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The Determinants of French Municipal Labor Demand

Touria Jaaidane

Sophie Larribeau

Matthieu Leprince

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The Determinants of French Municipal Labor Demand[1]

Touria Jaaidane[2], Sophie Larribeau[3], Matthieu Leprince[4]

Abstract: While in many countries municipalities are central employers, studies of the determinants of their labor demand are surprisingly scarce. Exploiting an original panel dataset of municipalities of more than 1,000 inhabitants in France over the 2002-2008 period, we first show that wages, grants, median income and tax capacity explain the labor demand, with the wage being by far the main driving force. The data exhibit a political cycle effect: mayors increase municipal employment in pre-electoral periods. Second, inter-municipal cooperation (hereafter IMC) is also a key factor, as revealed by the positive impact of the inter-municipal employment level on municipal employment (IMC direct effect). Third, we find that IMC leads mayors to increase municipal employment when unemployment is higher (IMC indirect effect). Moreover, Right-wing mayors tend to reduce municipal employment when unemployment is higher (partisan effect). Finally, controlling for the magnitude of the inter-municipal employment, it turns out that the IMC indirect effect holds only for municipalities in large employment cooperation bodies and that the partisan effect dominates the IMC indirect effect for Right-wing municipalities.

Keywords: Municipal labor demand, Inter-municipal cooperation, Median voter model, Instrumental variables, Panel data.

Les déterminants de la demande de travail des municipalités françaises

Abstract : Si dans de nombreux pays, les municipalités sont les principaux pourvoyeurs d'emploi au niveau local, les déterminants de la demande municipale de travail sont étonnamment peu étudiés. Dans cet article, nous exploitons un panel de communes de plus de 1000 habitants sur la période 2002 à 2008. Nous mettons d'abord en évidence que les salaires des employés municipaux, les dotations de l'État, le revenu médian des habitants et la richesse fiscale communale expliquent la demande, les salaires étant le facteur le plus important. Nous observonségalement un effet de cycle électoral : les maires tendent à embaucher plus en période pré-électorale. Ensuite, l'intensité de la coopération intercommunale (CI), mesurée par l'ampleur de l'emploi intercommunal, est un autre déterminant clé, l'emploi intercommunal affectant positivement la demande municipale (effet direct de la CI). Nous identifions par ailleurs un effet indirect de la CI et un effet partisan : quand le chômage augmente, les maires ont tendance à augmenter l'emploi, mais ceux de droite à le diminuer. Enfin, en contrôlant pour l'ampleur de l'emploi intercommunal, nous montrons que l'effet indirect de la CI ne se manifeste que dans les grandes intercommunalités - au sens où l'emploi y est élevé - et que l'effet partisan domine l'effet indirect de la CI pour les municipalités de droite.

Mots-clefs : Demande de travail municipal, Coopération intercommunale, Modèle de l'électeur médian, Variables instrumentales, Données de panel.

1 Introduction

Three tiers of local authorities coexist in France: from the largest to the smallest, they are the *régions*, *départements* and the *communes*— hereafter regions, counties and municipalities respectively—which form the local civil service. Decisions taken at the national level have to be implemented at the local level. Local authorities also have their own prerogatives.

A vast movement of decentralization has been at work since 1982 and accentuated subsenqutently. The objective was to give local authorities more autonomy with regard to administrative and budgetary decisions.

A large number of municipalities being very small (80 % of them have less than 1000 inhabitants), merging was recommended and resulted in the creation of new municipalities. Moreover, inter-municipal cooperation (IMC) was first made possible for municipalities and then became mandatory (see the institutional details in section 2.1).

The Mayor is the municipality's elected authority and, more marginally, the State's representative when some issues (elections to be organized, for example) are at stake. The Mayor implements the decisions voted by the municipality's council—a deliberative and decision-making body—which adopts the budget, manages municipal assets, notably primary school buildings, municipal roads and public facilities. The Mayor is responsible for implementing the budget, and for security and public health as well as for the conservation of the natural resources of the municipality. A point worthy of note is that the French Constitution establishes a principle of free administration by which local authorities set the public employment at the level they wish, as long as norms and mandatory requirements are respected.

1.1 The local government employment

As of 31st December 2017, 1,902 237 employees (agents[1]) were hired by the local governments, i.e. the regions, counties and municipalities and the local administrative public bodies depending on them[2].

It is generally accepted that the municipalities are the main providers of local employment. This is a particularly stable characteristics over our

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[1]This figure does not include the beneficiaries of subsidized contracts (emplois aidés).
[2]Etablissements publics administratifs locaux

period of study, 2002-2008, as shown by the statistics on employment [3]. As of 2002, 1,460 million people were hired by the local governments. The regions, counties and municipalities hired 78 % of these agents and their local administrative public bodies hired 22 %. The municipalities covered 64 % of total employment. As of 2008, the total employment was as high as 1,769 845 agents and the municipal sector's share was 57 %, with a decreasing share throughout the period 2002-2008. In the meantime, we observed an increase in the inter-municipal tier—as a consequence of the different acts that led to the creation of IMC structures (see details in section 2.1)—and an increase at the county and region tiers, resulting from the 13th August 2004 Act, which granted new competencies to the regions and counties and organized the transfer of personnel from the State to the local level. These transfers were massive between 2006 and 2008 during which the counties and regions welcomed agents coming from the Departments of *Education Nationale* and *Equipement*. The personnel transfer has modified the allocation of employment among the different tiers: by the end of 2008, 23 % of the agents were concentrated in counties and regions as compared to 16 % 10 years before.

Over the period 1998 to 2008, local public employment increased by 467 000 including the personnel transfers induced by the decentralization. Excluding these transfers, 350 000 jobs have been created, of which 2/3 were in the municipal sector. Below, table 1 gives the average annual evolution of employment [4] between 2002 and 2008:

Table 1: Employment evolution (%) between 2002 and 2008

State Civil Service	-0.9
without transfers	-0.4
Local Civil Service	3.8
without transfers	2.6
Health Civil Service	1.8
Total Civil Service	1.1

[3]Bulletin Informations Statistiques de la DGCL 75, 2010 and the report Les collectivités locales en chiffres 2019

[4]Without the beneficiaries of subsidized contracts. Source: FGE, Colter, DADS, SIASP, Insee; enquête SAE, DRESS, Traitement DGAFP, département des études et des statistiques.

These personnel transfers[5] have naturally had an impact on the wage bill.

1.2   Turning to the spending issue

The share of the wage bill in municipal spending is likely to be significant because public services such as education and care programs as well as road or building maintenance are intensive in labor. A look at the evolution of the wage bill at the different levels of local government is insightful with an increasing and long-lasting trend where the counties and regions logically increased their wage bill as a consequence of the personnel transfers. Yet the municipalities' wage bills have also increased by 3 % on average each year over the period 2000 to 2015. If the competencies and personnel transfers can partly explain the increase for the counties and regions, this cannot be argued for the municipalities. The increase in personnel expenditures of municipalities jeopardizes their participation in the national effort to consolidate public accounts and to comply with budgetary commitments of the European Union. This would call for reducing or at the very least controlling the expenditures.

Given that the municipalities were not affected by personnel transfers from the State, it is all the more important to understand and identify the causes of such increases, and to measure the impact of the driving forces in order to control the wage bill in a tight budgetary context.

1.3   The features of the French public sector labor market

The French local public sector (as well as the State and Health public sectors) is governed by a set of rules that might help explain the evolution of the expenditures in general and the wage bills in particular. The Public employees are hired under contracts that are distinct from their counterparts in the private sector (for a detailed analysis, see Jaaidane (2010)). In particular, Public employees cannot be fired once they have been tenured (generally one year after hiring). Their wages are determined according to scales decided at the national level which are uniformly implemented. Owing to the national dimension of wages and careers, expenditure on personnel mechanically increases as, for instance, the State decides to increase the wage base and/or to

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[5]Since 2011, the transfers are residuals in terms of employees.

promote some or all of the agents. They can also be affected by reforms that are decided at the national level and have to be implemented at the local level[6]. Yet there are measures that are the result of local decision-makers. They can decide on the number of employees and on the work schedules (notably they have a say in the annual duration of work[7]). Moreover, they can unilaterally decide to give bonuses a greater share in the wages and benefits package and can also make the promotion process faster. Though there is a large body of studies on the determinants of fiscal (Leprince & Guengant (2002)) and spending decisions (among others Frère et al. (2014)) at the municipal level, to the best of our knowledge the labor demand using French data has not been studied.

