ACCESS TO SERVICES IN RURAL SPAIN

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Abstract

This paper explores the differences in accessibility to services between rural and urban areas in EU countries. According to our analysis, rural areas in Spain have worse accessibility to services than their European counterparts, while the differences are not significant in the case of urban areas. The availability of information at the municipal level in Spain means a deficit in the accessibility to services of rural as opposed to urban municipalities may be documented within each region. There are also some idiosyncrasies in the remoteness and fiscal structures of rural municipalities that might partly explain this deficit.

Keywords: services accessibility, rural areas, urban areas, Spain.

JEL classification: R10, I31, J11.

Resumen

Este documento analiza las diferencias que existen en la accesibilidad a servicios entre las zonas rurales y las urbanas en los países de la Unión Europea. Los resultados indican que, en España, las áreas rurales presentan una peor accesibilidad a servicios que sus homólogas europeas, mientras que las diferencias no son significativas en el caso de las áreas urbanas. La disponibilidad de información a nivel municipal para el caso español permite documentar un déficit en la accesibilidad a servicios de los municipios rurales frente a los urbanos dentro de cada comunidad autónoma. Asimismo, se observan algunas idiosincrasias en la geografía y en la fiscalidad de los municipios rurales que podrían explicar, al menos en parte, dicho déficit.

Palabras clave: accesibilidad, servicios, áreas rurales y urbanas.

Códigos JEL: R10, I31, J11.

Contents

1 Introduction

The economic literature has identified various economic reasons that may help explain why population and activity are concentrated in a relatively limited portion of the territory. Thus, for instance, greater physical proximity makes for easier interaction between companies and employees and allows, moreover, for the provision of services at a lower cost per person. These are the so-called "economies of agglomeration" (see Duranton and Puga (2020)). However, the demographic and economic dynamics these concentration-geared centripetal forces entail have very different implications for specific territorial areas which, in turn, may trigger some social unrest (see Rodríguez-Pose (2018)). Indeed, the increase in the rate of urbanisation of the Spanish economy over recent years has been accompanied by a new episode of rural depopulation in Spain (see Gutiérrez et al. (2020a)). Against this background, the discussion on inequality between rural and urban areas in terms of access to services has moved up the public debate agenda, at both the national and European level (see Banco de España (2021)).

This paper offers a detailed analysis of accessibility to different types of services in the EU countries, with a particular emphasis on the differences between rural and urban areas. Specifically, the services accessibility indicators compiled by Kompil et al. (2019) for the EU countries allow for research into whether there are significant differences in access to specific services between the EU regions – defined following the NUTS3 classification, which in Spain encompasses the provinces – and between different municipalities in Spain. The analysis particularly highlights what are called "local services" under the Kompil et al. (2019) taxonomy, which are those services whose scope or coverage is concentrated in small geographical areas, and which include, for example, a library, a primary school or a primary healthcare centre (see Annex 1 for a more detailed description of these services). Moreover, the availability of additional information at the municipal level in the Spanish case enables the factors at least partly behind the differences observed between rural and urban municipalities to be explored in greater detail.[1]

As to the situation of Spanish provinces from the European perspective, the results indicate that services accessibility in Spain is in line with its European counterparts. Specifically, the average Spanish citizen is 3.5 km away from the nearest local service, compared with 4 km for the average citizen in the rest of the EU. However, the differences in services accessibility between rural and urban areas are more marked in Spain. Predominantly rural provinces in Spain thus show a lesser availability of local services than their European counterparts in terms of distance to the closest service for the average citizen. In particular, the average citizen in Spanish rural provinces[2] is 12.4 km away from the closest local service, compared with 4.8 km, 7.6 km and 4.7 km for average citizens in the rural regions of

1 The data set out in Gutiérrez et al. (2020b) are used for the analysis of geographical variables at the municipal level, and the Spanish Ministry of Finance data presented in Alloza and Burriel (2019) for the analysis of fiscal variables.

2 According to Eurostat's taxonomy, any province in which over 50% of its population does not reside in urban areas and which, moreover, has no urban area with over 200,000 inhabitants is considered to be rural. For further details, see the second section.

Germany, France and Italy, respectively. Conversely, this difference between Spain and the other EU countries is not seen in the case of urban areas.

With regard to the differences between municipalities in Spain, a significant deficit can be observed in the services accessibility of rural as opposed to urban municipalities. For example, on average, citizens of rural municipalities in Spain are around 20 km further away than their urban counterparts from the closest local service.[3] Significant differences are also documented between rural and urban municipalities in Spain in terms of their geographical and local public finance characteristics. On one hand, rural municipalities tend to be more geographically isolated, which usually entails greater difficulty and a higher cost in the provision of specific services. On the other, lower public debt and a lower tax burden is observed in rural as opposed to urban municipalities. Finally, given their significance in numerous areas, accessibility to digital services is analysed in greater detail in a box at the end of the paper.

In light of the above-mentioned descriptive evidence, the paper offers some public policy-related considerations that illustrate the possible constraints on local authorities to improve services accessibility for their citizens. In particular, the evidence available suggests that the uncertainty associated with high dependence on transfers from other tiers of government in respect of the revenues of small municipalities, as is the case with those in rural areas, may play a key role in rural citizens' access to local services. Compounding this are other factors, including the higher fixed cost per inhabitant that the provision of these services in smaller and, especially, geographically remote municipalities usually entails, and various regulatory aspects that the delegation of the provision of certain services to local governments involves. Overall, these factors might explain part of the differences in the access to local services of rural municipalities compared with their urban counterparts in Spain. However, there are other factors, such as the economic situation or population age structure, to which these differences might also be attributed (see Fassman et al. (2014)).

The rest of the paper is organised as follows. Following this introduction, the second section analyses services accessibility at the European level, with the aim of identifying differences in access by an average EU citizen to the same services on the basis of country of residence and bearing in mind how rural the region which the citizen inhabits is. The third section examines the differences in access to local services in Spain's rural and urban municipalities, along with other potential idiosyncrasies in terms of geography and fiscal matters. The fourth section uses a regression analysis to assess the role that geography and fiscal arrangements may play in explaining the difference in local services accessibility between both types of municipalities in Spain. The fifth section offers some considerations on which local fiscal aspects might be most significant in the provision of services. The final section draws the main conclusions.

3 Note that this difference of 20 km is calculated comparing distances from the average rural municipality with the average urban municipality, while the average distance of 12.4 km to the closest service in Spanish rural provinces mentioned in the previous paragraph refers to the average distance from all rural province municipalities. This latter figure, therefore, masks much of the heterogeneity at the municipal level within each province once it has been classified as rural or urban according to Eurostat. Unfortunately, we only have the services accessibility indicators at the municipal level for Spain, while for the other countries we have solely the aggregate information at the NUTS3 regional level, equivalent to the Spanish provinces.

2 Accessibility to services in the European Union regions

Services play an important role in a territory's economic and social development. In this connection, 33% of the EU budget goes to economic, social and territorial cohesion policies, with the aim of catalysing the convergence of the most disadvantaged – typically rural – regions. It is therefore essential to accurately diagnose the differences in accessibility to services between the various European and Spanish rural and urban areas.

Despite its unquestionable interest, the absence of comprehensive and comparable information about services accessibility indicators for a broad set of countries explains the lack of studies researching into whether there are differences in the provision of services within the EU.[4] Against this backdrop, Kompil et.al. (2019) construct a harmonised services accessibility indicator for each municipality in the various EU countries to assess whether there is inequality in European citizens' access to services. Specifically, Kompil et al. (2019) define accessibility as the distance in kilometres that an average citizen resident in a municipality (region or country) has to travel – by road – to access the nearest service.[5] In the case of local services, the indicator refers to primary or basic services, such as primary healthcare or a supermarket, which are used daily or regularly by citizens and are usually provided in the locality where they reside. Although access to local services is the main focus of interest in this study, Kompil et al. (2019) also construct an indicator of accessibility to what are known as "regional services", such as those offered by specialised healthcare centres, which are required occasionally and are located in large cities. Annex 1 describes in detail the methodology applied by Kompil et al. (2019) to construct the services accessibility indicators we have used in this study.

Accessibility to local services is more uniform among EU citizens than accessibility to regional services (see Chart 1). This result is in line with what might be expected, since the provision of regional services, which is costlier than that of local services, requires a greater critical mass of population. In the case of local services, the difference between the indicator's lowest and highest values (Malta and Finland, respectively) is 7.6 km, compared with 103.3 km in the case of the regional services accessibility indicator. The Benelux countries, Malta, the United Kingdom and Spain generally present more favourable indicators of access to regional services, while citizens in the Nordic and Baltic countries have to cover greater distances to access such services. At aggregate level, there is greater accessibility in Spain than in the EU countries on average to both local services (3.5 km in Spain versus 4 km in the EU) and regional services (27.2 km versus 30 km).

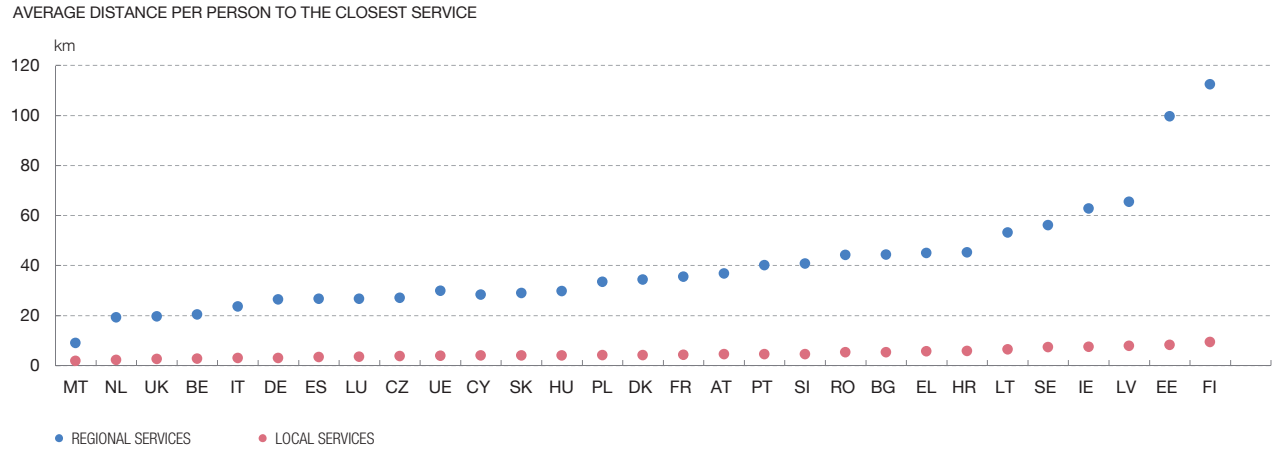
This heterogeneity in services accessibility between countries is also seen between the different EU regions. Chart 2 depicts the indicators of accessibility to local and regional

4 The various projects developed by the EU include the PROCECY project, which aims to identify those territories at provincial level (NUTS 3) where it is more complicated, in terms of the travel time required, to access basic services. Information on some of the indicators constructed within the framework of this project are available in the EPSON database (https://database.espon.eu/).

5 See Páez et al. (2012) and Gutiérrez and García-Palomares (2020) for a discussion about the measurement of accessibility, and Goerlich et al. (2021) for an alternative service access indicator in the Spanish case.

Chart 1

ACCESSIBILITY TO LOCAL AND REGIONAL SERVICES



SOURCES: Kompil et al. (2019) and own data.

services for EU regions at NUTS 3 level, which are equivalent to Spanish provinces. The indicator measures the average distance by road that a citizen in a given region must travel to access the nearest service.[6]

In line with that observed at country level, local services accessibility is distributed more uniformly than regional services accessibility, both between the different EU countries' regions and between regions within each country. In the case of local services, the average distance ranges from a minimum of 1 km in Paris to 45 km in the Jämtlands län Swedish region. The Spanish province with the best accessibility – excluding Ceuta and Melilla – is Madrid, with an average distance of 1.5 km, followed by Barcelona (1.6 km). At the tail of the distribution are the Teruel, Zamora and Cuenca provinces (20 km, 16.4 km and 15 km, respectively), all of which are predominantly rural. Their inhabitants must travel much longer distances than the EU average (4 km) to access a local service.

