The main source of variation of our identification strategy is the time a politician is appointed as minister. Fixed effects regressions enable us to compare how subsidies that flow to municipalities evolve once the politician they are connected to is appointed as a minister. This difference-in-differences setting requires a careful definition of the control group as the probability for a municipality to be linked to a future minister is arguably not randomly distributed over the population of cities. Connected municipalities do differ from non-connected ones in some dimensions such as size and political orientation for example. We thus use three different control groups. The first one is made of all French municipalities. The second is constituted by municipalities with more than $10,000$ inhabitants as size is an important determinant of the probability to be connected to a minister at some point in time. We finally construct a third control group by using propensity score matching to ensure that observable characteristics balance between treated and control municipalities. All empirical results hold when using the three control groups.

This paper's empirical setting enables us to evaluate returns to different kinds of connections in a single framework. Empirical evidence we present supports the view that what matter are political connections rather than private ones. This result contrasts with previous contributions that highlighted the key role of private ties. From a bird's eye view, this finding suggests that politicians' career concerns are the main driver of subsidies' targeting. This echoes evidence on the importance of career concerns provided by Castells & Solé-Ollé (2005), Aidt & Shvets (2012), and Albouy (2013) among others. One can also expect that ministers have better information on municipalities they are politically connected to,[1] or having more ties with municipalities in which they held office than with those they originate from.

Additional evidence speaks in favor of information being the driver of our findings. We indeed provide evidence that the targeting in favor of municipalities in which a minister held office during her career persists once the politician terminates her term in the government. This contrasts with Hodler & Raschky (2014), who do not find such a persistence of the effect toward birth places of political leaders. Despite the limited time span for which French municipalities' detailed accounts are available, this novel finding suggests that connections play a key role on the allocation of intergovernmental transfers through information transmission. Intergovernmental grants of interest are allocated in a discretionary way between jurisdictions which explicitly applied for them through a specific investment project. Municipalities' information about grants' application and allocation processes may be imperfect. It is likely that ministers share such information with municipalities they are connected to. Municipalities may benefit from this better information even after the minister left her office in the national government. An alternative explanation of this persistence is in terms of network. Ministers may use the network they accumulated during their experience in national government to influence public decisions in favour of their municipality even once they left office in government. However, two additional findings tend to support the mechanism related to information transmission. First, this persistence holds even when the former minister to whom the municipality is connected is not from the same political affiliation than the current national government. Second, there is no heterogeneous difference according to the degree of influence of the minister, measured by her formal rank in government. Finally, we also provide evidence that politically connected municipalities do not receive more grants from intermediate tiers of government. This suggests that ministers do not benefit from any broad influence to play on grants from other administrations than the central State, or to provide any relevant information on transfers they do not formally control.

This paper contributes to the literature on the impact of political links on intergovernmental grants. This strand of research has focused on political ties related to political affiliation. All papers in this literature find that local jurisdictions politically aligned with an upper tier of government receive on average more funds from this layer.[2] By showing that the whole history

[1] Grantors face an issue of asymmetric information in the allocation of subsidies. Given the potential high collective cost of this asymmetry (Besfamille 2004), government members may target jurisdictions for which they have better knowledge, and which they can better monitor.

[2] See Solé-Ollé & Sorribas-Navarro (2008) and Curto-Grau et al. (2014) for Spain, Arulampalam et al. (2009) for India, Brollo & Nannicini (2012) for Brazil, Migueis (2013) for Portugal, and Bracco et al. (2015) for Italy.

of politicians' career matters in the allocation of subsidies, we offer new insights in this research area.

This paper also contributes to the literature on the influence of Governments' executive members on public policy choices. Despite the potential high influence of these politicians, this question has received few attention, relatively to the influence of members of parliament. Most papers find that electoral districts of government's members are favored through higher investment (Golden & Picci 2008), larger grants (Crampton 2004 and Milligan & Smart 2005) or more transfers to inhabitants (Jennes & Persyn 2015). However, these papers only focus on ministers' electoral districts. In contrast, we investigate connections between ministers and local jurisdictions by using the whole curricula and private life of these politicians.

By investigating the impact of different kinds of connection on intergovernmental transfers, we also contribute to the large literature on the impact of political connections on economic activity. Fisman (2001), Faccio (2006), Goldman et al. (2009), Cingano & Pinotti (2013), Coulomb & Sangnier (2014), and Do et al. (2016) among others show that firms connected to elected incumbents gain in value. Bertrand et al. (2007) complement this finding, by providing evidence of political connections' costs for connected firms. Cingano & Pinotti (2013) further show that these costs are compensated by higher sales to the public sector. Fisman et al. (2012) is an exception in this literature, as they find no impact of connections between politics and firms. Our paper brings new insight in this literature, as we highlight that, in addition to play a role on firms' activity, political connections seem to matter as well on the geographical allocation of funds devoted to the provision of public goods.

This paper also contributes to the study of distributive politics in developed countries. These countries are studied in only 37% of the 158 articles listed in the recent literature review by Golden & Min (2013). France appears to be particularly under-studied as Cadot et al. (2006) is the only paper inventoried by Golden & Min (2013) that explicitly focuses on this country by providing evidence that French infrastructure investments were primary driven by political concerns at the turn of the nineties. More recently, contributions by Bertrand et al. (2007) and Coulomb & Sangnier (2014) also contributed to fill this gap by showing how much linked French industry and politics are.

The remainder of the paper is organized as follows. The institutional context, the data, and the estimation strategy are presented in Section 2.2. Empirical results are presented and discussed in Section 2.3. Section 2.4 concludes.

2.2 Data and estimation strategy

This section presents the institutional context, the data we use, and the empirical strategy we adopt.

2.2.1 Institutional context and data

French parliamentary and presidential elections are synchronized since 2002. Shaded areas of Figure 2.1 map the different heads of state and government from 2000 to 2013, together with their respective political orientation. Over this time period, the French government was made of 36 ministers on average. However, its composition regularly changed. Either following parliamentary elections or because of political choices made by the head of the political majority. This gives raise to frequent changes in the identity of ministers as illustrated by instantaneous entries and exits in and from the government represented by spikes of Figure 2.1.

All in all, exactly 200 distinct individuals served as ministers in the French government between 2000 to 2013. The original data set used in this paper contains the detailed curricula of all these politicians. Information have been collected and cross-checked from manual search on various online resources: the French parliament and government's websites, politicians' official websites, Wikipedia, and other occasional resources such as information websites. These resources allowed us to gather detailed information about French ministers' past political career and private life. From the later information, we use birth cities and places where individuals attended high-school to identify municipalities that will at some point benefit from a *private connection* to a minister.[3] Similarly, we define a municipality as benefiting from a *political career connection* if a member of the government once served as municipal councilor or mayor of that municipality.[4] For the definition of both kinds of connection, a politician is considered as being a Member of Government during a given year if she holds this function during at least one day during that year.

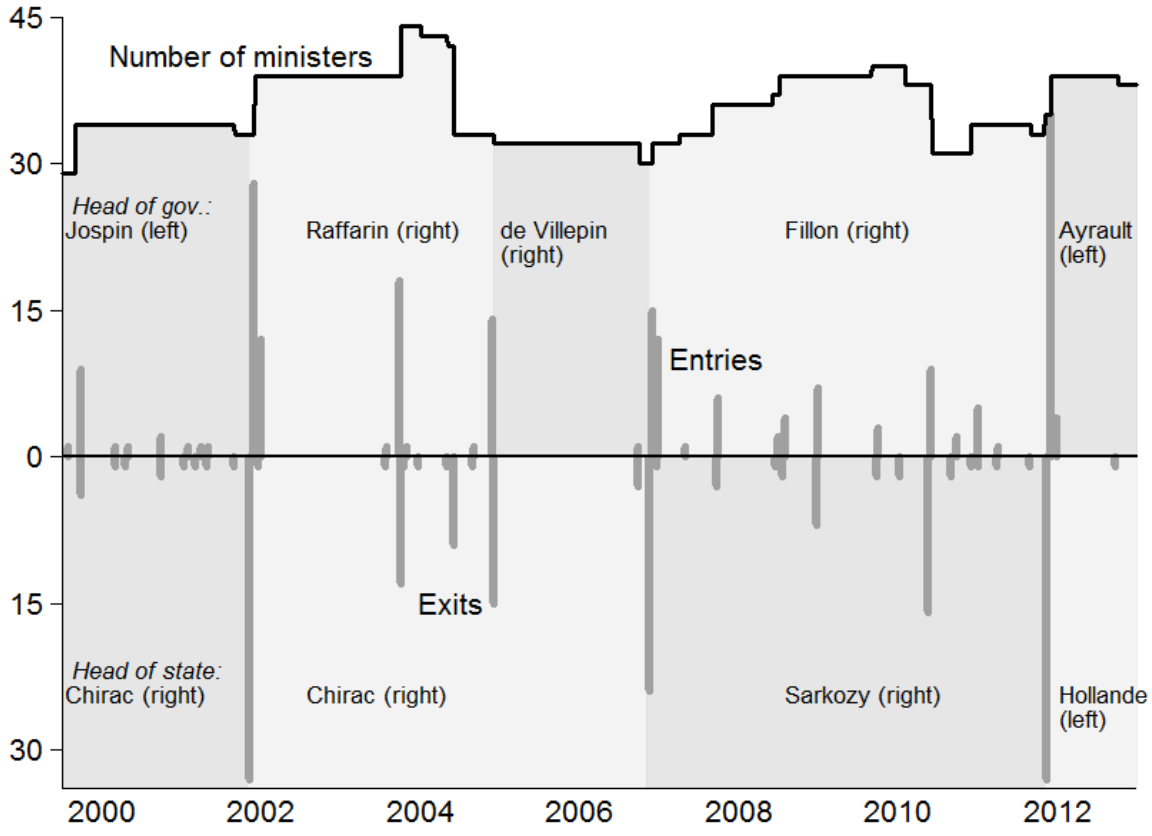
Variations in ministers' past history and in the composition of the French government allow us to assess at each point in time whether or not a municipality benefits from a political or a private connection to a current member of the government. Figure 2.2 plots the yearly number of French municipalities that benefit from such connections. Over the 2000–2013 period, the average yearly number of connected municipalities is 65, with peaks close to 100 in 2002 and 2012 when the political majority changed side.[5] On a average year, 35 municipalities are politically

[3] All birth places of the 200 politicians who have held office in the French government between 2000 and 2013 were identified: 181 in France and 19 abroad. 152 ministers attended high-school in a French municipality and 4 in a foreign cities. This information remains unknown for 44 individuals. All in all, only 7 out of the 200 politicians have no known private connection to some French municipality.

[4] Only 16 out of the 200 politicians have never been elected. These are mostly individuals who were appointed as ministries following a career in the private sector (known as "*issus de la société civile*" in French). 155 served at least once as municipal councilor or mayor (the mayor is elected by and among municipal councilors). The remaining 29 ministers did hold electoral mandates, but not at the municipal level.

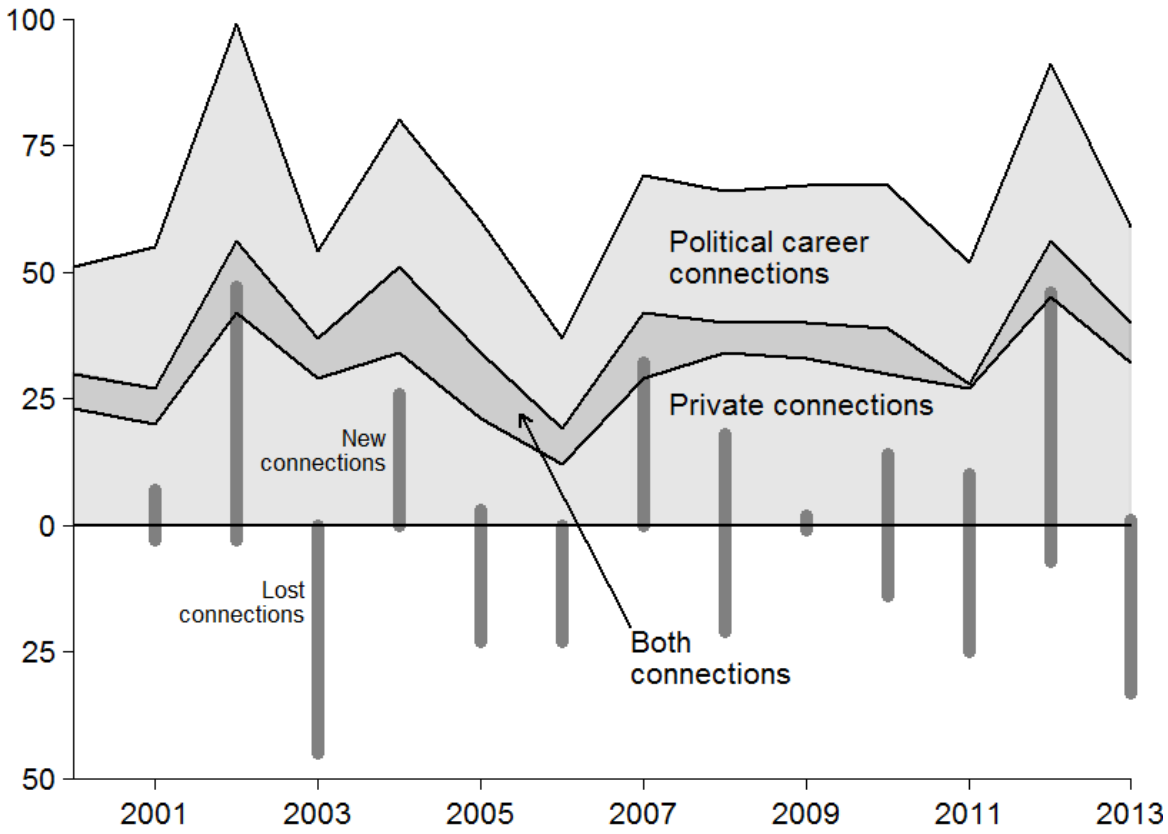
[5] These peaks are a consequence of our choice to consider a politician as being a Member of Government during a given year if she holds such a position at least during one day during the year. Then, by construction, the number of Members of Government is higher during years of transition. We check in Subsection 2.3.2 that our results are not driven by this choice.

Figure 2.1: Political majorities and size of government between 2000 and 2013.



Source: Official composition and daily changes of the French government. Exits followed by re-entries in the government within less than 30 days have been ignored. Entries and exits are aggregated at the monthly level.

Figure 2.2: Yearly number of connected municipalities between 2000 and 2013.



Source: Official composition and daily changes of the French government and authors' original data collection of government's member curricula. A municipality is considered as benefiting from a *political career connection* on year t if a minister who holds office during year t once served as municipal councilor or mayor of this municipality. A municipality is considered as benefiting from a *private connection* on year t if a minister who holds office during year t is born or attended high-school in this municipality. Spikes represent new and lost connections. *New connections* correspond to municipalities that where not connected to any government's member over the previous calendar year. *Lost connections* correspond to municipalities that were connected to a government's member over the previous year but not during the current year anymore.

connected to a minister while 38 benefit from a private connection and 9 benefit from both.[6]

We map information about municipalities that benefit from connections to current government's members into official detailed accounts of French municipalities provided by the French *Direction Générale des Finances Publiques*. These data are available over the 2002–2011 period for all municipalities. They allow us to observe the precise yearly amount of discretionary investment grants allocated to each municipality by the central state. Relying on discretionary grants is key, as such transfers can be easily manipulated and are thus highly relevant to study connection effects. To benefit from these investment grants, municipalities have to send an application in which they present a specific investment project. Municipalities receive on average 54 euros per head of discretionary investment grants each year, all grantors included. This

[6]These average figures only fall to 33, 36, and 8, respectively, when excluding 2002 and 2012.

represents 11% of municipal investment revenues on average. This illustrates the important incidence this grants' allocation may have on the geographical allocation of local infrastructures. Discretionary investment grants allocated by the central state, which is our dependent variable of interest, represent on average 10 euros per head per municipality each year, which accounts on average for 2% of municipal investment resources. These amounts related to discretionary investment grants have to be considered as lower bounds, since some formula-based investment grants include funds for which eligibility depends on a formula, but the allocation between eligible jurisdictions is subject to discretion.[7]

We also use information on political and socio-economic characteristics of municipalities from various official sources. We use local results of municipal and national ballots from the French Home Office. We also rely on information on local population, its age structure and its characteristics regarding employment from the French national census provided by the French National Institute of Statistics and Economic Studies (INSEE). Our final sample of made of the $2,489$ municipalities of more than $3,500$ inhabitants.[8]

2.2.2 Estimation strategy

Given within variations in both kinds of connection illustrated by Figures 2.1 and 2.2, we can uncover whether municipalities experience any increase in the amount of subsidies they received once a politician they are connected to is appointed as a government's member. The panel structure further allows to investigate whether this increase persists once the politician to which the municipality is connected terminates her term in the government. We achieve these objectives by estimating the following fixed effects equation:

$$\begin{aligned} y_{it} &= \beta_1 \text{Political career connection}_{it} + \beta_1' \text{Terminated political career connection}_{it} \\ &+ \beta_2 \text{Private connection}_{it} + \beta_2' \text{Terminated private connection}_{it} \\ &+ \boldsymbol{I}_i + \boldsymbol{I}_t + \alpha + \varepsilon_{it}, \end{aligned} \tag{2.1}$$

where y_{it} denotes the log of per capita amount of discretionary investment grants received by municipality i on year t from the central government, Political career connection$_{it}$ and Private connection$_{it}$ are dummy variables equal to 1 if municipality i is politically or privately connected to a current government's member on year t, Terminated political career connection$_{it}$ and Terminated private connection$_{it}$ are dummy variables equal to 1 if municipality i is connected to a former government's member, $\boldsymbol{I}_i$ and $\boldsymbol{I}_t$ are sets of municipality and year fixed effects, respectively, α is a constant term, and ε_{it} is the error term. The expression also includes interaction terms between connection variables. We estimate equation (2.1) using ordinary least squares

[7] For instance, the *Dotation Globale d'Équipement* (DGE) is an investment grant whose eligibility depends on total municipal population and municipal tax bases. Then, the allocation between eligible municipalities is decided by the central state, after consultation of a committee composed by local elected incumbents. Therefore, the power on this grant allocation is implicitly shared between different actors. This is why we prefer not to consider these grants and to focus on funds whose allocation is decided by one well-identified organisation, without ambiguity.

[8] Municipalities of more than $3,500$ inhabitants represent 68% of the total population of metropolitan France. We also exclude the three largest cities—Paris, Lyon, and Marseille—from the sample as they depart from other French municipalities in many dimensions such as administrative status, size, etc.

and cluster standard errors at the municipality level.

This difference-in-differences setting will allow us to uncover the causal effect of a municipality benefiting from a connection to a minister only if the treatment is as close as possible from random. The treatment—being connected to a current member of the government—can be divided in two steps. First, a municipality must be candidate to the treatment. In other words, it must be linked to a politician that might at some point become a minister. Second, the precise timing of ministers' appointments must not depend on the local situation. This second statement is backed by the mere observation of changes in the government's composition that are mainly due to elections or within-party political debates or disputes. In contrast, the first step of the treatment is more challenging as politicians that will at some point become ministers are likely to hold particular social origins and to have spent their childhood in specific cities. Similarly, early political career experience of top-level politicians are not likely to be random: they often depend on political parties' decisions.[9]

The strategy we use to alleviate this selection issue is to define alternative control groups. As a first candidate counterfactual group, we agnostically select all the 2,320 municipalities that did not benefit from any connection (private of political) to a current government's member between 2002 and 2011. These municipalities however differ strongly from connected municipalities as illustrated by descriptive statistics presented in the left part of Table 2.1 and by the discrepancy between the dashed and the solid size distributions of Figure 2.3. This latter observation leads us to create a second estimation sample from all municipalities with more than 10,000 inhabitants. This condition ensures that compared municipalities will be of comparable size and also improves on comparability across other dimensions as shown by the middle part of Table 2.1. Finally, we construct a third sample thanks to a matching model where the treatment is being privately or politically connected, and that we estimate using observable characteristics measured in 2001. This matching procedure, whose outcome is tabulated in the right part of Table 2.1, allows us to ensure that connected and non-connected municipalities share similar observable characteristics as illustrated for example by the comparison between the doted and the solid size distributions of Figure 2.3. The detailed description of this matching procedure is provided in the Appendix.

2.3 Results

In this section, we present evidence that subsidies accrue disproportionally to municipalities that benefit from a connection to a current government's member. We show that this only applies to municipalities that are politically connected to a minister and that private connections do not bring extra revenues. We then show that these findings are robust to various robustness checks. We also explore the different channels though which ministers may tunnel subsidies and provide additional results that help us to further interpret the main findings.

[9]For example, high-potential politicians are frequently designated as candidates to gain or defend a particular city. Others are also designated as candidates in easy-to-in places as a reward. See Dolez & Hastings (2003) among others.

Table 2.1: Differences in observable characteristics across connected and non-connected municipalities.

	Full sample			$\geq 10,000$ inh.			Matched		
	Connected municipalities	Non-connected municipalities	P-val. of diff.	Connected municipalities	Non-connected municipalities	P-val. of diff.	Connected municipalities	Non-connected municipalities	P-val. of diff.
Population (log of)	10.26	8.99	0.00	10.66	9.90	0.00	9.99	10.02	0.84
Share of pop. under 14	0.18	0.19	0.00	0.18	0.20	0.00	0.18	0.18	0.81
Share of pop. over 65	0.17	0.16	0.02	0.16	0.15	0.03	0.17	0.18	0.86
Median income per UC (log of)[1]	9.75	9.77	0.20	9.76	9.76	0.84	9.74	9.72	0.35
Unemployment rate[2]	0.13	0.11	0.00	0.13	0.12	0.05	0.13	0.13	0.40
Share of self-employed workers[3]	0.06	0.06	0.00	0.05	0.06	0.04	0.06	0.06	0.96
Share of high-skilled workers[3]	0.16	0.13	0.00	0.18	0.14	0.00	0.15	0.15	0.50
Right-wing vote share at last municipal elec.	0.50	0.45	0.01	0.50	0.44	0.00	0.50	0.49	0.72
Right-wing vote share at the 2002 presidential elec.	0.38	0.35	0.00	0.37	0.34	0.00	0.38	0.37	0.52
Right-wing mayor	0.33	0.45	0.00	0.32	0.45	0.01	0.33	0.37	0.44
Mayor is member of the parliament	0.38	0.07	0.00	0.44	0.15	0.00	0.31	0.32	0.79
P.c. housing tax base (log of)	7.06	6.90	0.00	7.08	6.97	0.00	7.05	7.04	0.88
P.c. property tax base on built assets (log of)	7.06	6.82	0.00	7.07	6.93	0.00	7.04	7.02	0.75
P.c. property tax base on non-built assets (log of)	1.84	2.48	0.00	1.64	1.90	0.00	1.98	1.98	0.98
P.c. business tax base (log of)	7.37	7.03	0.00	7.42	7.22	0.00	7.32	7.35	0.73
Belongs to a *communauté de communes*[4]	0.23	0.37	0.00	0.15	0.22	0.06	0.26	0.30	0.50
Belongs to a *communauté d'agglomération*[4]	0.36	0.29	0.05	0.40	0.34	0.17	0.31	0.28	0.60
Belongs to a *communauté urbaine*[4]	0.09	0.10	0.54	0.10	0.17	0.06	0.07	0.09	0.66
Shared tax decisions[4]	0.17	0.21	0.19	0.13	0.15	0.47	0.18	0.19	0.75
# of municipalities	169	2,320		136	679		134	134	

The set of covariates presented in this table is the one used in the propensity score matching procedure. See Section 2.A in Appendix for a description of these variables. *P.c.* stands for "per capita". *Elec.* stands for "election". *P-val. of diff.* stands for "p-value of difference". All variables are measured in 2001, except *Right-wing vote share at the* 2002 *presidential election* which is measured in 2002, and variables on local tax bases, for which we do have information only from 2002. Then, this table comes from a sample with one observation per municipality, with no panel dimension. *Connected municipalities* are municipalities that benefit from a political career or a private connection to a government's member at least once between 2002 and 2011 (see the text for the definitions of connections). The full sample is made of all French municipalities of more than 3,500 inhabitants. The $\geq 10,000$ inhabitants sample is made of all French municipalities of more than 10,000 inhabitants. The matched sample has been constructed following a matching procedure on the probability for a municipality to benefit from any type of connection (see Section 2.A in Appendix for more details on this matching procedure).

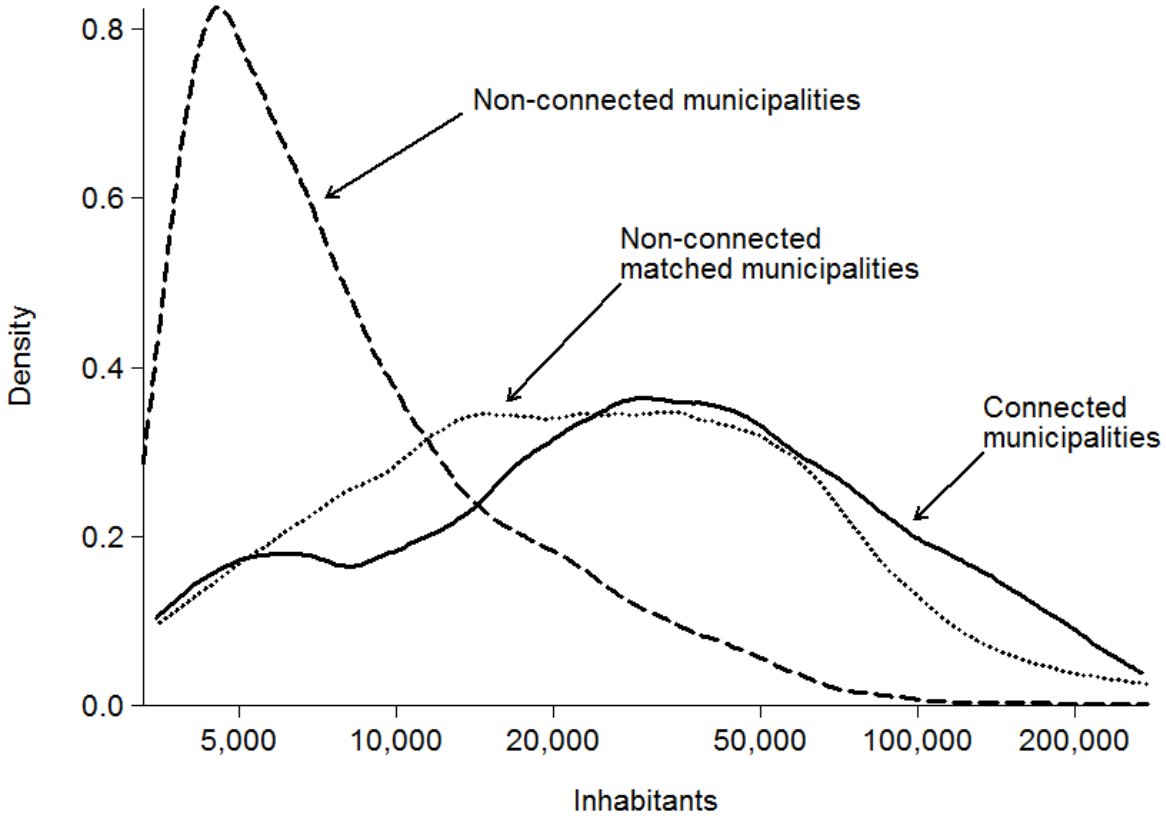
[1] UC : unit of consumption. It is a measure of household size: one unit for the first adult, 0.5 unit per other individual who is 14 or more and 0.3 unit per child below 14.