1.4   Related literature

Among the rare studies on local governments' labor demand, the closest to our analysis focuses on municipal labor demand in Sweden. Bergström et al. (2004) studied the effects of grants and wages on municipal labor demand, over the period 1988-1995. They find that the grants received by municipalities had a negligible effect on total local employment, with a 1 % increase in grants leading to a 0.1 % increase in municipal employment in the long run. They also investigate the effects of a reform in 1993 which changed the grants from targeted to general. They find that intergovernmental grants affected municipal labor demand more before the reform than afterwards. This pattern is particularly strong for local socialist governments. The policy implication of this estimation is that if the central government wants to increase municipal labor demand using grants, it ought to use targeted rather than general grants.

Lundqvist et al. (2014) looked at Swedish local public employment over the period 1996-2004, exploiting a rule of grant allocation to estimate the causal effect of grants on local public employment. They show that the

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[6]The wage base can be modified through the variation of the point value and/or the number of points that are attached to each scale of each job. For instance, the State has decided to help its less skilled agents (*catégorie C*) by granting them wage increases. In 2006, the *Accords Jacob* boosted the wage and career of public agents, both at the State and local levels, and in 2008, the measure *garantie du maintien du pouvoir d'achat*, was adopted to protect public agents against inflation.

[7]Several reports by the Cour des Comptes (the national auditing body) pointed out that the annual work duration was frequently below the legal annual duration.

impact on total local employment is not statistically significant. Running the estimation to evaluate the impact on the different sectors (childcare, schools, elderly care and social welfare...) they found no impact on employment in the latter sectors but a positive and significant impact on administrative personnel. This result echoes that of Dahlberg & Mörk (2006), based on the study of employment in Swedish municipalities over the period 1990-2002 which shows that increased wages for bureaucrats have a smaller effect on labor demand than increased wages for other types of public employees.

These different papers focusing on municipal labor demand in Sweden, and those published earlier by Courant et al. (1979) and others (see surveys by Gregory & Borland (1999)) give contrasting empirical results on the explanatory factors of municipal demand. For example, the impact of a higher population on the rate of municipal employment is negative in Dahlberg et al. (2008) but positive in Alesina et al. (2000)[8]. The impact of a higher household income is not significant in Dahlberg et al. (2008) but positive in Bergström et al. (2004) and Alesina et al. (2000). Finally, the effect of a higher share of young people is positive (although only slightly significant) in Dahlberg et al. (2008), whereas Bergström et al. (2004) found mixed evidence. These studies also vary by their modelling assumptions. Dahlberg et al. (2008) and Bergström et al. (2004) adopt a dynamic model controlling for the level of municipal wage while Lundqvist et al. (2014) do not.

Two other strands in the literature are worth noting. First, studies of the impact of public employment on the labor market and unemployment exist both at the aggregate level (see Algan et al. (2002)) and the local level (see for example Jofre-Monseny et al. (2018)). Their main result is that hiring more public employees leads to lower private sector employment, a crowding-out effect confirmed by different studies (see among others Caponi (2017) and Faggio & Overman (2014)). Second, we refer to two important contributions on employment in French hospitals. Clark & Milcent (2011) and Clark & Milcent (2018) exploit the fact that mayors are responsible for public hospitals to investigate whether public hospital employment is used by mayors to cope with local unemployment. They conclude that the relationship between public-hospital employment and local unemployment is stronger in Left-wing

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[8]They evaluate the impact on municipal employment of income inequality in US Cities. Note however that municipal wages and grants received by municipalities were not controlled for, and that local unemployment was not significant in the different employment equations considered.

local municipalities. To the best of our knowledge, however, the impact of political partisanship on municipal employment–which is at the discretion of mayors–has not been studied.

We are interested in municipal labor demand in a context of increasing cooperation between local jurisdictions. This cooperation issue is important, as evidenced by the numerous contributions on the impact of IMC using French data. However they all consider the impact on local taxation (see, among others, Ly & Paty (2019) and Leprince & Guengant (2002)[9]) or on local spending (see Frère et al. (2014)[10]).

1.5 Main objective of the paper

We study the determinants of the municipal labor demand in France over the 2002-2008 period. We first give estimates of elasticities of municipal employment with respect to the main factors identified in the literature (see Ehrenberg & Schwarz (1986), Gregory & Borland (1999) and Lucifora & Meurs (2006)), such as the public employees' wages, grants received from the central government, the tax capacity and household median incomes. Second, since municipalities in IMC bodies lose some of their responsibilities, IMC employment increases but the nature and size of the municipal reaction in terms of its labor demand are a priori unknown. We therefore provide estimates of the *direct effect* of inter-municipal employment on municipal employment. Third, we consider whether the mayor is concerned with local unemployment and whether his hiring decisions might be driven by political partisanship; we call this an *indirect effect* of IMC.

Methodology

We thus exploit an original balanced panel dataset of 8387 French municipalities of more than 1,000 inhabitants over the 2002-2008 period. We use an IV estimation method where all variables are first-differenced, assuming fixed municipal effects. Given that wages and employment at the IMC level are affected by endogeneity, we build instruments to deal with this issue.

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[9]They show that a 10 % increase in the rate of inter-municipal taxation results in a reduction of only 1 % in the rate of taxation in the majority of the municipalities and can even lead to an increase in rates for the smaller urban municipalities.

[10]Using a 1994-2003 panel analysis, they conclude that the cooperation effect is not significant for urban and suburban municipalities.

Results

Our theoretical framework, a median voter model, provides us with predictions that are met in our empirical results. We show first that the impact of average wage on municipal labor demand is highly significant, with an estimated elasticity of less than one in absolute value. This makes wages the main driving force behind labor demand. As far as we know, this is the first work on French data providing an estimate of this elasticity. The wage elasticities estimated by Bergström et al. (2004) have the same magnitude. Second, the impact of the main central government transfer is positively significant although the magnitude of the elasticity is rather small.

The estimated elasticity of median income is positive and significant and its magnitude is large compared to grant elasticity (more than four times higher). Again, similar results are obtained by Bergström et al. (2004). We thus do not have a fly-paper effect[11] when municipal employment is studied, whereas former French studies have shown this to be the case when considering total municipal spending.

The data exhibit a political cycle effect. This is in line with the traditional public choice point of view that politicians in office tend to have opportunistic behavior in order to maximize their chances of re-election. Using time dummies, we show that mayors do have their own self-serving agenda: they increase municipal employment in pre-electoral periods. For a theoretical analysis of the effect of elections on policies decided by incumbents, see among others Besley & Case (1995) and Besley & Case (2003). Empirical studies echo these theoretical findings. Among others, Veiga & Veiga (2007) analysis on Portuguese data shows that mayors increase total expenditures and change their composition favoring items that are highly visible to the electorate. Such political cycle effects are also shown by Foucault et al. (2008) on French municipalities' spending.

We provide evidence of a significant and positive *direct effect* of IMC employment on municipal employment. It is the result of a combined effect: a substitution effect due to the transfer of responsibilities to the IMC body and a complement effect due to the creation of new municipal public services. The dominance of the complement effect over the substitution effect explains the net positive effect.

Moreover, we focus on the interplay between unemployment in the munici-

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[11]See seminal papers by Henderson (1968), Gramlich (1969) and Hamilton (1986) among others.

pality, IMC membership, the extent of cooperation at the IMC level and local politics. This analysis offers several insights into municipal employment decisions.