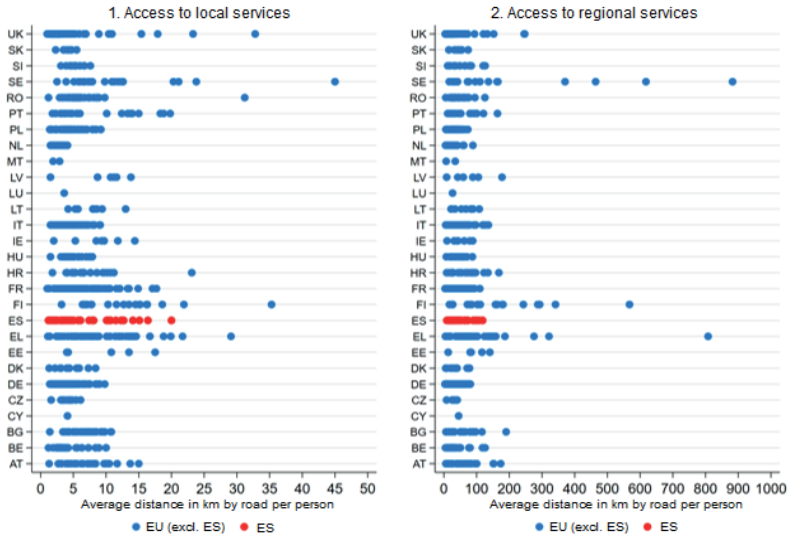
Cross-regional heterogeneity in the EU is considerably higher in the case of regional services accessibility. Three German regions and Paris rank first in terms of ease of access of their residents to regional services (around 3.5 km). In contrast, residents in certain regions in Finland and Sweden have to travel a distance nearly 200 times greater to access such services. In Spain, once again, the residents of predominantly rural provinces – such as Teruel, Cuenca, Cáceres, Soria and Lugo – have greater difficulty in accessing regional services (between 89.6 km and 118.4 km).

Previous evidence suggests that the degree of urbanisation affects individuals' accessibility to the provision of services. Indeed, Chart 3 shows accessibility to local

6 The distance to the nearest service is calculated at the 1 km^2 spatial grid level. Subsequent aggregations (at municipal, regional or country level) are made starting from this minimum level of disaggregation. See Annex 1 for further details.

Chart 2

ACCESSIBILITY TO LOCAL AND REGIONAL SERVICES, BY REGION



SOURCES: Kompil et al. (2019) and own data.

and regional services by the degree of urbanisation of regions (provinces in Spain) in EU countries.[7] On average, a person resident in a predominantly urban region would have a local service within an area of 2.1 km (7.1 km in the case of predominantly rural regions). The gap widens considerably in the case of access to regional services: 14.8 km in urban regions and 57.4 km in rural ones.

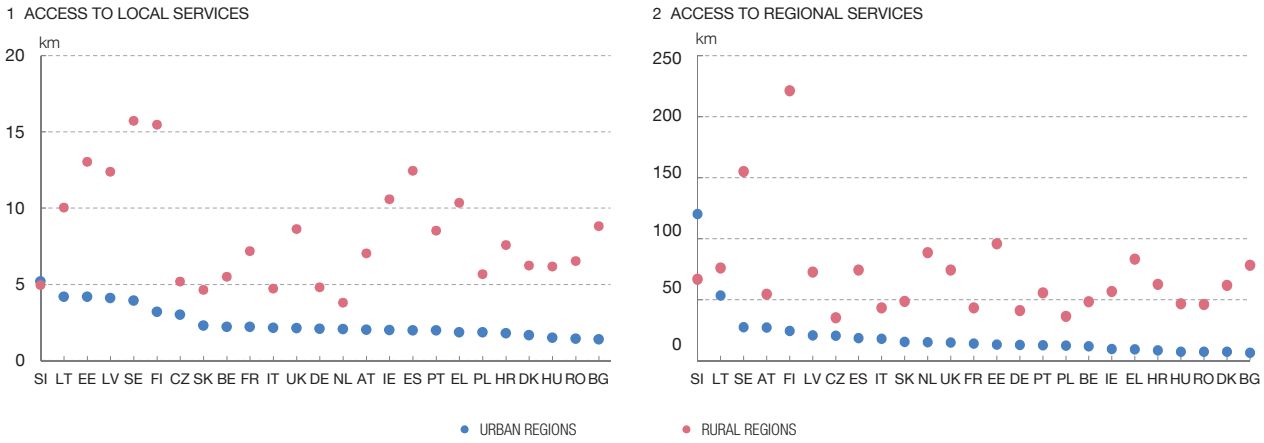
The relative position of Spanish rural and urban provinces from a European perspective is particularly interesting. Residents in Spanish urban provinces are about as far from local services as residents in the other urban regions of the EU (2 km, compared with 2.1 km on average in the EU). However, this indicator worsens considerably in the case of rural provinces (12.4 km, compared with 7.1 km in the EU). There are hardly any differences in accessibility to regional services between Spain's rural provinces and those of the rest of the EU.

The percentage of inhabitants who have access to a service within a specific radius of kilometres confirms that access to services in each country is uneven (see Chart 4). For

7 Eurostat classifies the EU NUTS level 3 regions (Spanish provinces) into predominantly urban (where at least 80% of the population lives in urban clusters), intermediate urbanisation (where more than 50% but less than 80% of the population lives in urban clusters) and predominantly rural (where at least 50% of the population lives in rural or low-density areas). Certain adjustments are applied to this classification. For instance, if a region is initially classified as predominantly rural (intermediate) but has a city with more than 200,000 (500,000) inhabitants where at least 25% of the region's total population lives, it will be reclassified as intermediate urbanisation (predominantly urban). Chart 3 only considers urban and rural regions, excluding intermediate ones. For a more detailed description of this taxonomy, see https://ec.europa.eu/eurostat/web/rural-development/methodology.

Chart 3

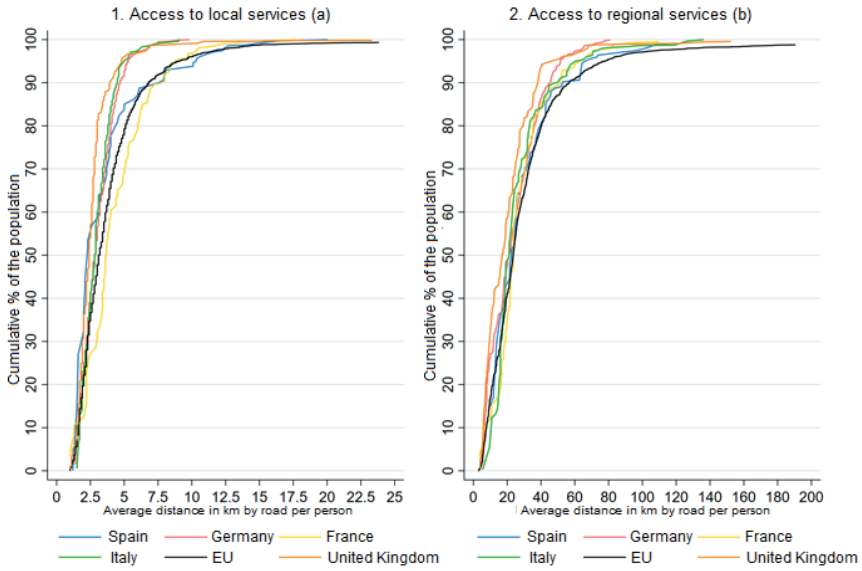
ACCESSIBILITY TO LOCAL AND REGIONAL SERVICES, BY DEGREE OF URBANISATION



SOURCES: Kompil et al. (2019) and own data.

Chart 4

CUMULATIVE DISTRIBUTION OF ACCESSIBILITY TO LOCAL AND REGIONAL SERVICES, BY PERCENTAGE OF POPULATION



SOURCES: Kompil et al. (2019) and own data.

a In the United Kingdom (EU), 100% of the population is not reached until a distance of 33 km (45 km) has been covered.
b In the United Kingdom (EU), 100% of the population is not reached until a distance of 247 km (nearly 900 km) is covered.

example, 50% of the Spanish population is less than 2.2 km away from a local service (3.2 km in the case of the EU as a whole) and less than 22.2 km from regional services (23.6 km in the EU). This 50% of the population lives in approximately 10% of the total 8,116

Spanish municipalities, according to the 2011 Census.[8] The distance to a local and regional service rises to 4 km and 36 km, respectively, for 75% of the population (4.7 km and 36 km, in each case, in the EU) and to 7 km and 53 km, respectively (6.9 km and 56.8 km in the EU), for 90%.

In summary, analysis of the Kompil et al. (2019) indicators evidences that heterogeneity across countries and regions in the EU is high in accessibility to services. Specifically, it is more difficult for rural regions to access the provision of both local and regional services than it is for predominantly urban regions. As regards Spain's relative position from a European perspective, although Spain compares favourably with other European countries on average, Spanish rural provinces generally have significantly worse access to local services than other European countries' rural regions (a deficit not observed in Spanish urban areas). Thus, the rural-urban difference in local services accessibility in Spain is more pronounced than in the other European countries.

8 The number of municipalities in Spain in 2011, the reference year for calculating the services accessibility indicators compiled by Kompil et al. (2019).

3 The rural-urban divide at the municipal level in Spain

This section provides a more granular analysis at the municipal level of the differences in access to services in rural and urban areas in Spain. It also conducts an initial analysis of the characteristics that could explain these disparities. Specifically, the differences between rural and urban municipalities are explored in two important respects: geographical aspects, and fiscal and budgetary organisation. The former play a relevant role in the cost of providing the service and the latter in financing it. The definition of rurality that was used in the previous section, i.e. the official Eurostat definition, which defines a rural municipality as any municipality with a population of less than 5,000 and/or a population density below 300 inhabitants per square kilometre, is also used here.[9]

3.1 Differences in access to services

The differences in access to local and regional services between urban and rural regions across EU countries have been pointed out in the previous section. Here we will analyse the differences in access to local services across Spanish municipalities. We are focusing on local services because it was there that a significant difference between Spain and the EU was identified in terms of the accessibility gap between rural and urban areas. The municipal analysis is conducted only for Spain,[10] as no information is available with this degree of disaggregation for the other European countries.

Chart 5.1 shows a map with all rural municipalities in red and all urban municipalities in blue.[11] Chart 5.2 shows the distance that the average citizen in each municipality has to travel to access the nearest local service. As can be seen, there is a certain overlap between the rural areas in the left-hand map and the areas characterised by a greater distance to services in the right-hand map.

Table 1 shows the differences in access to local services according to the degree of urbanisation of municipalities. In the average rural municipality, inhabitants have to travel almost 23 km to access local services such as a library, a nursery school or a supermarket.[12] In the case of urban municipalities, this distance decreases to 2 km, meaning that the difference in accessibility between rural and urban municipalities is just over 20 km.

9 Eurostat classifies territorial units at the LAU2 level (i.e. municipalities) into three groups according to their degree of urbanisation (DEGURBA): cities (densely populated urban areas); towns and suburbs (intermediate density areas); and rural areas (thinly populated areas). In this paper, municipalities falling into the third category (thinly populated areas) are considered rural and those included in the first two categories are considered urban. See https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-18-008.