[2] : This is the unemployment rate among the labour force between 25 and 54 years old.

[3] : These variables provide a decomposition of the active labour force between 25 and 54 years old in terms of socio-professional categories.

[4] : *Communauté de communes*, *communauté d'agglomération*, and *communauté urbaine* refer to status of inter-municipal cooperation. *Shared tax decisions* is a dummy relative to the fiscal sharing between municipalities and their inter-municipal community. See Section 2.A in Appendix for an explanation of these variables related to intermunicipal cooperation.

Figure 2.3: Size distributions of connected and non-connected municipalities.



Source: Authors' calculation. The 169 *connected municipalities* are municipalities that benefit from at least one private or political connection to a current government's member between 2002 and 2011. The 2,320 *non-connected municipalities* are municipalities that did not benefit from any connection to a current government's member between 2002 and 2011. The 134 *non-connected matched municipalities* are a sub-group of non-connected municipalities selected following a matching procedure. See Table 2.1 for descriptive statistics on this matched sample, and Section 2.A in Appendix for a full description of this matching procedure.

2.3.1 Main results

Columns 1–3 of Table 2.2 present the estimated coefficient of Equation (2.1) when treating identically both types of connections, i.e. without making a distinction between political career connections and private ones. Estimates turn out to be positive whatever the sample used. Their magnitude however decreases as the counterfactual group becomes better defined. The matched sample even provide us with estimates that are not statistically significant at conventional levels.

Columns 4–6 of Table 2.2 decompose the previous estimates depending on the type of connection. Connections associated to the political career of a current minister appear to have a large and positive effect on investment subsidies' flows. Interestingly, this effect seems to persist even once the minister the municipality is connected to has left office at national government. In contrast, we do not find evidence that private connections to current government's members allow municipalities to benefit from larger discretionary investment grants.[10] The absence of any significant effect of private connections is key, as it is in tension with previous papers which highlighted the significant role of private ties on local favoritism. This difference of evidence between political and private connections suggests that (i) ministers give support to municipalities as a result of political motives, or (ii) that they have better information on municipalities they are politically connected to[11], or (iii) that they have more proximity with jurisdictions in which they held office, or (iv) that they are more solicited by incumbents of municipalities in which they held office than by those of municipalities they originate from.

All in all, estimates presented in Table 2.2 suggest that the amount of discretionary investment grants increase by about 50% by the time one of a municipality's former or current incumbent becomes a government's member. This effect persists and even seems to become larger once the politician has left office in national government. This latter finding is consistent with (i) some decisions needing time to be taken and/or having lasting consequences, (ii) municipalities being able to continue using accumulated information related to grants application even once their direct connections to the government are terminated, and (iii) former ministers being able to continue to lobby in favor of specific municipalities even once they have left office. This persistence results however need to be taken with caution as one of the main limit of this paper lies in the short time period under scrutiny.[12]

[10] These point estimates are computed without the inclusion of time-varying covariates related to political and socio-economic characteristics of municipalities, as these factors have few yearly variations for a given municipality. Point estimates after the inclusion of a set of covariates are shown in Appendix (Table 2.C.1), and illustrate the fact that evidence remains almost unchanged after the inclusion of these controls. We take the same set of covariates used for the implementation of the propensity score matching. See Section 2.A in Appendix for a description of these variables.

[11] When allocating intergovernmental transfers, the central political power has to face a problem of asymmetric information. A grantor may have imperfect knowledge on the quality of local incumbents and mayors can benefit from this position to exaggerate their needs and preferences in new infrastructures. Although some incentive devices can emerge from this setting, it may have an important collective costs, as some investment projects with high benefits may be rejected while some others with low benefits may be accepted (Besfamille 2004). Given this setting, it may be efficiency improving for the central state to target municipalities they directly or indirectly know the best and over which they may have higher monitoring power.

[12] In particular, while information we use on current connections are exhaustive, we do not observe an unknown number of terminated connections as information on ministers' curricula only covers individuals who were member of the government between 2000 and 2013.

Table 2.2: Effect of being politically or privately connected to a current government's member on discretionary investment grants received by a municipality.

Dependent variable : Per capita grants received from the central government (log of)

Sample:	(1) Full	(2) $\geq 10,000$ inh.	(3) Matched
Any connection	0.300**	0.265**	0.203
	(0.117)	(0.133)	(0.143)
Any terminated connection	0.372***	0.256*	0.103
	(0.120)	(0.143)	(0.150)
Sample:	(4) Full	(5) $\geq 10,000$ inh.	(6) Matched
Political career connection	0.490***	0.521***	0.452**
	(0.164)	(0.147)	(0.211)
Terminated political career connection	0.695***	0.586***	0.434**
	(0.158)	(0.176)	(0.189)
Private connection	0.037	-0.047	-0.072
	(0.165)	(0.219)	(0.190)
Terminated private connection	0.046	-0.099	-0.171
	(0.182)	(0.231)	(0.220)

*** p<0.01, ** p<0.05, * p<0.1. White heteroskedastic standard errors clustered at the municipality level in parentheses. OLS regressions. Each column presents estimates from a separate regression. All regressions include a constant term, year and municipality fixed effects. Regressions presented in columns 4–6 also include interaction terms between the two types of connections. The dependent variable is the log of yearly per capita discretionary investment grants received by a municipality from the central government. *Political career connection* and *private connection* are dummy variables equal to 1 if the municipality is politically or privately connected to a current government's member (see the text for the definitions of connections). *Terminated political career connection* and *terminated private connection* are dummy variables equal to 1 if a municipality was, but is not anymore, connected to a government's member. *Any connection* and *any terminated connection* do not distinguish between political career and private connections. The full sample is made of all French municipalities of more than $3,500$ inhabitants. The $\geq 10,000$ inhabitants sample is made of all French municipalities of more than $10,000$ inhabitants. The matched sample has been constructed following a matching procedure on the probability for a municipality to benefit from any type of connection. See Table 2.1 for descriptive statistics on these three samples, and Section 2.A in Appendix for a description of the propensity score matching implementation.

There is however still sufficient variation in the data to further investigate the dynamics of the effect we are interested in. We achieve this by estimating a modified version of Equation (2.1) in which we decompose each of the two sets of dummy variables into finer time periods relative to the appointment as minister of the politician a municipality is connected to. More precisely, we replace Political career connection$_{it}$ and Terminated political career connection$_{it}$ in Equation (2.1) by ten dummies. Two dummies for the two years before a municipality gets politically connected, two dummies for the two first years of political connection, one dummy for all subsequent years of this treatment, four dummies for the four first years of terminated political career connection, and one dummy for all subsequent years of this post-treatment. We include ten other similar dummies for private connections. Figure 2.4 plots the associated series of estimates that we obtain using the full sample.[13] This graphical representation allows us to clearly see that (i) connected municipalities do not receive more grants than non-connected ones until the start of the connected minister's term, (ii) for political career connections, the effect persists for a while once the term is terminated, and (iii) private connections definitely do not trigger any dynamics in the evolution of received grants. This dynamic representation further enables us to state that the above discussed finding about persistence cannot only be due to decisions needing time to be implemented as visual investigation makes clear that subsidies immediately increase once the politician to which a municipality is connected to starts her term.

All in all, the most conservative estimate of Table 2.2 suggests that municipalities that benefit from political career connections to a current member of government experience a 45% increase in the amount of investment subsidies they receive. A back-of-the-envelope calculation suggests that this targeting by politicians represents a total amount of 30 million euros per year. This corresponds to 7.8% of the total budget allocated by the central government to discretionary investment grants transferred to municipalities.[14]

2.3.2 Robustness checks

This sub-section presents a series of tests that demonstrate the robustness of our main findings.

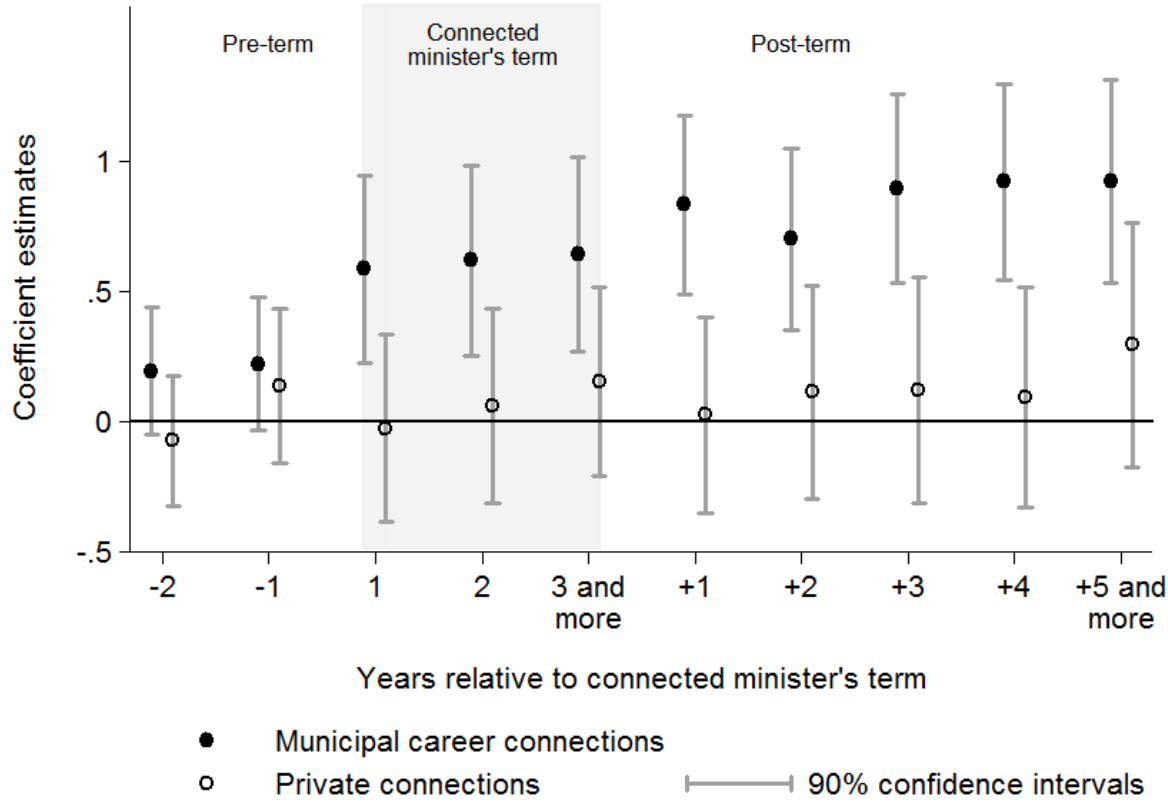
We first start by a placebo test. We estimate again Equation (2.1), but swapping the dependent variable for the per capita *dotation globale de fonctionnement*, a formula-based item of municipalities' detailed accounts that corresponds to funds allocated to municipalities for their general functioning expenditure.[15] As shown by estimates presented in columns 1–3 of

[13] See Figures 2.B.1 and 2.B.2 in Appendix for mirroring estimates obtained using the sample restricted to municipalities of more than 10,000 and the matched sample, respectively.

[14] The detailed calculation is as follows. The most conservative estimate of Table 2.2 is 0.45. It is obtained when using the matched sample. Politically connected municipalities receive on average 14.54 euro per capita as discretionary investment grants during years that immediately precede the beginning of the relevant politician's term as minister. They thus experience a $0.45 \times 14.54 = 6.54$ euros per capita increase in subsidies. The population of municipalities that benefited at least once from a political connection between 2002 and 2011 sums to 4.68 million inhabitants. This implies that they receive together on average $4.68 \times 6.54 = 30.6$ million euros per year because of their connections. This represents 7.8% of the yearly average total budget allocated to discretionary investment grants (394 million euros).

[15] The total *dotation globale de fonctionnement* received by a municipality is derived from a formula that takes into account the number of inhabitants, the age structure of the population, the area, local tax bases, average income of residents, the share of inhabitants who rely on social benefits, and occasional factors such as the fact

Figure 2.4: The dynamics of connections (full sample).



Source: Authors' calculation. Estimates are from an OLS regression of the log of yearly per capita discretionary investment grants received by a municipality from the central government on year and municipality fixed effects, and a series of dummy variables defined relatively to the term of the minister to which the municipality is connected. For both kinds of connection (private and political), we include two dummies for the two years before treatment (-2, -1), two other ones for the two first years of treatment (1, 2), one dummy for all subsequent years of treatment (3 and more), four dummies for the four first years of post-treatment (+1, +2, +3, +4), and one last dummy for all subsequent years of post-treatment (5 and more). The regression also includes interaction terms between the two types of connection. Standard errors are clustered at the municipality level. The sample is made of all French municipalities with more than 3,500 inhabitants. Estimates have been horizontally shifted for aesthetic considerations.

Table 2.3, political and private connections do not have any robust impact on municipalities' formula-based revenues.

Second, we test whether estimates depend on our methodological choice of arbitrarily considering that a municipality is treated a given year as soon as the politician it is connected to served as minister for at least one day during that year. We thus remove each connected municipality's first and last years in treatment from the sample. Estimates tabulated in columns 4–6 of Table 2.3 show that these restrictions hardly affect findings.

As a third robustness check, we introduce the lagged dependent variable as supplementary explanatory variable to explicitly account for the potential time structure of investment grants allocated to municipalities. While this variable is indeed positively and significantly correlated to the dependent one, its introduction in Equation (2.1) leaves estimates of interest qualitatively unchanged as shown by columns 7–9 of Table 2.3.

Moreover, we show in columns 10–12 of Table 2.3 that estimates we obtain on the matched sample are not particularly sensitive to the approach used to construct this particular sample. Namely, we construct two distinct matched samples by separately considering political career connections and private connections. This allow us to estimate the effect of each type of connection on a distinct sample whose composition is not affected by the alternative type of connection. We obtain estimates that are consistent with those of the main specification. This also holds true when using the union of both preceding matched samples. Summary statistics related to these alternative matched samples are provided in the Appendix.

One issue with our measure of political connections is that it might capture private links as well. It is indeed likely that politicians once served as municipal counselors in locations they privately know best. In order to check whether our baseline political connection effect is driven by private links, we investigate the heterogeneity of this effect according to the potential private content of political connections. We achieve this thanks to the fact that the central administration of political parties frequently designate candidates to run for local elections in places from which they do not originate. This practice, called "political parachuting" (*parachutage politique*) is common in France, as highlighted by Dolez & Hastings (2003). We use two alternative ways to identify parachuted politicians. First, a member of government is considered as having been parachuted in a municipality in which she held office if that municipality is located in a different *département* than the one in which she were born or went to high school.[16] Second, we use an analogous measure, using the *régions* instead of the *départements*.[17] For each of these two measures, we interact our dummies of connection with a dummy equal to one in case of parachuting. Columns 13–18 of Table 2.3 show that baseline effects of political career connections are not driven by unparachuted politicians, suggesting that they are not the result of private links that would be embedded into political ones.

that part of a municipality's area overlaps with a national park.

[16]The *département* is the second tier of the French decentralization architecture (starting from the lower layer, which is the municipality). Metropolitan France has 96 *départements*.

[17]The *régions* constitute the tier of government between the *départements* and the central state. Metropolitan France had 22 *régions* until 2016.

Table 2.3: Effect of being politically or privately connected to a current government's member on discretionary investment grants received by a municipality: *robustness tests*.

Dependent variable : Per capita grants received from the central government (log of), except if differently specified			
Per capita *dotation globale de fonctionnement* (log of) as dependent variable			
	(1)	(2)	(3)
Sample:	Full	$\geq 10,000$ inh.	Matched
Political career connection	-0.013	-0.020	-0.035
	(0.036)	(0.042)	(0.042)
Private connection	-0.092**	-0.079*	-0.038
	(0.043)	(0.047)	(0.050)
Excluding transition years			
	(4)	(5)	(6)
Sample:	Full	$\geq 10,000$ inh.	Matched
Political career connection	0.438***	0.425***	0.393*
	(0.162)	(0.130)	(0.225)
Private connection	0.081	-0.023	-0.036
	(0.171)	(0.208)	(0.192)
Including lagged dependent variable as explanatory variable			
	(7)	(8)	(9)
Sample:	Full	$\geq 10,000$ inh.	Matched
Lagged dependent variable	0.138***	0.193***	0.146***
	(0.009)	(0.016)	(0.027)
Political career connection	0.356***	0.252**	0.432***
	(0.121)	(0.110)	(0.163)
Private connection	-0.061	-0.118	-0.082
	(0.169)	(0.212)	(0.180)
Different matched samples			
	(10)	(11)	(12)
	Matched on	Matched on	Union of
Sample:	political connections	private connections	both samples
Political career connection	0.329**		0.350**
	(0.138)		(0.135)
Private connection		-0.018	-0.130
		(0.182)	(0.164)
Heterogeneity - parachuting according to the *département*			
	(13)	(14)	(15)
Sample:	Full	$\geq 10,000$ inh.	Matched
Political career connection	0.600*	0.438	0.891**
	(0.324)	(0.305)	(0.402)
Political career connection × (Parach. in another *département*)	-0.140	0.126	-0.536
	(0.366)	(0.338)	(0.465)
Private connection	0.035	-0.048	-0.064
	(0.167)	(0.224)	(0.194)
Heterogeneity - parachuting according to the *région*			
	(16)	(17)	(18)
Sample:	Full	$\geq 10,000$ inh.	Matched
Political career connection	0.475*	0.528**	0.512
	(0.269)	(0.235)	(0.396)
Political career connection × (Parach. in another *région*)	0.075	0.038	-0.093
	(0.311)	(0.286)	(0.436)
Private connection	0.031	-0.056	-0.073
	(0.165)	(0.219)	(0.194)

*** p<0.01, ** p<0.05, * p<0.1. White heteroskedastic standard errors clustered at the municipality level in parentheses. OLS regressions. Each column presents estimates from a separate regression. All regressions include a constant term, year and municipality fixed effects, as well as variables corresponding to terminated connections (see Table 2.2 and Equation (2.1)), and interaction terms between the two types of connections. The dependent variable is the log of yearly per capita discretionary investment grants received by a municipality from the central government, except in columns 1–3 where the dependent variable is the log of yearly per capita *dotation globale de fonctionnement* (a formula-based item). *Political career connection* and *private connection* are dummy variables equal to 1 if the municipality is politically or privately connected to a current government's member (see the text for the definitions of connections). In columns 4–6, observations that correspond to a connected municipality's first and last years in treatment are excluded from the sample. The full sample is made of all French municipalities of more than 3,500 inhabitants. The $\geq 10,000$ inhabitants sample is made of all French municipalities of more than 10,000 inhabitants. The matched sample has been constructed following a matching procedure on the probability for a municipality to benefit from any type of connection. The sample used in column 10 has been constructed following a matching procedure that considers as treated municipalities that benefit from a political career connection. The sample used in column 11 has been constructed following a matching procedure that considers as treated municipalities that benefit from a private connection. The sample used in columns 12 is the union of the two preceding ones. See Section 2.A in Appendix for a description of our matching procedures and for summary statistics on each matched sample. Columns 13–18 present results of regressions where we introduce heterogeneity of the political career connection effect according to political *parachuting* (denoted *Parach.* in the table). We use two proxies for political parachuting, respectively in columns 13–15 and 16–18. See the text for the definition of these two proxies.

Table 2.4: Effect of being politically or privately connected to a current government's member on discretionary investment grants received by a municipality: *additional evidence*.

Dependent variable : Per capita grants received from the central government (log of), except if differently specified			
	(1)	(2)	(3)
Sample:	Full	$\geq 10,000$ inh.	Matched
Political career connection	0.432***	0.416***	0.373***
	(0.131)	(0.107)	(0.133)
Politically connected neighbor	-0.096	-0.160	-0.174**
	(0.085)	(0.134)	(0.088)
	(4)	(5)	(6)
Sample:	Full	$\geq 10,000$ inh.	Matched
Political career connection	0.479***	0.530***	0.326**
	(0.149)	(0.126)	(0.159)
Political career connection × Terminated municipal term	-0.155	-0.498**	0.007
	(0.269)	(0.237)	(0.294)
No municipal fixed effects			
	(7)	(8)	(9)
Sample:	Full	$\geq 10,000$ inh.	Matched
Political career connection	0.856***	0.742***	0.465*
	(0.223)	(0.220)	(0.243)
Terminated political career connection	0.971***	0.570***	0.306**
	(0.127)	(0.140)	(0.154)
Political career connection × Right-wing minister	0.043	-0.089	-0.186
	(0.261)	(0.263)	(0.282)
Terminated political career connection × Right-wing minister	0.098	0.209	0.053
	(0.235)	(0.237)	(0.248)
	(10)	(11)	(12)
Sample:	Full	$\geq 10,000$ inh.	Matched
Political career connection	0.489***	0.487***	0.392**
	(0.143)	(0.132)	(0.157)
Terminated political career connection	0.479***	0.342**	0.214
	(0.143)	(0.145)	(0.172)
Political career connection × High rank minister	-0.052	-0.178	-0.072
	(0.219)	(0.236)	(0.223)
Terminated political career connection × High rank minister	0.055	0.060	0.027
	(0.186)	(0.210)	(0.195)
Per capita grants received from the *département* (log of) as dependent variable			
	(13)	(14)	(15)
Sample:	Full	$\geq 10,000$ inh.	Matched
Political career connection	0.131	0.113	0.058
	(0.129)	(0.151)	(0.143)
Per capita grants received from the *région* (log of) as dependent variable			
	(16)	(17)	(18)
Sample:	Full	$\geq 10,000$ inh.	Matched
Political career connection	0.056	0.021	0.017
	(0.128)	(0.136)	(0.145)

*** p<0.01, ** p<0.05, * p<0.1. White heteroskedastic standard errors clustered at the municipality level in parentheses. OLS regressions. Each column presents estimates from a separate regression. Regressions presented in columns 1–6 and 10–18 include a constant term, year and municipality fixed effects, while those presented in columns 7–9 omit municipality fixed effects. All regressions presented in this table include variables corresponding to terminated political connections. The dependent variable is the log of yearly per capita discretionary investment grants received by a municipality from the central government, except in columns 13–15 and 16–18 where the dependent variable is the log of yearly per capita investment grants received by a municipality from the *départements* and the *régions*, respectively. *Political career connection* is a dummy variables equal to 1 if the municipality is politically connected to a current government's member (see the text for more details). *Politically connected neighbor* is a dummy variable equal to 1 if a municipality's direct neighbor benefits from a political connection to a current minister. *Terminated municipal term* is a dummy variable equal to 1 if the minister to which the municipality is connected has terminated her term as municipal counselor. *Right-wing minister* is a dummy variable equal to 1 if the minister to which the municipality is connected currently serves in a right-wing government. *High rank minister* is a dummy variable equal to 1 if the minister to which the municipality is connected currently serves as *ministre*, *ministre d'état* or *premier ministre* rather than as *secrétaire d'état* or *ministre délégué* (see the text for details). The full sample is made of all French municipalities of more than 3,500 inhabitants. The $\geq 10,000$ inhabitants sample is made of all French municipalities of more than 10,000 inhabitants. The matched sample has been constructed following a matching procedure on the probability for a municipality to benefit from a political connection, except in column 3 where it is made from the union of the preceding one and of a sample constructed following a matching procedure on the probability for a municipality to have a direct neighbor that benefits from a political connection. See Section 2.A in Appendix for a description of our matching procedures and for summary statistics on each matched sample.

2.3.3 Heterogeneity and mechanisms

In this sub-section, we provide additional empirical evidence that help us to have a finer look at mechanisms at play. In what follows, we only focus on political career connections as the above results demonstrated that municipalities do not benefit from private connections to ministers. We therefore replace the original matched sample by a matched sample that is specific to political connections and remove from estimations all terms that relate to private connections (see Section 2.A in Appendix for a description of this sample).

We first identify neighboring municipalities of connected ones to check whether subsidies are precisely targeted or only directed toward geographic areas that are of some interest for a minister. We define neighboring municipalities as any municipality that share an administrative border with a municipality that is politically connected to a current minister. 346 municipalities of the full sample fall into this category. This number amounts 174 once the sample is restricted to municipalities of more than $10,000$ inhabitants. As for the matched sample, we run a new matching procedure to select municipalities that have observable characteristics that are as close as possible to those of actual neighboring municipalities (see Section 2.A in Appendix for a description of this sample). We then re-estimate a modified version of expression (2.1) in which we add a dummy variable equal to 1 for municipalities that share a border with a politically connected municipality. As shown by estimates presented in columns 1–3 of Table 2.4, neighboring municipalities do not benefit from being close to a politically connected municipality. This suggests that subsidies targeting by ministers is accurate and does not consist in favoring an approximate area. This finding is consistent with reelection concerns at the municipal level. It also deals with an issue of simultaneity underlying our baseline specification. If a region is seen as strategic at the national level, the President and the Prime Minister could decide simultaneously to give more funds to municipalities of this region and to appoint as a member of government a politician who comes from this area. In this case, estimates would not provide us with the causal effect of being connected to a minister. Under the assumption that such strategic regions are broader than a municipality, and that connected municipalities are not systematically the main jurisdictions which concentrate all infrastructures in their area, such evidence of precise targeting suggests that the impact attributed to political career connections is not the result of such a simultaneity issue. Finally, this finding of no impact on neighbors contrasts with Hodler & Raschky (2014), who find that additional economic development observed in birth regions of political leaders holds in broader areas. This difference in results illustrates the fact that we are identifying a precise channel through which connection effects can happen, while variables related to economic development may be more subject to spatial diffusion.

We next take a closer look at the past political career of ministers and distinguish between those who are still member of the municipality's council and those who terminated their term. This distinction could go along with some differences in the intensity of a politician's attachment toward municipalities and/or denote different local reelection concerns. We empirically investigate this potential heterogeneity in political career connections by constructing a supplementary dummy variable that acts as an interaction term and is equal to 1 if the current minister is not

anymore a member of the municipality's council. Estimates coefficients presented in columns 4–6 of Table 2.4 reveal negative but non-statistically significant interaction terms, except for the sample of municipalities over 10,000 inhabitants. This non-robust evidence suggests that ministers do not behave differently towards municipalities depending on whether or not they still hold a seat at the municipal council. This finding suggests that reelection concerns underlying the impact of political career connections, if some, may be not related to municipal reelection, but to other kinds of ballot (e.g. legislative elections) for which the politician connected to the municipality needs local support. It is also possible that members of government target municipalities in which they have or had political responsibilities through an informal contract with current municipal incumbents (e.g. a politician willing to reach national positions may require a local support in return of some help in case of success).