In a model without politics, we show an *IMC indirect effect* by which *mayors employ more people when unemployment is higher*. This suggests that when mayors control a reduced range of local public services due to the transfer to the IMC level, as members of an IMC, they tend to be sensitive to unemployment. Moreover, they have access to additional resources within the IMC body (both fiscal revenues and grants) so that they are more inclined to seek to deal with unemployment.

In a political model without an IMC, a *partisan effect* shows that *Right-wing mayors tend to decrease municipal employment when unemployment is higher*. This reluctance to use municipal employment to cope with unemployment could be rooted in their confidence in the private sector to do so. Unfortunately, our data do not allow us to prove this conjecture. Interestingly, our result echoes Clark & Milcent (2011) who find that within public hospitals, employment increases when unemployment increases, but this effect is reduced when the hospital is headed by a Right-wing mayor.

In a more complete model controlling for the magnitude of the inter-municipal employment, it turns out that the *IMC indirect effect* holds only for municipalities in large employment cooperation bodies and that the *partisan effect* dominates the *IMC indirect effect* for Right-wing municipalities, while the reverse holds for Left-wing and other parties' municipalities.

Organization of the paper

Section 2 is devoted to the presentation of the main institutional facts related to municipalities. We develop our theoretical model and its predictions in Section 3. Section 4 presents the data and the identification strategy. The empirical results are provided in Sections 5 and 6. Finally, Section 7 concludes the present work sketching possible ways of enriching the analysis.

2 Institutional facts about French municipalities

2.1 Local government architecture in France

France is a unitary country with three levels of local governments: 34,970 municipalities, 101 counties, and 18 regions in 2019. There were 27 regions before mergers implemented in 2016, and there were more than 36,000 municipalities before 2010 and the mergers induced by the creation of some new municipalities (*communes nouvelles*).

Regions are responsible for regional planning and transport (train lines, inter-urban transportation, airports), high schools (building costs and technical staff after 2006), vocational training and apprenticeships, support to universities and R&D. Counties are responsible for county-level fire and emergency services, rural development and roads (mainly secondary ones, but also, after 2006, national roads), secondary schools and, more importantly, for the social welfare for families, children, disabled people, elderly people and social insertion. These last social responsibilities account for more than half of their spending, with a very low local ability to change the criteria to select social beneficiaries and the amount of the monetary aid.

As far as our period of study (2002-2008) is concerned, the number of municipalities is almost constant and municipalities are responsible for childcare, school building costs, care for the elderly, water distribution, waste collection and local roads. However, the law leaves them free to develop a wide range of additional and optional local public services such as tourism, sports and culture. The high fragmentation at the municipal level—20,200 municipalities have less than 500 inhabitants—has motivated governments to foster IMCs. The objectives were to reduce tax competition between municipalities in the same employment zone, to reduce the costs of local public services via economies of scale, and to create new public services that were not provided before. This movement, mainly initiated by the 1992 Act, has successfully promoted the creation of many IMC structures. These IMC communities were endowed with the possibility to raise taxes autonomously and the central government granted them subsidies without reducing the municipal grants. While the 1992 Act was a success mainly in rural areas, the shift towards cooperation was strengthened with the 1999 Act that created flexible cooperation tools and gave more incentives to urban municipalities

thanks to higher grants per inhabitant. The number of IMC structures with tax power increased from 183 in 1991 to 1,577 in 1998 and 2,601 in 2009. The cooperation process went on as consequence of different laws forcing first municipalities under 5,000 inhabitants and then those under 15,000 to cooperate. The 2010 Act required every municipality to be a member of an IMC structure by 2014. Therefore, the number of IMC bodies has decreased from 2,145 in 2014 to 1,258 in 2019.

Finally, the jurisdictional type[12] of the IMC structure, its fiscal regime and the willingness of its members will determine the set of competencies that a municipality will indeed transfer to the IMC level. IMC structures are allowed to proceed to statutory modifications at any time concerning, for example, the tax regime, set of competencies and number of members. Therefore, the share of local competencies between the municipal and inter-municipal levels is highly diversified and changes over time. As a consequence, the allocation of local employees between the two layers differs from one IMC body to another.

2.2   Municipalities' budgets

Spending by local governments[13] corresponds to 20 % of total public spending in France, with municipalities and their IMC structures responsible for 56 % of local spending, counties for 30 % and regions for 14 % in 2017. Operating costs represent more than 75 % of the total budgets in the municipal sector (municipalities and their cooperation structures) with the wage bill weighing more than 50 % of the operating budgets.

Since public services such as education and care programs as well as road or building maintenance are decided at the municipal level, the wage bill is likely to be high as these services are intensive in labor. The principle of free administration permitted by the French Constitution allows the local authorities to set public employment at the level they wish, as long as norms and mandatory requirements are respected. The municipalities' resources consist mainly of tax revenues and transfers from the central government, borrowing being dedicated only to finance investment spending. More precisely, the municipalities decide on four direct local taxes: the residence tax, the property

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[12]Several types of IMC may be adopted: *communautés de communes*, *communautés d'agglomération*, *communautés urbaines* and *syndicats d'agglomération nouvelle*, which differ by their size, fiscal regime and shared competencies.

[13]Source: Direction Générale des Collectivités Locales (2019)

tax on developed land and the property tax on undeveloped land are levied on households. The base depends on the housing rental value. The business tax[14] is paid by firms and its base is the firm's capital. The municipal tax capacity is defined as the tax revenues that could be obtained out of the local tax bases if the national average tax rates were applied in the municipality (or equivalently the amount of the tax bases for the four local taxes weighted by the national average fiscal rate of each tax). A per capita tax capacity can be used to take into account the municipal population.

The main transfer received from the central government is the *Dotation globale de fonctionnement* (DGF), a lump-sum grant allocated to municipalities in order to help them in their operating budget. It also has a fiscal equalization objective. It is a general grant so that local governments can freely use it. Its allocation is based on a set of criteria reflecting the characteristics of the municipalities, among them their tax capacity. Beside this DGF, by far the most important grant for local jurisdictions, many targeted subsidies are granted to local governments by different State Departments according to so many different rules that a reform was called for. Therefore, a merging of the different grants was implemented in 2004, the former DGF (in 2003) representing half the new DGF in 2004 at the national level. This could have led the municipalities to the misleading perception that the central government was more generous in 2004 than in 2003.

2.3 Decision-making process

The mayor and the municipal council, elected by direct universal suffrage, are responsible for the decisions related to expenses and resources at the municipal level. When a municipality is part of an IMC, it chooses delegates among municipal counsellors to represent the municipality in the IMC council[15]. Elections at the municipal level are held every 6 years. The IMC council changes just after the municipal elections. Cities of at least 3,500 inhabitants fall under the following electoral rules (the voting system applying to under 3,500 inhabitants cities is different): these cities have to publish the different lists of candidates and there may be two rounds of elections. The winner of the competition wins half of the seats in the municipal council;

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[14]The business tax was removed in 2009 and replaced by a bundle of new taxes, mainly on value-added.

[15]A 2010 reform first implemented in 2014 led to the direct election of inter-municipal officials with more than 1000 inhabitant municipalities.

the rest of the seats are allocated proportionally to all the lists of candidates (which have more than 5 % of the votes). When a list gathers more than 50 % of the votes, there is no second round. Otherwise, a second round is run with all lists gathering more than 10 % of the votes. Merging is possible between the two rounds for lists with more than 5 %. Important for our analysis is the fact that local elections were held on 2001 and 2008 because of the presidential elections, which were organized in 2002 and 2007.

The French political landscape is characterized by numerous competing parties. A dichotomous left-right distinction would not be relevant for it would not reflect the complexity of the French political context (See table 6 in Appendix 8.1). Thus, we retain four categories of parties as far as mayors of municipalities of more than 3,500 inhabitants are concerned: Left-wing, Others, Right-wing and Far-Right.