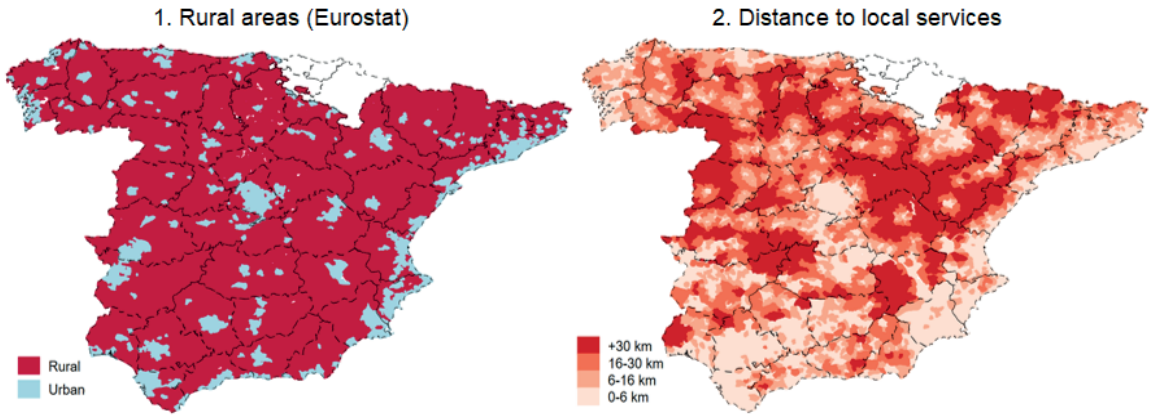
10 At the domestic level, Goerlich et al. (2021) provide an alternative indicator for accessibility to services, such as primary healthcare centres or non-university educational establishments, based on travel times to the nearest facility.

11 Our analysis excludes the regions of Navarre and the Basque Country to enable comparison between regions with the same tax regime.

12 The increase in the average distance when the calculation is made using municipal-level data compared with that obtained using regional-level data illustrates the high degree of heterogeneity within each region.

Chart 5

DISTRIBUTION OF RURAL MUNICIPALITIES AND DISTANCE TO LOCAL SERVICES



SOURCES: Gutiérrez et al. (2020b) and own data.

It should also be noted that this difference is considerably heterogeneous at the regional level. Thus, in regions such as the Balearic Islands or Murcia the difference between urban and rural municipalities is smaller (around 3 km). However, it is approximately ten times greater in the case of regions such as Castile-La Mancha or Aragon.

3.2 Differences in geographical factors

Access to local services may be influenced by geographical characteristics, such as a difficult-to-access location, the distance to other larger municipalities or proximity to the coast. Thus, the provision of certain local services may be costlier in municipalities located, for instance, in mountainous and inaccessible areas which are far from urban centres.

To measure these geographical factors, we use the altitude of each municipality (measured in metres above sea level), the distance to the provincial capital and the distance to the coast (both measured in kilometres) (see Gutiérrez et al. (2020b) for further details on the construction of these indicators at the municipal level). Table 2 presents the differences in the average values of these variables for rural and urban municipalities.

First, rural municipalities are located, on average, at an altitude more than 400 m higher than urban municipalities. Second, urban municipalities tend to be almost 20 km closer to the provincial capital than rural municipalities. Furthermore, there is a significant difference in the location of both types of municipalities: the average rural municipality is 140 km from the coast, almost 60 km further than the average urban municipality.

In addition, these differences in average terms can also be extended to rural and urban municipalities as a whole. Chart 6 shows that rural municipalities are predominantly located at higher altitudes and significantly further from the provincial capital and the coast.

Table 1

DIFFERENCES IN THE DISTANCE TO LOCAL SERVICES (2011)

	(1) Rural	(2) Urban	(3) Difference
National total	22.69	2.16	-20.53***
Andalusia	12.71	1.96	-10.75***
Aragon	29.94	1.64	-28.30***
Asturias	17.09	2.16	-14.93***
Balearic Islands	5.78	2.41	-3.37**
Canary Islands	16.64	2.37	-14.27***
Cantabria	19.5	2.91	-16.60***
Catalonia	12.85	2.12	-10.73***
Castile-La Mancha	34.33	1.69	-32.64***
Castile-Leon	26.57	1.98	-24.59***
Extremadura	21.51	1.56	-19.95***
Galicia	14.68	2.42	-12.27***
Madrid	11.41	2.02	-9.38***
Murcia	4.81	1.97	-2.84**
Rioja	16.57	1.53	-15.05***
Valencia	14.91	2.09	-12.82***
Total number of observations	6,743	767	

SOURCES: Gutiérrez et al. (2020b) and own data.
NOTE: Columns (1) and (2) refer to the average values of the distance to local services for all the municipalities classified as rural or urban, respectively. Column (3) is the difference between columns (2) and (1). *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 2

DIFFERENCES IN GEOGRAPHICAL ASPECTS

	(1) Rural	(2) Urban	(3) Difference
Altitude (m)	733.63	310.19	-423.43***
Distance to capital (km)	47.08	29.65	-17.43***
Distance to the coast (km)	140.47	57.93	-82.54***
Total number of observations	6,743	767	

SOURCES: Gutiérrez et al. (2020b) and own data.
NOTE: Columns (1) and (2) refer to the average values of the variables for all the municipalities classified as rural or urban, respectively. Column (3) is the difference between columns (2) and (1). *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

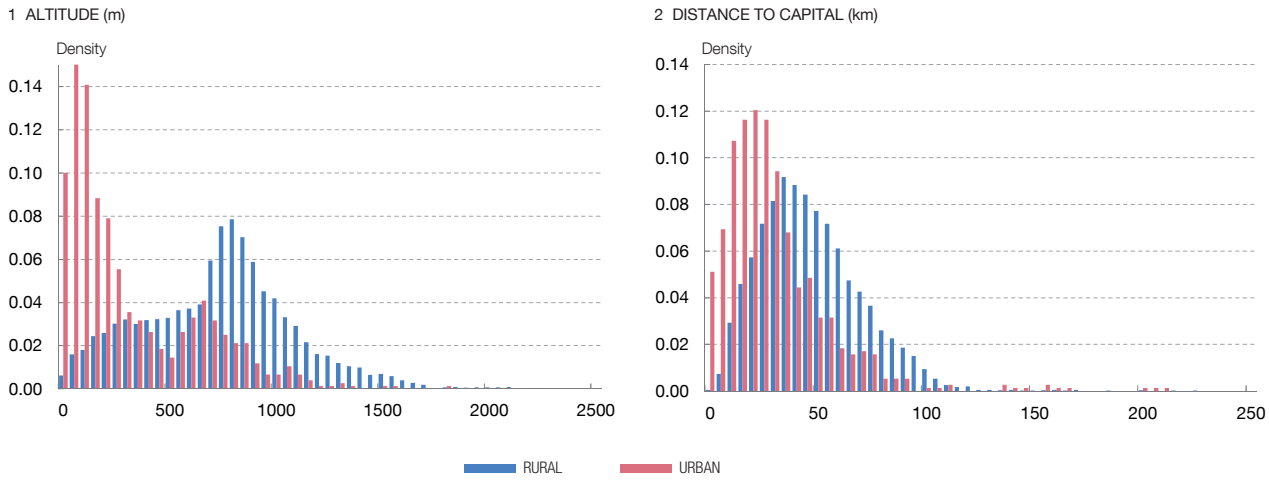
3.3 Differences in taxation and the budgets of rural and urban municipalities

This section highlights the differences in taxation and budgetary performance between rural and urban municipalities in Spain.[13] In particular, we analysed each municipality's tax

13 The local government sector encompasses over 8,000 municipalities and 52 provincial governments, together with any public units controlled by them. Owing to differences in their remit, we have excluded from this analysis provincial governments (including ordinary-regime provincial governments, the specific status provincial governments of Álava, Gipuzkoa, Bizcaya and Navarre and island authorities) and municipalities in the Basque Country and Navarre.

Chart 6

DISTRIBUTION OF ALTITUDE AND DISTANCE TO CAPITAL, BY TYPE OF MUNICIPALITY



SOURCES: Gutiérrez et al. (2020b) and own data.

burden, as measured by the use of locally-legislated taxes, bearing in mind their propensity to indebtedness and the level of compliance with budget rules at the municipal level.[14] These municipal differences in fiscal matters, in addition to the geographical factors discussed above, could also be affecting the existing gap in accessibility to local services between rural and urban municipalities. Specifically, as explained in Section 5, municipalities with greater revenue-raising capacity could have more leeway to provide certain local services.

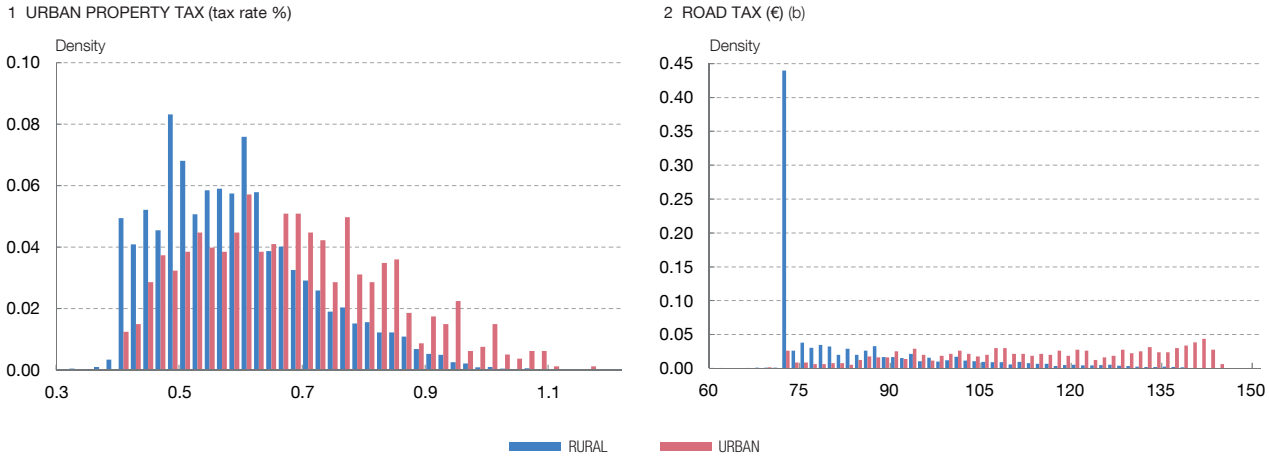
First, we analysed the possible differences in the use of locally-regulated taxes. These include property tax, tax on business activity, road tax, tax on constructions, installations and works, and tax on increase in urban land value. Table 3 shows the average values of these taxes in the period 2003-2018 for all rural and urban municipalities. Column (3) shows the differences between the two types of municipalities. Thus, for instance, the property tax tax rate for urban properties is almost 0.1 pp higher, on average, in urban municipalities than in rural ones (although this gap has narrowed in recent years).

This is also evidenced in Chart 7.1, which shows the distribution of the average property tax rates over the period 2003-2018 for rural and urban municipalities. Although tax rates are highly heterogeneous across both groups, there is a higher concentration of urban municipalities in the higher levels of this tax. These differences can also be extrapolated to other taxes. Thus, road tax on a car with between 12 and 16 fiscal horsepower is, on average, €30 higher in an urban municipality than in a rural municipality. This difference is especially visible in Chart 7.2, which shows that road tax amounts are concentrated at the

14 See Alloza and Burriel (2019) for an analysis of recent local government budget dynamics and a detailed description of the data used in this section.

Chart 7

TAX RATE DISTRIBUTION FOR URBAN PROPERTY TAX AND ROAD TAX (a)



SOURCES: Ministerio de Hacienda and own data.

a Average for the period 2003-2018.
b The right-hand panel shows the total road tax in euro for a vehicle of between 12 and 15.99 fiscal horsepower.

lower end of the distribution (at around €80) for rural municipalities, as opposed to urban municipalities, for which road tax is more concentrated at amounts above €100.[15]

Second, we analysed the performance of municipalities in terms of financial liability accumulation, budget balances and compliance with the expenditure rule.[16] Table 4 shows the results of this analysis. Notably, rural municipalities present a lower level of debt. This is true both when it is analysed in per capita terms and as a share of its current revenue. Both variables show that the level of indebtedness of urban municipalities is more than twice that of rural municipalities. Thus, for instance, the average debt stock of urban municipalities between 2008 and 2018 amounted to almost half of current revenue, whereas for rural municipalities, this figure stood at 21%.[17] Chart 8 depicts the distribution of this debt/current revenue ratio for the two types of municipalities. As can be seen, the values of this ratio for rural municipalities tend to be concentrated at around 0, in contrast to urban municipalities. Moreover, rural municipalities are also more prone than urban municipalities to having a non-

15 These differences are also observed when possible tax base reductions and tax relief on the total amount of the taxes considered are taken into account.