The persistence of the political connection effect highlighted in Table 2.2 has two alternative interpretations. First, politically connected municipalities may receive more grants than others through better information they have on these funds, especially about the way to apply for them, or even about the mere existence of these funding opportunities. They may benefit from such information even once the minister they are connected to left the national government. Second, this persistence may support the view that what matters is the network accumulated by the member of government during her experience in government. This network may give her the ability to lobby in favour of her municipality even after the end of her term in the government. Two additional findings support the former interpretation at the expense of the latter. First, we provide evidence that the persistence holds even when the current government is of a different political affiliation than the former minister connected with the municipality. We achieve this objective by isolating members of left-wing governments from members of right-wing ones.[18] Estimated coefficients of interest are presented in columns 7–9 of Table 2.4.[19] As shown by the interaction term, the political orientation of ministers does not appear to make any difference, even for estimates related to terminated political career connections. Regarding the recent history of the national government's affiliation (see Figure 2.1), this suggests that municipalities politically connected to a former member of a left-wing government still benefit on average from additive amounts of grants when the current government is right-wing. This finding argues against former ministers still lobbying in favor of their municipality, as one could expect such a lobbying to be hard for a former minister when her political challengers are in power. However, it is in line with the key role of information transmission from ministers to municipalities, as such a higher quality information on discretionary grants may not be less relevant when the political colour of the national government has changed. Second, we isolate

[18] As illustrated in Figure 2.1, 2002 is the only year of the period covered by data on subsidies where the central government was left-wing. Thus, we do not have pre-treatment periods for municipalities connected to a left-wing member of government. Therefore, we remove municipality fixed effects from Equation (2.1) for these estimations, but we include as control variables a set of covariates related to political and socio-economic characteristics of municipalities. Included covariates are the same than those used for the implementation of the propensity score matching. See Section 2.A in Appendix for more details.

[19] The omission of municipality fixed effects obviously lead to an overestimation of the main effects when using the un-matched samples. This issue however seems to vanish when using the matched sample.

high rank ministers from others.[20] High rank ministers are politicians who are in charge of larger departments and/or supervise lower ranked ministers who served in their department. Ministers' rank is thus correlated with differences in decision-making power. It may also be correlated with ministers' network and ability for lobbying once they left office. However, such differences in rank do not seem to make any difference on investment grants received by politically connected municipalities as shown by columns 10–12 of Table 2.4.

We finally investigate whether subsidies allocated to municipalities by intermediate tiers of government (the *départements* and the *régions*) also depend on political career connections. Both of these tiers also allocate investment subsidies whose amounts are available from municipalities' detailed accounts. As shown in columns 13–18 of Table 2.4, municipalities that are connected to a current government's member do not receive higher funding from intermediate administrative tiers. This suggests (i) that ministers do not use their hierarchical position to influence decisions taken by *départements* and *régions*, or (ii) that ministers are not able to exert any pressure on these actors, or (iii) that ministers do not have any additive relevant information to give to their municipality regarding grants controlled by intermediate administrative tiers.[21]

2.4 Conclusion

To the best of our knowledge, this paper is the first to use a single framework that enables to distinguish the impact of different kinds of intergovernmental connections on intergovernmental transfers. We use an original data set that contains the detailed curricula of French ministers, their terms in office, and French municipalities' detailed accounts between 2002 and 2011. We provide evidence that municipalities in which a minister held office during her career experience a 45% increase in the amount of discretionary investment subsidies they receive during the time the politician they are linked to serves as minister. In contrast, we do not find any evidence that subsidies flow to municipalities from which ministers originate. These findings contrast with the determinant role of politicians' birthplace highlighted in previous contributions. They suggest ministers favoring municipalities according to political motives, or ministers having more ties with municipalities in which they held office than with those they originate from.

We provide evidence that the effect of political connections persists once the politician terminates her term at the national government. This novel finding suggests that political connections play a role through information transmission. Municipalities may have imperfect information on discretionary grants they can apply for. A minister they are connected to might improve this information, which can be used even once this top-politician left the national government. Two additive findings support this channel. First, the persistence holds even when the national government is of a different political affiliation than the former minister. Second, findings do not depend on the power or the degree of influence of the minister, proxied by the minister's formal rank in government. These evidence are argue against channels related to network and influence

[20] There are four distinct levels in the protocol of the French government: *secrétaire d'état*, *ministre délégué*, *ministre*, and *ministre d'état*. The head of the government is called *premier ministre*. We classify as high rank ministers all *ministres* and *ministres d'état*, as well as heads of government.

[21] While these three interpretations might be correct, we are not able to discard one from the others.

of ministers and advocate in favor of information transmission being the central mechanism at play.

The main caveat of this paper is the limited time span of the panel database we rely on. With a period of ten years, it is not possible to investigate the time length during which a persistence in the political career connection effect remains. Being able to tackle this issue would allow to give more precise insight on mechanisms driving our findings. This calls for further research on intergovernmental transfers exploiting longer run information on politicians' career and private background.

Appendix

2.A Propensity score matching

To construct the matching sample mentioned in Section 2.2 and described in the right part of Table 2.1, we first run a probit model explaining our dummy of treatment. Since we simultaneously investigate the impact of private and political career connections, the dependent variable in this probit is a dummy equal to one if the municipality has been privately or politically connected at least once over the period covered by data on subsidies (2002–2011). Therefore, we run this model on a database which contains one observation per municipality (with no panel dimension). As we have to take explanatory variables which are not impacted by our connection dummy, we consider values covariates take in 2001. Estimates from this probit model allow us to compute a predicted probability of treatment for each municipality and to match treated jurisdictions with non-treated ones on the basis of this predicted probability. We apply a one-to-one matching, without replacement, with a caliper of 0.05.

The matching procedure has to be implemented with covariates which are suspected to have an impact either on discretionary investment grants, or on the probability of treatment. First, we include the log of total municipal population. Some municipal investments may need a critical size in terms of inhabitants to be funded. In such cases, the central state may allocate more investment grants to smaller jurisdictions. At the same time, it is possible that members of government, because of their high political skills, managed to get municipal offices in bigger municipalities. Second, we include the share of people aged 14 and less in the municipal population and the share of people aged 65 and over. As an important part of municipal facilities are intended to young people (e.g. primary schools, cultural activities) and elderly people (e.g. retirement houses), one can expect a positive relationship between these variables and needs in municipal investment. We also consider the log of median inhabitants' income per unit of consumption.[22] and the municipal unemployment rate as one can expect that the central state uses discretionary grants as a tool for redistribution and help toward households out of employment.[23] We also include the log of the net value per head of each municipal tax base, as these variables are good indicators of fiscal revenues local jurisdictions can raise for their investment.[24] We also

[22]The number of consumption units is a measure of households size used by INSEE. It takes into account economies of scale in consumption needs according to household's size. The rule is the following: one unit for the first adult, 0.5 unit per other individual who is 14 or more and 0.3 unit per child below 14.

[23]We take the median income instead of the mean, since this last indicator is by definition highly impacted by extreme values in the distribution of income.

[24]These variables could be seen as being redundant with median income. However, French local taxes are

include the share of self-employed among the population in employment, as well as the share of high-skilled workers (used as a proxy of higher education). These two variables aim at capturing local preferences of voters for redistribution. They may have explanatory power on discretionary investment grants, since public investment corresponds to future in-kind redistribution.[25] Our set of covariates counts also municipal political factors. We include the share of votes got by the first right-wing candidate in 2001 municipal elections as well as the sum of shares of votes got in the municipality by all right-wing candidates in the 2002 presidential election.[26] The support for right-wing politics may capture some components of voters preferences for public investment. At the same time, since the central government is right-wing during almost all the period covered by data on subsidies (see Figure 2.1), these variables are likely to be correlated with the probability of being connected with a member of government. We also include a dummy equal to one if the mayor of the municipality has concurrently a seat at the National Parliament. Such a connection with the central political power is likely to have an impact on investment grants targeted to the municipality. Moreover, a mayor holding a position in Parliament may be more likely to get an office in government than other municipal incumbents. Finally, our matching procedure includes covariates related to intermunicipal cooperation. Municipalities can decide to cooperate for the provision of public goods for which there are potential economies of scale, through the creation of an inter-municipal community (IMC). These groups of jurisdictions have to choose between different degrees of cooperation, each degree being related to a formal status of IMC. Status in place during the investigated period can be listed from the lowest to the highest degree of cooperation as follows: *communauté de communes* (CC), *communauté d'agglomération* (CA), and *communauté urbaine* (CU). We add a dummy for each of these status. Although there is mixed evidence on the impact of inter-municipal cooperation on municipal spending (Frère et al. (2013), Guengant & Leprince (2006), Leprince & Guengant (2002)), one could expect that municipalities with a high degree of cooperation will undertake less investment, as a result of a delegation to the community. In addition to chose such a status, IMCs and municipalities have to define a sharing rule of local taxation. Either the IMC has the responsibility of the local business tax while municipalities keep the competency of all other local taxes, or each tax is subject to a shared competency.[27] The first solution may be correlated with a higher willingness to redistribute resources among municipalities of the IMC, as economic activity may be more

mainly based on real assets. Then, municipalities with the same median income can have different values of tax bases. There are four municipal taxes in France. The housing tax (*la taxe d'habitation*) is paid by residents on the cadastral value of their accommodation. The property tax on built estate (*la taxe foncière sur les propriétés bâties*) is paid by owners (households and firms) on the cadastral value of their real estate. The property tax on unbuilt estate is similar to the previous tax, but based on unbuilt lands. Finally, the local business tax (*la taxe professionnelle*) is paid by firms on their real estate and their production facilities. While tax bases computation is not over the control of the municipality, municipal councillors decide tax rates and some tax base reductions for these four fiscal tools. For these variables on tax bases, we take the value in 2002 instead of 2001, as we do not have any information on them for previous years.

[25] Alesina & Ferrara (2005) show that self-employed have a lower preference for redistribution, which could be explained by a lower risk-aversion or a more "individualistic behaviour" of this category of worker. Moreover, Alesina & Giuliano (2011) show that higher education has a negative impact on preferences for redistribution, which can be interpreted as the result of expectations of social mobility due to higher education.

[26] As for tax bases, we consider the year 2002 instead of 2001 for this variable.

[27] See the above description of local taxes in footnote.

geographically concentrated than households. This factor may have an explanatory power on grants, since this degree of willingness to redistribute may be correlated with lower needs in external funding from the central state. This is why we include a dummy equal to one for municipalities in IMCs with no fiscal specialization between municipalities and their cooperation body.

In robustness checks of columns 10–12 of Table 2.3, we rely on matched samples related to each kind of connection. In other words, we implement the same above procedure by considering one kind of connection, instead of a dummy equal to one if the municipality is politically or privately connected. This leads to the construction of two additive matched sample: one based on political career connections, and another one based on private links. The matched sample with respect to political career connections is also used for the investigation of mechanisms presented in Subsection 2.3.3. To estimate the grants targeting toward neighbors of connected municipalities, we create a fourth matched sample through the same procedure, where the treatment of interest is being the neighbor of a politically connected municipality at least once over the sample period.

While balancing tests in terms of covariates for the matched sample based on the treatment of being subject to any kind of connection are presented in the right part of Table 2.1, Table 2.A.1 provides similar statistics for the three other matched samples. These tables suggest that our matchings are very efficient in removing differences in observables between the treated and the control group. Table 2.A.2 provides summary statistics on each of our four matching implementations. The p-value of joint significance of the probit model goes from almost zero to almost one when we moves from the unmatched sample to any of the four samples constructed through our propensity score matching. The pseudo-R-squared of the probit model also drops substantially for the four procedures. These statistics mean that once one moves to any of the four matched samples, there is no evidence of differences in terms of investigated covariates between treated and untreated municipalities through the same probit model used for the matching procedure. Finally, the median absolute standardized bias defined by Rosenbaum & Rubin (1985) always goes down when we move from unmatched to matched samples.[28]

[28]The "standardized bias" between the treated and the control group for a given covariate x is defined as: $100.\frac{\overline{x_1}-\overline{x_0}}{\sqrt{\frac{1}{2}(V_1(x)+V_0(x))}}$, where $\overline{x_1}$ (respectively $\overline{x_0}$) is the mean of the covariate among treated (respectively untreated) units, while $V_1(x)$ (respectively $V_0(x)$) is the variance among treated (respectively untreated) observations. The median absolute standardized bias is the median of the absolute value of this statistics across the different covariates.

Table 2.A.1: Differences in observable characteristics across connected and non-connected municipalities for alternative matched samples.

	Match on political connections			Matched on private connections			Match on politically connected neighbors		
	Treated municipalities	Non-treated municipalities	P-val. of diff.	Treated municipalities	Non-treated municipalities	P-val. of diff.	Treated municipalities	Non-treated municipalities	P-val. of diff.
Population (log of)	10.3	10.27	0.84	10.12	10.14	0.89	9.4	9.36	0.54
Share of pop. under 14	0.18	0.18	0.83	0.18	0.17	0.66	0.19	0.19	0.45
Share of pop. over 65	0.16	0.16	0.86	0.17	0.17	0.64	0.14	0.14	0.92
Median income per UC (log of)[1]	9.73	9.76	0.38	9.73	9.77	0.28	9.85	9.85	0.69
Unemployment rate[2]	0.13	0.12	0.24	0.13	0.12	0.44	0.1	0.1	0.94
Share of self-employed workers[3]	0.06	0.06	1	0.06	0.06	0.81	0.06	0.06	0.5
Share of high-skilled workers[3]	0.16	0.17	0.38	0.16	0.18	0.29	0.16	0.16	0.55
Right-wing vote share at last municipal election	0.5	0.5	0.84	0.52	0.48	0.09	0.45	0.44	0.64
Right-wing vote share at last presidential election	0.37	0.38	0.43	0.38	0.39	0.51	0.35	0.35	0.66
Right-wing mayor	0.34	0.37	0.66	0.27	0.31	0.6	0.47	0.48	0.76
Mayor is member of the parliament	0.44	0.49	0.49	0.34	0.27	0.38	0.13	0.13	1
Per capita housing tax base (log of)	7.07	7.07	0.93	7.01	7.02	0.79	7.07	7.07	0.95
Per capita property tax base on built assets (log of)	7.08	7.09	0.89	6.97	7	0.67	7	6.98	0.58
Per capita property tax base on non-built assets (log of)	1.83	1.79	0.62	1.86	1.82	0.7	2.14	2.14	0.98
Per capita business tax base (log of)	7.35	7.22	0.39	7.35	7.43	0.38	7.2	7.19	0.9
Belongs to a *communauté de communes*[4]	0.17	0.18	0.86	0.32	0.29	0.6	0.13	0.11	0.56
Belongs to a *communauté d'agglomération*[4]	0.37	0.32	0.47	0.35	0.34	0.87	0.39	0.42	0.44
Belongs to a *communauté urbaine*[4]	0.1	0.13	0.39	0.1	0.12	0.8	0.14	0.14	1
Shared tax decisions[4]	0.15	0.17	0.71	0.22	0.23	0.85	0.1	0.08	0.28
# of municipalities	104	104		77	77		344	344	

This table provides the same picture as the three last columns of Table 2.1, but for the three other matched samples we rely on in this paper. *P.c.* stands for "per capita". *Elec.* stands for "election". *P-val. of diff.* stands for "p-value of difference". All variables are measured in 2001, except *Right-wing vote share at the* 2002 *presidential election* which is measured in 2002, and variables on local tax bases, for which we do have information only from 2002. Then, this table comes from a sample with one observation per municipality, with no panel dimension. *Connected municipalities* are municipalities that benefit from a political career or a private connection to a government's member at least once between 2002 and 2011 (see the text for the definitions of connections). The full sample is made of all French municipalities of more than $3,500$ inhabitants. The $\geq 10,000$ inhabitants sample is made of all French municipalities of more than $10,000$ inhabitants. The matched sample has been constructed following a matching procedure on the probability for a municipality to benefit from any type of connection (see Section 2.A in Appendix for more details on this matching procedure).

[1] UC : unit of consumption. It is a measure of household size: one unit for the first adult, 0.5 unit per other individual who is 14 or more and 0.3 unit per child below 14.

[2] : This is the unemployment rate among the labour force between 25 and 54 years old.

[3] : These variables provide a decomposition of the active labour force between 25 and 54 years old in terms of socio-professional categories.

[4] : *Communauté de communes*, *communauté d'agglomération*, and *communauté urbaine* refer to status of inter-municipal cooperation. *Shared tax decisions* is a dummy relative to the fiscal sharing between municipalities and their inter-municipal community. See the text of this Appendix subsection for an explanation of these variables related to intermunicipal cooperation.

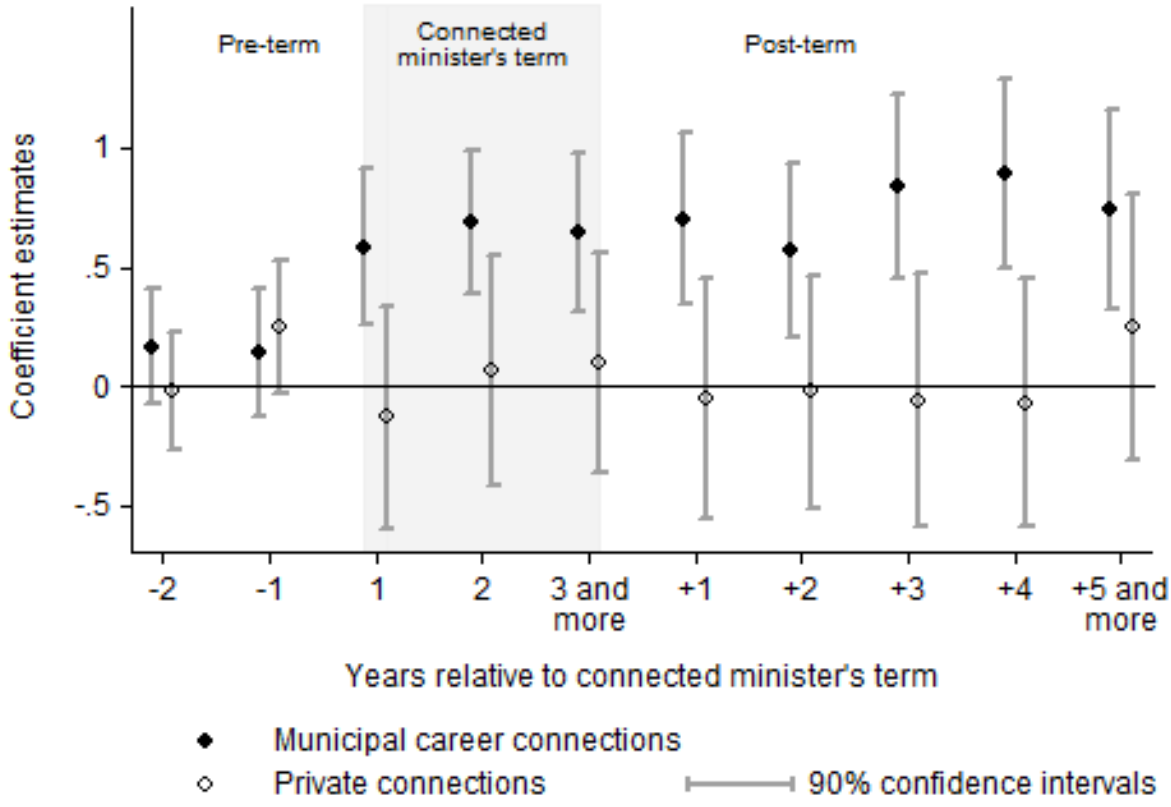
Table 2.A.2: Summary of propensity score matching procedures.

	Match on any connection	Match on political connections	Match on private connections	Match on politically connected neighbors
# of matched treated obs.	134	104	77	344
# of treated obs. out of the common support	35	3	18	2
# of matched non-treated obs.	134	104	77	344
Pseudo-R^2 of the probit before matching	0.371	0.346	0.399	0.130
Pseudo-R^2 of the probit after matching	0.012	0.025	0.053	0.005
$p > \chi^2$ of the probit before matching	0.000	0.000	0.000	0.000
$p > \chi^2$ of the probit after matching	1.000	0.993	0.916	0.999
Median absolute bias before matching	32.4	30.9	35.2	35.8
Median absolute bias after matching	3.8	5.8	7.2	3.2

This table summarizes the different propensity score matching procedures used in the paper. The method used is the "nearest neighbor matching without replacement", with a caliper of 0.05. Matching procedures are based on a probit model, using all covariates listed in Tables 2.1 and 2.A.1 as explanatory variables. The original sample is always the full sample made of all French municipalities of more than 3,500 inhabitants. The median bias before and after matching are median absolute standardized bias as defined by Rosenbaum & Rubin (1985). The "standardized bias" between the treated and the control group for a given covariate x is defined as: $100.\frac{\overline{x_1}-\overline{x_0}}{\sqrt{\frac{1}{2}(V_1(x)+V_0(x))}}$, where $\overline{x_1}$ (respectively $\overline{x_0}$) is the mean of the covariate among treated (respectively untreated) units, while $V_1(x)$ (respectively $V_0(x)$) is the variance among treated (respectively untreated) observations. The median absolute standardized bias is the median of the absolute value of this statistics across the different covariates.

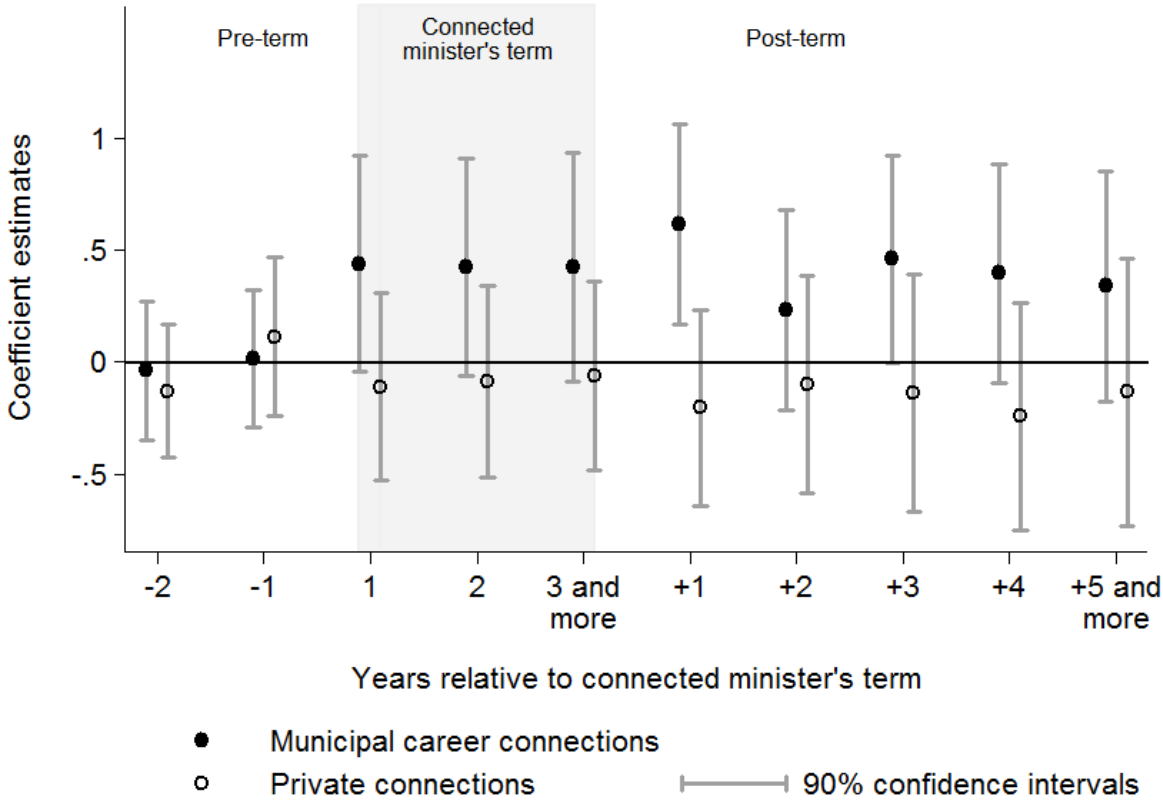
2.B Additional figures

Figure 2.B.1: The dynamics of connections (municipalities over 10,000 inhabitants).



Source: Authors' calculation. Estimates are from an OLS regression of the log of yearly per capita discretionary investment grants received by a municipality from the central government on year and municipality fixed effects, and a series of dummy variables defined relatively to the term of the minister to which the municipality is connected. For both kinds of connection (private and political), we include two dummies for the two years before treatment (-2, -1), two other ones for the two first years of treatment (1, 2), one dummy for all subsequent years of treatment (3 and more), four dummies for the four first years of post-treatment (+1, +2, +3, +4), and one last dummy for all subsequent years of post-treatment (5 and more). The regression also includes interaction terms between the two types of connection. Standard errors are clustered at the municipality level. The sample is made of municipalities with more than 10,000 inhabitants. Estimates have been horizontally shifted for aesthetic considerations.

Figure 2.B.2: The dynamics of connections (matched sample).



Source: Authors' calculation. Estimates are from an OLS regression of the log of yearly per capita discretionary investment grants received by a municipality from the central government on year and municipality fixed effects, and a series of dummy variables defined relatively to the term of the minister to which the municipality is connected. For both kinds of connection (private and political), we include two dummies for the two years before treatment (-2, -1), two other ones for the two first years of treatment (1, 2), one dummy for all subsequent years of treatment (3 and more), four dummies for the four first years of post-treatment (+1, +2, +3, +4), and one last dummy for all subsequent years of post-treatment (5 and more). The regression also includes interaction terms between the two types of connection. Standard errors are clustered at the municipality level. The sample is made of matched municipalities according to the treatment of being privately or politically connected. See Section 2.A in Appendix for details on the matching procedure. Estimates have been horizontally shifted for aesthetic considerations.

2.C Additional tables

Table 2.C.1: Effect of being politically or privately connected to a current government's member on discretionary investment grants received by a municipality: *inclusion of time-varying control variables.*

Dependent variable : Per capita grants received from the central government (log of)

Sample:	(1) Full	(2) $\geq 10,000$ inh.	(3) Matched
Any connection	0.274**	0.236*	0.186
	(0.116)	(0.136)	(0.143)
Any terminated connection	0.334***	0.221	0.082
	(0.122)	(0.147)	(0.154)
Sample:	(4) Full	(5) $\geq 10,000$ inh.	(6) Matched
Political career connection	0.456***	0.489***	0.428**
	(0.157)	(0.148)	(0.207)
Terminated political career connection	0.651***	0.549***	0.387**
	(0.159)	(0.179)	(0.195)
Private connection	0.019	-0.072	-0.081
	(0.167)	(0.223)	(0.193)
Terminated private connection	0.014	-0.135	-0.177
	(0.185)	(0.239)	(0.222)

*** p<0.01, ** p<0.05, * p<0.1. White heteroskedastic standard errors clustered at the municipality level in parentheses. OLS regressions. This table reproduces regressions of Table 2.2, when we add time-varying control variables. We include the set of covariates used for the propensity score matching procedure, and listed in Tables 2.1 and 2.A.1 (see Section 2.A in Appendix for a description of these variables). Each column presents estimates from a separate regression. All regressions include a constant term, year and municipality fixed effects. Regressions presented in columns 4–6 also include interaction terms between the two types of connections. The dependent variable is the log of yearly per capita discretionary investment grants received by a municipality from the central government. *Political career connection* and *private connection* are dummy variables equal to 1 if the municipality is politically or privately connected to a current government's member (see the text for the definitions of connections). *Terminated political career connection* and *terminated private connection* are dummy variables equal to 1 if a municipality was, but is not anymore, connected to a government's member. *Any connection* and *any terminated connection* do not distinguish between political career and private connections. The full sample is made of all French municipalities of more than 3,500 inhabitants. The $\geq 10,000$ inhabitants sample is made of all French municipalities of more than 10,000 inhabitants. The matched sample has been constructed following a matching procedure on the probability for a municipality to benefit from any type of connection. See Table 2.1 for descriptive statistics on these three samples, and Section 2.A in Appendix for a description of the propensity score matching implementation.