3 Theoretical background

Almost everywhere, whether at the central or local level of government, the rule used to decide on how large the public services should be (which translates, ignoring outsourcing, into how large the public employment should be), is based on voting. We will adopt the now classical approach in public finance when dealing with matters such as fiscal choices, and government spending levels. Elections are the channel through which citizens can express their desired policy. When citizens, endowed with unimodal preferences, vote on a one dimensional public good, and the majority rule is used, it is known that the electoral outcome is congruent with the median voter's preferred policy. As predicted by Hotelling (1929) and Downs (1957), electoral competition will drive towards the outcome preferred by the decisive voter, i.e. the median voter. Our baseline model is adapted from Courant et al. (1979).

3.1 Assumptions

More precisely, let us describe the economy. The municipality has N inhabitants. The municipality provides the public services mainly through direct employment: we assume that the production of public services is measured by the level of public employment E in the municipality.

The citizens have preferences defined on private consumption, denoted C and whose price is normalized to 1, and public consumption E. The utility

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function $U(.)$ representing these preferences is quasi-concave.

The annual income of the decisive voter is denoted by ym. The municipality levies local taxes, denoted t and receives a transfer G from the central government. Let w be the annual wage received by public employees. The total municipal resources should cover the production costs of the public services, that is the wage bill wE.

We express utility as follows $U(C, e)$ where $e = E/N$ is per capita public employment. Similarly, we will denote by $g = G/N$ the per capita grant.

3.2   The determination of the labor demand

The median voter's demands for private and public goods are the result of the maximization of $U(C, e)$ subject to his own budget constraint and the local government's budget constraint.

The local tax revenues are the result of the imposition of a tax rate t, a tax effort, on the sum of tax bases in the municipality. Let B denote the total tax base (the sum of the households' tax base and the firms' tax base) of the municipality and $b = B/N$ the average local tax base. The local government's budget constraint $tNb + G = wE$ can be rewritten as follows: $tb + g = we$.

The median voter budget constraint is given by $C + tb_m = ym$, where b_m denotes his tax base. Solving for t from the local government's budget constraint, $t = -g/b + w(e/b)$, and substituting it in the median voter's budget constraint, we obtain $ym + (b_m/b)g = C + (b_m/b)we$ showing that the citizen has an income augmented by his share of the grant, $ym + (b_m/b)g$ and this should pay for his private and public consumptions. The ratio b_m/b of the median voter tax base to the average tax base in the municipality is the tax ratio, and $(b_m/b)w$ is the tax price: what the individual pays for an additional unit of public services (here public employment).

Let us denote by $\tau = b_m/b$ the tax ratio[16] (or the marginal cost in terms of increased taxes to get an additional unit of public good), and replace $C = ym + \tau g - \tau we$ in the utility function $U(ym + \tau g - \tau we, e)$ and maximize with respect to e, to get the demand for public services.

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[16]Note this tax ratio is defined as the ratio of the median voter's income to the average income in Bergström et al. (2004). It is relevant for Sweden as there exists an income tax at the local level but not for France, where the income tax is set at the national level.

The median voter's desired level of public employment e^* is given by the equality of the marginal rate of substitution between public and private consumptions and the tax price.

$$U_e(C, e^*)/U_C(C, e^*) = \tau w$$

Considering an explicit expression for U would help and would give insights as to the relevant driving forces of the municipal labor demand

$$e^* = e(w, g, ym, \tau) \tag{1}$$

This function would show the median voter's income ym, the per capita grant g, the public workers' wage w and the tax ratio τ as the main driving forces.

3.3 Predictions of the model

As predicted by the theoretical model, we should expect to have a negative relationship between e and the public employee's wage w. All other things being equal, the employment level should decrease as the public employee's wage increases.

It should be the case that both the median voter's income and the per capita grant have an impact on the demand for public services. It is likely that there will be a positive relationship between e and the per capita grant g and a positive relationship also between e and the citizen's income ym. However, a question remains: should we retain the median voter's income ym or the augmented median voter's income defined as $ym+\tau g$? Empirically, it is documented that demand reacts differently to an increase (of the same amount) in income or grant. This is known as the fly-paper effect, according to which an extra euro of grant leads to larger public spending than would an extra euro of the median voter's income. Owing to this approach, we will distinguish the two, as in Bergström et al. (2004).

4 Empirical test of the relationship

4.1 The dependent and independent variables

The dependent variable, denoted by e, is the employment rate[17] defined as the ratio of the number of employees expressed in full-time equivalent terms—taking into account part-time workers—to the population in the municipality. In our attempt to identify the driving forces behind municipal labor demand, we consider total municipal employment. However, we do not distinguish between public employees and employees who are not civil servants, nor between employees operating in different types of services (Administration, Security, Technical services, Culture and Sports, Medical and Social services).

Municipal labor demand is governed by the following set of variables. The resources of municipalities are central to explaining differences in municipal employment. Total municipal revenues come from taxation and a transfer from the central government, as already mentioned. Both the tax capacity in level to capture the total wealth of the municipality or in structure using the tax ratio are relevant. Choosing the tax ratio, as recommended by our basic model in equation (1) above, we implicitly admit the median voter as the household occupying a house subject to the occupancy tax. This is rather classical in the literature on local public economics, where the supply of public services is adjusted to meet the median voter's expenditure. Naturally the households' median income plays a key role.

The provision costs relating to public services also matter: hence, the wages of public employees are crucial. We compute the public employee average annual wage, dividing the total payroll by the number of employees (see Bergstrom et al. (2004)). There is clearly an endogeneous issue since municipalities choose both employment levels and wages (for the methodology and the identification strategy, see section 4.3.).

To complete the analysis, we also control for other variables of interest such as the main characteristics of the municipalities. First, we take into consideration the inhabitants, both in density and structure (by computing the share of young people aged 3-16); we count for the respective shares of social housing (subsidized) and of second homes; and the unemployment rate (defined as the ratio of job-seekers at the end of the month to the municipal

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[17]We will express this ratio per 1000 inhabitants.

population). Moreover the mayor's political party is introduced into the analysis.

Finally, we exploit the municipality's membership in an IMC body and the public employment rate at the IMC level, bearing in mind that the latter is subject to an endogeneity bias as explained in section 2.1.

4.2 The Data

The main datasets used in this study are the following. First, employment data in the municipalities and their IMC structures come from the COLTER survey handled each year by INSEE[18] between 2002 and 2008. This survey gives raw labor employment at each level of local government, and various sub-variables. We exploit one of these in this paper: the full-time equivalent (FTE) employment, a variable calculated by INSEE in order to control for the widespread use by municipalities of part-time jobs. We use this information both at the municipal and inter-municipal levels.

Second, we use the INSEE database to generate the population level in each municipality, a key variable, as it is used both to create the dependent variable and to control for a density effect in the explanatory variables. However, our 2002-2008 period of study is specific since a new census methodology was implemented by INSEE due to a 2003 Act, with new legal municipal population numbers available only for 2006 and the following years. That is why we choose to use the 2006, 2007 and 2008 legal municipal numbers as such and to generate 2002 to 2005 numbers with the following methodology. We exploit the 1999 and 2006 legal municipal population variables and generate the annual data thanks to a linear interpolation. Moreover, we also use the median income and retain the median income per unit of consumption—an indicator that controls for the number of people in the household—as recommended by INSEE.

Third, we exploit the DGFIP[19] database to take account of the municipal employees' payroll. This enables us to calculate for each municipality the average wage for the local public employees. In order to control for the endogeneity of the municipal wage variable, we make use of the local employment dataset available at the *zone d'emploi*[20] level, hereafter employment zone

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[18]Institut National de la Statistique et des Etudes Economiques
[19]Direction Générale des Finances Publiques
[20]An EZ is a geographical space in which mostly all the workers live and work and in

(EZ). This EZ is a zoning created by INSEE to study the sectoral structure of employment in local labor markets. We use two instruments: H is the Herfindhal Hirschman Index and z is the average public wage computed on the other EZs within the same county in the neighborhood of the EZ to which municipality i belongs. We will comment on these instruments below.

Fourth, we use the DGCL[21] annual database providing the criteria used by the central government to allocate its grants to local jurisdictions. This enables us to calculate the following variables at the municipal level: per capita grant, population density, shares of subsidized housing and of second homes, share of young people (3-16) and tax ratio. We also consider two instruments for the IMC employment level: population density and the share of second homes at the IMC level.