16 The current budget rule framework, implemented by Organic Law 2/2012 of Budgetary Stability and Financial Sustainability of 27 April 2012 (LOEPSF by its Spanish abbreviation) sets restrictions on the conduct of general government, overall and by subsector, in three areas: deficit, expenditure and debt. As regards local governments, the deficit rule requires them to maintain a balanced budget, the expenditure rule establishes that the change in eligible expenditure cannot exceed the medium-term Spanish benchmark GDP growth rate and the debt rule limits total local government indebtedness to a maximum of 3% of national GDP (or, individually, to 110% of their current revenue). In the case of the expenditure rule, eligible expenditure is defined as the non-financial expenditure, excluding interest expenses, the non-discretional part of unemployment benefits, funds for specific purposes from the EU or other tiers of general government and transfers to the regional and local governments linked to the Spanish financing system.

17 To analyse debt and expenditure compliance, shorter periods are used (2008-2018 and 2016-2017, respectively) owing to these data being available.

Table 3
DIFFERENCES IN LOCAL TAXES (2003-2018 AVERAGE)

	(1) Rural	(2) Urban	(3) Difference
Urban property tax (tax rate)	0.58	0.67	0.09***
Rural property tax (tax rate)	0.6	0.65	0.05***
Tax on business activity (max. situation coefficient)	1.15	1.97	0.82***
Tax on business activity (min. situation coefficient)	1.04	1.43	0.39***
Road tax on cars (8 fiscal horsepower) (€)	14.6	19.8	5.16***
Road tax on cars (8-11.99 fiscal horsepower) (€)	39.4	53.6	14.2***
Road tax on cars (12-15.99 fiscal horsepower) (€)	82.9	113	30.4***
Road tax on cars (16-19.99 fiscal horsepower) (€)	104	143	39.4***
Road tax on cars (>20 fiscal horsepower) (€)	129	179	50.2***
Road tax on tractors (<16 fiscal horsepower) (€)	20.1	27.6	7.55***
Road tax on tractors (16-25 fiscal horsepower) (€)	31.5	43.4	11.9***
Road tax on tractors (>25 fiscal horsepower) (€)	94.3	130	35.8***
Tax on increase in urban land value (rate up to 5 years)	8.7	25.4	16.7***
Tax on increase in urban land value (rate up to 10 years)	8.59	25.2	16.6***
Tax on increase in urban land value (rate up to 15 years)	8.48	25	16.5***
Tax on increase in urban land value (rate up to 20 years)	8.4	24.8	16.4***
Tax on constructions, installations and works (tax rate)	2.08	3.24	1.17***
Total number of observations	6,800	805	

SOURCES: Ministerio de Hacienda and own data.
NOTE: Columns (1) and (2) refer to the average values for the period 2003-2018 for all the municipalities classified as rural or urban, respectively. Column (3) is the difference between columns (2) and (1). *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

financial balance that is in equilibrium or positive and to complying to a greater extent with the expenditure rule (which limits changes in local governments' non-financial expenditure). This evidence suggests that rural municipalities, on average, tend to post lower budget and financial imbalances. It should be highlighted that, overall, the budget rule framework applicable to local governments has influenced their financial performance, contributing to the sector's budget surplus from 2012 onwards and to their financial deleveraging process.[18]

Lastly, Annex 2 analyses the differences in the budget structure of urban and rural municipalities. The evidence shows that rural municipalities have a different budget structure than urban municipalities: the former have higher revenues and non-financial expenditure per person, while urban municipalities allocate a higher share of their budget to the provision of public services (for example, educational, health, cultural and sports facilities and services).

In short, the analysis included in this section highlights the differences in financial and budgetary performance between rural and urban municipalities. On average, the former

18 Among other legal restrictions, Article 32 of the LOEPSF (along with the sixth provision) determines how the surplus can be used. In particular, the LOEPSF stipulates that the surplus is to be used for reducing net debt (provided that the municipality has a positive cash surplus for general and administrative expenses). For further details, see Alloza and Burriel (2019).

Table 4

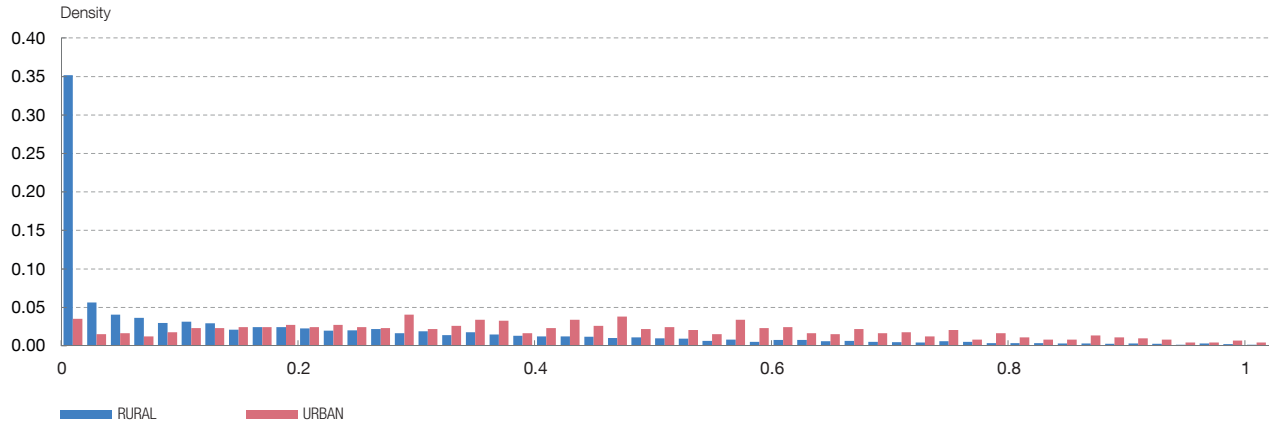
DIFFERENCES IN FINANCIAL AND BUDGETARY PERFORMANCE

	(1) Rural	(2) Urban	(3) Difference
Public debt (€ per person)	199	431	232***
Public debt/current receipts	0.21	0.48	0.27***
Change in debt 2008-2018 (%)	15.9	45.7	29.8
% of municipalities not complying with the expenditure rule	18.4	21.9	0.04***
% of muncipalities with non-financial balance <0	12.1	20.5	0.08***
Total number of observations	6,745	804	

SOURCES: Ministerio de Hacienda and own data.
NOTE: Columns (1) and (2) refer to the average values (in euro per capita) of the variables for all the municipalities classified as rural or urban, respectively. Column (3) is the difference between columns (2) and (1). The period under review is 2008-2018 (except for the percentage of municipalities not complying with the expenditure rule, which refer to the period 2016-2017, and the percentage of municipalities with a negative non-financial balance, which refer to the period 2003-2018). *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Chart 8

DISTRIBUTION OF THE DEBT/CURRENT REVENUE RATIO (a)



SOURCES: Ministerio de Hacienda and own data.

a Average for the period 2008-2018.

have a smaller tax burden and a lower propensity to accumulate liabilities. Given that local authorities are responsible for the provision of certain local public services, this evidence suggests that differences in the fiscal and budgetary organisation of these bodies could be directly related to accessibility to services. This issue is discussed in the following section.

4 The deficit in services accessibility in Spain's rural municipalities and the role of the geographical and fiscal situation

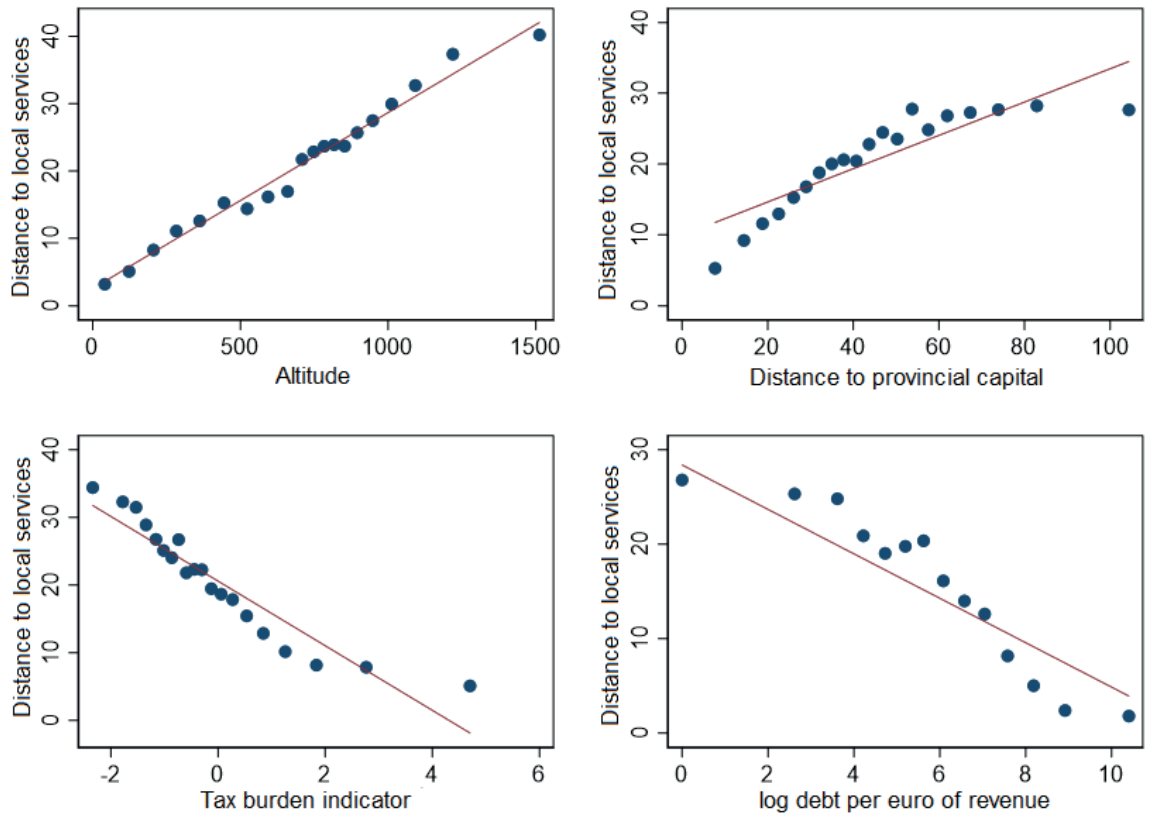
As set out in the second section, the average distance to local services in Spain is in line with that observed in other European countries for the case of urban areas. However, this distance is significantly greater in Spain than in our EU peers for rural areas. Specifically, the distance separating average inhabitants of Spanish rural areas from local services is similar to those in countries such as Finland, Sweden and Greece, where geo-climatic conditions might account for the difficulty of providing services in certain rural areas (e.g. the Greek islands or the Scandinavian taiga). In the third section we have further noted that rural municipalities in Spain show significant differences from urban municipalities, not only in terms of geography, but also fiscal arrangements, both of which factors may be considered fundamental in the provision of local services. In this respect, Chart 9 shows the simple correlations between the local services accessibility indicator and certain geographical (altitude and distance from the capital) and fiscal (tax burden and debt) variables at the municipal level. As can be seen, there is a strong association between these variables: remote municipalities, with a lower tax burden and less debt, are further away from local services. In this section we explore whether this apparent relationship holds in a more systematic econometric analysis, in which other possible conditioning factors are taken into account.