Chapter 3

The Impact of Local Income Inequality on Public Goods and Taxation: Evidence from French Municipalities

This paper brings new evidence on the impact of income inequality on public decisions. Using a new panel database on French municipalities' accounts, and on households' income distribution at the local level, I estimate the impact of income distribution on municipal policy. This paper is the first to investigate this issue by simultaneously using a high number of comparable observations and identifying deciles of the income distribution which matter. After controlling for municipal fixed effects and for the dynamics of municipal incumbents' decisions, I find no impact of income inequality on operating spending, but a strong positive impact on municipal infrastructures. Evidence suggests that an increase in income inequality by 1% leads on average to an increase in the value of municipal infrastructures between 0.06% and 0.18%. Importantly, I find that this result is driven by variations in bottom and top deciles. There is clear evidence that additive public facilities associated to more inequality are due to higher tax rates. When poorest individuals get poorer, or when richest ones get richer, municipal incumbents decide to increase the amount of infrastructures by increasing local taxation. These results suggest that what matter in public decisions are the extreme parts of voters' income distribution, and that lower bottom incomes and higher top ones both lead to a higher size of government.

3.1 Introduction

After a dramatic decrease during the first half of the twentieth century, income inequality has strongly increased in developed countries over the past decades (Piketty & Saez, 2014). This evolution has raised important debates on consequences of such a path, and on what public intervention should be regarding this fact. In parallel of this research on the evolution of income inequality, there have been many attempts among scholars to investigate theoretically the relationship between voters' income inequality and the size of governments in terms of public revenues and expenditure. Theoretical predictions on this relationship provide a mixed picture. The standard Political Economy literature highlights the decisive weight of the middle of the income distribution in the political process. The median-voter theorem implies that, in a framework where public goods benefit to every one in the same way and are funded through a proportional income tax, income inequality defined as the ratio between the mean and the median income increases the amount of public goods and the tax rate (Roberts, 1977; Meltzer & Richard, 1981). In contrast with this prediction, Benabou (2000) shows, by providing a model which incorporates welfare improvements due to public policy, that there can be a long-run negative relationship between inequality and governments' size. Another strand of theoretical research tackles the issue of the choice of the amount of public goods when there are substitutes in the private sector. In such a framework, Epple & Romano (1996) highlight a non-monotonic demand for public goods according to income: low-income individuals tend to favour more private consumption than middle-income ones, while high-income individuals may prefer to rely on the private sector. Then, the bottom and the top class of income form a coalition against the middle to decrease the amount of public goods. Finally, De La Croix & Doepke (2009) propose a framework in which the political power is biased towards the rich and that, given the higher preference for top incomes to rely on the private sector, higher income inequality can lead to a decrease in the level of public goods.

Regarding this mixed theoretical predictions, this paper aims at investigating empirically the relationship between income inequality and governments' size, by relying on a new panel dataset on French municipal accounts and individuals' pre-tax income distribution at the municipal level. The existing empirical literature on the link between income inequality and governments' size suffers from different caveats. This paper contributes in different ways to the improvement of identification in this field. First, data used in this paper allow to increase precision of estimates compared to existing contributions, and to go deeper on the estimation of the way income distribution may influence public decisions. Existing empirical papers can be divided in two groups. A first set of contributions uses country-level data, and relies on few observations (Schwabish et al., 2006; Shelton, 2007; Karabarbounis, 2011; Perotti, 1996).[1] Despite a low statistical power, data at the country level may have the advantage to give information on different deciles of the income distribution, in addition of income inequality measures. A second set of papers looks at

[1]See also Scervini (2012) and Milanovic (2000) who investigate the impact of income inequality on monetary redistribution, and earlier contributions of Persson & Tabellini (1994) and Alesina & Rodrik (1994) who addressed this issue through the link between income inequality and economic growth.

the relationship between income inequality at the local level on the size of local governments (Ramcharan, 2010; Corcoran & Evans, 2011; Boustan et al., 2013; Kosec, 2014). These papers benefit from higher statistical power, but have limited information on local income distribution, which is problematic in the sense that a given variation in income inequality can be driven by different variations in deciles, and can have therefore many interpretations. Results of all these contributions provide mixed empirical conclusions.[2] In contrast to this existing empirical literature, this paper uses a new panel dataset which provides detailed information on French municipalities' accounts, as well as a whole variety of income distribution indicators at the municipal level. To my knowledge, this paper is the first to investigate the relationship between income inequality and the size of governments by simultaneously relying on a high statistical power and investigating deeply the impact of income *distribution* on public decisions.

Second, this paper improves the way of dealing with endogeneity issues related to the link between income inequality and the size of government. In addition to control for unobservable municipal factors constant over time (through municipal fixed-effects), I exploit the dynamics over time of the variables of interest to deal with issues related to individuals sorting across local jurisdictions. This sorting implies a reverse causality problem, in the sense that individuals can move from a municipality to another one according to municipal policy. If preferences related to municipal policy, as well as individuals' mobility, are not independent from income, these mobilities can lead to variations in local income inequality. Most recent papers that attempt to deal with this issue instrument variations in local income inequality over time by an estimation of what would be these variations if they were driven by national trends (Corcoran & Evans, 2011; Boustan et al., 2013). In addition to apply a similar empirical strategy in a first step, I rely then on an estimation which controls more directly for sorting and is more realistic from a public decision-making point of view. First, while existing papers regress variables related to public policy at a given point in time on income inequality observe at this same date, I explain municipal decisions over a political term by income inequality policy makers observed at the beginning of their mandate. In addition to avoid simultaneity issues, this model based on one-term lagged explanatory variables may be more realistic. Then, I include a lagged dependent variable in order to identify, in a first-difference equation, the impact of lagged variations in income inequality given a level of lagged changes in municipal policy. The comparison of the instrument variable strategy and this dynamic specification suggests that endogeneity is mainly driven by measurement errors, instead of behaviours related to sorting.

Third, among contributions investigating the impact of inequality on governments' size at the local level, this paper is the first one to distinguish accurately between the effect on public revenues uncontrolled by local governments (e.g. formula-based intergovernmental transfers) and revenue components driven by active public decisions (e.g. local tax rates). Previous papers

[2]While Schwabish et al. (2006) and Ramcharan (2010) show evidence of a negative impact of inequality on governments' size, Shelton (2007), Corcoran & Evans (2011) and Boustan et al. (2013) provide empirical support for a positive effect. Karabarbounis (2011) looks ate the impact of different deciles of the income distribution, and shows that political decisions depends on a "one dollar one vote" process. Kosec (2014) provides interesting evidence that the impact of income inequality depends on the existence of substitutes for public goods in the private sector.

rely on aggregated measures of local revenues. The best previous contribution from this point of view is Boustan et al. (2013), who isolate the impact of inequality on taxation. However, they cannot distinguish between variations in tax bases, and variations in tax rates decided by jurisdictions.

To estimate the impact of income inequality on municipal governments' size, municipal operating spending and investment are considered separately, as these two components of municipal decisions can be related to different kinds of policy in reaction to income inequality.[3] For municipal investment, I use as a dependent variable the value of the stock of municipal infrastructures, instead of yearly investment spending, considering that the real target of municipalities is a given stock of infrastructures rather than a flow of this stock variation (Castells & Solé-Ollé, 2005; Solé-Ollé, 2013). While there is no robust evidence of a significant impact of income inequality on operating spending, findings suggest a robust and positive effect of income inequality on municipal infrastructures. An increase in income inequality by 1% leads on average to an increase in the stock of public infrastructures between 0.06% and 0.18% across measures of income inequality. Given the limited time span of the data (10 years), this contrast between operating and investment policy may reveal the fact that local facilities is the main municipal policy scope, and that operating spending are mainly the consequence of the stock of infrastructures, which may imply a later adjustment. The absence of a robust effect on operating spending is also in tension with previous papers who highlight the propensity of policy-makers to use public employment to reduce inequality (Alesina et al., 2000; Alesina et al., 2001; Clark & Milcent, 2011).

This evidence on a positive impact of income inequality on municipal infrastructures is important, as it is in tension with the seminal theoretical paper of Benabou (2000) which predicts a negative relationship between heterogeneity in terms of income and the size of governments. However, a given variation in income inequality can be driven by many different combinations of deciles variations. Then, it is important to investigate the impact of each decile of the income distribution on the amount of municipal public goods in order to provide a good insight of channels driving this result. Since all deciles are correlated, it is of key importance to run a variety of estimations which differ according to the set of included deciles. Then, by focusing on the municipal infrastructures side, I estimate a whole set of regressions, by making vary the number of included deciles in a same regression and the set of included deciles. I find robust evidence that the positive relationship between income inequality and municipal infrastructures is driven by the bottom and the top of the income distribution. Governments' size gets higher when low income individuals get poorer and when richest ones get richer. It suggests that what matters for the choice of the amount of public goods is not the middle, but the extreme parts of the income distribution.

This sensitivity of municipal infrastructures with respect to income distribution can be driven by automatic variations in municipal revenues due to deciles variations. It is possible that a

[3]Operating spending can include financial supports for low-income households. It also includes public employment, which can be used to decrease inequality or unemployment (see Alesina et al., 2000; Alesina et al., 2001; Clark & Milcent, 2011). Municipal infrastructures, created through investment, consist in creating public goods whose beneficiaries are not necessarily those with more needs (e.g. public schools).

decrease in bottom deciles leads to an increase in equalization grants received by municipalities, or that an increase in top deciles coexists with an increase in municipal tax bases. This is why I estimate the impact of local income distribution on the different categories of municipal revenues. For local taxation, I look separately at the impact on tax bases, and at the impact on tax rates controlled by municipal councils. I find that the impact of income inequality on municipal public goods is driven by taxation, and especially by tax rates. Intergovernmental grants, as well as debt, are not impacted by the income distribution according to my results. This evidence suggests that additive infrastructures associated to lower bottom deciles or higher top incomes are the result of active decisions of municipal councils, and not the result of an automatic variation of revenues out of the control of policy makers.

The higher propensity of French municipalities to raise more revenues and fund more infrastructures when poorest individuals get poorer or when richest ones get richer is in tension with existing theoretical predictions. It contrasts with median voters considerations, as well as with mechanisms suggesting a coalition between the bottom and the top of the distribution toward less public goods (Epple & Romano, 1996). It also do not allow to conclude to a "one dollar, one vote" channel since there is no evidence that every part of the income distribution matters.[4] Instead, findings supported in this paper raise different explanations. On the one hand, a higher government size due to lower bottom deciles or higher top ones may reveal a demand of voters or municipal incumbents for redistribution, through public goods funded by taxation. On the other hand, voters in bottom and top deciles may have higher demand for public goods and taxation with respect to the middle class, either because of different degrees of preference for public goods and taxation, or because of gains from redistribution induced by taxation. Although these different mechanisms cannot be distinguished, the conclusion is that decreases in lowest incomes, and increases in top ones induce variations in municipal policy of the same direction, which makes the middle class non-decisive in the political process. As a result, what matters is not the middle of the income distribution, but the extremes.

This paper proceeds as follows. Section 3.2 describes the French institutional context. Section 3.3 presents the data. The empirical strategy follows in Section 3.4. Section 3.5 presents the results. Section 3.6 provides a discussion of empirical findings. Section 3.7 concludes.

3.2 Institutional background

In this paper, I focus on French municipalities. This is the lowest tier of local government in France. The national territory is made up of 36,677 municipalities. I focus on the 2,200 municipal jurisdictions which are over 3,500 inhabitants for the whole panel period (2000-2011). Then, the French territory is made up of 2,599 inter-municipal communities (*intercommunalités*)[5],

[4] As highlighted by Karabarbounis (2011), if the influence of a given individual over the political process depends on her weight in terms of income, then one should expect that an increase in *any* decile leads to a policy closer to the preferred platform of this part of the income distribution. The insignificant impact of middle deciles claims in favour of a rejection of this mechanism.

[5] Inter-municipal communities are groups of municipalities which decide to cooperate and merge for the provision of public goods for which there are potential economies of scale. Since 2013, being in such a community is mandatory for every municipality. During the sample period (2000-2011), this was not the case. However, 95.5%

Table 3.1: Total spending of the different tiers of French government in 2011 (non-consolidated[1])

	Amounts	Percentage of GDP
Central State	445.3 billion €	21.6%
Provinces (*régions*)	27.2 billion €	01.3%
Counties (*départements*)	69.6 billion €	03.4%
Inter-municipal communities (*intercommunalités*)	37.7 billion €	01.8%
Municipalities (*communes*)	94.1 billion €	04.6%

Source: DGFiP (French Ministry of Economy and Finance)
This table shows for each tier of French government, from the highest to the lowest one, statistics on the sum of total spending of all governments in this tier in 2011.
[1] These amounts are not consolidated. For instance, transfers from the State to municipalities are counted twice in these data.

100 counties (*départements*) and 26 provinces (*régions*). Apart from having a high number of observations, an additional reason to focus on municipalities is that this is the most important tier of local government in terms of expenditure. As shown in Table 3.1, total municipal spending represents 4.6% of French GDP in 2011, while this share goes from 1.3% to 3.4% for the other tiers of local government.

Table 3.2 provides a picture of the structure of municipal accounts, by showing macro data on municipal revenues from the budgets of all French municipalities in 2011. This table distinguishes between revenues over the control of municipalities (in bold) and those municipalities do not control. In France, the budget of each municipality has to be decomposed into an operating section and an investment section. Municipalities are not allowed to have an operating section in deficit, that is why there is no debt in this section. However, debt can be used to fund municipal investment. If the operating section of a municipality is in surplus, this extra-money can be used to fund investment expenditure.

The operating section is the most important part of resources, accounting for 81,1% of total municipal revenues. Operating revenues can be grouped in four categories. Local taxes represent the most important one, by funding 60.1% of the operating section in 2011. They represent the main tool for redistribution municipalities can play on in their decisions on revenues. There are four local taxes in France. For each of them, municipalities decide on tax rates. The first is the housing tax (HT)[6]. This household tax is paid by all residents on the cadastral value of their accommodation, whatever their status regarding it (owner or tenant).[7] Second, the property tax on built estate (PTBE)[8] is paid by owners of all private real estate (households as well as firms). The tax base is still the cadastral value. The third tax is the property tax on unbuilt estate (PTUE)[9]. The principle is the same as the previous property tax. The only difference is the nature of taxed property (unbuilt lands). Fourth, the local business tax (LBT)[10] is paid by firms on their real estate and their production facilities.[11]

of municipalities were in a community in 2011.

[6] *La taxe d'habitation.*

[7] In order to prevent from a regressive design at the bottom of the income distribution, tax exemptions and reductions exist for low-income households. Rules of these exemptions and reductions are decided by national law. The resulting loss of fiscal product for municipalities is compensated by the Central State.

[8] *La taxe foncière sur les propriétés bâties.*

[9] *La taxe foncière sur les propriétés non-bâties.*

[10] *La taxe professionnelle.*

[11] A reform in 2010 has removed production facilities from the local business tax base, through the creation of a new tax called the Contribution of Companies on Property (*La contribution foncière des entreprises*). Munici-

Table 3.2: Revenues of French municipalities in 2011

Category of revenue	Amounts (in € per head)	Share in operating revenues	Share in investment revenues	Share in total revenues
	Operating section			
Local taxes[a]	**713**	**60.1%**	**.**	**48.8%**
Formula-based operating grants	300	25.3%	.	20.5%
Other operating revenues[b]	**173**	**14.6%**	**.**	**11.8%**
TOTAL operating revenues (1)	1186	100.0%	.	81.1%
	Investment section			
Surplus of the operating section[c] (2)	**203**	**.**	**42.4%**	**13.9%**
Loans	**100**	**.**	**20.9%**	**6.9%**
Formula-based investment grants	65	.	13.6%	4.4%
Discretionary investment grants	57	.	11.8%	3.9%
Assets transfers[d]	54	.	11.3%	3.7%
TOTAL investment revenues (3)	479	.	100.0%	32.8%
TOTAL municipal revenues : (1)+(3)-(2)	1462	.	.	100.0%
Used for operating spending : (1)-(2)	*983*	.	.	*67.2%*
Used for investment spending : (3)	*479*	.	.	*32.8%*

Source: DGFiP (French Ministry of Economy and Finance).
The first column of this table represents the sum of each category of investment revenue over all French municipalities in 2011, divided by the total French population of this same year.
Revenues in bold are revenues over the control of municipalities.
[a] There are four municipal taxes in France. The housing tax (HT) is paid by residents on the cadastral value of their accommodation. The property tax and built estate (PTBE) and the property tax on unbuilt estate (PTUE) are paid by owners on the cadastral value of their property. The local business tax (LBT) is paid by firms on their real estate and their production facilities. Municipalities have the control of the tax rate of each of these taxes. See Section 3.2 for more details.
[b] "Other operating revenues" mainly contain fees and sales.
[c] Although transferred operating surplus are classified in this table as an investment revenue over the control of municipalities, one can consider this control as partial, as some operating revenues are not controlled by municipal councils (e.g. formula-based operating grants).
[d] This item represents transfers of capital assets due to transfers of competencies.

The second main source of operating revenues are formula-based operating grants, which fund 25.3% of the operating section. These grants mainly come from the Central State, and are not over the control of municipalities. The operating section can also be funded by other resources (e.g. fees, sales, etc.) which represent 14.6% of operating revenues.

As for investment revenues, most of them are directly controlled by municipalities, through operating surplus transferred to the investment section and loans. Transferred operating surplus represent the most important source of investment revenues, with a share of 42.4%. As for loans, they fund 20.9% of the investment section. Then, municipalities benefit from other revenues they do not control. They receive formula-based grants from the State, which represent 13.6% of investment revenues, and discretionary investment grants (i.e. grants allocated by other upper tiers of government in a discretionary way), which count for 11.8% of investment revenues. Finally, municipalities can benefit from assets transfers due to transfers of competencies.

3.3 Data and sample

Data on local income distribution come from the RFL (*Revenus Fiscaux Localisés*) database, provided by the French National Institute of Statistics and Economic Studies (INSEE). This database gives information on residents' *pre-tax* income distribution at the municipal level. It is constructed from French tax returns on the income tax and the local housing tax, which

palities are compensated for this change, through a yearly transfer from the State which is fixed over time.

ensures high reliability. It provides for each municipality with more than 2,000 inhabitants over the period 2000-2011 indicators of the distribution of residents' income per unit of consumption (UC). The number of units of consumption is a measure of household size. It allows to take into account economies of scale in consumption needs according to this size.[12] This database gives for each municipality and year the amount of each decile, the mean, and the Gini coefficient of the distribution of pre-tax residents' income. For deciles, the sorting unit is the individual, whatever her age. The amount given for each decile is the cut-off of income above which one moves to the other decile of population.[13]

Inequality can be defined in many ways, with very different meanings. Then, it is important to consider different kinds of income inequality. I use five different measures of inequality. The first is the ratio between the interquartile gap and the median (*IQ/D5*). It measures inequality for the half of population which is in the middle of the distribution. Then, I take three different decile ratios: the ratio between the ninth and the first (*D9/D1*), the ratio between the median and the first decile (*D5/D1*) and the ratio between the ninth decile and the median (*D9/D5*). The last measure is the Gini coefficient. Moreover, information on each decile of income allows to identify which part of the distribution matters for municipal policy.

Information on municipal spending and revenues come from different administrative sources, all provided by the General Broad of Public Finance (*DGFiP*, French Ministry of Economy and Finance). The first provides on a yearly basis municipal profit and loss statements, which contain information on operating spending and revenues. It covers all French municipalities over the period 2000-2011. It gives aggregated accounting variables (the total of operating expenditures and revenues) for the period 2000-2001, and provide detailed information on each category of expenditures and resources from 2002. Second, I use data on municipal balance sheets, which provide information on municipal assets. They cover the period 2002-2011, and give a picture of the whole history of the investment section of municipal accounts: variables of this section are *stock* variables, contrary to profit and loss statements where variables are in annual flows. This database gives for each municipality and year the monetary value of the stock of municipal infrastructures. It also gives the value of the stock of investment revenues associated to these infrastructures. Stocks of investment revenues are decomposed in the categories mentioned in Section 3.2. As I have information on depreciation, I can compute stock values net of it. The third administrative source (the "REI" database) is on local taxes. It gives for each local tax information on the tax base, the tax product and the tax rate, and covers the period 2002-2011.

In regressions, I use control variables from different sources. The French national census (provided by INSEE) gives information on total municipal population and its age structure. I include as well political variables from the French Home Office. Section 3.4 provides a detailed description of included control variables. All monetary variables are per capita and deflated using the consumption price index with base 2010 provided by INSEE. In regressions, all non-dummy

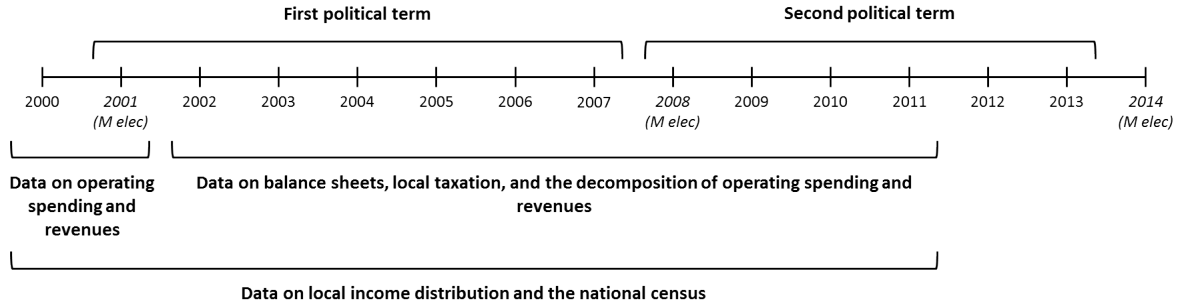
[12]The rule is the following: one unit for the first adult, 0.5 unit per other individual who is 14 or more and 0.3 unit per child below 14.

[13]For instance, a first decile of X euros means that 10% (respectively 90%) of the population has a pre-tax income per UC lower (respectively higher) than X euros.

variables are in logarithm, so that coefficients can be interpreted as elasticities.

Although the data are in a yearly basis, the time unit I choose is the political term. A municipal council may take its policy decisions at the scale of its whole term rather than year by year. Then, it is important to take as the time unit political terms instead of years in order to prevent from autocorrelation. Thus, the final panel database is made up of one observation per municipality per political term. The last three municipal elections in France took respectively place in 2001, 2008 and 2014. Then, the sample period is related to two political terms: 2001-2007 and 2008-2013.[14] Figure 3.1 gives a picture which compares political terms and periods covered by the different data sources. As illustrated in this figure, data cover only partially the two political terms, and especially the second one (which ends in 2013, while data end in 2011).

Figure 3.1: Periods covered by the different data sources



This figure confronts the two analyzed political terms with periods covered by the different data sources. *M elec* stands for "municipal elections". These covered periods impose some constraints in the years to consider in regressions for these two political terms (see Section 3.4 for a description of empirical specifications). For variables related to stocks, I take in my regressions values of 2007 and 2011 (instead of 2013) respectively for the two political terms. For the operating spending variable, I consider means over the period 2001-2007 and 2008-2011 respectively for the two terms. For variables on income distribution and other covariates from the national census, I take values of 2000 and 2007, as these variables are lagged by one political term. As for lagged dependent variables related to stocks, I am constrained to use values of 2002 (instead of 2000) and 2007. Finally, the lagged mean of operating spending over the term covers the period 2001-2007 for the second term, and takes only the year 2000 for the first one.

I focus on municipalities which reach some critical size. The sample is comprised of jurisdictions over 3,500 inhabitants.[15] The sample is a balanced panel of 2,200 municipalities. As the panel is made up of two time periods (two political terms), there is a total of 4,400 observations. This sample size illustrates the high statistical power I rely on with respect to existing papers using country-level data. Table 3.3 provides descriptive statistics on this sample. The average total municipal population is 13,763 inhabitants. The sample is almost balanced between left-wing and right-wing municipalities. 50% are right-wing, 46% are left-wing and the remaining jurisdictions have an independent mayor. As for income inequality, Table 3.3 illustrates the high heterogeneity in each of the different measures across municipalities. This heterogeneity is especially large for ratios where the first decile is the denominator. For instance, D9/D1 goes from 2.80 to 14.00, with a mean of 4.81 and a standard deviation of 1.39. As for municipal policy variables, yearly operating spending represents on average 1,037 euros per head, while

[14] Municipal elections take place in March. Then, a new municipal council can play on the budget during the year of its election. Thus, I assume that political terms start during the year of the ballot.

[15] Another reason to make this restriction is that political variables are not available for smaller municipalities, while these variables may be important controls for regressions. The three largest French cities (Paris, Lyon, and Marseille) are excluded from the sample as they depart from other French municipalities in many dimensions such as administrative status and municipal policy.

the net value of the stock of municipal facilities per head has a mean value of 6,305 euros. These amounts represent respectively 3.3% and 20.2% of the French GDP per capita of 2011. This illustrates the crucial importance of municipal policy in France.

Figure 3.2 provides a macro picture of effects investigated in this paper. Figure 3.2a sorts municipalities in quintiles according to their value of D9/D1. The horizontal axis represents these quintiles and indicates for each of them the corresponding range in terms of D9/D1. The vertical axis gives for each quintile the average total operating spending. Figures 3.2b provides the same investigation for the stock of municipal infrastructures. Moving from the first to the last quintile makes both municipal policy variables increase significantly. This suggests that an increase in income inequality leads to more active municipal policy both in terms of operating policy and local investment. Figure 3.2c provides the same investigation for local tax products, which are the main source of municipal revenues (see Table 3.2). This figure shows for the same quintiles of D9/D1 the average amount of total municipal tax products. As in previous figures, the pattern is increasing, and suggests effects of important magnitude. When one moves from the first to the last quintile, the total fiscal product per head moves from 407 euros to 534 euros. These three figures are an additional motivation to look more deeply at the impact of income inequality on municipal policy. Although they provide only macro pictures, without any control and any empirical strategy to identify causal links, they bring preliminary suggestion that income inequality may play an important role in public decisions.