Fifth, we make use of a DARES[22] dataset on municipal unemployed people. We compute a share of the local population being unemployed each year, with a delay of one year. Taking a lagged value allows us to avoid endogeneity issues.

Finally, to identify the mayor's political party, we exploit the outcomes of the 2001 municipal election made available by the Department of Home Affairs. These data constrain us to consider municipalities under and above 3,500 inhabitants because of the availability of electoral outcomes for municipalities over 3,500 inhabitants only. The data do not allow for the distinction between center right and right. We distinguish Left-wing, Right-wing and count for the Far-Right, and Others (see tables 6 and 7 in Appendix 8.1). Mayors elected on 2001 hold office until the next election (which was held on 2008) and thus our politics variable is constant over the period.

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which firms can find a large share of the labor force needed for the jobs they supply. The decomposition into employment zones corresponds to a partition of the territory that is adapted to study local labor markets. The partition provides relevant territories for local analysis as well for the design of public policies by authorities whether at the local or national level. The partition, which encompasses France (including its overseas territories) is based on the flows of workers' commuting journeys observed in 2006. The 2010 geographical partition is used. The estimation of salaried and non-salaried employment is provided for 321 EZs of France (excluding Mayotte). The salaried employment is available based on the activities aggregated into 5 sectors: Agriculture, Industry, Construction, Market Services and Non-Market Services.

[21]Direction Générale des Collectivités Locales

[22]Direction de l'Animation de la Recherche et des Etudes et des Statistiques, Ministère du Travail.

All the monetary data are expressed in real values (euros 2018).

We have set up a balanced panel dataset of municipalities of more than 1000 inhabitants, this threshold being observed in 1999. The matching process and the merging of these six different datasets lead to the loss of 280 municipalities[23]. We eventually built an original balanced panel database of 8,387 French municipalities over the 2002-2008 period.
Summary statistics are provided in Appendix 8.2.

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[23]We have lost observations because of a lack of information and/or of abnormal values (overseas municipalities were excluded). The attrition is the consequence of the matching process between municipal employment, unemployment, the geographical partition at the EZ level and the wage bill. Moreover, we have lost observations in the matching process due to the municipal elections results.

4.3 Methodology and identification strategy

We estimate equation (1) using the following econometric specification:

$$ln(e_{it}) = \beta_w ln(w_{it}) + \beta_g ln(g_{it}) + \beta_m ln(ym_{it}) + \beta_\tau ln(\tau_{it}) + \beta_I ln(I_{it})$$
$$+ \sum_j \gamma_j ln(X_{it}^j) + u_i + \delta_t + \epsilon_{it} \quad (2)$$

Where i denotes the municipality index and t denotes time. Variable I refers to the public employment rate at the IMC level. Variables X are control variables. As mentioned above, both the public average wage w and the IMC employment rate I are subject to an endogeneity bias. We thus need to instrument these variables.

As far as w is concerned, it is difficult to find an instrument correlated to labor supply which does not affect labor demand. Ideally, simultaneously estimating the two sides of the labor market (supply and demand) would have been relevant, but because of lack of information, we estimated a reduced form. Eventually, we use two distinct instruments that do not provide the same information. We exploit a partition in terms of employment zones provided by INSEE since they offer a good approximation of local labor markets.

First, we use the Herfindhal Hirschman Index[24] H, that reflects the allocation of employment across sectors within an employment zone.

Second, we use an additional instrument, inspired from the industrial organization literature methodology (Hausman et al. (1994)). A job seeker is likely to compare the wage set by municipality i to the average of wages proposed by the other municipalities in the same area. We then instrument the local public wage set by a given municipality i by the average public wage,[25] denoted z, set by the municipalities in the neighborhood of municipality i, but excluding municipalities in the same EZ as i. This is in line with the strategy used in Azar et al. (2019). By neighborhood, we mean the municipalities members of EZs close to the EZ to which i belongs, and within the same county. The choice for the average wage computation at the county

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[24]H is defined as the sum of the squared shares of the salaried employment in each sector.

[25]Since we estimate a log-linear model, we compute the average logarithm of the wages at the EZ level.

level allows for having large enough variance of the instrument z. z conveys further information which is the result of a wage policy at the municipal level.

Regarding the IMC employment variable I, we consider two instruments: population density and the number of second homes at the IMC level. As explained in section 2.1, IMC competencies, and then IMC employment, are the result of a mix of factors. Whereas recent laws force IMC bodies to change their competencies, the free choices made by municipalities that are members of the IMC may also lead employment in the IMC to change, according to political motivations (mayors have to be able to define a joint policy if the competence is chosen to be transferred) or economic motivations (mayors may look for economies of scale, for example).

We estimate equation (2) using a 2SLS method where all variables are first-differenced, assuming fixed municipal effects.

5   Main results

The main results are displayed below in table 2. Additional results, exploiting the interplay between unemployment, political partisanhip and IMC are provided in table 3 in section 6.

Table 2: Dependent variable: municipal employment (e)

	(1)	(2)
Wage (w)	-0.724***	-0.733***
	(-6.19)	(-6.24)
Grant (g)	0.0121***	0.0119***
	(5.52)	(5.43)
Grant*Reform	-0.00426***	-0.00421***
	(-3.04)	(-3.01)
Income (ym)	0.0519***	0.0525***
	(3.25)	(3.30)
TaxRatio (τ)	-0.0170**	-0.0186**
	(-2.28)	(-2.48)
IMCemp (I)	0.00696***	0.00719***
	(4.34)	(4.51)
Unemp	0.00124	0.000646
	(0.57)	(0.29)
Unemp*IMC	0.00287***	0.00325***
	(5.39)	(5.68)
Unemp*IMC*Q1		-0.000750**
		(-2.19)
Unemp*IMC*Q3		0.00166***
		(3.65)
Density	-0.145***	-0.145***
	(-10.18)	(-10.22)
SocHouse	0.000479	0.000479
	(0.78)	(0.78)
Young	0.0257***	0.0252***
	(4.22)	(4.15)
SecHome	-0.0646***	-0.0667***
	(-3.38)	(-3.48)
2004	-0.0101***	-0.00998***
	(-4.96)	(-4.88)
2005	-0.00466**	-0.00447**
	(-2.47)	(-2.36)
2006	-0.000341	-0.000228
	(-0.22)	(-0.14)
2007	0.00958***	0.00976***
	(5.13)	(5.20)
Constant	0.0124***	0.0128***
	(7.27)	(7.40)
N	41935	41935
Municipalities	8387	8387
R2 Overall	0.1310	0.1299
R2 Within	0.4289	0.4278
R2 Between	0.8354	0.8352
Corr(u,Xb)	-0.6373	-0.6373

t statistics in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

IV estimation with first-differenced variables and fixed municipal effects

Tests for excluded instruments: Partial-F for wage first stage equation: 47.10***

Partial-F for IMCemp first stage equation: 807.2***

5.1 Robust results across models

We comment on robust results across models displayed in tables 2 and 3. First, the impact of average wage on municipal labor demand is highly significant, with an estimated elasticity of less than one in absolute value (between -0.64 and -0.73). As far as we know, this is the first work on French data providing an estimate of this elasticity. Bergström et al. (2004) already cited above display estimates of wage elasticities of labor demand using data from Swedish municipalities in 1988-1995. The range of the estimates lies between -0.896 (long run elasticity) and -0.533 (short run elasticity))[26]. There exist some empirical evidence on the public sector wage premium and the wage elasticity of labor demand in both the private and public sectors. Though this is beyond the scope of our analysis, it is worth providing the salient results of these studies. On US data, Ehrenberg & Schwarz (1986) show that the wages were higher in the public sector than in the private sector and unionization greater among public employees. They found negative wage elasticities for most categories of labor which were smaller in absolute value than those of the private sector[27].