As Chart 5 suggested, Table 5 shows that the average distance from local services is significantly greater in rural than in urban municipalities. Specifically, we consider a regression of the distance from local services in each municipality based on a dummy variable that takes the value 1 if the municipality is rural and 0 if it is urban. The coefficient associated with this dummy thus reflects the difference in the distance from local services between urban and rural municipalities. Column (1) of Table 5 indicates that rural municipalities are, on average, around 20.5 km further away from local services than urban municipalities (a gap that matches the difference in averages in Table 1). Yet as Section 3.1 has shown, rural municipalities are generally characterised by their location in more remote areas of the territory, with worse accessibility. This would, at least partly, justify the greater difficulty of providing services in these areas. Accordingly, orographic indicators are included in the original regression of column (1) to take into account how the differences in the geographical location of municipalities can be associated with disparities in the provision of services. Indeed, column (2) of Table 5 shows that greater altitude and a greater distance from the provincial capital are associated with less accessibility to local services. Hence, once these geographical differences are controlled for, the rural status of a municipality, per se, would only involve a distance of 8.5 km more (than in urban municipalities) to access the local services, instead of the 20.5 km identified in column (1).[19] That is to say, the fact that rural municipalities are located in more remote areas of Spanish territory would account for part of their worse access to

19 The inclusion of geographical controls means that the rurality coefficient estimated in column (2) captures the rural-urban difference in distance from services for rural and urban municipalities with the same orographic characteristics. For example, by including altitude above sea level as a control variable, the estimated coefficient for the rurality dummy is based on comparing rural and urban municipalities with the same altitude above sea level.

Chart 9

CORRELATIONS BETWEEN SERVICES ACCESS AND GEOGRAPHICAL AND FISCAL VARIABLES (a)



SOURCE: Own data.

a The chart shows the correlation at municipal level between distance to local services and possible explanatory factors. To make viewing easier, each point represents a data grouping. The red lines depict an estimation of the linear relationship between the two variables shown in the axes.

services. However, there would still be a significant difference of 8.5 km that cannot be attributed to these orographic factors.[20]

Differences in municipal fiscal arrangements might also account for some of the rural-urban gap in access to services. In this respect, Section 3.2 shows that rural municipalities in Spain have a lower tax burden in terms of different taxes (inter alia, road tax, property tax, tax on business activity and tax on constructions, installations and works) and a lower level of debt per euro of current revenue. Thus, we include in the regression analysis in Table 5 both a tax burden indicator[21] and a measure of municipal debt. Column (3) shows the results

20 These results are in line with those found by Goerlich et al. (2021). According to their work, small municipalities, normally in poorly connected mountain areas characterised by an older population, are those that evidence worse accessibility to basic healthcare, education and financial services.

21 This tax burden indicator is obtained through a principal components analysis in which the first principal component (factor) explains the change in the selective municipal tax rates explored in Section 3.2. In particular, this factor explains approximately 50% of this change.

Table 5

DETERMINANTS OF ACCESS TO LOCAL SERVICES

Variables	(1)	(2)	(3)	(4)
Rurality dummy	20.53***	8.53***	2.34	1.48
	(2.74)	(2.2)	(1.84)	(1.36)
Altitude		0.021***	0.01***	0.02***
		(0.00)	(0.00)	(0.00)
Distance from capital		0.14***	0.14***	0.13***
		(0.04)	(0.04)	(0.03)
Distance from the coast		0.01	0	-0.04**
		(0.01)	(0.01)	(0.01)
Tax burden			-0.98***	-0.84***
			(0.2)	(0.22)
(log) Debt/CR			-1.09***	-0.91***
			(0.23)	(0.23)
Observations	7,490	7,486	6,260	6,260
R^2	0.12	0.37	0.41	0.77
Region fixed effects	No	No	No	Yes
Controls	No	Yes	Yes	Yes

SOURCE: Own data.
NOTE: *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Standard errors in brackets clustered at regional level. The Debt/CR variable refers to each municipality's stock of debt/current revenue ratio.

of this exercise, which suggest that those municipalities with a lower tax burden and a lower level of debt per euro of revenue are characterised by a greater average distance from the closest local service. Therefore, once we control for these fiscal aspects, the rural-urban difference in average distance from local services falls markedly to 2.3 km, and it is no longer statistically significant.[22]

In any event, the explanatory power (measured by R^2) of the econometric model set out in column (3), which includes geographical and fiscal factors, stands at around 41%. This suggests that there is still a high percentage of variability between municipalities in access to local services which neither rurality nor the geographical/fiscal factors envisaged can explain. In this respect, column (4) adds region fixed effects to the foregoing model. These enable cross-regional systematic differences in the provision of services – which might derive from the regions' heterogeneity in the exercise of their competencies in healthcare and education, for instance[23] – to be taken into account. By including these fixed effects, the model's R^2 increases to almost 80%, suggesting that these systematic

22 Note that this reduction in the rural-urban difference is likewise observed if we restrict the sample of column (2) and make it the same as column (3), given that some observations in column (3) are lost owing to the non-availability of fiscal information for some municipalities.

23 The 1978 Spanish constitution set in place a decentralised State model that distributes the exercise of education and healthcare competencies among all tiers of government. For example, in the case of education, central government is entrusted with the broad regulation of the education system, while regional government responsibilities cover the executive-administrative competencies for managing the education system in their own territory.

Table 6

DETERMINANTS OF ACCESS TO SERVICES. ALTERNATIVE INDICATOR

Variables	(1)	(2)	(3)	(4)
Rurality dummy	11.35***	5.22***	1.33	1.22
	(1.65)	(1.2)	(0.92)	(0.74)
Altitude		0.01***	0.01***	0.01***
		(0.00)	(0.00)	(0.00)
Distance from capital		0.07**	0.07**	0.07**
		(0.03)	(0.03)	(0.02)
Distance from the coast		0.01	0.01	-0.02***
		(0.01)	(0.01)	(0.01)
Tax burden			-0.75***	-0.47***
			(0.18)	(0.11)
(log) Debt/CR			-0.61***	-0.48***
			(0.1)	(0.11)
Observations	7,508	7,500	6,272	6,272
R^2	0.16	0.43	0.51	0.87
Region fixed effects	No	No	No	Yes
Controls	No	Yes	Yes	Yes

SOURCE: Own data.
NOTE: *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. The dependent variable refers to an alternative services access indicator to that considered in the rest of the paper. Specifically, this indicator has been constructed using precise data on the location in Spain of hospitals, nurseries, automated teller machines and petrol stations. Standard errors in brackets clustered at regional level. The variable Debt/CR refers to each municipality's stock of debt/current revenue ratio.

differences between regions account for much of the heterogeneity between municipalities in services accessibility. Indeed, on comparing municipalities in a single region, the rural-urban difference in accessibility to local services diminishes to 1.5 km, which is statistically non-significant. The contributions to the R^2 of each of the explanatory variables included in column (4) indicate that it is the geographical characteristics of municipalities that explain a greater proportion of the variability in services accessibility (42%), followed by region fixed effects (25%), fiscal arrangements (24%) and rurality (9%).[24]

Finally, to corroborate the robustness of the foregoing results, an alternative indicator of services accessibility has been used. This indicator has been constructed using precise data on the location in Spain of hospitals, nurseries, automated teller machines and petrol stations.[25] In Table 6, the dependent variable proxies the minimum distance that average citizens have to cover from their municipality of residence to gain access to the four basic services mentioned. According to this indicator, average citizens from rural areas would have to travel 11.3 km further than average citizens from urban areas to have access

24 Contributions calculated using the methodology of Huettner and Sunder (2012).

25 The annex describes in greater detail how this indicator has been constructed. The authors thank Kiko Llaneras for sharing the data (see https://elpais.com/politica/2019/10/25/actualidad/1572027354_718725.html).

to these services (column (1)). As in the case of the local services accessibility indicator used in this paper, much of this difference is on account of orographic factors. In particular, when these factors are controlled for in the regression, the rural-urban gap – as regards access to the four services this alternative indicator includes – diminishes to 5.2 km (column (2)). The inclusion of fiscal and fixed-effects variables at the regional level reduces this difference even further, to scarcely 1.2 km, which is not statistically significant (column (4)).

The services accessibility indicators analysed in this section draw together, in a single indicator, accessibility to a varied set of presence-based services. This study is complemented by an itemised analysis of online services. Technological progress has allowed some of the traditionally presence-based services to now be provided remotely via internet. In this connection, a box is included that analyses access to online services in Spain in detail, on the basis of the rural-urban typology of the municipality.

5 Some significant additional dimensions to the provision of services in rural areas

The results of the previous section suggest that the heterogeneity of municipal public finances might explain many of the differences observed in access to local services in rural municipalities. This section sets out some useful theoretical arguments for interpreting these results, and for illustrating other possible dimensions that affect how the different tiers of government offer their services.

One possible aspect that would restrict the provision of local services in rural municipalities is their lesser financial capacity. As Table 3 illustrates, rural municipalities evidence a lower tax burden insofar as they set lower tax rates on those taxes over which they have powers. This, along with a lower tax revenue base (owing to the lower value of property and other taxable events in rural municipalities), diminishes the tax take in these municipalities, resulting in less financial autonomy and, therefore, a greater dependence on transfers from other levels of government. In this respect, numerous studies link lower financial autonomy, understood as a high dependence on financing unrelated to all budgetary policy decisions, to a lower amount of and lower quality in the provision of local public services (see, for example, Oates (1972), Musgrave and Musgrave (1973), and Blöchliger and King (2006)). It should further be noted that the system of transfers to local government authorities, known as the "share in State revenue", tends to induce some uncertainty and volatility in the transfers received (Cordero-Ferrera et al. (2013)).[26]

Another constraint on the provision of services by small municipalities is the presence of economies of scale in the provision of public services (Bel (2011)). Hence, rural and low-population-density municipalities would face higher costs in providing public services, compared with other municipalities (Solé-Ollé and Bosch (2005); Hortas-Rico and Solé-Ollé (2010)). Compounding this difficulty is the high fixed cost in relative terms that the functioning of local government for a small-sized municipality entails (see Annex 2). In this connection, associations of municipalities can play a key role in alleviating the difficulties rural municipalities face in the provision of services. The founding of such associations formalises a legal association between several municipalities to offer services and execute works jointly, promoting the harnessing of potential synergies and economies of scale.

Finally, there are regulatory factors that might constrain the provision of certain public services. Thus, although local government competencies are regulated by law 7/1985 of 2 April 1985, in practice there is a lack of clarity about the distribution of some of these

26 Transfers to municipalities with fewer than 75,000 inhabitants, that are not provincial or regional capitals, are determined on the basis of the "variables model", which will weight the size of the population, the tax burden and the tax-raising capacity of each municipality. In the case of the calculation of the tax burden, for example, this variable is determined on the basis of aspects that might be affected by changes in the tax rates that the municipality imposes, thereby altering the transfer received. See Suárez Pandiello and Fernández Llera (2008).

competencies across the tiers of government involved.[27] The fact that local government is advantageously positioned to provide local services has led some municipalities to assume competencies initially envisaged for other government levels, incurring so-called "replacement spending attributable to competencies not their own" (derived from the provision of services assumed by local governments that the regulations attribute to other levels of government). This might be a significant factor for small-size – such as rural – municipalities, given that their lesser financial autonomy and higher costs in providing services hamper taking on expenses that are not their own and the provision of local services that lie outside their remit. Compounding these factors would be greater difficulty in access to external financing compared with larger municipalities, which will give rise to less incurrence of debt and a greater containment of expenditure (in line with the results in Table 4).

In short, the evidence available suggests that the limited leeway for the financial autonomy of smaller-sized municipalities, such as rural ones, the higher fixed costs they have to bear in the provision of such services and regulatory constraints might account for some of the difficulties rural municipalities face in offering specific local services.

27 See Muñoz-Merino and Suárez Pandiello (2018). The lack of definition characterising competencies (e.g. in the case of spending on culture, sports and festivities) led to the approval of Law 27/2013 of 27 December 2013 on Local Government rationalisation and sustainability, aimed at avoid overlapping between different levels of government. However, its effective application has been restricted by the approval of differing regional regulations and the filing of appeals claiming the legislation is unconstitutional.

6 Conclusions

Ease of access to services by the citizens of a country or region may be considered an indicator of their degree of economic and social development. In this connection, there are significant inequalities in accessibility to certain services, not only between countries with a highly uneven degree of development, but also between relatively homogeneous economic areas, such as between citizens in EU countries or between residents in a country's different municipalities.