3.4 Empirical specification

I estimate the impact of income inequality on municipal public decisions by considering operating and investment policies separately. For the operating side, I consider the amount of public spending decided by the municipality. As for investment policy, I consider the stock of municipal infrastructures instead of investment spending, the underlying idea being that the real targeted outcome of municipalities is not the increase in infrastructures per se, but the value of the stock, which measures the amount of municipal facilities available in the jurisdiction (Castells & Solé-Ollé, 2005; Solé-Ollé, 2013). This leads to the following baseline equations:

$$\begin{cases} \overline{OS}_{it} &= I_{it-1}\beta + X_{it-1}\gamma + \lambda_t + \mu_i + \epsilon_{it} \quad \text{for } t = 1;2 \\ SI_{it} &= I_{it-1}\theta + X_{it-1}\varphi + \phi_t + \eta_i + \upsilon_{it} \quad \text{for } t = 1;2 \end{cases}$$

In these equations, the time unit t is the municipal term (where $t = 1;2$, as there are two terms in the data). Considering political terms as the time unit instead of years allows to take into account that municipal policy-makers are likely to take their decisions at the scale of their political term. In this case, considering separately different years in a same term would raise an autocorrelation issue. Variables indexed by t denote the value they take at the end of the term, except $\overline{OS}_{it}$, which denotes the mean of yearly operating spending of the municipality over political term t. SI_{it} denotes the net value of the stock of municipal infrastructures of municipality i at the end of political term t. I_{it-1} is the income inequality variable, while X_{it-1} is a vector of time-varying control variables. They are both lagged by one political term. If one

Table 3.3: Descriptive statistics

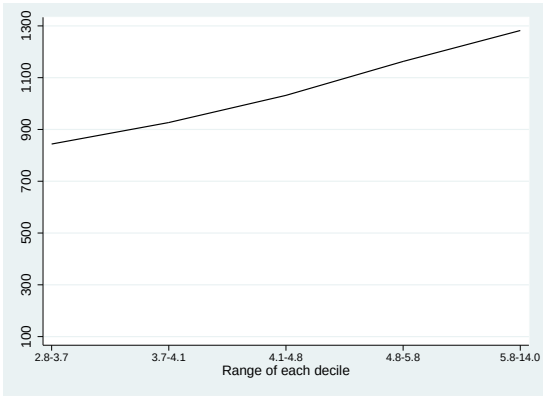
	Mean	Std. dev.	Min	Max
Municipal population (in inhabitants)[a]	13763	22353	3018	346388
Share of municipal population aged 14 or less	0.19	0.03	0.09	0.29
Share of municipal population aged 60 and over	0.22	0.06	0.04	0.50
Left-wing mayor	0.46	0.50	0.00	1.00
Right-wing mayor	0.50	0.50	0.00	1.00
Independent mayor	0.04	0.20	0.00	1.00
Average pre-tax income per UC[b]	20695	4967	11276	72298
D1 - pre-tax income per UC[b]	7708	2583	2334	18430
D5 - pre-tax income per UC[b]	18245	3940	9874	44204
D9 - pre-tax income per UC[b]	34548	8400	19194	131879
IQR/D5 - pre-tax income per UC[b]	0.72	0.11	0.48	1.16
D9/D1 - pre-tax income per UC[b]	4.81	1.39	2.80	14.00
D5/D1 - pre-tax income per UC[b]	2.51	0.57	1.70	5.88
D9/D5 - pre-tax income per UC[b]	1.89	0.15	1.55	2.98
Gini - pre-tax income per UC[b]	0.33	0.04	0.23	0.54
Yearly operating spending p.c.	1037	417	341	5966
Net stock of municipal facilities p.c.	6305	2799	1796	50730
Nb. observations	4400			

These descriptive statistics come from a sample with one observation per municipality per political term (see Section 3.3). For each variable, I consider its value at the end of the term, except for municipal policy variables in annual flow (here operating spending), for which I consider the mean of all yearly amounts over the term. See Section 3.4 for more details. All monetary variables are in 2010 euros. *P.c.* stands for "per capita".

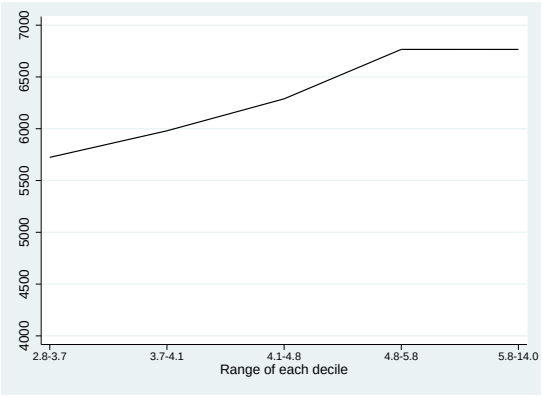
[a] The sample is made up of municipalities over 3,500 inhabitants for the whole panel period. The criteria used to do this restriction is the existence of political variables. In France, municipal electoral rules are different for municipalities over 3,500 inhabitants and those under this population threshold. Political data are reliable only for the first group of municipalities. Then, the used criterion for the restriction is the value of population used by the French administration for municipal elections. Because this value is lagged, some municipalities of the sample do not fill the condition of a population higher than 3,500 inhabitants for some years. In addition, a municipality with more than 3,500 inhabitants before an election can experience a decrease in population between two municipal elections. This is why the minimal municipal population in the sample is lower than 3,500.

[b] UC : unit of consumption. It is a measure of household size: one unit for the first adult, 0.5 unit per other individual who is 14 or more and 0.3 unit per child below 14.

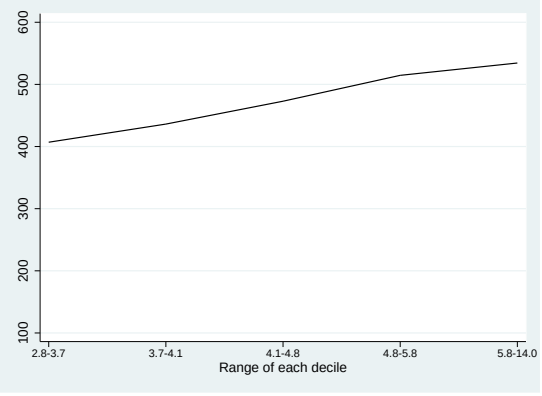
Figure 3.2: Municipal policy variables by quintile of D9/D1



(a) *Operating spending p.c.*



(b) *Net value of the stock of municipal infrastructures p.c.*



(c) *Total municipal tax revenues p.c.*

This graph shows for the whole sample (one observation per municipality per political term) a macro picture of the impact of income inequality on main variables related to municipal policy. Figure 3.2a (respectively Figure 3.2b) shows for each quintile of D9/D1 the average total operating spending per head (respectively the average net value of municipal facilities per head), while Figure 3.2c shows the average total fiscal product. All amounts are in 2010 euros. The horizontal axis indicates the range of D9/D1 in each quintile. For each observation (each municipality and political term), I consider values variables take during the last year of the term. *P.c.* stands for "per capita".

considers that municipal policy-makers take their decision at the scale of their municipal term, municipal incumbents may take into account local characteristics they observe when they start their mandate. These choices on periodicity and timing contrast with existing papers, which make public decisions at a point in time depend on income inequality and other characteristics observed at the same date.[16] Considering that SI_{it} depends on I_{it} implies to assume that income inequality impacts immediately decisions of policy-makers, which may be a strong hypothesis.

λ_t and ϕ_t are political term fixed-effects. They capture factors specific to period t, and affecting all municipalities in the same way (e.g. macroeconomic shocks). μ_i and η_i are municipal fixed-effects. They capture all unobservable factors constant over time, and specific to each municipality. Given that data cover two periods (two municipal terms), the dropping out of municipal fixed-effects is achieved through the following first-difference equations:[17]

$$\begin{cases} \Delta\overline{OS}_{i2} = \Delta I_{i1}\beta + \Delta X_{i1}\gamma + \Delta\epsilon_{i2} & \text{(3.1a)} \\ \Delta SI_{i2} = \Delta I_{i1}\theta + \Delta X_{i1}\varphi + \Delta\upsilon_{i2} & \text{(3.1b)} \end{cases}$$

$\Delta(.)_{it}$ denotes variations between the end of term t and the end of term $t-1$ ($\Delta(.)_{it} = (.)_{it} - (.)_{it-1}$). Municipal fixed effects disappear through first-difference. These equations do not contain political term fixed-effects anymore. After first-differencing, these effects correspond to a constant, so that they are included in the vector ΔX_{i1} for writing-convenience. In regressions, all non-dummy variables are in logarithm, so that coefficients can be interpreted as elasticities.

Even after controlling for time invariant municipal factors, estimating these equations by simple OLS would be subject to reverse-causality issues due to sorting behaviours. Households may choose their municipality of residence according to municipal policy. Then, it is likely that $\overline{OS}_{it}$ (respectively SI_{it}) has an impact on I_{it} for a given t. It follows that ΔI_{i1} may be correlated with $\Delta\epsilon_{i2}$ (respectively $\Delta\upsilon_{i2}$), due to the correlation between I_{i1} and ϵ_{i1} (respectively υ_{i1}).

Most recent contributions aiming at dealing with this issue instrument time-variations in income inequality in a given jurisdiction by what would be this variation if it followed the national evolution in income inequality (Corcoran & Evans, 2011; Boustan et al., 2013). Such an instrument aims at focusing on variations in income inequality due to national factors, and not due to municipal differences which would imply inter-jurisdictional mobility. In a first step, I apply a similar strategy, as a benchmark regarding this previous literature. In a 2SLS setting, I use as an instrument for the log-variation in municipal income inequality over the first political term the log-variation in income inequality at an upper level over the same period. Since this log-variation at the national level is the same for every municipality, I have to rely on log-variations at intermediate tiers between municipalities and the central State. I use two alternative instruments: the log-variation of income inequality at the county level, and the one

[16] The only existing paper which does not use a specification with such a simultaneity is Karabarbounis (2011). The author defines time-periods by averaging variables over non-overlapping three-years periods. Regressors are lagged by one of these periods. However, given that estimations in this paper rely on country-level data, these periods do not coincide with any political term.

[17] With two periods, estimations in first-difference are equivalent to the within estimator when standard errors are clustered at the municipal level.

at the province level.[18] Relying separately on different tiers is key, as the choice of the size of the jurisdiction used for the instrument is subject to the following trade-off. One the one hand, a smaller tier of jurisdiction increases the variability of the instrument, as this instrument takes (at best) as many different values as the number of upper jurisdictions over the territory. On the other hand, the use of such an instrument implies to assume that economic agents are not mobile at the chosen intermediate level. The smaller upper jurisdictions, the stronger this assumption.

Then, I propose an alternative way to deal with endogeneity issues due to sorting behaviours, by estimating a dynamic model, taking into account the persistence of variables related to municipal policy. The use of such a model is not new for the investigation of the link between income inequality and public decisions. The novelty is that such a dynamic model, combined with time-lagged measures of income inequality, offers a new way to deal with issues related to sorting behaviours. This model is represented by the following equations:

$$\begin{cases} \Delta\overline{OS}_{i2} = \alpha\Delta\overline{OS}_{i1} + \Delta I_{i1}\beta + \Delta X_{i1}\gamma + \Delta\epsilon_{i2} & \text{(3.2a)} \\ \Delta SI_{i2} = \rho\Delta SI_{i1} + \Delta I_{i1}\theta + \Delta X_{i1}\varphi + \Delta\upsilon_{i2} & \text{(3.2b)} \end{cases}$$

As explained above, sorting behaviours imply that ΔI_{i1} may be correlated with $\Delta\epsilon_{i2}$ (respectively $\Delta\upsilon_{i2}$), due to the correlation between I_{i1} and ϵ_{i1} (respectively υ_{i1}). In terms of first-difference, variations in income inequality over the first political term may be a result of variations in municipal policy over this same term. In Equations (3.2a) and (3.2b), the impact of variations in income inequality over this first term is estimated after controlling for changes in municipal policy during this term, which is a direct way to control for sorting behaviours, with potentially lower loss in heterogeneity across municipalities in terms of variation in inequality, compared to the IV strategy.

Equations (3.2a) and (3.2b) also reveal conceptual differences between estimations related to operating and investment policy. The lagged dependent variable $\Delta\overline{OS}_{i1}$ aims at capturing persistence in operating spending, while Equation (3.2b) captures the fact that decisions related to investment spending are made by taking in consideration the existing stock of municipal facilities, in order to get closer from the desired stock of municipal infrastructures. This is illustrated by the following transformation of Equation (3.2b), resulting from the subtraction of ΔSI_{i1} on both sides:

$$\Delta\left(\Delta SI_{i2}\right) = \Delta(\rho-1)SI_{i1} + \Delta I_{i1}\theta + \Delta X_{i1}\varphi + \Delta\upsilon_{i2}$$

In other words, this equation consists in explaining, in a first-difference setting, the variation in the stock of municipal infrastructures ΔSI_{it} by the existing stock of municipal facilities SI_{it-1}.[19] As ΔSI_{it} corresponds to municipal investment spending non-related to infrastructure replacement, this is equivalent to explain this measure of investment by the existing stock of

[18] The French territory is made of 100 counties, and 26 provinces. These are the two main intermediate tiers of local government in France. See Section 3.2 for more details.

[19] If one gets rid of the first-difference transformation, the equation becomes:
$\Delta SI_{it} = (\rho-1)SI_{it-1} + I_{it-1}\theta + X_{it-1}\varphi + \phi_t + \eta_i + \upsilon_{it}$ for $t = 1; 2$

infrastructures.

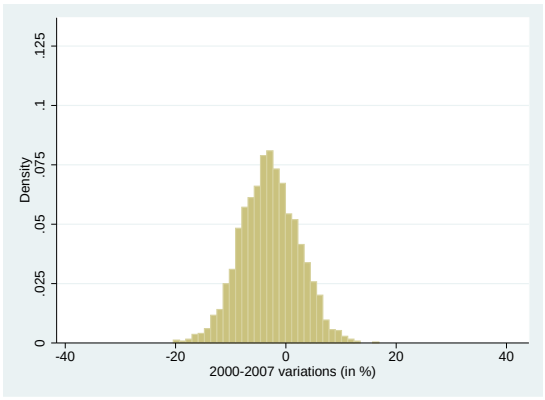
Although the inclusion of lagged dependent variables deals with the issue of sorting behaviours, it raises new concerns due to the limited time span of the data. In Equation (3.2a), $\Delta\overline{OS}_{i1}$ is the difference between $\overline{OS}_{i1}$ and $\overline{OS}_{i0}$, where this last expression denotes the mean of yearly operating spending over the mandate before 2001-2007 (see Figure 3.1). Since data on operating spending start in 2000, I assume that the mean over this uncovered term is equal to the spending value in 2000. As for the stock equation, the lagged dependent variable ΔSI_{i1} is defined as the difference between the value of the stock of public goods in 2007 and the one in 2002, instead of the difference between 2007 and 2000 (see Figure 3.1). Then, ΔSI_{i1} is correlated with $\Delta\upsilon_{i2}$, as 2002 is already in the first political term, and the value of the dependent variable during this year (used as a measure of SI_{i0}) is correlated with υ_{i1}. In addition, there is a correlation between ΔSI_{i1} and $\Delta\upsilon_{i2}$ because SI_{i1} is correlated with υ_{i1} (see Nickell (1981) for a characterisation of this bias). One solution to deal with this issue is to apply a GMM estimation (Arellano & Bond, 1991; Arellano & Bover, 1995; Blundell & Bond, 1998). However, this strategy leads to misleading results in this framework. Relying on values in 2002 instead of 2000 for the lagged dependent variable ΔSI_{i1} implies the invalidity of usual instruments for the first-difference equation.[20] These issues related to the lagged dependent variables calls for a careful comparison of results with and without the inclusion of this regressor.

A first-difference estimation may seem very demanding, as it relies on within-variations in income inequality over a period of seven years (between 2000 and 2007). At first stage, one could think that there may not be enough variations over time in income distribution at the local level for identification. Figure 3.3 provides some evidence on this point. It shows for each measure of income inequality used in estimations an histogram of the distribution of relative variations in these measures between 2000 and 2007. These variations are not negligible, and present a high degree of heterogeneity across municipalities, whatever the inequality measure. This makes the first-difference specification reliable. These relative variations move from about -20% to 20%, except for D9/D5 and the Gini coefficient where the range is narrower. For D9/D1 and D5/D1, there are some municipalities with very high variations, which can reach a maximum of about 40% in absolute value. This higher range is due to the higher variability over time of the first decile with respect to others.

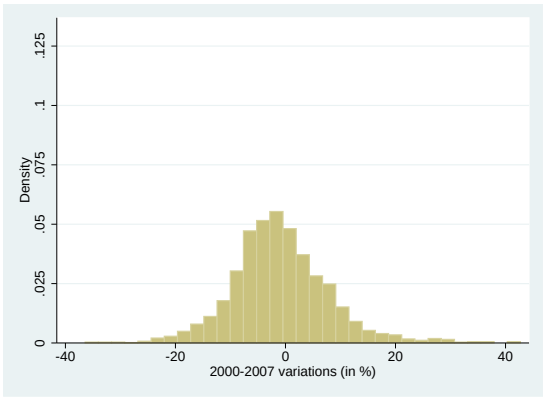
The vector X_{it-1} is a set of control variables, which are suspected to be simultaneously correlated with income distribution and municipal policy. The most important control to keep in mind is the average income per unit of consumption. In other words, estimated impacts of income inequality are *given the average income*, so that the estimated impact of income inequality is only related to the shape of the income distribution, and not to factors in terms of income orders of magnitude. I control for total municipal population, as well as its age structure: I include in the regressions the share of population aged 14 or less and the share of population aged 60 or more. Total population may be an important determinant of municipal public goods, as some local facilities may need a critical size in terms of inhabitants to be funded. The share of

[20] Instrumenting ΔSI_{i1} by SI_{i0}, as it is done in a GMM framework, is invalid here, as SI_{i0} is measured by the value in 2002, which is already in the first term, and is thus still correlated with $\Delta\upsilon_{i2}$.

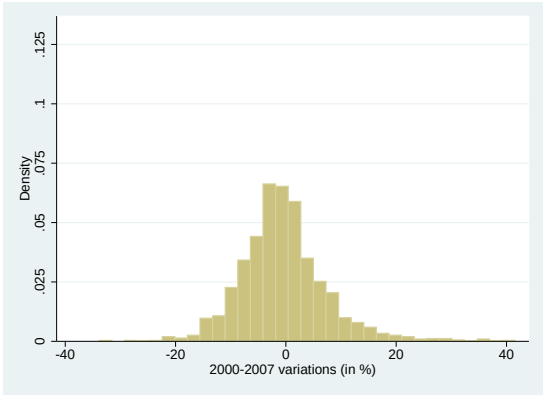
Figure 3.3: Distribution of relative variations in income inequality over the first political term (2000-2007) - in percentage point



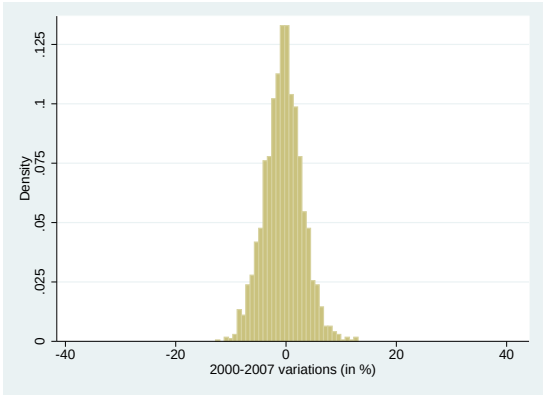
(a) *IQ/D5*



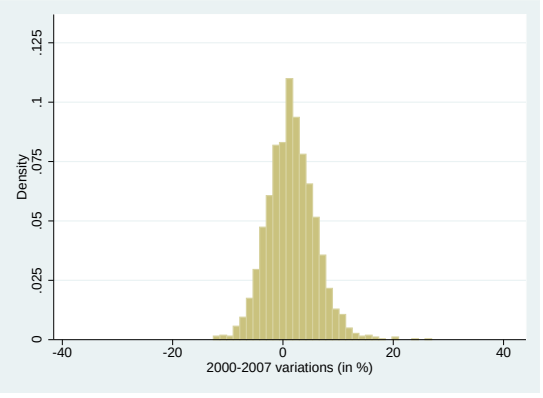
(b) *D9/D1*



(c) *D5/D1*



(d) *D9/D5*



(e) *Gini coefficient*

young and elderly people are also of high interest, as an important part of municipal policy are intended to young people (e.g. primary schools) and elderly population (e.g. retirement houses). I also include political variables.[21] I control for political affiliation of the mayor. Two dummies are considered: a left-wing dummy and a dummy for independent mayors (the reference being right-wing municipalities). I also control for the margin of victory of the mayor and for the interaction between this margin and dummies on political affiliation. This margin is defined as the difference in percentage point between the share of votes of the mayor and the one of her first challenger. These political variables are used as proxies for the municipal political landscape. Dummies on affiliation are used as proxies for the ideology of the mayor, which can play a role on the impact of inequality on municipal decisions. Interaction terms between these dummies and the margin of victory measure the extent to which voters are in majority for the winning affiliation. They can be seen as proxies for the ideology of voters in the jurisdiction, which may be an important determinant in decisions the municipal council takes on municipal policy. Finally, the margin of victory independently from the affiliation of the mayor can be seen as a proxy for experience and skills of the municipal council. I also include as a control a dummy equal to one if the mayor has changed between the first and the second political term. This variable is key, as a new incumbent is likely to have a different objective function than the previous one, leading to more changes in municipal policy.[22] I control as well for the share of households who are owners of their accommodation (distinguished from tenants). This variable measures the share of stable residents. These residents may not have the same influence on the political process. I also include in regressions the share of secondary residences, as municipalities where this share is high may have a different structure of public facilities and municipal spending. Finally, I control for inter-municipal cooperation, as defined in Section 3.2.[23] This is motivated by the expectation that delegation of some tasks to an inter-municipal community could lead to less public goods managed by municipalities.

[21] Contrary to other controls related to the socio-economic characteristics of the population, political variables are not lagged by one political term, since they consist in controlling by political characteristics following last municipal elections.

[22] This dummy is directly included in the first-difference equation, without being subject to first-differencing. Indeed, this is the dummy itself which has an impact on variations in the amount of public goods, not the variation of this dummy.

[23] In addition to decide to cooperate or not for the provision of public goods, municipalities which decide to be in an inter-municipal community have the choice between three degrees of cooperation. I include as control variables a dummy for each of these degrees, the reference being the absence of inter-municipal cooperation. These degrees differ in the number of competencies municipalities can delegate to their community. The higher the degree of cooperation of a status (i.e. the number of delegated competencies), the higher the requested degree of urbanisation of the group of municipalities to benefit from this status. During the period of analysis of this paper, there were four status of inter-municipal community. They can be listed from the lowest to the highest degree of cooperation as follows: *communauté de communes* (CC), *communauté d'agglomération* (CA), *communauté urbaine* (CU), and *syndicats d'agglomération nouvelle* (SAN). Requests on the degree of urbanisation are defined according to population. For instance, to cooperate through a CA, a group of municipalities has to count at least 50,000 inhabitants, and to be organized around one or more center-municipalities with more than 15,000 inhabitants. Given the low number of municipalities which are in a SAN, municipalities belonging in a CU or a SAN are included in the same group for the definition of the degree of cooperation, so that there are finally three kinds of cooperation. Similarly to political variables, these controls related to inter-municipal cooperation are not lagged by one political term, since they consist in controlling for the current status of the municipality which is instantaneously known.

Other controls could have been included from the French national census: the structure of municipal population in terms of socio-professional categories, or the unemployment rate at the municipal level. These controls would have been relevant for a cross-sectional analysis. However, the first-difference specification relies on variations in income distribution over time. Variations in income distribution may be highly linked to variations in the distribution of residents' economic activity. This is why it is natural not to consider variations in income distribution given variations in the socio-professional structure of population or the unemployment rate. This choice highlights an important aspect common to the different specifications. I do not focus on a specific factor of variations in income distribution, but I consider an average effect of all these factors.

If evidence supports an impact of income inequality on operating spending or municipal infrastructures, one needs to identify municipal revenues which drive these effects, in order to know whether they are due to variations in revenues over the control of municipal policy-makers. In case of an impact on operating spending, the same identification strategies can be applied for operating revenues. In case of an effect on municipal facilities, one needs to look at *stocks* of investment revenues provided in municipal balance sheets, by applying the same strategies than for the stock of infrastructures. However, operating revenues intervene in investment resources through transferred operating surplus (see Table 3.2). Although data give the stock of transferred operating surplus, making the link between one precise component of the operating surplus (e.g. a category of operating revenues) and the specifications estimating municipal facilities is more challenging, as operating components are in annual flow and not in stock. Then, I take for each observation the cumulated amount of these components over the political term. If STI_{it} denotes the stock of transferred operating surplus of municipality i at the end of political term t, the dynamic first-difference specification is:

$$\Delta STI_{i2} = \rho^{'} \Delta STI_{i1} + \Delta I_{i1}\theta^{'} + \Delta X_{i1}\varphi^{'} + \Delta \upsilon_{i1}^{'}$$

Where:

$$STI_{it} = SS_{it} - STO_{it} \text{ for } t = 1; 2$$

SS_{it} corresponds to the stock of cumulated operating surplus and STO_{it} denotes the part of this stock which has been kept in the operating section. Data contain both amounts (in addition of STI_{it}).[24] I denote C_{kit} the cumulated amount of the k$^{\text{th}}$ component of the operating surplus of municipality i over political term t (with $k = 1, ..., K$). If revenue components are positive and spending components are negative, then:

$$\Delta SS_{it} = \sum_{k=1}^{K} C_{kit} \text{ for } t = 1; 2 \tag{3.3}$$

[24]This allows to know whether an effect on STI_{it} is driven by SS_{it} or STO_{it} (i.e. if it is driven by higher accumulated operating surplus or by a different allocation of surplus between the operating section and the investment one).

The dynamic first-difference equation for SS_{it} gives:

$$\Delta SS_{i2} = \rho'' \Delta SS_{i1} + \Delta I_{i1}\theta'' + \Delta X_{i1}\varphi'' + \Delta \upsilon''_{i1}$$

Which is equivalent to:

$$\Delta\left(\Delta SS_{i2}\right) = (\rho'' - 1)\Delta SS_{i1} + \Delta I_{i1}\theta'' + \Delta X_{i1}\varphi'' + \Delta \upsilon''_{it}$$

Given Equation (3.3), I run for each component (for each $k = 1; ...; K$):

$$\Delta C_{ki2} = (\rho''_k - 1)\Delta SS_{i1} + \Delta I_{i1}\theta''_k + \Delta X_{i1}\varphi''_k + \Delta \upsilon''_{ki2} \tag{3.4}$$

This specification consists in explaining variations over time in each component of the operating section by variations over time in income inequality.

Finally, in case of an evidence of a significant impact of income inequality on municipal policy, one needs to identify the part of the income distribution associated to such an effect in order to provide an interpretation for it. The above empirical strategies allow to reach easily this goal, by including values of deciles instead of the inequality variable. As all deciles are correlated, one needs to run for a given specification different estimations by making vary the number of included deciles in a same regression as well as the set of included deciles. Although such a strategy does not allow to identify accurately the deciles which are decisive, it allows to provide conclusions on the impact of the bottom, the middle and the top of the income distribution.