A complementary approach, developed by Forni & Giordano (2003), assumes that the public decision maker follows an efficiency goal[28]—providing public services at minimal cost—and has an employment objective since he is also concerned about the unemployment level in the overall economy. They show that the wage elasticity of the labor demand is lower in the public sector than the private sector. The public decision maker has fewer incentives to reduce unemployment by resorting to public employment since this would crowd out private employment[29] .

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[26]Dahlberg et al. (2008) led to higher (in absolute values) estimated coefficients for the impact of wage on employment, with elasticities ranging from -1.1 to -1.3 for child care and schooling employment, whereas these estimates were not significant for administrative employment and that related to care for elderly.

[27]Gregory & Borland (1999) adopt a cross-country perspective. They insist on the importance of using microeconomic data to control for composition and skill heterogeneity in analyzing the public sector wage premium. The (wage) premium, which is found in most analyses, is related to the degree of unionization.

[28]The Public expenditure is financed out of the taxes on private labor income, in other words, there is a budget constraint that is taken into account by the public sector when choosing the employment level whereas the private sector is motivated by the prospect of profit maximization.

[29]On this, see Boeri et al. (2000) and Algan et al. (2002) as well as Holmlund (1993) and Holmlund (1997) who analyzes a model where an increase in public wage or employ-

To treat endogeneity of wage, we used H and H^2, and z, as instruments in the first stage wage regression. We find a significant effect of H and H^2, with a negative but increasing marginal effect. The intuition is the following: as one of the five sectors dominates in the EZ, the workers become less demanding in terms of wages since they are facing a firm concentrating a large share of the employment and likely to behave as a monopsony. The positive sign associated to H^2 suggests there is a limit to the effort accepted by workers in terms of wage decrease. We find also, in line with the intuition, that the average of other public wages z has a positive and a highly significant effect on the municipal wage.

Second, the impact of the main central government transfer is positively significant but the magnitude of the elasticity is rather small (0.012). Moreover, the 2004 reform–merging the main grants allocated by the central government to municipalities–mitigates this impact: it is likely that the municipalities have internalized that the overall grant level would not increase (they anticipated that different subsidies would be rationalized into a global unchanged subsidy). Bergström et al. (2004), who studied the impact of the shift in 1993 from a targeted to a general grant, provide a basis for comparison bearing in mind that the French grant under consideration is general. They found that respectively before and after the shift, elasticities range from 0.06 (short run) to 0.10 (long run) for the targeted grant and from 0.025 (short run) to 0.042 (long run) for the general grant.

The impact of the median income is congruent with the outcome of median voter models: the estimated elasticity is positive and significant and its magnitude is large as compared to the grant elasticity (more than four times higher). Similar results are obtained by Bergström et al. (2004): they show that the median income elasticity is much higher than the general grant elasticity. We do not find a fly-paper (see Hines & Thaler (1995)) effect when municipal employment is studied, whereas former French studies, cited above, have found that total municipal spending displayed a fly-paper effect.

As expected, the tax ratio elasticity is negatively significant with a coefficient lying between -0.014 and -0.0186.
Moreover, we find a significant negative impact of the population density

ment, by increasing the reservation utility of private sector workers and their bargaining power, leads to an increase in the private sector wage and a reduction in private sector employment.

which suggests the existence of economies of density: public service provision cost might decrease with the density, as shown by Breuillé et al. (2019), so that the municipality resorts to fewer employees. The coefficient of the population density is highly significant and equal to -0.145.

Education services being labor consuming, the intuition suggests that we should expect a positive and significant effect of the share of young people in the municipality on the labor demand. Table 2 shows this to be the case with a magnitude around 0.026.

The impact of second homes is significantly negative, with an elasticity around -0.06, a result in line with the intuition that as being part-time occupied, their owners do not exploit public services intensively.

We also introduced time dummies to take into account the impact of the political cycle on municipal labor demand. Recall that the municipal election was held in 2001 and the next election in 2008 (used as reference year). Recall also that 2002 and 2003 dummies are dropped because of first differences and the unemployment first lag. As compared to 2008, 2004 and 2005 display a negative significant effect, while, as suggested by electoral competition models, 2007 shows a positive and significant effect: as an election approaches the prospect of being re-elected gives incentives to increase municipal labor.

5.2   Unemployment and IMC effects

One of the insights provided by our paper relates to the effects of IMC on municipal labor employment. On average over the period studied, 87.42% municipalities were members of an IMC body. It is thus a central issue to control for this cooperation effect.

In models (1) and (2), we study the direct impact of IMC taking into consideration the IMC employment level. Indeed, IMC structures are very different in the scope of the local public services offered, and the number of inter-municipal employees needed to provide these services, due to the high degree of liberty afforded by the central government to the municipalities in how they organize their cooperation. Regarding the impact of the inter-municipal employment level on municipal employment, models (1) and (2) reveal positive and highly significant –yet of small magnitude– elasticities (0.007), which we call an *IMC direct effect*. More precisely,

Higher IMC employment induces higher municipal employment.

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In order to understand this finding, it is worth noting that within an IMC body, municipal employment might decrease if municipalities transfer responsibilities. It might also increase when municipalities supply new public services and provide for additional facilities which did not exist before they joined the IMC body. This positive impact is actually the result of a combined effect of IMC membership. First, the transfer of municipal responsibilities to the IMC level leads to a substitution effect. Moreover, IMC employment can be increased due to the creation of new public services at the IMC level. However, municipalities are often reluctant to be marginalized by IMC structures and mayors tend to develop new municipal public services so as to be still considered powerful by voters (complement effect). The dominance of the complement effect over the substitution effect explains the net positive *direct effect* of IMC employment on municipal employment. It should be noted however that this net positive effect has a small magnitude. A similar dominance of the complement effect was found by Guengant & Leprince (2006) on municipal spending.

Our second focus is to understand how local unemployment impacts municipal labor demand and investigate whether IMC plays a role in this unemployment effect. Recall that the choice of the first-lagged unemployment avoids endogeneity issues and is also motivated by the larger significance of the lagged-unemployment coefficient as compared to its contemporaneous value. Model (1) shows that only municipalities within an IMC body react positively and significantly (0.00287) to unemployment, even though the magnitude of the elasticity is rather small. There is no impact of unemployment on municipalities outside an IMC structure. Outside an IMC body, mayors directly provide so many services to their electorate that they can avoid fighting unemployment without being sanctioned. Moreover, as a member of an IMC structure, mayors are endowed with more fiscal revenues and/or additional aids provided by the IMC structure to its members. As a result, mayors in IMC bodies have the opportunity to cope with unemployment, though this issue is mainly a central government concern. Clark and Milcent (2011) found no significant effect of unemployment on French hospital employment in their basic model. However, the impact of unemployment is found to be highly significant and positive only for public hospitals headed by mayors. This provides evidence for the existence of an *IMC indirect effect.* More precisely,

IMC leads mayors to employ more people when unemployment is higher.

This interplay between unemployment and IMC calls for the consideration of the extent of cooperation to obtain more refined results. In model (2) we focus on two types of municipalities: those belonging to IMC structures either with a low employment level (below the first quartile Q1) or with a high employment level (above the third quartile Q3). In municipalities with low inter-municipal employment level –which could be called "empty shell" IMC bodies– the impact of unemployment is mitigated: mayors are less sensitive to unemployment, although the total effect of unemployment on municipal employment is still significant and positive. The reverse holds for municipalities with high inter-municipal employment levels–which we call "integrated" IMC structures– where the impact of unemployment on municipal labor is higher. This suggests that mayors in these IMC structures, due to the loss of direct control over many public services, use municipal employment to cope with new issues such as unemployment. We therefore give additional evidence in support of the *IMC indirect effect*. Not only IMC *per se* changes the reaction of mayors to unemployment, but also the magnitude of the IMC employment level.

6   Further results

Recalling that mayors decide on municipal employment levels, it is worth exploring our data further to refine the *IMC indirect effect* considering the potential partisan effect. Our data constrain us to distinguish between municipalities under and above 3,500 inhabitants, hereafter denoted small and larger municipalities respectively, because of the availability of electoral results for large municipalities only. The following table 3 summarizes the results of four additional models.