A services accessibility indicator prepared by Kompil et al. (2019) for EU countries is used in this paper. This indicator proxies accessibility as the minimum distance to the closest of two types of services: local (usually provided at municipal level) and regional (provided in the main regional cities). According to this indicator, there is much heterogeneity in services accessibility between citizens resident in different EU countries and regions. In particular, it is more difficult for residents in rural areas than for residents in urban areas to access services. This worse accessibility of rural regions is particularly high in Spain, especially regarding access to local services. In light of this, the paper analyses the factors that could explain the differences in accessibility to local services between Spanish rural and urban municipalities.

Based on the available evidence, the greatest difficulties residents face in accessing local services in rural municipalities in Spain are on account, at least in part, of orographic and taxation factors. In particular, the rural-urban difference in services accessibility narrows when these characteristics of municipalities, which are key in determining the cost of providing local services and as regards their funding, are taken into account. However, the relative significance of these factors differs by type of service. Specifically, the rural-urban gap in access to digital services is highly significant even when having regard to the differences in factors such as geography and municipal taxes.

References

Alloza, M. and P. Burriel (2019). *La mejora de la situación de las finanzas públicas de las corporaciones locales en la última década,* Occasional Papers, No 1915, Banco de España.

Alloza, M. and C. Sanz (2021). "Jobs Multipliers: Evidence from a Large Fiscal Stimulus in Spain", *Scandinavian Journal of Economics,* 123, pp. 751-779.

Banco de España (2021). "The spatial distribution of population in Spain and its economic consequences", Chapter 4, *Annual Report 2020.*

Bel, G. (2011). "Servicios locales: tamaño, escala y gobernanza", *Informe IEB sobre Federalismo Fiscal,* ed. IEB, Barcelona, pp.12-20.

Blöchliger, H. and D. King (2006). *Fiscal Autonomy of Sub-Central Governments,* OECD Working Papers on Fiscal Federalism, No. 2, OECD Publishing, Paris.

Christaller, W. (1933). "Die zentralen Orte in Süddeutschland", Gustav Fischer, Jena.

Cordero-Ferrera, J.M., F. Pedraja-Chaparro, J. Suárez Pandiello, and A. Utrilla de la Hoz (2013). "El índice de evolución de los ingresos tributarios del Estado y sus efectos sobre la PIE municipal", *Hacienda Pública Española / Review of Public Economics,* 206. pp. 137-161.

Duranton, G. and D. Puga (2020). "The Economics of Urban Density", *Journal of Economic Perspectives,* 34(3), pp. 3-26.

European Commission (2003). "Green Paper on Services of General Interest", COM (2003) 270 final, Brussels.

European Commission (2007). "Services of general interest, including social services of general interest: a new European commitment", COM (2007) 725 final, Brussels.

European Commission (2011). "A Quality Framework for Services of General Interest in Europe", COM (2011) 900 final, Brussels.

Fassman et al. (2014). "Determinants and Drivers of the Provision of Services of General Interest", 10th Congress of Regional Science Association International, pp. 26-30

Goerlich,F., J. Maudos, and S. Mollá (2021). *Distribución de la población y acceso a los servicios públicos,* Fundación Ramón Areces e Instituto Valenciano de Investigaciones Económicas.

Gutiérrez, E., E. Moral-Benito and R. Ramos (2020a). Tendencias recientes de la población en las áreas rurales y urbanas de España, Occasional Papers, No 2027, Banco de España.

Gutiérrez, E., E. Moral-Benito, D. Oto-Peralías and R. Ramos (2020b). The spatial distribution of population in Spain: an anomaly in European perspective, Working Papers, No 2028, Banco de España.

Gutiérrez, J., and J. García-Palomares (2020). "Transport and Accessibility", *International Ecyclopedia of Human Geography,* 2nd edition, vol. 13, pp. 407–414

Hortas-Rico, M. and A. Solé-Ollé (2010). "Does Urban Sprawl Increase the Costs of Providing Local Public Services? Evidence from Spanish Municipalities". *Urban Studies Journal,* pp. 1513-1540

Huettner, F. and M. Sunder (2012). "Axiomatic Arguments for Decomposing Goodness of Fit According to Shapley and Owen Values", *Electronic Journal of Statistics,* vol. 6, pp. 1239-1250.

Kompil, M., C. Jacobs-Crisioni, L. Dijkstra and C. Lavalle (2019). "Mapping accessibility to generic services in Europe: A market-potential based approach", *Sustainable Cities and Society,* vol. 47, 101372.

Lösch, A. (1938). "The nature of economic regions", *Southern Economic Journal,* 5, pp. 71-78.

Milbert, A., I.M. Breuer, P. Rosik, M. Stepniak and X. Velaxco (2013). "«Accessibility of services of general interest in Europe", *Romanian Journal of Regional Science,* vol. 7.

Muñoz-Merino, A. and J. Suárez Pandiello (2018). *Reformando la financiación local. ¿Un viaje o una excursión? Las propuestas de la Comisión,* FEDEA Policy Papers No 2018/08.

Musgrave, R. and P. Musgrave (1973). *Public Finance in Theory and Practice,* Tokyo, McGraw-Hill Kogakusha.

Oates, W. (1972). *Fiscal Federalism,* New York, Harcourt Brace Jovanovich.

Páez, A., D. Scott and C. Morency (2012). "Measuring accessibility: positive and normative implementations of various accessibility indicators", *Journal of Transport Geography,* 25, pp. 141-153.

Papaionnou, D. and N. Wagner (2018). "Measuring Access to Healthcare and Education by Car and Public Transport in 18 Cities Across the World". *Transportation Research Board 97th Annual Meeting,* p. 14.

Rodríguez-Pose, A. (2018). "The revenge of the places that don't matter (and what to do about it)", *Cambridge Journal of Regions, Economy and Society,* 11(1), pp. 189-209.

Solé-Ollé, A. and N. Bosch (2005). "On the Relationship between Authority Size and the Costs of Providing Local Services: Lessons for the Design of Intergovernmental Transfers in Spain", *Public Finance Review,* 33(3), pp. 343-384.

Suárez Pandiello, J. and R. Fernández Llera (2008). "Esfuerzo fiscal municipal y aportación del usuario al coste de los servicios", *XV Encuentro de Economía Pública: políticas públicas y migración,* p. 55.

European Union (2019). Official Journal of the European Union. Commission Implementing Regulation (EU) 2019/1130 of 2 July 2019 on the uniform conditions for the harmonised application of territorial typologies pursuant to Regulation (EC) No 1059/2003 of the European Parliament and of the Council.

Box 1

DIGITAL SERVICES ACCESSIBILITY IN SPANISH MUNICIPALITIES

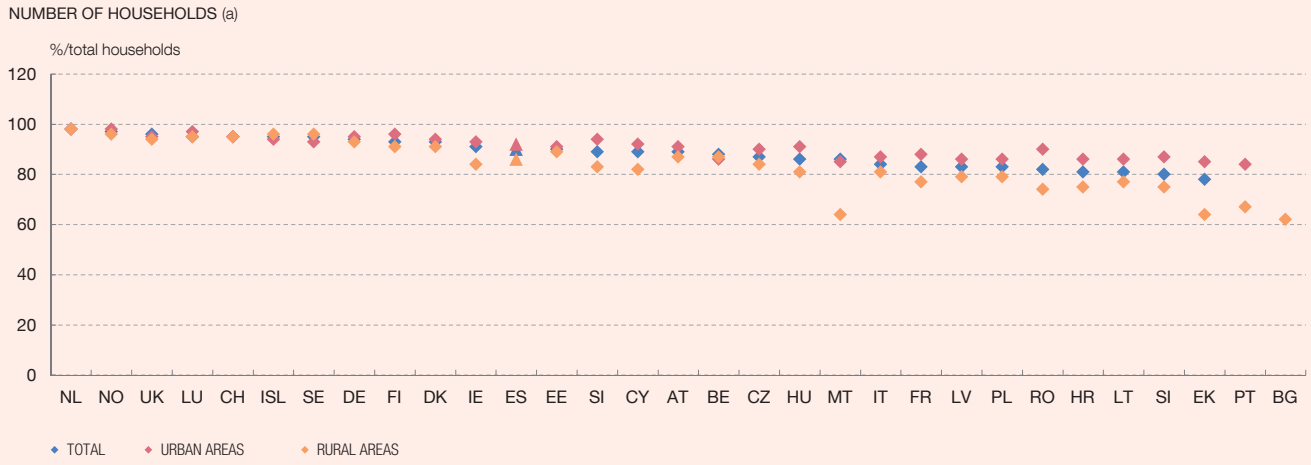
One of the advantages of digitalisation is that certain services that previously required the physical presence of the provider and the final user can now be provided remotely. In addition to saving on travel costs, the number of persons potentially requiring such services increases with digitalisation, since many users are able to access them even if they live in distant or small locations. However, this extension of the provision of certain services requires that providers have an adequate infrastructure ensuring efficient and secure connectivity and that citizens be competent in the use of new technologies.

In 2019, broadband availability in Spain exceeded the average for the European Union (EU). According to Eurostat, around 91% of Spanish households had access to broadband internet, compared with 88% in the EU as a whole.[1] However, these figures are somewhat lower than those seen in the northern European countries and in the United Kingdom (98% and 96%, respectively). In any event, these aggregate data mask a degree of heterogeneity based on how urbanised the geographical area analysed is. Thus, the percentage of households with access to broadband in urban areas is 93% in Spain and 90% in the EU, while in rural areas these percentages are 84% for Spain and 82% for the EU. Based on these data, Spain ranks 11th and 15th (out of 28 countries) in access to broadband for the total population and for people living in rural areas, respectively. On average, a Spanish citizen who lives in a rural area will have fewer possibilities of accessing broadband Internet than one who resides in an urban area. This difference is slightly greater in Spain than in the EU as a whole (0.9 pp and 0.8 pp, respectively) (see Chart 1).

However, good connectivity is not only determined by the availability of broadband infrastructure (to which the European comparison mentioned in the previous paragraph refers), but also by connection speed, which will determine the type of digital service that may be accessed. For example, while a 30 MB connection would be enough to access e-commerce websites, it would not be enough to hold a videoconference. Therefore, only areas with good connectivity might potentially benefit from the recent boost in remote working in certain sectors of activity.[2] In this respect, having a network of adequate technological infrastructures would be particularly beneficial for rural municipalities.

Chart 1

BROADBAND ACCESSIBILITY IN EU HOUSEHOLDS



SOURCE: Eurostat.

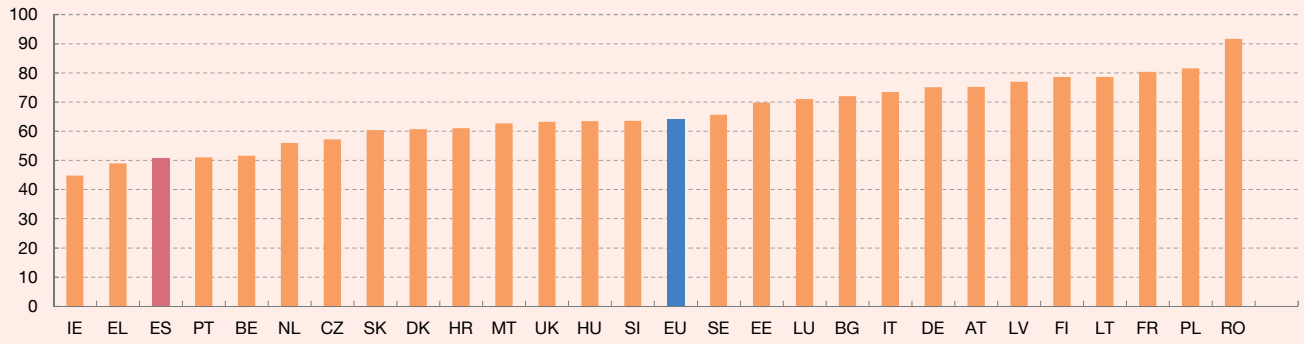
a Countries in order of broadband availability at national level.