3.5 Results

Tables 3.4 and 3.5 show respectively for operating spending and municipal facilities results from the different specifications presented in Section 3.4. In each of these tables, Column (1) shows results from Equations (3.1a) and (3.1b), which correspond to the simple first-difference specification, without instrumenting inequality and with no dynamics. Columns (2) and (3) show results from the IV specifications, taking respectively as an instrument the variation in income inequality at the province and the county level. Each of these columns show the F-statistics on the excluded instrument. In both tables, this statistics is always higher than the recommended threshold of ten (Staiger & Stock, 1997), which suggests a rejection of the null hypothesis that the instrument is weak. Finally, column (4) shows result from the main specification of this paper, which addresses the issue of sorting behaviours through the lagged dependent variable. These two tables show results from these four specifications for the five alternative measures of income inequality mentioned in Section 3.3.

Evidence presented Table 3.4 suggests a non-robust positive impact of income inequality on operating spending. Significance at conventional levels is almost never reached for specifications without instrumenting income inequality. It is then hard to support the view of any impact of income inequality on operating spending. In contrast, Table 3.5 reveals strong evidence of a positive and significant effect of income inequality at the municipal level on the stock of municipal infrastructures, with an estimated elasticity of interest going from 0.06 to 0.55 across

specifications and income inequality definitions.[25]

In both tables, IV coefficients on income inequality in columns (2) and (3) are always higher than in column (1), except in Table 3.4 where D9/D5 is the considered inequality measure. This result is similar than in Boustan et al. (2013). One possible explanation is that sorting behaviours of households lead to an underestimation of the impact of income inequality. However, the inclusion of the lagged dependent variable, without instrumenting income inequality (column (4)) always gives similar coefficients than in column (1), while it should lead to a similar increase in the effect of income inequality if the previously mentioned underestimation were due to sorting. This suggests that underestimation of the impact of income inequality revealed by IV estimates is due to measurement errors. This suggestion that households do not sort according to municipal policy in a way of making income inequality vary with municipal policy changes may seem surprising at first stage. However, it may be explained by the short time span of data. Changing location regarding variations in municipal policy may be a decision which takes time to be made for households, so that variations in income inequality over the first political term may not correspond to sorting behaviours according to changes in municipal public decisions. Regarding these comparisons between specifications, the first-difference estimation, with a lagged dependent variable seems the most appropriate for the purpose of this paper, and will be the one used in further evidence. On the one hand, the caveat of IV estimates is that they restrict drastically the heterogeneity in income inequality variations across municipalities. This is a key issue for further more demanding estimations which include different deciles in a same regression. On the other hand, do not relying on IV strategies has the disadvantage of ignoring measurement errors. However, these measurement errors lead to underestimations of point estimates. Ignoring them would consist in keeping more conservative estimates. Considering the dynamic specification without instruments as the preferred specification leads to suggest that the elasticity of the stock of public infrastructures according to income inequality varies from 0.06 to 0.18 across the different measures of inequality, while operating spending does not seem to react to households' income distribution.

This contrast between operating spending and municipal infrastructures raises two suggestions. First, it may reveal the main competency of French municipalities, which consists in providing local facilities. In this context, one should expect municipal policy-makers to react to income distribution through investment.[26] Second, it suggests that municipalities do not face income inequality by increasing public employment, contrary to what was observed in other

[25] All regressions include average income as a control variable, so that the estimated impact of income inequality is only related to the shape of the income distribution, and not to factors in terms of income orders of magnitude. Whatever the specification, the coefficient on the average income is positive and almost always significant, which suggests more municipal revenues in higher-income jurisdictions, or higher preferences for public goods in richer municipalities.

[26] Still, more municipal equipment may induce more operating expenditures. Then, one could have expected a positive and significant effect of income inequality on this spending. However, operating costs of a new equipment may start to be supported with some lag in time, once the new infrastructure is achieved and effectively used by residents. The empirical strategy consists in explaining variations in infrastructures during a unique period of four years (from 2007 to 2011). This period may be too short to observe an effect on operating spending due to new equipment.

Table 3.4: The effect of income inequality on municipal operating spending

	Dependent variable: mean of the yearly amount of operating spending per head over the political term			
	FD (1)	FD IV provinces (2)	FD IV counties (3)	FD dynamic (4)
		IQR/D5		
Lagged dependent variable				0.16***
				(0.02)
Average income	0.38***	0.44***	0.44***	0.32***
	(0.05)	(0.08)	(0.07)	(0.05)
Income inequality	0.12***	0.29*	0.29**	0.10**
	(0.04)	(0.17)	(0.13)	(0.04)
Adjusted R-squared	0.04	0.03	0.03	0.07
Nb. Obs	2200	2200	2200	2200
F-stat exclud. instruments		102.13	216.06	
		D9/D1		
Lagged dependent variable				0.16***
				(0.02)
Average income	0.36***	0.94***	0.75***	0.30***
	(0.06)	(0.18)	(0.12)	(0.06)
Income inequality	0.02	0.72***	0.50***	0.02
	(0.03)	(0.20)	(0.13)	(0.02)
Adjusted R-squared	0.03	-0.30	-0.12	0.07
Nb. Obs	2200	2200	2200	2200
F-stat exclud. instruments		43.47	81.95	
		D5/D1		
Lagged dependent variable				0.16***
				(0.02)
Average income	0.35***	1.46***	1.07***	0.29***
	(0.06)	(0.28)	(0.19)	(0.06)
Income inequality	0.01	1.40***	0.90***	0.00
	(0.03)	(0.34)	(0.23)	(0.03)
Adjusted R-squared	0.03	-0.89	-0.35	0.07
Nb. Obs	2200	2200	2200	2200
F-stat exclud. instruments		36.84	50.19	
		D9/D5		
Lagged dependent variable				0.16***
				(0.02)
Average income	0.34***	0.34***	0.34***	0.29***
	(0.05)	(0.05)	(0.05)	(0.05)
Income inequality	0.10	-0.08	0.09	0.09
	(0.06)	(0.22)	(0.17)	(0.06)
Adjusted R-squared	0.03	0.03	0.03	0.07
Nb. Obs	2200	2200	2200	2200
F-stat exclud. instruments		138.21	251.28	
		Gini		
Lagged dependent variable				0.16***
				(0.02)
Average income	0.34***	0.34***	0.33***	0.29***
	(0.05)	(0.05)	(0.05)	(0.05)
Income inequality	0.02	0.21	0.44**	0.03
	(0.05)	(0.21)	(0.17)	(0.05)
Adjusted R-squared	0.03	0.03	0.00	0.07
Nb. Obs	2200	2200	2200	2200
F-stat exclud. instruments		89.79	173.85	

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.
This table shows estimates of the impact of different measures of inequality on municipal operating spending. Column (1) shows results from Equation (3.1a), which is the simple first-difference equation, with no lagged dependent variable. Columns (2) and (3) estimate the same equation, by instrumenting the income inequality measure in a 2SLS setting. In Column (2) (respectively in Column (3)), the log-variation in income inequality at the municipal level is instrumented by the log-variation in income inequality at the province (respectively county) level. For each regression of these two columns, the F-statistics on the excluded instrument is shown. Column (4) presents estimates from Equation (3.2a), which is the first-difference equation without instrumenting, but with the inclusion of the lagged dependent variable. Coefficients represent elasticities, as variables are in logarithm.

Table 3.5: The effect of income inequality on municipal infrastructures

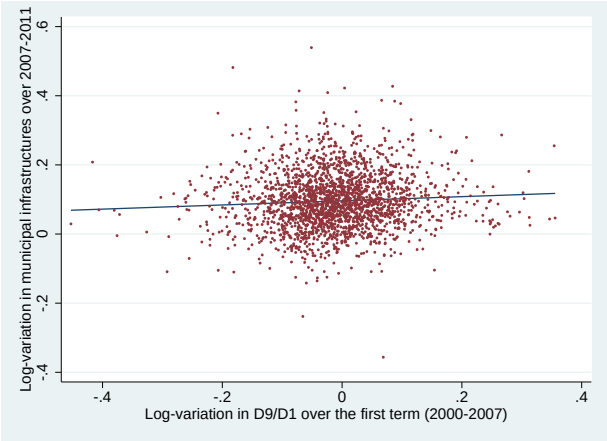
	Dependent variable: net value of the stock of municipal infrastructures per head			
	FD (1)	FD IV provinces (2)	FD IV counties (3)	FD dynamic (4)
			IQR/D5	
Lagged dependent variable				0.12***
				(0.02)
Average income	0.13***	0.20***	0.16***	0.10**
	(0.05)	(0.07)	(0.06)	(0.05)
Income inequality	0.11***	0.32**	0.22*	0.10***
	(0.03)	(0.15)	(0.12)	(0.03)
Adjusted R-squared	0.03	0.02	0.03	0.05
Nb. Obs	2200	2200	2200	2200
F-stat exclud. instruments		102.13	216.06	
			D9/D1	
Lagged dependent variable				0.12***
				(0.02)
Average income	0.15***	0.30**	0.24**	0.12**
	(0.05)	(0.13)	(0.10)	(0.05)
Income inequality	0.08***	0.25*	0.19*	0.08***
	(0.02)	(0.14)	(0.10)	(0.02)
Adjusted R-squared	0.03	0.00	0.02	0.05
Nb. Obs	2200	2200	2200	2200
F-stat exclud. instruments		43.47	81.95	
			D5/D1	
Lagged dependent variable				0.12***
				(0.02)
Average income	0.14***	0.17	0.22*	0.11**
	(0.05)	(0.16)	(0.13)	(0.05)
Income inequality	0.06**	0.10	0.17	0.06**
	(0.03)	(0.20)	(0.16)	(0.03)
Adjusted R-squared	0.03	0.03	0.02	0.05
Nb. Obs	2200	2200	2200	2200
F-stat exclud. instruments		36.84	50.19	
			D9/D5	
Lagged dependent variable				0.12***
				(0.02)
Average income	0.09**	0.10**	0.10**	0.06
	(0.05)	(0.05)	(0.05)	(0.05)
Income inequality	0.18***	0.54***	0.33**	0.18***
	(0.05)	(0.20)	(0.16)	(0.05)
Adjusted R-squared	0.03	0.01	0.03	0.05
Nb. Obs	2200	2200	2200	2200
F-stat exclud. instruments		138.21	251.28	
			Gini	
Lagged dependent variable				0.12***
				(0.02)
Average income	0.09*	0.08*	0.08*	0.06
	(0.05)	(0.05)	(0.05)	(0.05)
Income inequality	0.17***	0.55***	0.43***	0.17***
	(0.04)	(0.20)	(0.15)	(0.04)
Adjusted R-squared	0.04	-0.00	0.02	0.06
Nb. Obs	2200	2200	2200	2200
F-stat exclud. instruments		89.79	173.85	

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.
This table shows estimates of the impact of different measures of inequality on municipal infrastructures. Column (1) shows results from Equation (3.1b), which is the simple first-difference equation, with no lagged dependent variable. Columns (2) and (3) estimate the same equation, by instrumenting the income inequality measure in a 2SLS setting. In Column (2) (respectively in Column (3)), the log-variation in income inequality at the municipal level is instrumented by the log-variation in income inequality at the province (respectively county) level. For each regression of these two columns, the F-statistics on the excluded instrument is shown. Column (4) presents estimates from Equation (3.2b), which is the first-difference equation without instrumenting, but with the inclusion of the lagged dependent variable. Coefficients represent elasticities, as variables are in logarithm.

contexts.[27]

Evidence supporting the influence of income inequality on municipal facilities relies on first-difference over time in inequality and in the stock of municipal infrastructures. Given the short time span of data, these regressions may seem highly demanding, so that positive and significant coefficients on income inequality could be driven by outliers. Figure 3.4 provides a scatter plot which crosses the log-variation of D9/D1 and the log-variation of the stock of municipal infrastructures. This figure also shows the fitted line from the regression of this second variable on the first one, without any control. There is clear evidence that the positive relationship between these two variables is the result of a global trend, and not of some extreme cases.

Figure 3.4: Variations in infrastructures according to variations in income inequality



This figure provides a scatter plot confronting the variation of the logarithm of D9/D1 over the first political term and the variation of the logarithm of the net stock of municipal infrastructures over the second political term. It also shows the fitted line from the regression of this log-variation in infrastructures on this log-variation in D9/D1. This regression corresponds to the estimation of Equation (3.1b) without any control.

A given variation in income inequality can be of different natures, depending on the part of the income distribution which drives this variation. Then, a positive impact of income inequality on public infrastructures can have different explanations. This is why it is key to identify the parts of the income distribution which drive this result. Given the high number of observations in the data, it is possible to identify precisely the impact of one decile given others. Table 3.6 shows results from such identification. Point estimates come from estimations of Equation (3.2b) where the income inequality variable is replaced by different deciles in a same regression. Because of the correlation between different deciles, such estimations have to be considered with cautious. This is why it is key to make vary the number of deciles included in a same regression. The first part of Table 3.6 corresponds to regressions in which two deciles are included, while the second one corresponds to regressions where regressors contain three deciles. In each of these parts, each column corresponds to a different regression. Deciles used as regressors in a same estimation have to be far enough in order to prevent multicollinearity, and to ensure identification. Then, they are classified in categories: the three first deciles, the three next ones, and the three last deciles. No regression includes different deciles of the same category. The key idea underlying results of Table 3.6 is to present point estimates by taking different sets of deciles, and to induce

[27] See Alesina et al. (2000), Alesina et al. (2001) and Clark & Milcent (2011).

from all these regressions a broad picture of the parts of the income distribution which matter in the amount of infrastructures. Table 3.A.1 in Appendix shows results of a similar exercise for operating spending, and provides additive evidence that it is not possible to conclude to an impact of income distribution on municipal operating expenditures.

Results of Table 3.6 suggest that the positive impact of income inequality on municipal infrastructures is driven by bottom and top deciles. Whatever the number or the set of included deciles, significant coefficients are always related to the first four deciles, and to the ninth one. They are negative for these four first deciles, and positive for the top one, which is coherent with a positive impact of income inequality. It is important to note that these regressions can only provide suggestions on the impact of approximate parts of the income distribution. Given the correlation between the different deciles, it is hard to identify the precise fractiles which are decisive. This is why the only aim of these regressions is to identify the effect of approximate parts of the income distribution, by testing the impact of different sets of deciles. Despite this limitation, Table 3.6 gives for each regression the Akaike Information Criterion (AIC) in order to have an idea of the regression which fits better the data. For regressions with two deciles, the best regression according to this criterion is the one which includes the third and the ninth decile, where both deciles have significant coefficients. For regressions with three deciles, the best one according to the AIC is the one which includes the second, the sixth and the ninth deciles, where only the two extreme ones have significant impact. While this criterion cannot be used to claim conclusions on the precise decisive deciles, it provides additive support that what matter are the bottom and the top of income distribution, but not the middle. When poorest households get poorer, or when richest ones get richer, the stock of municipal infrastructures increases.

These effects of income distribution on public infrastructures are not necessarily driven by decisions of municipal policy-makers. They can be due to automatic variations in municipal revenues correlated with income distribution. For the impact of top deciles, it is possible that an increase in highest deciles leads to an increase in local tax bases. As for the impact of the bottom of the income distribution, it can be the result of intergovernmental equalization grants. When poorest people can poorer, the municipality may benefit from a higher level of these transfers. Then, it is important to know whether this impact of income distribution on infrastructures is linked to revenues effectively controlled by municipalities.

Table 3.7 shows the impact of D9/D1 on uncontrolled investment revenues, and on each category of controlled investment resources, as defined in Table 3.2 (results with alternative measures of income inequality are presented in Table 3.A.2 in Appendix). There is clear evidence that the impact of income inequality on municipal infrastructures is not driven by investment resources uncontrolled by municipalities, but by other sources of revenues, and especially by the operating surplus municipalities transfer to the investment section.[28] Another result is a

[28]Table 3.A.3 in Appendix shows the impact of the same sets of deciles as in Table 3.6, by replacing the dependent variable and the lagged dependent variable by the stock of this category of revenue, instead of the stock of municipal public goods. Results are qualitatively similar with respect to Table 3.6, which suggests that the impact of income inequality on municipal public goods and on transferred operating surplus are related to the same effect of the income distribution.

Table 3.6: The effect of the different deciles on municipal infrastructures

Dependent variable: net value of the stock of municipal infrastructures per head									
					Two deciles				
Lagged dependent variable	0.12***	0.12***	0.12***	0.12***	0.12***	0.11***	0.12***	0.12***	0.12***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Average income	-0.04	0.24***	-0.05	0.19*	0.06	0.27***	0.29***	0.06	-0.04
	(0.09)	(0.08)	(0.10)	(0.10)	(0.10)	(0.08)	(0.07)	(0.10)	(0.10)
D1	-0.05**	-0.06**					-0.04		
	(0.02)	(0.03)					(0.03)		
D2				-0.17***		-0.17***			
				(0.04)		(0.05)			
D3					-0.16***				
					(0.06)				
D4							-0.19***	-0.19***	
							(0.07)	(0.07)	
D5		-0.10	-0.11						
		(0.08)	(0.08)						
D6						-0.02			-0.14
						(0.10)			(0.09)
D8				0.08					
				(0.11)					
D9	0.23***		0.25***		0.20**			0.21**	0.27***
	(0.08)		(0.08)		(0.08)			(0.08)	(0.08)
Adjusted R-squared	0.06	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.05
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	2200
AIC	-4871.19	-4864.59	-4868.72	-4873.72	-4874.58	-4873.12	-4870.14	-4874.31	-4869.28
					Three deciles				
Lagged dependent variable	0.12***	0.12***	0.12***	0.12***	0.12***	0.12***	0.12***	0.12***	0.12***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Average income	0.01	0.09	0.10	0.20**	0.06	0.22**	0.19*	0.32***	0.17*
	(0.11)	(0.11)	(0.11)	(0.10)	(0.11)	(0.10)	(0.10)	(0.09)	(0.10)
D1	-0.04*	-0.03		-0.03				-0.04	
	(0.03)	(0.03)		(0.03)				(0.03)	
D2			-0.13***			-0.13*	-0.17***		
			(0.05)			(0.07)	(0.06)		
D3					-0.15**				-0.24***
					(0.07)				(0.09)
D4		-0.16**		-0.21***		-0.10		-0.17**	
		(0.07)		(0.08)		(0.10)		(0.08)	
D5	-0.07						0.01		0.06
	(0.08)						(0.11)		(0.13)
D6			-0.04		-0.01				
			(0.10)		(0.11)				
D7								-0.06	
								(0.11)	
D8				0.12		0.10	0.08		0.09
				(0.11)		(0.11)	(0.12)		(0.12)
D9	0.22***	0.19**	0.18**		0.20**				
	(0.08)	(0.08)	(0.09)		(0.08)				
Adjusted R-squared	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	2200
AIC	-4869.87	-4873.57	-4875.71	-4869.64	-4872.59	-4873.00	-4871.72	-4868.47	-4868.41

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.
This table shows results from Equation (3.2b), which is the first-difference equation with the inclusion of the lagged dependent variable. This table is divided in two parts: the first one shows regressions where two deciles are simultaneously included as regressors while the second one shows results where three deciles are included. In each of these parts, each column represents a different regression with a different set of deciles. Coefficients represent elasticities, as variables are in logarithm. The table shows for each regression the Akaike Information Criterion (AIC).

Table 3.7: The effect of D9/D1 on municipal investment revenues

	Dependent variable: net value of the stock of municipal investment revenues per head		
	Uncontrolled investment revenues (1)	Loans (2)	Transferred operating surplus (3)
Lagged dependent variable	0.14***	0.08**	0.32***
	(0.02)	(0.03)	(0.02)
Average income	-0.08	0.46	0.15***
	(0.06)	(0.30)	(0.05)
D9/D1	-0.01	0.18	0.11***
	(0.03)	(0.12)	(0.02)
Adjusted R-squared	0.08	0.01	0.23
Nb. Obs	2200	2200	2200

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.
This table shows estimations of the impact of D9/D1 on the different categories of investment revenues, as defined in Table 3.2. *Uncontrolled investment revenues* cover formula-based investment grants, discretionary investment grants, and assets transfers. Results in this table come the estimation of Equation (3.2b), which is the first-difference equation with the inclusion of the lagged dependent variable. Coefficients represent elasticities, as variables are in logarithm. Results using alternative measures of income inequality are presented in Appendix, in Table 3.A.2.

positive impact of the average income on investment revenues controlled by municipalities, but a negative impact on resources uncontrolled by local policy-makers. Although this last effect is not significant, it illustrates the role of inter-jurisdictional equalization of these revenues, especially through intergovernmental transfers.

Then, it is important to know which components of the operating surplus drive these results related to inequality. This surplus is the difference between operating revenues and operating spending of municipalities. As data on components of this surplus provide information in annual flow instead of stock, Equation (3.4) is estimated. Table 3.8 provides results on the impact of D9/D1 on different components of the operating surplus (Table 3.A.4 in Appendix provides the same results for alternative income inequality measures). Each column corresponds to a different regression, related to a specific dependent variable. Columns (1) and (2) show respectively the impact of income inequality on total operating spending, and total operating revenues. Consistently to previous finding, there is no significant impact of income inequality on operating spending. However, the impact on operating revenues is positive and significant. Then, columns (3) to (5) of Table 3.8 show results on the impact of income inequality on each category of these revenues, as defined in Table 3.2. There is clear evidence that income inequality has an impact on local fiscal products, while other kinds of operating revenues do not play any role according to these results. Since the effects seem to be concentrated on fiscal products, columns (6) to (9) show the impact of income inequality on each of the products of the four taxes presented in Section 3.2. Over these tax revenues, three of them react positively to income inequality: the PTBE, the PTUE and the LBT.[29]

[29]For this last tax, the sample size is reduced because of delegation of this tax to inter-municipal communities. Regressions on this tax rely only on 435 observations. Municipalities which are in an inter-municipal community (92.3% of municipalities of the sample) can decide, either to transfer competencies regarding this tax to the community, or to keep a share of it. The first case is the most frequent: 77.5% of municipalities of the sample do not have any fiscal product from the local business tax because of this transfer of taxation. The complement of this share is 22.5% while the reduced sample of 435 observations used for regressions on the local business tax rate represents 19.8% of the whole sample. Indeed, in order to run the first-difference equation, I need to keep municipalities which take decisions on the local business tax rate for both political terms.

Table 3.8: The effect of D9/D1 on components of the operating surplus

	Dependent variable: cumulated amount per head of the component over the political term								
	Spending and revenues		*Categories of revenue*			*Tax products*			
	Operating spending	Operating revenues	Formula-based revenues	Fiscal products	Other operating revenues	HT product	PTBE product	PTUE product	LBT product
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Lagged dependent variable	0.04***	-0.03***	0.03**	-0.09***	-0.06	-0.08***	-0.06***	-0.04*	-0.52
	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)	(0.02)	(0.50)
Average income	0.36***	0.35***	0.13*	0.69***	0.32	0.53***	0.49***	-0.15	1.27
	(0.06)	(0.05)	(0.07)	(0.07)	(0.21)	(0.04)	(0.04)	(0.11)	(1.16)
D9/D1	0.03	0.05**	0.01	0.13***	-0.10	0.02	0.05**	0.12**	1.02*
	(0.03)	(0.02)	(0.03)	(0.03)	(0.09)	(0.02)	(0.02)	(0.05)	(0.56)
Adjusted R-squared	0.04	0.05	0.16	0.17	0.01	0.15	0.10	0.12	-0.01
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	435

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.

This table shows estimations of the impact of D9/D1 on each category of the operating surplus of municipalities. Since the aim is to investigate the operating section from the specification in stocks, these results come from the estimation of Equation (3.4). Columns (1) and (2) take as the dependent variable operating expenditures and operating revenues respectively. Columns (3) to (5) show results on the impact of D9/D1 on each category of operating revenues, as defined in Section 3.2. Finally, columns (6) to (9) present estimates on the impact of D9/D1 on the product of each of the four municipal taxes described in Section 3.2. Coefficients represent elasticities, as variables are in logarithm. Results using alternative measures of income inequality are presented in Appendix, in Table 3.A.4.

HT, *PTBE*, *PTUE* and *LBT* respectively stand for "housing tax", "property tax on built estate", "property tax on unbuilt estate" and "local business tax".

The main part of municipalities of the sample has transferred the competency of the LBT to their inter-municipal community. This explains the lower number of observations for regressions related to this tax. See Section 3.5 for more details.

Table 3.9: The effect of D9/D1 on tax bases and tax rates

	Dependent variable: sum of the tax base per head or the tax rate over the political term							
	HT		*PTBE*		*PTUE*		*LBT*	
	Tax base	Tax rate	Tax base	Tax rate	Tax base	Tax rate	Tax base	Tax rate
Lagged dependent variable	-0.01**	-0.06***	0.01*	-0.07***	0.02	-0.05***	-0.35	-0.07***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.37)	(0.02)
Average income	0.30***	0.21***	0.25***	0.22***	-0.32***	0.15***	0.97	0.20**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.09)	(0.03)	(0.86)	(0.08)
D9/D1	-0.03***	0.04***	-0.00	0.04***	0.05	0.06***	0.71*	0.08**
	(0.01)	(0.01)	(0.02)	(0.02)	(0.04)	(0.01)	(0.42)	(0.03)
Adjusted R-squared	0.16	0.09	0.06	0.09	0.18	0.06	-0.01	0.08
Nb. Obs	2200	2200	2200	2200	2200	2200	435	435

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.
This table shows estimations of the impact of D9/D1 on the tax base and the tax rate of each of the four municipal taxes described in Section 3.2. Since the aim is to investigate operating revenues from the specification in stocks, these results come from the estimation of Equation (3.4). Coefficients represent elasticities, as variables are in logarithm. Results using alternative measures of income inequality are presented in Appendix, in Table 3.A.5.
HT, *PTBE*, *PTUE* and *LBT* respectively stand for "housing tax", "property tax on built estate", "property tax on unbuilt estate" and "local business tax".
The main part of municipalities of the sample has transferred the competency of the LBT to their inter-municipal community. This explains the lower number of observations for regressions related to this tax. See Section 3.5 for more details.

However, these results could be driven by increases in local tax bases and/or by increases in local tax rates. The distinction is important, as only tax rates are parameters controlled by municipal policy-makers. The importance of this distinction is illustrated by the relatively high size of the coefficient on average income in estimated equations on total fiscal products (column (4)), and on the HT and the PTBE products (columns (6) and (7)). This coefficient is likely to be driven by a positive correlation between individuals' average income and the average tax base.

Table 3.9 aims at providing such evidence. It shows for each local tax base and local tax rate the impact of the ratio D9/D1, by still estimating Equation (3.4) (regressions using alternative measures of inequality are in Table 3.A.5 in Appendix). Results suggest a positive impact of income inequality on the four tax rates decided by municipalities. They also support the view that, except for the HT, these effects on tax rates are not a reaction to variations in tax bases in the opposite direction.[30] Overall, these results suggest that on average, municipalities react to more income inequality by increasing taxation in order to fund more public infrastructures.