Table 3: Dependent variable: municipal employment (e)

	(3)	(4)	(5)	(6)
Wage (w)	-0.725***	-0.727***	-0.719***	-0.674***
	(-6.20)	(-6.19)	(-6.14)	(-5.74)
Grant (g)	0.0122***	0.0122***	0.0121***	0.0123***
	(5.54)	(5.56)	(5.50)	(5.58)
Grant*Reform	-0.00399***	-0.00405***	-0.00399***	-0.00410***
	(-2.85)	(-2.89)	(-2.85)	(-2.89)
Income (ym)	0.0531***	0.0531***	0.0516***	0.0485***
	(3.34)	(3.34)	(3.24)	(3.01)
TaxRatio (τ)	-0.0143*	-0.0144*	-0.0160**	-0.0169**
	(-1.93)	(-1.94)	(-2.14)	(-2.24)
IMCemp (I)	0.00659***	0.00659***	0.00694***	0.0112***
	(4.19)	(4.19)	(4.33)	(5.52)
Unemp*Small	0.00540**	0.00556**	0.00415*	0.00427*
	(2.50)	(2.57)	(1.83)	(1.87)
Unemp*Small*IMC			0.00168***	0.00230***
			(2.85)	(3.72)
Unemp*Large	-0.0119**			
	(-2.43)			
Unemp*RW		-0.00870**	-0.0123***	-0.0128***
		(-2.55)	(-3.51)	(-3.63)
Unemp*IMC*RW			0.00436***	0.00410***
			(5.93)	(5.55)
Unemp*IMC*Q1*RW				-0.00545***
				(-6.69)
Unemp*IMC*Q3*RW				0.00597***
				(7.61)
Unemp*LW		-0.00193	-0.00500	-0.00663
		(-0.19)	(-0.49)	(-0.64)
Unemp*IMC*LW			0.00349*	0.00324
			(1.70)	(1.55)
Unemp*IMC*Q1*LW				-0.00872***
				(-4.57)
Unemp*IMC*Q3*LW				0.00636***
				(3.15)

Unemp*OP		-0.0105	-0.0173	-0.0254
		(-0.40)	(-0.66)	(-0.95)
Unemp*IMC*OP			0.00864**	0.00756*
			(1.97)	(1.70)
Unemp*IMC*Q1*OP				-0.00930**
				(-2.50)
Unemp*IMC*Q3*OP				0.0180***
				(2.67)
Unemp*FR		0.0414	0.0365	0.0382
		(0.63)	(0.55)	(0.57)
Unemp*IMC*FR			0.0177	0.0194
			(1.18)	(1.19)
Unemp*IMC*Q1*FR				-0.00106
				(-0.07)
Unemp*IMC*Q3*FR				-0.00265
				(-0.23)
Density	-0.143***	-0.144***	-0.144***	-0.145***
	(-10.10)	(-10.13)	(-10.12)	(-10.12)
SocHouse	0.000475	0.000477	0.000466	0.000355
	(0.77)	(0.77)	(0.76)	(0.57)
Young	0.0252***	0.0252***	0.0253***	0.0262***
	(4.15)	(4.14)	(4.16)	(4.27)
SecHome	-0.0650***	-0.0644***	-0.0639***	-0.0594**
	(-3.41)	(-3.38)	(-3.35)	(-3.08)
2004	-0.00978***	-0.00994***	-0.00952***	-0.00968***
	(-4.79)	(-4.87)	(-4.65)	(-4.68)
2005	-0.00429**	-0.00446**	-0.00406**	-0.00444**
	(-2.28)	(-2.36)	(-2.13)	(-2.32)
2006	0.0000837	-0.0000743	0.000202	-0.0000588
	(0.05)	(-0.05)	(0.13)	(-0.04)
2007	0.00976***	0.00970***	0.00978***	0.00927***
	(5.26)	(5.18)	(5.22)	(4.94)
Constant	0.0120***	0.0121***	0.0123***	0.0118***
	(7.04)	(7.09)	(7.20)	(6.88)

t statistics in parentheses $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

IV estimation with first-differenced variables and fixed municipal effects

In table 3, we use RW, LW, OP, FR for Right-wing, Left-wing, Other-parties and Far-Right respectively. The results[30] in table 3 above exploit 41,935 observations (8,387 municipalities). Model (3) compares the unemployment effect for small and larger municipalities. This benchmark model shows a significant positive impact of unemployment on municipal employment for small municipalities and a negative one for the larger cities. Model (4) differentiates the unemployment effect according to the mayor's political party for the larger municipalities. We still find a significant positive effect for small municipalities but we are able to reveal significant partisan differences: municipal employment decreases when unemployment increases for Right-wing larger municipalities, while no significant effect is found for other parties. This suggests that Right-wing mayors tend not only to be reluctant to increase municipal employment to cope with unemployment, as do mayors in small municipalities, but Right-wing mayors tend to reduce municipal employment when unemployment is higher. If we had data to control for the private sector's decisions at the municipal level, we would be able to formulate the intuition that Right-wing mayors are prone to rely on the private sector's decisions. Interestingly, the model (4) result is in line with the partisan differences revealed by Clark and Milcent (2011). They found that within public hospitals, employment increases when unemployment increases, but this effect is reduced when the public hospital is headed by a Right-wing mayor. As a consequence, we now have a *partisan effect* which can be formulated as follows:

Right-wing mayors tend to decrease municipal employment when unemployment is higher. However, no significant effect is found for Left-wing, Others and Far-Right mayors.

We finally try to give a picture of the interplay of politics, unemployment and IMC in models (5) and (6).
In model (5), we study the impact of unemployment considering the membership of an IMC both for small and large cities, and political parties for the latter. Whatever the size of the municipality, the coefficient of the interaction term between IMC, parties and unemployment is positive. This confirms the model (1) results above. For small municipalities, whether or not a member of an IMC, there is a positive and significant impact of unemployment on municipal employment. For Right-wing municipalities, the impact of unem-

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[30]Since the R2s are stable across models, we reproduce those of model(6): R2 Overall=0.1059; R2 Within= 0.4281; R2 Between=0.8296; Corr(u,Xb)=-0.5999.

ployment is still negative but the membership of an IMC structure mitigates this effect. For Left-wing and Others municipalities, the specific impact of partisanship on unemployment is still null as in model (4), but it becomes positive only for Others and Left-wing mayors when the municipality is a member of an IMC structure. Two explanations for the mitigating effect of IMC membership in Right-wing municipalities are possible. First, political preferences of Right-wing mayors could be influenced by their connections within the IMC. Second, they might fear an electoral sanction if they reduce municipal employment too much. This echoes the traditional yardstick competition argument (see Dubois & Paty (2010) for evidence on French municipal data).

In model (6), we study the impact of unemployment now taking into consideration the IMC body's level of aggregation (or cooperation) as in model (2), and political parties. In a nutshell, we find, that regardless of the party, the impact of unemployment on municipal employment is negative for municipalities in an "empty shell" IMC body. The opposite holds for municipalities in "integrated" IMC bodies. In Left-wing and Others municipalities, the specific impact of partisanship on unemployment is null, so that the *IMC indirect effect* dominates the *partisan effect*. For Right-wing municipalities, the *partisan effect* dominates the *IMC indirect effect*. Gathering these comments, we finally show that the *IMC indirect effect* depends on the magnitude of the IMC employment level. More precisely,

IMC leads mayors to employ more people when unemployment is higher, only for municipalities within "integrated" IMC bodies. However, the partisan effect dominates the IMC indirect effect in Right-wing municipalities, while the IMC indirect effect dominates for Left-wing and Others municipalities.