1 See https://ec.europa.eu/eurostat/web/digital-economy-and-society/data/database.

2 Remote working differs across regions and these differences remain when controlling for population and productive system characteristics. The available evidence suggests that there is much room for improvement in all the regions for increasing the use of remote working. Nonetheless, Madrid, the Basque country and Catalonia would be the regions where the percentage of employees working from home could most increase (see https://www.bde.es/f/webbde/SES/Secciones/Publicaciones/InformesBoletinesRevistas/ArticulosAnaliticos/20/T2/descargar/Fich/be2002-art13.pdf).

Chart 2

INDICATOR OF BROADBAND PRICES (a)



SOURCE: European Commission.

a Indicator constructed on the basis of a representative basket of different broadband providers. It takes a value of between 0 and 100. The higher the index value, the lower the price.

Although Spain is better positioned than the EU on average in terms of connectivity, the price of broadband access is much higher in Spain. According to the DESI index, in 2020 Spain ranked fifth in digital connectivity (coverage and quality), much higher than in terms of the population's digital skills (16th). As regards the indicators which define digital competitiveness, Spain is one of the top performers in the roll-out of very high-capacity networks (ranking 4th), while being one of the countries with the highest broadband prices (ranking 4th) (see Chart 2).[3]

At the national level, the information published by the Ministry of Economic Affairs and Digital Transformation[4] is used to conduct a granular analysis of differences in access to broadband (and, therefore, to digital services) in Spanish municipalities. Specifically, this database provides information for each singular unit of population on the percentage of households with four different types of band coverage (30 MB, 100 MB, 3G and 4G).[5]

Chart 3 shows coverage by type of network throughout Spain. There is nearly full coverage for 4G mobile networks and practically all of Spain has coverage for over 95% of households. However, 100 MB broadband coverage is under 75% in most municipalities and, in fact, 62% of municipalities have no 100 MB broadband coverage whatsoever.

As regards differences in coverage between rural and urban municipalities, average coverage in urban municipalities is 91.9% (30 MB), 81.9% (100 MB), 99.9% (3G) and 99.8% (4G). These figures decline to 71.3%, 18.6%, 97.5% and 92.8% in the case of rural municipalities.

The rural-urban gap of 20.6 pp in 30 MB broadband coverage can be seen to be statistically significant in column (1), panel A of Table 1, on estimating a linear regression of the level of coverage on the rural municipality dummy. In line with our analysis for on-site services, we also include in the regression controls for geography and municipal taxation, along with regional fixed effects. Based on the results included under column (4), the rural-urban difference in 30 MB broadband access loses significance once the differences between municipalities regarding taxation and orography are taken into account. Specifically, a greater altitude and distance from the

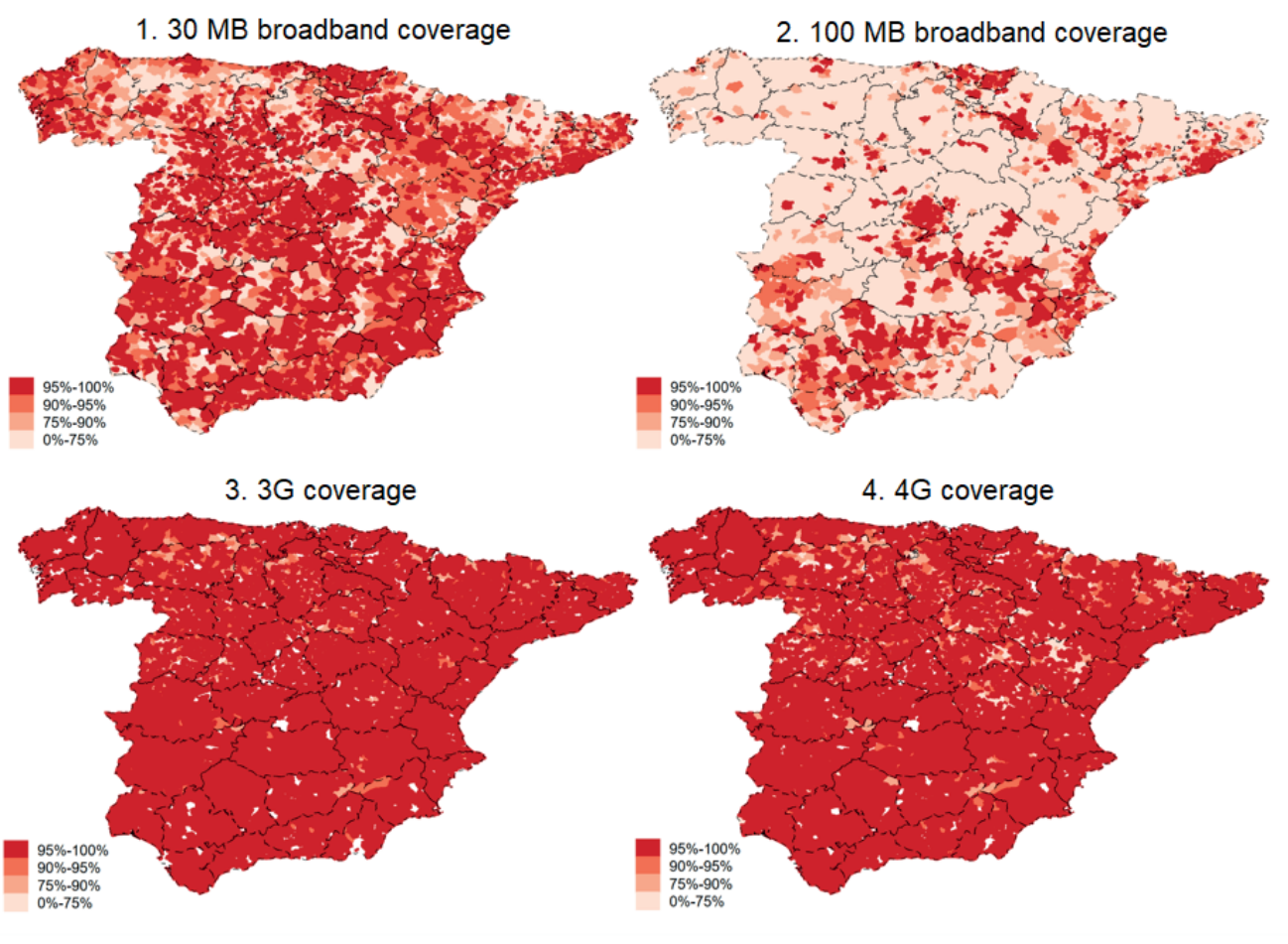
3 https://digital-agenda-data.eu/charts/desi-components#chart={%22indicator%22:%22desi_1d_bbpi%22,%22breakdown-group%22:%22desi_1d_bbpi%22,%22unit-measure%22:%22egov_score%22,%22time-period%22:%222020%22}.

4 See https://avancedigital.gob.es/banda-ancha/cobertura/Paginas/informacion-cobertura.aspx.

5 The technology used to provide broadband services varies greatly and may be classified into three large groups according to type of access: cable or fixed (with download speeds that may vary substantially, for example: 30 MB or 100 MB); wireless; and mobile (3G or 4G).

Chart 3

NETWORK COVERAGE IN SPAIN (JUNE 2019)



SOURCES: Ministerio de Asuntos Económicos y Transformación Digital and own data.

provincial capital, and less indebtedness, are associated with lower 30 MB coverage. Along the same lines, the rural-urban gap of 63.3 pp in 100 MB broadband coverage declines to 25.7 pp when these differences are taken into account (see column (4) in panel B of Table 1). The rural-urban differences in mobile network coverage (both 3G and 4G) also lose significance when geography and municipal taxation are taken into account (see panels C and D of Table 1).

It may be concluded from the analysis that there are significant shortcomings in the access to 100 MB broadband in rural areas in Spain, even after controlling for geography and taxation. Looking ahead, the new scenario emerging in the wake of the economic and health crisis triggered by the COVID-19 pandemic, with a likely increase in remote working and a growing demand for access to digital services, is both a challenge and an opportunity for local governments and, in particular, rural municipalities.[6]

6 According to the Spanish Labour Force Survey, the percentage of the employed who, at least occasionally, work from home was 8.3% in 2019, 2.4 pp higher than in 2009. This dynamic has been substantially affected by the COVID-19 health crisis. Thus, in a recent Banco de España survey of a group of companies, virtually 80% of the sample increased teleworking so that their activity would be affected as little as possible by the epidemic (see the Analytical Article "Teleworking in Spain" and Box 1 entitled "Business survey on the impact of the COVID-19 crisis" of the Analytical Article "Reference macroeconomic scenarios for the Spanish economy after COVID-19", both published as part of the Economic Bulletin, 2/2020, Banco de España).

Table 1

DETERMINANTS OF NETWORK COVERAGE

VARIABLES	(1)	(2)	(3)	(4)
Panel A: 30 MB coverage				
Rurality dummy	-20.634***	-9.512***	3.456	3.462*
	(3.704)	(2.818)	(1.984)	(1.652)
R^2	0.03	0.089	0.15	0.856
Panel B: 100 MB coverage				
Rurality dummy	-63.297***	-48.681***	-27.019***	-25.738***
	(6.187)	(6.379)	(4.754)	(4.249)
R^2	0.261	0.343	0.457	0.666
Panel C: 3G coverage				
Rurality dummy	-2.436**	-0.790*	0.593	0.58
	(0.84)	(0.396)	(0.391)	(0.376)
R^2	0.007	0.027	0.038	0.994
Panel D: 4G coverage				
Rurality dummy	-7.082***	-2.177*	1.826*	2.671*
	(1.465)	(1.164)	(0.93)	(1.344)
R^2	0.014	0.061	0.077	0.974
Observations	7,508	7,500	6,272	6,272
Region fixed effects	No	No	No	Yes
Geographic controls	No	Yes	Yes	Yes
Taxation controls	No	No	Yes	Yes

SOURCES: Own data.
NOTE: *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

In this connection, it is advisable to consider the possibility of providing municipalities with the digital infrastructures required to facilitate access to online services, thus reducing the rural-urban gap.[7]

7 The 2021-2027 multiannual financial framework envisages an allocation of €132.8 billion for actions relating to the single market, innovation and the digital economy in the EU as a whole. A further €10.6 billion from the Next Generation EU fund will be added to this. In the case of Spain, the investment in digitalisation will be used to deploy the Digital Spain 2025 Agenda, the main strategic priority of which is: "guaranteeing digital connectivity for the entire population, fostering the eradication of the digital gap between rural and urban areas with the aim of providing 100 Mbps coverage by 2025 for all the population". The actions financed within the Digital Spain 2025 Agenda framework will amount to around €20 billion, of which approximately €15 billion relate to various EU schemes and new instruments.

Annex 1 Services accessibility indicators: Kompil et al. (2019) database

Models for selecting the best location for the provision of a service ("the land-use literature") set considerable store by factors such as centrality (lower transport costs) and agglomeration (economies of scale and diversity), given their greater capacity to attract potential customers.[1] Under these models, services providers will seek the best location among all possible alternatives that will ensure them the customers (if not the optimal at least a minimum number) for their activity to be economically viable.[2] Along with the assumptions on market size, Kompil et al. (2019) (hereafter KJDL) set limits on the maximum distance most of the population would have to cover to have access to a specific service.[3] According to these parameters, market size (or population size) and distance from the service, KJDL estimate where providers of specific services might be expected to establish themselves in each of the EU countries.

The value these parameters (population size and distance) take is related to the characteristics of the service provided. Thus, in services used frequently or daily (e.g. a school or a hairdresser's), proximity is a major factor for the user. Conversely, for those services that are used only sporadically (e.g. a specialist hospital), distance is less important and the catchment area for potential users is more extensive. Accordingly, KJDL firstly define three types of services: local, sub-regional and regional. Local services (such as schools, primary healthcare, electricity supply, basic sports facilities, grocery stores, etc.) are generally available at the municipal level, although in rural areas the average distance users must travel may be greater owing to the greater dispersion of the population making up the municipality. In contrast, regional services (such as specialist healthcare centres, universities, airports, some cultural activities and museums, government organisations, etc.) are normally provided in large urban centres, where there is a greater concentration of population; consequently, inhabitants in rural areas will have to travel a greater distance to have access to them. Finally, sub-regional services (e.g. secondary schools, theatres, hospitals, etc.) are usually to be found in medium-sized cities (see Table A1.1).