If these effects on tax rates are associated to previous results on the stock of municipal public infrastructures, one should observe for taxation the same results regarding the impact of different sets of deciles. Table 3.10 provides results of such estimations. It focuses on tax rates of the three taxes for which a positive impact of inequality on the rate is observed without a negative impact on the tax base. In order to present compact results, this table only shows results from regressions with the inclusion of two deciles in a same regression. Results related to all sets of deciles (where two and three deciles are included) are in Appendix (Tables 3.A.6, 3.A.7

[30]The negative relationship between income inequality and the HT tax base may be the result of tax reductions and exemptions the national law imposes for this specific tax (see Section 3.2). When bottom deciles decrease, these reductions and exemptions, which consist in decreasing the tax base of taxpayers, may increase.

and 3.A.8). Results of this table fits previous evidence on the impact of the different deciles on municipal infrastructures. They suggest that the PTBE rate decreases with the bottom part of the income distribution, and increases with top deciles. As for the PTUE rate and the LBT rate, they seem to react negatively with the bottom of income distribution, but there is only very weak evidence that top deciles matter. Results on the PTBE may be the most important ones, since this tax has the highest weight in terms of revenues: products from the PTBE represent on average 48.9% of total tax revenues in the sample, while the similar shares for the PTUE and the LBT are respectively 2.0% and 9.9%. The weak evidence of the effect of the top of the income distribution on the PTUE rate is not of key importance regarding low amounts of this tax. As for the LBT, this same weak evidence might be the result of the highly demanding estimations on this tax due to the low number of observations they rely on.

3.6 Discussion

The key result of this paper is a positive and significant impact of income inequality on municipal infrastructures, driven by bottom and top deciles. When poorest households get poorer, or when richest ones get richer, the stock of municipal infrastructures increases. It is shown that such an increase is driven by higher tax rates. In other words, municipal policy-makers react to increases in gaps between the extreme parts of the income distribution by increasing taxation in order to provide more public facilities.

The main conclusion is that, in the investigated context, what matter for taxation and the amount of public goods are the extreme parts of the income distribution. This result is in tension with widely studied mechanisms in Political Economy. First, it contrasts with median-voter considerations, which would suggest a decisive role of the fifth decile, or of deciles just above (if one considers voter turnout to be increasing with income).[31] Second, it contrasts with Benabou (2000), who shows theoretically that more heterogeneous societies lead to less public policies. Third, it is also in tension with "one dollar one vote" considerations supported by Karabarbounis (2011), since there is no evidence that every decile matters for public decisions.[32] Finally, findings are not in line with Epple & Romano (1996), who suggest a coalition of the rich and the poor in favour of less public goods. If findings were in line with this mechanism, one should find that increases in top deciles and decreases in bottom ones decrease the amount of public goods in the jurisdiction.

However, even if the precise story of Epple & Romano (1996) is not validated by evidence of this paper, the idea of a coalition of the top and the bottom of the income distribution can hold. Such a coalition would imply that poorest and richest voters have a higher demand for public goods than the middle class. On the one hand, richer residents may have a relatively

[31] See Filer et al. (1993) and Lassen (2005), who provide evidence that voter turnout increases with income and education.

[32] If the influence of voters over public decisions is a function of their economic weight, then one should expect that *for every decile*, an increase in its value will increase the weight of individuals in this decile, making public decisions closer to the preferred platform of this category of income. One then should get significant coefficients for each decile, whatever the sign of them. Since there is no evidence of an impact of all deciles on public goods (and more precisely no impact of the middle of the income distribution), this channel cannot be supported.

Table 3.10: The effect of the different deciles on tax rates

	Dependent variable: sum of the tax rate over the political term								
					PTBE rate				
D1	-0.03	-0.04*					-0.02		
	(0.02)	(0.02)					(0.02)		
D2				-0.10***		-0.12***			
				(0.03)		(0.03)			
D3					-0.12***				
					(0.04)				
D4							-0.14**	-0.13***	
							(0.06)	(0.05)	
D5		-0.05	-0.05						
		(0.06)	(0.06)						
D6						0.11			0.02
						(0.07)			(0.07)
D8				0.17**					
				(0.08)					
D9	0.14**		0.16***		0.11*			0.12**	0.17***
	(0.06)		(0.06)		(0.06)			(0.06)	(0.06)
AIC	-6400.89	-6395.46	-6398.87	-6408.56	-6407.45	-6404.89	-6401.73	-6405.00	-6398.08
					PTUE rate				
D1	-0.06***	-0.06***					-0.05**		
	(0.02)	(0.02)					(0.02)		
D2				-0.12***		-0.13***			
				(0.03)		(0.03)			
D3					-0.13***				
					(0.04)				
D4							-0.12**	-0.15***	
							(0.05)	(0.05)	
D5		-0.08	-0.12**						
		(0.06)	(0.06)						
D6						0.02			-0.08
						(0.07)			(0.06)
D8				0.07					
				(0.07)					
D9	0.09		0.11**		0.07			0.08	0.13**
	(0.06)		(0.06)		(0.06)			(0.06)	(0.05)
AIC	-6624.88	-6624.59	-6617.67	-6628.75	-6624.30	-6627.75	-6628.44	-6624.02	-6614.53
					LBT rate				
D1	-0.07	-0.06*					-0.05		
	(0.04)	(0.04)					(0.04)		
D2				-0.20***		-0.22***			
				(0.07)		(0.07)			
D3					-0.20*				
					(0.11)				
D4							-0.20	-0.23*	
							(0.13)	(0.13)	
D5		-0.19	-0.22						
		(0.15)	(0.15)						
D6						0.13			-0.06
						(0.15)			(0.15)
D8				0.25					
				(0.15)					
D9	0.16		0.18		0.11			0.15	0.23**
	(0.11)		(0.11)		(0.12)			(0.12)	(0.11)
AIC	-1256.33	-1256.99	-1255.95	-1264.49	-1259.09	-1262.67	-1258.17	-1257.84	-1252.71

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.
This table shows results on the impact of different sets of deciles on the different tax rates, where two deciles are included in the same regression. It focuses on tax rates of the three taxes for which a positive impact of inequality on the rate is observed without a negative impact on the tax base (see Table 3.8). For each tax rate, each column is related to a different regression. Since the aim is to investigate operating revenues from the specification in stocks, these results come from the estimation of Equation (3.4). Coefficients represent elasticities, as variables are in logarithm. The table shows for each regression the Akaike Information Criterion (AIC). Tables 3.A.6, 3.A.7 and 3.A.8 in Appendix provide results for each of these tax rates where two and three deciles are simultaneously included, taking the same sets of deciles as in Table 3.6.
PTBE, *PTUE* and *LBT* respectively stand for "property tax on built estate", "property tax on unbuilt estate" and "local business tax".
Regressions related to the PTBE rate and the PTUE rate rely on 2,200 observations, while the sample for regressions explaining the LBT rate is made up of 435 observations. The main part of municipalities of the sample has transferred the competency of the LBT to their inter-municipal community. This explains the lower number of observations for regressions related to this tax. See Section 3.5 for more details.

high preference for public goods and support high size of local governments, even if the amount they pay through taxation is higher than the amount of public goods they benefit from. On the other hand, low-income voters may have a higher demand for public goods relatively to the middle class because of their net gain through taxation.

Findings of this paper can also be the result of a demand of voters or municipal incumbents for redistribution between households, through the provision of municipal infrastructures. A decrease in income of poorest households or an increase of top incomes can be seen as events to be corrected.

Although it is not possible to disentangle between these different mechanisms, the main result is that decreases in bottom deciles and increases in top ones lead to a variation in public goods and taxation in the same direction. These variations in public policy are either the result of heterogeneous demands for public goods and taxation according to income, or the result of a demand for redistribution.

3.7 Conclusion

This paper brings new empirical evidence on the impact of income distribution on public policy. Using a new panel database on French municipalities' accounts and on households' income distribution at the municipal level, this paper is the first one to investigate this research question by simultaneously relying on a high number of comparable observations, and estimating the impact of each part of the income distribution. I propose a new way to address and document the endogeneity issue associated to sorting behaviours of voters. In addition to apply specifications of previous papers by instrumenting local income inequality, I also estimate a first-difference equation taking into account the dynamics of municipal decisions. Finally, detailed information on municipal accounts allows to identify precisely the impact of income distribution on each category and parameter of municipal revenues, so that to distinguish accurately between variations in revenues associated to an active decision of policy-makers, and those out of the control of local incumbents.

Results suggest robust evidence of a positive and significant impact of income inequality on the net value of the stock of municipal infrastructures. An increase in income inequality by 1% leads on average to an increase in this stock value between 0.06% and 0.18% across different measures of income inequality. In contrast, it is not possible to conclude to an impact of income inequality on operating spending. The comparison of the different empirical specifications suggests that sorting behaviours may not be an issue for identification, while bias would be due to measurement errors, which leads to choose more conservative estimates.

In order to interpret this evidence of an impact of income inequality on public infrastructures, I investigate the nature of income inequality which drives this result. More precisely, I estimate the part of the income distribution which matters for the amount of public facilities. There is robust evidence that municipal infrastructures significantly react to bottom and top deciles, while the middle part of the income distribution does not seem to play any role. When poorest individuals get poorer, or when richest ones get richer, the amount of public infrastructures

significantly increases.

Then, I investigate deeply the impact of income distribution on each category of municipal revenues, in order to know whether this effect on public infrastructures is associated to active decisions of municipal incumbents through revenue parameters they control, or to automatic variations in revenues due to income distribution. I find evidence that the previous effect of income distribution on public infrastructures is driven by variations in local tax rates, which are directly controlled by municipalities. In other words, when lowest income get lower, or when highest ones get higher, municipal incumbents decide to increase the amount of public goods by increasing taxation.

The main message of this paper is that what matter in the amount of public goods are not middle deciles of income, but extreme parts of the income distribution. A decrease in lowest incomes or an increase in top ones makes taxation and the amount of public goods move in the same direction. Such a result is new regarding the existing literature. It can be either due to a demand of voters or municipal incumbents for redistribution, or due to a higher demand of low and top incomes for public goods and taxation with respect to the middle class. Such a higher demand for public goods would be the result of gains from redistribution for low-income individuals, while it would come from a higher preference for public goods for top income residents.

Deciding between these different interpretations remains open and requires further investigation. Identifying the categories of municipal equipment (schooling, urban policy, elderly policies, sport, etc.) which drive my results may be a way to give a more precise interpretation. Unfortunately, there is no data on such a functional decomposition with enough precision for a first-difference specification over the time span of these data.

Appendix

3.A Additional tables

Table 3.A.1: The effect of the different deciles on municipal operating spending

	Dependent variable: mean of the yearly amount of operating spending per head over the political term								
					Two deciles				
D1	-0.00	-0.00					-0.00		
	(0.03)	(0.03)					(0.03)		
D2				-0.07		-0.10**			
				(0.05)		(0.05)			
D3					-0.10				
					(0.07)				
D4							-0.05	-0.02	
							(0.09)	(0.09)	
D5		-0.08	-0.06						
		(0.11)	(0.10)						
D6						0.12			0.05
						(0.12)			(0.11)
D8				0.23*					
				(0.13)					
D9	0.14		0.12		0.08			0.13	0.14
	(0.11)		(0.10)		(0.11)			(0.11)	(0.10)
Adjusted R-squared	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	2200
AIC	-4067.18	-4065.91	-4067.54	-4071.46	-4069.53	-4068.87	-4065.59	-4067.26	-4067.36
					Three deciles				
D1	0.01	0.00		0.01				0.00	
	(0.03)	(0.03)		(0.03)				(0.03)	
D2			-0.08			-0.09	-0.05		
			(0.05)			(0.07)	(0.06)		
D3					-0.17**				-0.13
					(0.08)				(0.09)
D4		-0.03		-0.08		0.03		-0.08	
		(0.10)		(0.09)		(0.12)		(0.10)	
D5	-0.06						-0.08		0.00
	(0.11)						(0.13)		(0.14)
D6			0.11		0.19				
			(0.12)		(0.12)				
D7								0.09	
								(0.13)	
D8				0.26**		0.22*	0.26*		0.24*
				(0.13)		(0.13)	(0.13)		(0.13)
D9	0.13	0.13	0.09		0.07				
	(0.11)	(0.11)	(0.11)		(0.11)				
Adjusted R-squared	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.07
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	2200
AIC	-4065.57	-4065.27	-4067.61	-4067.96	-4069.67	-4069.53	-4069.87	-4064.08	-4070.87

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.
This table shows results from Equation (3.2a), which is the first-difference equation with the inclusion of the lagged dependent variable. This table is divided in two parts: the first one shows regressions where two deciles are simultaneously included as regressors while the second one shows results where three deciles are included. In each of these parts, each column represents a different regression with a different set of deciles. Coefficients represent elasticities, as variables are in logarithm. The table shows for each regression the Akaike Information Criterion (AIC).

Table 3.A.2: The effect of income inequality on municipal investment revenues

	Dependent variable: net value of the stock of municipal investment revenues per head		
	Uncontrolled investment revenues (1)	Loans (2)	Transferred operating surplus (3)
		IQR/D5	
Lagged dependent variable	0.14***	0.08**	0.32***
	(0.02)	(0.03)	(0.02)
Average income	-0.06	0.34	0.10**
	(0.06)	(0.29)	(0.05)
IQR/D5	0.04	0.09	0.12***
	(0.04)	(0.20)	(0.04)
Adjusted R-squared	0.08	0.01	0.23
Nb. Obs	2200	2200	2200
		D5/D1	
Lagged dependent variable	0.14***	0.08**	0.32***
	(0.02)	(0.03)	(0.02)
Average income	-0.09	0.52	0.15***
	(0.07)	(0.32)	(0.06)
D5/D1	-0.03	0.26*	0.11***
	(0.03)	(0.14)	(0.03)
Adjusted R-squared	0.08	0.01	0.23
Nb. Obs	2200	2200	2200
		D9/D5	
Lagged dependent variable	0.14***	0.08**	0.32***
	(0.02)	(0.03)	(0.02)
Average income	-0.07	0.31	0.06
	(0.06)	(0.28)	(0.05)
D9/D5	0.07	-0.02	0.21***
	(0.07)	(0.30)	(0.06)
Adjusted R-squared	0.08	0.01	0.23
Nb. Obs	2200	2200	2200
		Gini	
Lagged dependent variable	0.14***	0.08**	0.32***
	(0.02)	(0.03)	(0.02)
Average income	-0.07	0.31	0.06
	(0.06)	(0.28)	(0.05)
Gini	0.07	0.23	0.21***
	(0.05)	(0.24)	(0.05)
Adjusted R-squared	0.08	0.01	0.23
Nb. Obs	2200	2200	2200

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.

This table presents the same estimations as Table 3.7 with alternative measures of income inequality. It shows estimations of the impact of income inequality on the different categories of investment revenues, as defined in Table 3.2. *Uncontrolled investment revenues* cover formula-based investment grants, discretionary investment grants, and assets transfers. Results in this table come the estimation of Equation (3.2b), which is the first-difference equation with the inclusion of the lagged dependent variable. Coefficients represent elasticities, as variables are in logarithm.

Table 3.A.3: The effect of the different deciles on transferred operating surplus

	Dependent variable: net value of the stock of municipal transferred operating surplus per head								
					Two deciles				
Lagged dependent variable	0.32***	0.32***	0.32***	0.32***	0.32***	0.32***	0.32***	0.32***	0.32***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Average income	0.08	0.32***	0.01	0.26**	0.05	0.30***	0.36***	0.11	-0.03
	(0.10)	(0.09)	(0.12)	(0.11)	(0.11)	(0.09)	(0.08)	(0.12)	(0.12)
D1	-0.10***	-0.11***					-0.09***		
	(0.03)	(0.03)					(0.03)		
D2				-0.21***		-0.21***			
				(0.04)		(0.05)			
D3					-0.16**				
					(0.06)				
D4							-0.18**	-0.24***	
							(0.08)	(0.08)	
D5		-0.11	-0.17*						
		(0.10)	(0.09)						
D6						-0.01			-0.16
						(0.12)			(0.11)
D8				0.04					
				(0.12)					
D9	0.19**		0.24***		0.20**			0.19**	0.27***
	(0.09)		(0.09)		(0.09)			(0.09)	(0.09)
Adjusted R-squared	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	2200
AIC	-4365.90	-4363.06	-4355.33	-4363.77	-4357.83	-4363.62	-4366.41	-4361.23	-4354.14
					Three deciles				
Lagged dependent variable	0.32***	0.32***	0.32***	0.32***	0.32***	0.32***	0.32***	0.32***	0.32***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Average income	0.14	0.20	0.15	0.31***	0.07	0.29**	0.26**	0.38***	0.20*
	(0.13)	(0.12)	(0.13)	(0.11)	(0.13)	(0.11)	(0.11)	(0.10)	(0.11)
D1	-0.10***	-0.08***		-0.09***				-0.09***	
	(0.03)	(0.03)		(0.03)				(0.03)	
D2			-0.18***			-0.17**	-0.21***		
			(0.05)			(0.07)	(0.06)		
D3					-0.15**				-0.18**
					(0.07)				(0.09)
D4		-0.15*		-0.18**		-0.10		-0.16*	
		(0.09)		(0.09)		(0.11)		(0.10)	
D5	-0.08						-0.01		-0.06
	(0.10)						(0.12)		(0.14)
D6			-0.02		-0.03				
			(0.12)		(0.13)				
D7								-0.05	
								(0.13)	
D8				0.06		0.07	0.05		0.10
				(0.12)		(0.12)	(0.13)		(0.13)
D9	0.17*	0.15	0.15		0.20**				
	(0.09)	(0.09)	(0.09)		(0.09)				
Adjusted R-squared	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	2200
AIC	-4364.65	-4367.01	-4364.21	-4364.72	-4355.92	-4362.77	-4361.77	-4364.57	-4351.89

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.
This table shows results from Equation (3.2b), which is the first-difference equation with the inclusion of the lagged dependent variable. This table is divided in two parts: the first one shows regressions where two deciles are simultaneously included as regressors while the second one shows results where three deciles are included. In each of these parts, each column represents a different regression with a different set of deciles. Coefficients represent elasticities, as variables are in logarithm. The table shows for each regression the Akaike Information Criterion (AIC).

Table 3.A.4: The effect of income inequality on components of the operating surplus

	Dependent variable: cumulated amount per head of the component over the political term								
	Spending and revenues		*Categories of revenue*			*Tax products*			
	Operating spending (1)	Operating revenues (2)	Formula-based revenues (3)	Fiscal products (4)	Other operating revenues (5)	HT product (6)	PTBE product (7)	PTUE product (8)	LBT product (9)
				IQR/D5					
Lagged dependent variable	0.04***	-0.03***	0.03**	-0.09***	-0.06	-0.08***	-0.06***	-0.04*	-0.62
	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)	(0.02)	(0.49)
Average income	0.38***	0.35***	0.14**	0.63***	0.44**	0.51***	0.46***	-0.19*	1.72
	(0.05)	(0.04)	(0.06)	(0.06)	(0.20)	(0.04)	(0.04)	(0.11)	(1.25)
IQR/D5	0.12***	0.14***	0.07	0.16***	0.12	-0.02	0.03	0.17**	4.06**
	(0.04)	(0.03)	(0.05)	(0.06)	(0.15)	(0.03)	(0.03)	(0.07)	(1.57)
Adjusted R-squared	0.04	0.05	0.16	0.16	0.01	0.15	0.10	0.12	0.01
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	435
				D5/D1					
Lagged dependent variable	0.04***	-0.03***	0.03**	-0.09***	-0.06	-0.08***	-0.06***	-0.04*	-0.52
	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)	(0.02)	(0.50)
Average income	0.35***	0.33***	0.14**	0.68***	0.25	0.56***	0.50***	-0.18	1.11
	(0.06)	(0.05)	(0.07)	(0.07)	(0.21)	(0.04)	(0.04)	(0.12)	(1.16)
D5/D1	0.01	0.04	0.03	0.13***	-0.18*	0.06***	0.06***	0.08	0.76
	(0.03)	(0.03)	(0.04)	(0.04)	(0.11)	(0.02)	(0.02)	(0.06)	(0.62)
Adjusted R-squared	0.04	0.05	0.16	0.16	0.01	0.15	0.10	0.12	-0.01
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	435
				D9/D5					
Lagged dependent variable	0.04***	-0.03***	0.03**	-0.09***	-0.06	-0.08***	-0.06***	-0.04*	-0.56
	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)	(0.02)	(0.49)
Average income	0.34***	0.31***	0.12*	0.58***	0.40**	0.51***	0.45***	-0.24**	0.38
	(0.05)	(0.04)	(0.06)	(0.06)	(0.19)	(0.03)	(0.04)	(0.10)	(1.17)
D9/D5	0.09	0.16***	-0.05	0.24***	0.18	-0.13***	0.01	0.35***	2.91
	(0.06)	(0.05)	(0.07)	(0.08)	(0.22)	(0.04)	(0.05)	(0.11)	(1.81)
Adjusted R-squared	0.04	0.05	0.16	0.16	0.01	0.15	0.10	0.13	-0.01
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	435
				Gini					
Lagged dependent variable	0.04***	-0.03***	0.03**	-0.09***	-0.06	-0.08***	-0.06***	-0.04*	-0.57
	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)	(0.02)	(0.49)
Average income	0.34***	0.30***	0.12*	0.58***	0.40**	0.52***	0.45***	-0.25**	0.20
	(0.05)	(0.04)	(0.06)	(0.06)	(0.19)	(0.03)	(0.04)	(0.10)	(1.19)
Gini	0.02	0.10**	0.04	0.16***	-0.10	-0.09***	-0.02	0.26***	2.68**
	(0.05)	(0.04)	(0.06)	(0.06)	(0.17)	(0.03)	(0.04)	(0.09)	(1.35)
Adjusted R-squared	0.04	0.05	0.16	0.16	0.01	0.15	0.10	0.12	-0.01
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	435

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.
This table presents the same estimations as Table 3.8 with alternative measures of income inequality. It shows results of the impact of income inequality on each category of the operating surplus of municipalities. Since the aim is to investigate the operating section from the specification in stocks, these results come from the estimation of Equation (3.4). Columns (1) and (2) take as the dependent variable operating expenditures and operating revenues respectively. Columns (3) to (5) show results on the impact of income inequality on each category of operating revenues, as defined in Section 3.2. Finally, columns (6) to (9) present estimates on the impact of inequality on the product of each of the four municipal taxes described in Section 3.2. Coefficients represent elasticities, as variables are in logarithm.
HT, *PTBE*, *PTUE* and *LBT* respectively stand for "housing tax", "property tax on built estate", "property tax on unbuilt estate" and "local business tax".
The main part of municipalities of the sample has transferred the competency of the LBT to their inter-municipal community. This explains the lower number of observations for regressions related to this tax. See Section 3.5 for more details.

Table 3.A.5: The effect of income inequality on tax bases and tax rates

	Dependent variable: sum of the tax base per head or the tax rate over the political term							
	HT		*PTBE*		*PTUE*		*LBT*	
	Tax base	Tax rate	Tax base	Tax rate	Tax base	Tax rate	Tax base	Tax rate
					IQR/D5			
Lagged dependent variable	-0.01**	-0.06***	0.01*	-0.07***	0.02	-0.05***	-0.43	-0.07***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.37)	(0.02)
Average income	0.30***	0.20***	0.23***	0.22***	-0.32***	0.13***	1.29	0.20**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.08)	(0.03)	(0.93)	(0.08)
IQR/D5	-0.09***	0.06**	-0.07***	0.09***	0.13**	0.07***	2.87**	0.18***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.06)	(0.02)	(1.15)	(0.06)
Adjusted R-squared	0.17	0.09	0.07	0.10	0.18	0.06	0.01	0.10
Nb. Obs	2200	2200	2200	2200	2200	2200	435	435
					D5/D1			
Lagged dependent variable	-0.01**	-0.06***	0.01*	-0.07***	0.02	-0.05***	-0.35	-0.07***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.37)	(0.02)
Average income	0.34***	0.21***	0.27***	0.21***	-0.36***	0.15***	0.84	0.20**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.09)	(0.03)	(0.86)	(0.09)
D5/D1	0.01	0.04**	0.02	0.04*	0.01	0.06***	0.53	0.07*
	(0.01)	(0.02)	(0.02)	(0.02)	(0.04)	(0.02)	(0.47)	(0.04)
Adjusted R-squared	0.15	0.09	0.06	0.09	0.18	0.06	-0.01	0.08
Nb. Obs	2200	2200	2200	2200	2200	2200	435	435
					D9/D5			
Lagged dependent variable	-0.01**	-0.06***	0.01*	-0.07***	0.02	-0.05***	-0.38	-0.07***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.37)	(0.02)
Average income	0.32***	0.18***	0.25***	0.19***	-0.36***	0.11***	0.34	0.14*
	(0.02)	(0.03)	(0.03)	(0.03)	(0.08)	(0.03)	(0.86)	(0.07)
D9/D5	-0.21***	0.08**	-0.11***	0.10***	0.28***	0.12***	2.08	0.20**
	(0.02)	(0.04)	(0.03)	(0.04)	(0.09)	(0.04)	(1.32)	(0.08)
Adjusted R-squared	0.19	0.09	0.07	0.09	0.19	0.06	-0.01	0.08
Nb. Obs	2200	2200	2200	2200	2200	2200	435	435
					Gini			
Lagged dependent variable	-0.01**	-0.06***	0.01*	-0.07***	0.02	-0.05***	-0.39	-0.07***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.37)	(0.02)
Average income	0.33***	0.18***	0.25***	0.18***	-0.37***	0.10***	0.21	0.13*
	(0.02)	(0.03)	(0.03)	(0.03)	(0.08)	(0.03)	(0.88)	(0.08)
Gini	-0.15***	0.05*	-0.09***	0.06**	0.18***	0.09***	1.91*	0.14**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.07)	(0.03)	(0.99)	(0.07)
Adjusted R-squared	0.18	0.09	0.07	0.09	0.18	0.06	-0.01	0.08
Nb. Obs	2200	2200	2200	2200	2200	2200	435	435

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.
This table presents the same estimations as Table 3.9 with alternative measures of income inequality. It shows estimations of the impact of income inequality on the tax base and the tax rate of each of the four municipal taxes described in Section 3.2. Since the aim is to investigate operating revenues from the specification in stocks, these results come from the estimation of Equation (3.4). Coefficients represent elasticities, as variables are in logarithm.
HT, *PTBE*, *PTUE* and *LBT* respectively stand for "housing tax", "property tax on built estate", "property tax on unbuilt estate" and "local business tax".
The main part of municipalities of the sample has transferred the competency of the LBT to their inter-municipal community. This explains the lower number of observations for regressions related to this tax. See Section 3.5 for more details.