We can summarize the signs of the different effects in table 4 below:

Table 4: Signs of the effects

	RW $\leq Q_1$	RW $\geq Q_3$	LW $\leq Q_1$	LW $\geq Q_3$	OP $\leq Q_1$	OP $\geq Q_3$
Partisan Effect	(-)	(-)	NS	NS	NS	NS
IMC IE Average	(+)	(+)	NS	NS	(+)	(+)
IMC IE Magnitude	(-)	(+)	(-)	(+)	(-)	(+)
Overall Effect	(-)	(-)	(-)	(+)	(-)	(+)

To illustrate this finding, we give the overall elasticities of municipal employment with respect to unemployment in table 5 where the standard errors are reported in parentheses. This table reveals that the overall elasticities range from -0.01415 to +0.026. Consider first Right-wing municipalities. In an "empty shell" IMC body, municipal employment is reduced when unemployment increases with a net negative elasticity, possibly because cooperation is too light to induce them to change their preferences. In an "integrated" IMC structure, the overall effect of unemployment is still negative yet not statistically significant. For Left-wing and Others municipalities, the net elasticity is negative in an "empty shell" IMC (but not statistically significant for Others), while it is positive in an "integrated" IMC. No such effect is observed for Far-Right municipalities, possibly because of too few observations.

Table 5: Elasticities

	RW	RW	LW	LW	OP	OP
	$\leq Q_1$	$\geq Q_3$	$\leq Q_1$	$\geq Q_3$	$\leq Q_1$	$\geq Q_3$
Partisan Effect	-0.0128	-0.0128	0	0	0	0
IMC IE Average	+0.0041	+0.0041	0	0	+0.00756	+0.00756
IMC IE Magnitude	-0.00545	+0.00597	-0.00872	+0.00636	-0.0093	+0.01844
Overall Effect	-0.01415***	-0.00273	-0.00872***	+0.00636***	-0.00174	+0.026***
	(0.0036)	(0.0035)	(0.0019)	(0.0020)	(0.0060)	(0.0083)

As a concluding remark and to close the loop, we compare the different estimated elasticities of municipal employment with respect to the main variables of interest for our analysis. We comment on model 6 which is by far the richest. First, wages are the main driving force of municipal labor demand since the associated elasticity is the largest (-0.674). A second key factor appears to be the median income with an elasticity equal to 0.0485. The tax ratio, grant and IMC employment respective elasticities have comparable magnitudes (in absolute values) around 0.015.

7 Conclusion

To the best of our knowledge, our contribution is the first to adress municipal labor demand on French data. In this study, exploiting a French panel database of municipalities of more than 1,000 inhabitants over the 2002-2008 period, we have identified the main driving forces of municipal labor demand. As suggested by our theoretical model, our evidence suggests that increases

in public employees' wages or tax ratios lead to smaller municipal employment, while increases in grants from the State level or median income lead to higher municipal labor demand.

Since 87% of the French municipalities are part of an IMC structure, we also investigated the consequences of IMC on municipal employment and provide four additional results. We first find that higher IMC employment induces higher municipal employment (*IMC direct effect*). Moreover, we show that IMC leads mayors to hire more when unemployment is higher (*IMC indirect effect*). Moreover, Right-wing mayors tend to hire less when unemployment is higher (*partisan effect*). Finally, controlling for the magnitude of the IMC employment level it turns out that, in Others and Left-wing municipalities, the *IMC indirect effect* dominates the *partisan effect* in "integrated" IMC bodies, whereas the *partisan effect* dominates the *IMC indirect effect* for Right-wing municipalities.

In order to complete our study, a natural extension would exploit more recent data on municipalities. The analysis could be improved considering other elements of interest. First, instead of the aggregate employment level, we could distinguish between employees operating in different types of services (Administration, Security, Technical services, Culture and Sports, Medical and Social services) and also consider the status of employees (whether tenured or not). Second, since many public services (water distribution, urban transportation and waste collection) can be outsourced, this might have an impact on the wage bill (see Jaaidane & Gary-Bobo (2008) on the choice between private sector and public agents in the waste collection in Paris) so that it would be interesting to exploit the disparities of choices made by municipalities. Moreover, the increase in the extent of IMC calls for the introduction into the analysis of the jurisdictional type and fiscal regime of the cooperation bodies.

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8 Appendix

8.1 2001 French Municipal elections

Table 6: Municipal elections 2001

List acronyms	Possible Party of List Leaders
LXG	EXG
LGA	COM-MDC-SOC-PRG-DVG-VEC
LDG	DVG
LVE	VEC Les Verts
LEC	ECO (autres écologistes)
LRG	REG (régionalistes)
LDV	CPNT-DIV
LDR	RPR-UDF-DL-RPF-DVD
LDD	RPF-DVD
LFN	FR
LMN	MNR

Source: Department of Home Affairs

Table 7: Results for municipalities over 3,500 inhabitants in our dataset

Political Parties	First Round	Second Round
LGA (Left-wing))	151/1721	286/904
LDD (Right-wing)	579/1721	204/904
LDG(Left-wing)	110/1721	80/904
LFN (Far-Right)	8/1721	0
LMN (Far-Right)	6/1721	2/904
LEC+LVE (Left-wing)	6/1721	2/904
LDV (Others)	54/1721	18/904
LXG (Left-wing)	0	1/904

8.2 Summary statistics

Variable		Mean	Std. Dev.	Min	Max	Observations	
employ_e	overall	10.95483	6.407719	0	149.5427	N =	59850
	between		6.331889	0	139.4184	n =	8550
	within		.9849175	−5.51351	30.8668	T =	7
wage_w	overall	33.0735	4.682961	8.796075	82.22693	N =	59836
	between		3.862128	14.5611	73.70364	n =	8548
	within		2.648696	8.228637	62.05044	T =	7
grant_g	overall	.2126703	.0810653	0	1.629625	N =	59850
	between		.0760626	.0476884	1.144168	n =	8550
	within		.0280472	−.9306367	.8672905	T =	7
income	overall	19.83834	3.777346	9.634184	49.92582	N =	59850
	between		3.722942	10.0587	46.79925	n =	8550
	within		.6398721	14.66192	23.95201	T =	7
taxratio	overall	.2814205	.1069798	.010888	.5926805	N =	59850
	between		.106245	.0130079	.5424202	n =	8550
	within		.0125622	.1301398	.5295436	T =	7
dumIMC	overall	.8741688	.3316618	0	1	N =	59850
	between		.2827983	0	1	n =	8550
	within		.1732995	.0170259	1.731312	T =	7
I_employ	overall	1.896307	2.073585	0	55	N =	52319
	between		1.945588	0	28.66372	n =	7924
	within		.6846475	−20.67704	33.8235	T-bar =	6.6026
unemp	overall	.0343148	.0140631	0	.3493544	N =	58961
	between		.0129556	.0103769	.3030764	n =	8423
	within		.0054718	−.0462552	.0955156	T =	7
density	overall	5.036541	13.48594	.0539444	262.3444	N =	59850
	between		13.48267	.0553576	254.1972	n =	8550
	within		.3263766	−10.12584	17.69197	T =	7
soc_hous	overall	.1711529	.2582015	0	1.828694	N =	59850
	between		.2564499	0	1.730021	n =	8550
	within		.0301341	−.3835667	.8639665	T =	7
young	overall	.1737581	.0305731	.0578444	.3855488	N =	59850
	between		.0288599	.0781704	.3205894	n =	8550
	within		.0100948	.0830613	.353124	T =	7
sec_home	overall	.0846523	.1385068	0	1.728029	N =	59850
	between		.1383912	0	1.597544	n =	8550
	within		.005825	−.0563382	.218144	T =	7
HHI	overall	.3274458	.0364673	.2475913	.4939184	N =	58723
	between		.0362504	.2521411	.4850697	n =	8389
	within		.0039886	.2560947	.3987554	T =	7
instr_z	overall	32.64125	1.845736	25.75241	38.97648	N =	58723
	between		1.474075	28.52955	37.72526	n =	8389
	within		1.110886	28.8162	35.74595	T =	7
I_sec_H	overall	1925.048	4430.866	7	35956	N =	52319
	between		4305.137	7	35956	n =	7924
	within		958.3775	−28229.24	22567.19	T-bar =	6.6026
I_dens	overall	3.704457	7.855308	.0574514	158.7014	N =	52319
	between		8.341258	.0590195	155.9388	n =	7924
	within		.4296175	−10.17845	13.17544	T-bar =	6.6026