Based on the characteristics of these three types of services and the evidence found by the empirical literature available, KJDL set the values of the parameters used to estimate where each service should be located.[4] Table A1.2 summarises the values of these parameters: optimal and minimal market size, and ideal and maximum distance.

Thus, for instance, a local service would be located at a point to which 5,000-10,000 people would have access with a radius of 5 km at most. The minimum population

1 See Christaller (1933) and Lösch (1938).

2 A private-sector firm will seek to maximise its profits whereas a public sector firm will aim to cater for the highest possible number of people needing a specific service.

3 Kompil et al (2019) focus on accessibility to services that require the physical presence of the service user; therefore, all services provided online are excluded.

4 See Papaionnou and Wagner (2018) and Milbert et al. (2013) for a description of accessibility to specific services in selected world cities and EU provinces, respectively.

Table A1.1
TYPOLOGY OF SERVICES OF GENERAL INTEREST

Local services	Schools, primary healthcare centres, nurseries, small shops, electricity, water and gas supply, sports centres, etc.
Sub-regional services	Secondary schools, theatres, supermarkets, cultural activities, hospitals, employment agencies, etc.
Regional services	Universities, specialist hospitals, shopping centres, technology centres, government organisations, airports, etc.

SOURCES: Kompil et al. (2019).

size required in a specific area to locate a local service would be 5,000, rising to 50,000 in the case of regional services. These population thresholds match those set by Eurostat to classify LAU2-level municipalities by their degree of urbanisation: urban centres or densely populated areas, cities with an average population density and rural or low population-density areas. Two criteria – size and population density – determine in which category, according to Eurostat, a municipality should be considered.[5]

Drawing on the parameters in Table A1.2, using Eurostat 2011 data on the spatial distribution of the population at a high level of resolution (1 km2 cell) and on the road transport network, KJDL estimate the location of these three types of services throughout the territory of each of the 28 EU countries.[6] The distribution of services throughout national territory is carried out using an iterative procedure: first, services are located in accordance with ideal population size and minimum distance parameters; and subsequently, in accordance with minimum size and maximum distance criteria. Factors such as the spatial distribution of the population throughout a country, where depopulation and ageing are determinants, or geographical factors, which hamper the construction of transport infrastructures, play a key role in the location for the provision of the service. Next, the distance by road from each cell to the point where the closest service is located (local, sub-regional or regional) is calculated. And, finally, the accessibility indicator is obtained as the average distance in kilometres, per person, to the closest service at the municipal, regional or country level.[7]

5 According to the Eurostat classification, a municipality is considered an urban or densely populated area if at least 50% of the population lives in urban centres or a high-density cluster, which are adjoining 1 km^2 cells with a population density of at least 1,500 inhabitants per km^2 and a minimum of 50,000 inhabitants; an intermediate density area is one where at least 50% of the population lives in urban clusters, i.e. adjoining 1 km^2 cells with a population density of at least 300 inhabitants per km^2 and a minimum of 5,000 inhabitants, and, finally, rural areas are those in which over 50% of the population lives in rural cells that are not considered a high or medium-density cluster.

6 The EU population census at the 1km^2 grid level is from GEOSTAT (2011) and the road network data from TELEATLAS MultiNet 2014.

7 The accessibility indicators have been calculated using the 1 km^2 spatial grid population data for 2011 and, subsequently, the results are aggregated to obtain the average distance at the municipal, region or country level. The local accessibility indicator measures the average distance, in kilometres, per person to the closest local service, which ideally offers this type of service to 5,000-10,000 people within a range of 5 km. The sub-regional accessibility indicator measures the average distance, in kilometres, per person to the closest sub-regional service, which ideally offers services to 50,000-100,000 people within a range of 25 km. And, finally, the regional accessibility indicator measures the average distance, in kilometres, per person to the closest regional service, which ideally offers services to 500,000-1,000,000 people within a range of 100 km.

Table A1.2
MARKET-SIZE AND DISTANCE-FROM-SERVICE-LOCATION CRITERIA

	Ideal population size	Ideal distance	Minimum population size	Maximum distance
Local services	10,000	2,5 km	5,000	5 km
Sub-regional services	100,000	10 km	50,000	25 km
Regional services	1,000,000	50 km	500,000	100 km

SOURCE: Kompil et al. (2019).

KJDL calculate the accessibility indicators of the three types of services for the municipalities of the 28 EU countries. However, on the European Commission's website,[8] only the indicators of access to local and regional services at the NUTS3 level (equivalent to the Spanish provinces) are available for each EU country, which restricts the analysis.[9] Conversely, for Spain we have municipal-level data for the three accessibility indicators, directly provided by KJDL, i.e. for most of Spain's 8,116 municipalities in 2011.

This database has two significant advantages over those used in other articles. Firstly, the use of a common methodology for the allocation of the place where services are provided in each EU country allows for European-level comparisons and enables us to identify whether there is heterogeneity in access to the provision of services across the citizens of different countries and within a single country. And, secondly, the availability of municipal-level accessibility indicators allows us to study whether there are differences between municipalities in a single country in ease of access to the provision of services, information that is relevant in terms of economic policy. That said, it should be recalled that fundamental aspects such as the sufficiency and quality of the service provided, and whether it is accessible or not to the individual, are excluded from the analysis. Also, in estimating the location of services, government intervention that could ensure a minimum level of services in specific areas or regulate the provision of specific services is not taken into account.

As a complement to the KJDL indicator, we have constructed for Spain an alternative indicator of accessibility to four basic services: a hospital, a nursery, a petrol station and an automated teller machine. This indicator is constructed drawing on information prepared by INE on the exact location of infrastructures that provide the four foregoing services. These data have been provided to us by the newspaper El País and coincide with those used by it on its website.[10] Using this information it is possible to calculate the distance from most of the 8,131 municipalities in Spain to the nearest hospital, school, petrol station and automated teller machine. That would give

8 https://urban.jrc.ec.europa.eu/rel2018/#/en/download.

9 The database includes information for 1,328 regions of the EU-28, 402 of which are for Germany (the maximum number) and 1 for Luxembourg (the minimum number). There are 52 regions in Spain's case.

10 https://elpais.com/politica/2019/10/25/actualidad/1572027354_718725.html.

an indicator for each type of service, which would subsequently be aggregated, using a simple mean, to obtain a single composite indicator of accessibility to these four services. This indicator, constructed with real location data, shows a correlation of 0.78% of the KJDL accessibility indicator to that used in this paper.

Annex 2 Analysis of the differences in the budgetary structure of rural and urban municipalities

This annex analyses the possible differences in the budgetary structure of Spanish municipalities according to their degree of urbanisation. In this connection, Table A2.1 shows the average values over the 2003-2018 period of the various revenue and expenditure headings of the initial budgets (measured in euro per capita) for the set of municipalities classified as rural and urban. The results highlight the differences between both types of municipality.

On the revenue side, rural municipalities show less tax revenue per person in direct and indirect taxes and in charges. This is the consequence of various factors, such as the greater fiscal competencies attributed to larger municipalities,[1] bigger tax bases in urban

Table A2.1
DIFFERENCES IN BUDGETARY STRUCTURE (EURO PER PERSON)

	(1) Rural	(2) Urban	(3) Difference
Revenue			
1 Direct taxes	286	353	67.2***
2 Indirect taxes	36.9	45.5	8.54***
3 Charges and other revenue	198	208	9.92
4 Current transfers	351	257	-93.9***
5 Profits and dividends	114	23.3	-90.7***
6 Disposal of real investment	26.9	43.7	16.8***
7 Capital transfers	386	74.7	-312***
8 Financial assets	1.36	2.07	0.71**
9 Financial liabilities	28.8	43.1	14.3***
Total revenue	1.43	1.051	-379***
Expenditure			
1 Personnel costs	309	353	44.3***
2 Current expenditure	453	332	-121***
3 Financial costs	11	18.5	7.41***
4 Current transfers	70.8	62.4	-8.44**
5 Contingency fund	1.47	2.64	1.17***
6 Real investment	528	207	-321***
7 Capital transfers	13.7	9.56	-4.19**
8 Financial assets	0.617	1.94	1.32***
9 Financial liabilities	29.6	48.8	19.1***
Total expenditure	1.416	1.035	-381***
Total observations	6,753	804	

SOURCES: Ministerio de Hacienda and INE.
NOTE: Columns (1) and (2) refer to the average values (in euro per capita) of the various budgeteary revenue and expenditure headings over the 2003-2018 period for municipalities classified as rurual or urban, respectively. Column (3) is the difference between columns (2) and (1). *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively..

1 Municipalities that are provincial capitals or that have over 75,000 inhabitants are assigned, in addition to their own previously mentioned taxes, a percentage of personal income tax, value added tax and excise duties, which is complemented by a financial transfer from the State under the Complementary Financing Fund. The remaining municipalities receive a State transfer (share in State taxes) in order to ensure their financial sufficiency based on their population, average tax burden, and the inverse of their tax-raising capacity (see Royal Legislative Decree 2/2004 of 5 March 2004 approving the Consolidated Text of the Law Regulating Local Tax Authorities).

Table A2.2

DIFFERENCES IN THE RELATIVE DISTRIBUTION OF EXPENDITURE ACCORDING TO ITS FUNCTIONAL CLASSIFICATION

	(1) Rural	(2) Urban	(3) Difference
0 Public debt	3.39	7.34	3.95***
1 Basic public services	30.17	37.01	6.84***
2 Social services and employment promotion measures	7.23	9.61	2.38***
3 Production of merit goods	14.68	17.55	2.87***
4 Economic measures	8.26	4.69	-3.56***
9 General measures	36.27	23.79	-12.48***
TOTAL	100	100	0
Total observations	6,701	804	

SOURCE: Ministerio de Hacienda.
NOTE: Columns (1) and (2) refer to the average values (as a percentage of total expenditure) of the variables shown for municipalities classified as rural or urban, respectively. Column (3) is the difference between columns (2) and (1). The period considered is 2010-2018 (there are no previous data owing to the changes in local government budgetary structure introduced under Ministerial Order EHA/3565/2008 of 3 December 2008). *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

municipalities (e.g. officially assessed property values that make up the tax base of property tax are higher in urban municipalities) and the lower tax burden in rural municipalities. Furthermore, rural municipalities show higher revenue in transfers received by other public entities (especially in capital transfers, earmarked for financing real investment[2]) and in profits and dividends (arising on the use and harnessing of municipal resources, such as public properties, land, etc.).

On the expenditure side, rural municipalities show lower per capita spending on personnel costs (which include the wages of civil servants and public sector employees), although spending per capita is higher under the current expenditure heading (which includes a wide range of expenses, from energy supply to those derived from cultural and sports activities) and, especially, on real investment (including most notably spending on new infrastructures, e.g. sports facilities and the replacement thereof).

This analysis infers that, overall, rural municipalities have higher budgets in per capita terms on both the revenue and expenditure sides. Thus, per capita revenue and per capita expenditure in a rural municipality over the 2003-2018 period were around €380 higher than those of an urban municipality.[3]

2 Revenue and capital spending in 2009 and 2010 were affected by the public investment plans routed through municipal budgets (State Fund for Local Investment and State Fund for Employment and Local Sustainability), commonly known as "Plan E". Overall, this fiscal measure amounted to around €13 billion and its aim was to stimulate demand and employment through the State financing of local infrastructure projects (see Alloza and Sanz (2021)).

3 This difference is slightly less when budget outturn data are considered.

Table A2.2 shows the relative distribution of municipalities' spending based on its functional classification. This table reflects how rural municipalities use a higher percentage of expenditure on general measures (relating mainly to the functioning of the town council: local government expenses, tax management-related expenses, etc.) and economic measures (those geared to protecting agricultural and fishing resources, the development of trade and tourist activities, etc.). Urban municipalities, for their part, are seen to have a greater relative share of spending on basic public services (housing and town planning, street lighting, environment), social action (social services, employment promotion) and the production of merit goods (e.g. educational, health, cultural and sports facilities and services), which are more related to the provision of local public services.

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