Table 3.A.6: The effect of the different deciles on the PTBE rate

Dependent variable: sum of the PTBE rate over the political term									
					Two deciles				
Lagged dependent variable	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Average income	0.12*	0.28***	0.11	0.17**	0.22***	0.24***	0.33***	0.20***	0.04
	(0.07)	(0.06)	(0.08)	(0.07)	(0.07)	(0.06)	(0.05)	(0.08)	(0.08)
D1	-0.03	-0.04*					-0.02		
	(0.02)	(0.02)					(0.02)		
D2				-0.10***		-0.12***			
				(0.03)		(0.03)			
D3					-0.12***				
					(0.04)				
D4							-0.14**	-0.13***	
							(0.06)	(0.05)	
D5		-0.05	-0.05						
		(0.06)	(0.06)						
D6						0.11			0.02
						(0.07)			(0.07)
D8				0.17**					
				(0.08)					
D9	0.14**		0.16***		0.11*			0.12**	0.17***
	(0.06)		(0.06)		(0.06)			(0.06)	(0.06)
Adjusted R-squared	0.10	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.09
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	2200
AIC	-6400.89	-6395.46	-6398.87	-6408.56	-6407.45	-6404.89	-6401.73	-6405.00	-6398.08
					Three deciles				
Lagged dependent variable	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Average income	0.14*	0.21***	0.14*	0.19***	0.16**	0.20***	0.17**	0.26***	0.18**
	(0.08)	(0.08)	(0.08)	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)
D1	-0.03	-0.01		-0.01				-0.01	
	(0.02)	(0.02)		(0.02)				(0.02)	
D2			-0.10***			-0.05	-0.10***		
			(0.03)			(0.04)	(0.04)		
D3					-0.18***				-0.19***
					(0.05)				(0.06)
D4		-0.11**		-0.16***		-0.11		-0.19***	
		(0.06)		(0.06)		(0.07)		(0.06)	
D5	-0.03						-0.02		0.08
	(0.06)						(0.08)		(0.09)
D6			0.10		0.17**				
			(0.07)		(0.08)				
D7								0.15*	
								(0.08)	
D8				0.21***		0.20**	0.18**		0.17**
				(0.08)		(0.08)	(0.08)		(0.08)
D9	0.14**	0.11*	0.10*		0.09				
	(0.06)	(0.06)	(0.06)		(0.06)				
Adjusted R-squared	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	2200
AIC	-6399.11	-6403.53	-6405.97	-6408.21	-6410.62	-6409.57	-6406.63	-6403.53	-6410.37

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.
PTBE stands for "property tax on built estate".
This table shows results on the impact of different sets of deciles on the PTBE rate. Since the aim is to investigate this operating component from the specification in stocks, these results come from the estimation of Equation (3.4). This table is divided in two parts: the first one shows regressions where two deciles are simultaneously included as regressors while the second one shows results where three deciles are included. In each of these parts, each column represents a different regression with a different set of deciles. Coefficients represent elasticities, as variables are in logarithm. The table shows for each regression the Akaike Information Criterion (AIC).

Table 3.A.7: The effect of the different deciles on the PTUE rate

Dependent variable: sum of the PTUE rate over the political term									
					Two deciles				
Lagged dependent variable	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Average income	0.13**	0.26***	0.11	0.19***	0.17**	0.24***	0.28***	0.17**	0.06
	(0.06)	(0.05)	(0.07)	(0.06)	(0.07)	(0.06)	(0.05)	(0.07)	(0.07)
D1	-0.06***	-0.06***					-0.05**		
	(0.02)	(0.02)					(0.02)		
D2				-0.12***		-0.13***			
				(0.03)		(0.03)			
D3					-0.13***				
					(0.04)				
D4							-0.12**	-0.15***	
							(0.05)	(0.05)	
D5		-0.08	-0.12**						
		(0.06)	(0.06)						
D6						0.02			-0.08
						(0.07)			(0.06)
D8				0.07					
				(0.07)					
D9	0.09		0.11**		0.07			0.08	0.13**
	(0.06)		(0.06)		(0.06)			(0.06)	(0.05)
Adjusted R-squared	0.06	0.06	0.06	0.07	0.06	0.07	0.07	0.06	0.06
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	2200
AIC	-6624.88	-6624.59	-6617.67	-6628.75	-6624.30	-6627.75	-6628.44	-6624.02	-6614.53
					Three deciles				
Lagged dependent variable	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Average income	0.18**	0.22***	0.18**	0.22***	0.16**	0.21***	0.20***	0.29***	0.18***
	(0.07)	(0.07)	(0.08)	(0.06)	(0.08)	(0.06)	(0.07)	(0.06)	(0.07)
D1	-0.05***	-0.04**		-0.04**				-0.05**	
	(0.02)	(0.02)		(0.02)				(0.02)	
D2			-0.12***			-0.09**	-0.11***		
			(0.03)			(0.04)	(0.04)		
D3					-0.14***				-0.14**
					(0.04)				(0.05)
D4		-0.11**		-0.13**		-0.08		-0.11*	
		(0.05)		(0.05)		(0.07)		(0.06)	
D5	-0.07						-0.04		-0.02
	(0.06)						(0.08)		(0.09)
D6			0.01		0.04				
			(0.07)		(0.07)				
D7								-0.02	
								(0.08)	
D8				0.09		0.09	0.08		0.09
				(0.07)		(0.07)	(0.07)		(0.07)
D9	0.08	0.06	0.06		0.07				
	(0.06)	(0.06)	(0.06)		(0.06)				
Adjusted R-squared	0.06	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.06
Nb. Obs	2200	2200	2200	2200	2200	2200	2200	2200	2200
AIC	-6624.51	-6627.61	-6626.77	-6628.15	-6622.61	-6628.37	-6627.04	-6626.49	-6622.40

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.
PTUE stands for "property tax on unbuilt estate".
This table shows results on the impact of different sets of deciles on the PTUE rate. Since the aim is to investigate this operating component from the specification in stocks, these results come from the estimation of Equation (3.4). This table is divided in two parts: the first one shows regressions where two deciles are simultaneously included as regressors while the second one shows results where three deciles are included. In each of these parts, each column represents a different regression with a different set of deciles. Coefficients represent elasticities, as variables are in logarithm. The table shows for each regression the Akaike Information Criterion (AIC).

Table 3.A.8: The effect of the different deciles on the LBT rate

Dependent variable: sum of the LBT rate over the political term									
					Two deciles				
Lagged dependent variable	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Average income	0.13	0.38**	0.16	0.20	0.24	0.29*	0.38***	0.21	0.01
	(0.16)	(0.16)	(0.19)	(0.16)	(0.19)	(0.15)	(0.14)	(0.19)	(0.17)
D1	-0.07	-0.06*					-0.05		
	(0.04)	(0.04)					(0.04)		
D2				-0.20***		-0.22***			
				(0.07)		(0.07)			
D3					-0.20*				
					(0.11)				
D4							-0.20	-0.23*	
							(0.13)	(0.13)	
D5		-0.19	-0.22						
		(0.15)	(0.15)						
D6						0.13			-0.06
						(0.15)			(0.15)
D8				0.25					
				(0.15)					
D9	0.16		0.18		0.11			0.15	0.23**
	(0.11)		(0.11)		(0.12)			(0.12)	(0.11)
Adjusted R-squared	0.08	0.09	0.08	0.10	0.09	0.10	0.09	0.09	0.08
Nb. Obs	435	435	435	435	435	435	435	435	435
AIC	-1256.33	-1256.99	-1255.95	-1264.49	-1259.09	-1262.67	-1258.17	-1257.84	-1252.71
					Three deciles				
Lagged dependent variable	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Average income	0.25	0.26	0.24	0.19	0.20	0.21	0.22	0.37**	0.18
	(0.21)	(0.20)	(0.20)	(0.17)	(0.20)	(0.17)	(0.17)	(0.16)	(0.17)
D1	-0.06	-0.04		-0.03				-0.05	
	(0.04)	(0.04)		(0.04)				(0.04)	
D2			-0.21***			-0.15	-0.16**		
			(0.08)			(0.09)	(0.08)		
D3					-0.28**				-0.18
					(0.12)				(0.11)
D4		-0.18		-0.26**		-0.13		-0.20	
		(0.13)		(0.13)		(0.16)		(0.15)	
D5	-0.17						-0.16		-0.14
	(0.15)						(0.17)		(0.19)
D6			0.12		0.20				
			(0.15)		(0.16)				
D7								0.00	
								(0.16)	
D8				0.33**		0.29*	0.31*		0.34**
				(0.16)		(0.16)	(0.17)		(0.16)
D9	0.14	0.12	0.06		0.08				
	(0.12)	(0.12)	(0.12)		(0.12)				
Adjusted R-squared	0.09	0.09	0.10	0.09	0.09	0.10	0.10	0.09	0.09
Nb. Obs	435	435	435	435	435	435	435	435	435
AIC	-1256.24	-1257.15	-1260.86	-1260.54	-1258.72	-1263.37	-1263.63	-1256.17	-1260.73

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.
LBT stands for "local business tax".
This table shows results on the impact of different sets of deciles on the LBT rate. Since the aim is to investigate this operating component from the specification in stocks, these results come from the estimation of Equation (3.4). This table is divided in two parts: the first one shows regressions where two deciles are simultaneously included as regressors while the second one shows results where three deciles are included. In each of these parts, each column represents a different regression with a different set of deciles. Coefficients represent elasticities, as variables are in logarithm. The table shows for each regression the Akaike Information Criterion (AIC).
The main part of municipalities of the sample has transferred the competency of the LBT to their intermunicipal community. This explains the lower number of observations for regressions related to this tax. See Section 3.5 for more details.

Bibliography

Aidt, T. S. & Shvets, J. (2012), 'Distributive politics and electoral incentives: Evidence from seven US state legislatures', *American Economic Journal: Economic Policy* **4**(3), 1–29.

Albouy, D. (2013), 'Partisan representation in congress and the geographic distribution of federal funds', *The Review of Economics and Statistics* **95**(1), 127–141.

Alesina, A., Baqir, R. & Easterly, W. (2000), 'Redistributive public employment', *Journal of Urban Economics* **48**(2), 219 – 241.

Alesina, A., Danninger, S. & Rostagno, M. (2001), 'Redistribution through public employment: The case of Italy', *IMF Staff Papers* **48**(3), 447–473.

Alesina, A. & Ferrara, E. L. (2005), 'Preferences for redistribution in the land of opportunities', *Journal of Public Economics* **89**(5-6), 897 – 931.

Alesina, A. & Giuliano, P. (2011), Preferences for redistribution, *in* A. B. Jess Benhabib & M. O. Jackson, eds, 'Handbook of Social Economics', North-Holland, chapter 4, pp. 93 – 131.

Alesina, A. & Rodrik, D. (1994), 'Distributive Politics and Economic Growth', *The Quarterly Journal of Economics* **109**(2), 465–490.

Arellano, M. & Bond, S. (1991), 'Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations', *The Review of Economic Studies* **58**(2), 277–297.

Arellano, M. & Bover, O. (1995), 'Another look at the instrumental variable estimation of error-components models', *Journal of Econometrics* **68**(1), 29 – 51.

Arulampalam, W., Dasgupta, S., Dhillon, A. & Dutta, B. (2009), 'Electoral goals and center-state transfers: A theoretical model and empirical evidence from India', *Journal of Development Economics* **88**(1), 103 – 119.

Bach, L. (2011), 'Politicians with many principals: Theory and evidence from France'. Manuscript available at https://sites.google.com/site/laurentbach/.

Bach, L. (2012), *Faut-il abolir le cumul des mandats ?*, Rue d'Ulm.

Banful, A. B. (2011), 'Do formula-based intergovernmental transfer mechanisms eliminate politically motivated targeting? Evidence from Ghana', *Journal of Development Economics* **96**(2), 380 – 390.

Bardhan, P. & Mookherjee, D. (2000), 'Capture and governance at local and national levels', *The American Economic Review* **90**(2), 135–139.

Baretti, C., Huber, B. & Lichtblau, K. (2002), 'A tax on tax revenue: The incentive effects of equalizing transfers: Evidence from germany', *International Tax and Public Finance* **9**(6), 631–649.

Becker, S. O., Egger, P. H. & von Ehrlich, M. (2013), 'Absorptive capacity and the growth and investment effects of regional transfers: A regression discontinuity design with heterogeneous treatment effects', *American Economic Journal: Economic Policy* **5**(4), 29–77.

Belleflamme, P. & Hindriks, J. (2005), 'Yardstick competition and political agency problems', *Social Choice and Welfare* **24**(1), 155–169.

Benabou, R. (2000), 'Unequal societies: Income distribution and the social contract', *American Economic Review* **90**(1), 96–129.

Berry, C., Burden, B. & Howell, W. (2010), 'The president and the distribution of federal spending', *The American Political Science Review* **104**(4), 783–799.

Bertrand, M., Kramarz, F., Schoar, A. & Thesmar, D. (2007), Politicians, firms and the political business cycle: Evidence from France. Unpublished manuscript.

Besfamille, M. (2004), 'Local public works and intergovernmental transfers under asymmetric information', *Journal of Public Economics* **88**(1-2), 353 – 375.

Besley, T. & Case, A. (1995), 'Incumbent behavior: Vote-seeking, tax-setting, and yardstick competition', *The American Economic Review* **85**(1), 25–45.

Blundell, R. & Bond, S. (1998), 'Initial conditions and moment restrictions in dynamic panel data models', *Journal of Econometrics* **87**(1), 115 – 143.

Boadway, R. & Flatters, F. (1982), 'Efficiency and equalization payments in a federal system of government: A synthesis and extension of recent results', *The Canadian Journal of Economics / Revue canadienne d'Economique* **15**(4), 613–633.

Boustan, L., Ferreira, F., Winkler, H. & Zolt, E. M. (2013), 'The effect of rising income inequality on taxation and public expenditures: Evidence from U.S. municipalities and school districts, 1970-2000', *The Review of Economics and Statistics* **95**(4), 1291 – 1302.

Bracco, E., Lockwood, B., Porcelli, F. & Redoano, M. (2015), 'Intergovernmental grants as signals and the alignment effect: Theory and evidence', *Journal of Public Economics* **123**, 78 – 91.

Brollo, F. & Nannicini, T. (2012), 'Tying your enemy's hands in close races: The politics of federal transfers in Brazil', *American Political Science Review* **106**, 742–761.

Cadot, O., Röller, L.-H. & Stephan, A. (2006), 'Contribution to productivity or pork barrel? The two faces of infrastructure investment', *Journal of Public Economics* **90**(6-7), 1133 – 1153.

Cai, H. & Treisman, D. (2004), 'State corroding federalism', *Journal of Public Economics* **88**(3-4), 819 – 843.

Carozzi, F. & Repetto, L. (2016), 'Sending the pork home: Birth town bias in transfers to Italian municipalities', *Journal of Public Economics* **134**, 42 – 52.

Castells, A. & Solé-Ollé, A. (2005), 'The regional allocation of infrastructure investment: The role of equity, efficiency and political factors', *European Economic Review* **49**(5), 1165–1205.

Cingano, F. & Pinotti, P. (2013), 'Politicians at work: The private returns and social costs of political connections', *Journal of the European Economic Association* **11**(2), 433–465.

Clark, A. E. & Milcent, C. (2011), 'Public employment and political pressure: The case of French hospitals', *Journal of Health Economics* **30**(5), 1103 – 1112.

Corcoran, S. P. & Evans, W. N. (2011), 'Income inequality, the median voter, and the support for public education'. Manuscript available at http://www.nyu.edu/projects/corcoran/papers/corcoran_evans_revision_09_28_2011.pdf.

Coulomb, R. & Sangnier, M. (2014), 'The impact of political majorities on firm value: Do electoral promises or friendship connections matter?', *Journal of Public Economics* **115**(0), 158 – 170.

Cox, G. W. & McCubbins, M. D. (1986), 'Electoral politics as a redistributive game', *The Journal of Politics* **48**(2), pp. 370–389.

Crampton, E. (2004), 'Distributive politics in a strong party system: Evidence from Canadian job grant programs', *Unpublished paper* .

Curto-Grau, M., Solé-Ollé, A. & Sorribas-Navarro, P. (2014), 'Does electoral competition curb party favoritism', *Unpublished paper* .

Dahlberg, M. & Johansson, E. (2002), 'On the vote-purchasing behavior of incumbent governments', *American political Science review* **96**(01), 27–40.

De La Croix, D. & Doepke, M. (2009), 'To segregate or to integrate: Education politics and democracy', *The Review of Economic Studies* **76**(2), 597–628.

Dixit, A. & Londregan, J. (1998), 'Fiscal federalism and redistributive politics', *Journal of Public Economics* **68**(2), 153 – 180.

Do, Q.-A., Lee, Y.-T. & Nguyen, B. D. (2016), Directors as connectors: The impact of the external networks of directors on firms, Technical report, LIEPP Working Paper nÂ°52.

Dolez, B. & Hastings, M. (2003), *Le parachutage politique*, L'Harmattan.

Epple, D. & Romano, R. E. (1996), 'Ends against the middle: Determining public service provision when there are private alternatives', *Journal of Public Economics* **62**(3), 297 – 325.

Faccio, M. (2006), 'Politically connected firms', *The American Economic Review* **96**(1), 369–386.

Faguet, J.-P. (2004), 'Does decentralization increase government responsiveness to local needs? evidence from bolivia', *Journal of Public Economics* **88**(3-4), 867 – 893.

Faguet, J.-P. & Sánchez, F. (2008), 'Decentralization's effects on educational outcomes in bolivia and colombia', *World Development* **36**(7), 1294 – 1316.

Ferreira, F. & Gyourko, J. (2009), 'Do political parties matter? Evidence from U.S. cities', *The Quarterly Journal of Economics* **124**(1), 399–422.

Filer, J. E., Kenny, L. W. & Morton, R. B. (1993), 'Redistribution, income, and voting', *American Journal of Political Science* **37**(1), 63–87.

Fisman, D., Fisman, R. J., Galef, J., Khurana, R. & Wang, Y. (2012), 'Estimating the Value of Connections to Vice-President Cheney', *The B.E. Journal of Economic Analysis & Policy* **13**(3), 1–20.

Fisman, R. (2001), 'Estimating the value of political connections', *The American Economic Review* **91**(4), pp. 1095–1102.

Foucault, M. (2006), 'How useful is the "cumul des mandats" for being re-elected? Empirical evidence from the 1997 French legislative elections', *French Politics* **4**, 292 – 311.

François, A. (2006), 'Testing the baobab tree hypothesis: The "cumul des mandats" as a way of obtaining more political resources and limiting electoral competition', *French Politics* **4**, 269 – 291.

François, A. & Weill, L. (2016), 'Does holding a local mandate alter the activities of deputies? Evidence from the French Assemblée Nationale', *French Politics* **14**(1), 30–54.

Frère, Q., Leprince, M. & Paty, S. (2013), 'The impact of intermunicipal cooperation on local public spending', *Urban Studies* pp. 1741–1760.

Galiani, S., Gertler, P. & Schargrodsky, E. (2008), 'School decentralization: Helping the good get better, but leaving the poor behind', *Journal of Public Economics* **92**(10-11), 2106 – 2120.

Golden, M. A. & Picci, L. (2008), 'Pork-barrel politics in postwar Italy, 1953–94', *American Journal of Political Science* **52**(2), 268–289.

Golden, M. & Min, B. (2013), 'Distributive politics around the world', *Annual Review of Political Science* **16**(1), 73–99.

Goldman, E., Rocholl, J. & So, J. (2009), 'Do politically connected boards affect firm value?', *Review of Financial Studies* **22**(6), 2331–2360.

Guengant, A. & Leprince, M. (2006), 'Évaluation des effets des régimes de coopération intercommunale sur les dépenses publiques locales', *Economie & prévision* **4**(175 - 176), 79–99.

Helland, L. & Sørensen, R. J. (2009), 'Geographical redistribution with disproportional representation: A politico-economic model of Norwegian road projects', *Public Choice* **139**(1), 5–19.

Hodler, R. & Raschky, P. A. (2014), 'Regional favoritism', *The Quarterly Journal of Economics* **129**(2), 995–1033.

Imbens, G. & Kalyanaraman, K. (2012), 'Optimal bandwidth choice for the regression discontinuity estimator', *The Review of Economic Studies* **79**(3), pp. 933–959.

Jennes, G. & Persyn, D. (2015), 'The effect of political representation on the geographic distribution of income: Evidence using Belgian data', *European Journal of Political Economy* **37**, 178 – 194.

Joanis, M. (2011), 'The road to power: Partisan loyalty and the centralized provision of local infrastructure', *Public Choice* **146**(1), 117–143.

Johansson, E. (2003), 'Intergovernmental grants as a tactical instrument: Empirical evidence from Swedish municipalities', *Journal of Public Economics* **87**(5-6), 883 – 915.

Karabarbounis, L. (2011), 'One dollar, one vote', *The Economic Journal* **121**(553), 621–651.

Kauder, B., Potrafke, N. & Reischmann, M. (2016), 'Do politicians reward core supporters? Evidence from a discretionary grant program', *European Journal of Political Economy* **45**, 39 – 56.

Knight, B. (2005), 'Estimating the value of proposal power', *The American Economic Review* **95**(5), 1639–1652.

Knight, B. (2008), 'Legislative representation, bargaining power and the distribution of federal funds: Evidence from the US congress', *The Economic Journal* **118**(532), 1785–1803.

Kosec, K. (2014), 'Relying on the private sector: The income distribution and public investments in the poor', *Journal of Development Economics* **107**, 320 – 342.

Larcinese, V., Rizzo, L. & Testa, C. (2006), 'Allocating the US federal budget to the states: The impact of the president', *Journal of Politics* **68**(2), 447–456.

Lassen, D. D. (2005), 'The effect of information on voter turnout: Evidence from a natural experiment', *American Journal of Political Science* **49**(1), 103–118.

Lee, D. S. & Lemieux, T. (2010), 'Regression discontinuity designs in economics', *Journal of Economic Literature* **48**(2), pp. 281–355.

Leprince, M. & Guengant, A. (2002), 'Interactions fiscales verticales et réaction des communes à la coopération intercommunale', *Revue économique* **53**(3), 525–535.

Levitt, S. D. & Snyder Jr, J. M. (1995), 'Political parties and the distribution of federal outlays', *American Journal of Political Science* **39**(4), 958–980.

Lindbeck, A. & Weibull, J. W. (1987), 'Balanced-budget redistribution as the outcome of political competition', *Public Choice* **52**(3), 273–297.

Litschig, S. (2012), 'Are rules-based government programs shielded from special-interest politics? Evidence from revenue-sharing transfers in Brazil', *Journal of Public Economics* **96**(11-12), 1047 – 1060.

Markevich, A. & Zhuravskaya, E. (2011), 'M-form hierarchy with poorly-diversified divisions: A case of khrushchev's reform in soviet russia', *Journal of Public Economics* **95**(11-12), 1550 – 1560.

Maskin, E., Qian, Y. & Xu, C. (2000), 'Incentives, information, and organizational form', *The Review of Economic Studies* **67**(2), 359–378.

McCrary, J. (2008), 'Manipulation of the running variable in the regression discontinuity design: A density test', *Journal of Econometrics* **142**(2), 698 – 714.

Meltzer, A. H. & Richard, S. F. (1981), 'A Rational Theory of the Size of Government', *Journal of Political Economy* **89**(5), 914–927.

Migueis, M. (2013), 'The effect of political alignment on transfers to Portuguese municipalities', *Economics & Politics* **25**(1), 110–133.

Milanovic, B. (2000), 'The median-voter hypothesis, income inequality, and income redistribution: An empirical test with the required data', *European Journal of Political Economy* **16**(3), 367 – 410.

Milligan, K. S. & Smart, M. (2005), Regional grants as pork barrel politics, Technical report, CESifo Working Paper No. 1453.

Nickell, S. (1981), 'Biases in Dynamic Models with Fixed Effects', *Econometrica* **49**(6), 1417–1426.

Oates, W. E. (1972), *Fiscal Federalism*, Edward Elgar Publishing.

Perotti, R. (1996), 'Growth, income distribution, and democracy: What the data say', *Journal of Economic Growth* **1**(2), 149–187.

Persson, T. & Tabellini, G. (1994), 'Is Inequality Harmful for Growth?', *The American Economic Review* **84**(3), 600–621.

Piketty, T. & Saez, E. (2014), 'Inequality in the long run', *Science* **344**(6186), 838–843.

Ramcharan, R. (2010), 'Inequality and redistribution: Evidence from US counties and states, 1890-1930', *The Review of Economics and Statistics* **92**(4), 729–744.

Roberts, K. W. (1977), 'Voting over income tax schedules', *Journal of Public Economics* **8**(3), 329 – 340.

Rosenbaum, P. R. & Rubin, D. B. (1985), 'Constructing a control group using multivariate matched sampling methods that incorporate the propensity score', *The American Statistician* **39**(1), 33–38.

Scervini, F. (2012), 'Empirics of the median voter: democracy, redistribution and the role of the middle class', *The Journal of Economic Inequality* **10**(4), 529–550.

Schwabish, J. A., Smeeding, T. M. & Osberg, L. (2006), Income distribution and social expenditures, *in* D. B. Papadimitriou, ed., 'The Distributional Effects of Government Spending and Taxation', Palgrave Macmillan UK, London, chapter 9, pp. 247–288.

Seabright, P. (1996), 'Accountability and decentralisation in government: An incomplete contracts model', *European Economic Review* **40**(1), 61 – 89.

Shelton, C. A. (2007), 'The size and composition of government expenditure', *Journal of Public Economics* **91**(11-12), 2230 – 2260.

Smart, M. (1998), 'Taxation and deadweight loss in a system of intergovernmental transfers', *The Canadian Journal of Economics / Revue canadienne d'Economique* **31**(1), 189–206.

Smart, M. & Bird, R. (1996), 'Federal fiscal arrangements in canada: An analysis of incentives', *Proceedings of the Annual Conference on Taxation Held under the Auspices of the National Tax Association-Tax Institute of America* **89**, 1–10.

Solé-Ollé, A. (2013), 'Inter-regional redistribution through infrastructure investment: Tactical or programmatic?', *Public Choice* **156**(1), 229–252.

Solé-Ollé, A. & Sorribas-Navarro, P. (2008), 'The effects of partisan alignment on the allocation of intergovernmental transfers. Differences-in-differences estimates for Spain', *Journal of Public Economics* **92**(12), 2302 – 2319.

Solé-Ollé, A. & Viladecans-Marsal, E. (2013), 'Do political parties matter for local land use policies?', *Journal of Urban Economics* **78**, 42 – 56.

Staiger, D. & Stock, J. H. (1997), 'Instrumental variables regression with weak instruments', *Econometrica* **65**(3), 557–586.

Starck, L. (2012), 'L'actualité des réformes territoriales en europe', *Civitas Europa* **29**(2), 165–168.

Wildasin, D. E. (1989), 'Interjurisdictional capital mobility: Fiscal externality and a corrective subsidy', *Journal of Urban Economics* **25**(2), 193 – 212.

Xu, C. (2011), 'The fundamental institutions of china's reforms and development', *Journal of Economic Literature* **49**(4), 1076–1151.

Zhuravskaya, E. V. (2000), 'Incentives to provide local public goods: fiscal federalism, russian style', *Journal of Public Economics* **76**(3), 337 – 368.

Zodrow, G. R. & Mieszkowski, P. (1986), 'Pigou, tiebout, property taxation, and the underprovision of local public goods', *Journal of Urban Economics* **19**(3), 356 – 370.

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