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Classifying small (TL3) regions based on metropolitan population, low density and remoteness

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This paper provides a method to classify TL3 regions across OECD countries based on their level of access to metropolitan areas. TL3 regions are classified as 'metropolitan' if more than half of their population lives in one or more functional urban area (FUA) of at least 250 thousand inhabitants and as 'non-metropolitan' otherwise. The method sub-classifies metropolitan regions into 'large metro' or 'metro' regions based on the population size of the FUAs located within those regions. Non-metropolitan TL3 regions are sub-classified into: with access to a metro, with access to a small/medium city, or remote based on their level of access to a FUA with population above a predetermined threshold. The method relies on publicly available grid-level population data and localised information on driving conditions.

Key words: Indigenous peoples, place, well-being, regional and rural development, sustainable development goals, culture:

JEL codes: C80; R41; R52, R58

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Introduction¹

The OECD Regional Database collects and publishes statistical indicators at two different geographical levels, namely large regions (Territorial Level 2, TL2) and small regions (Territorial Level 3, TL3). Both levels encompass entire national territories. With some exceptions, TL2 regions represent the first administrative tier of subnational government (i.e. States in the United States, Provinces in Canada, or *Régions* in France). TL3 regions are smaller territorial units that make-up each TL2 region.

Since the creation of the Regional Database, the OECD has provided classifications of regions based on key characteristics of those regions, with the objective of providing a tool to analyse and better understand regional development issues. For example, the OECD urban-rural typology classifies TL3 regions into: *predominantly urban*, *intermediate* and *predominantly rural* (see Box 1 for details). The OECD extended urban-rural typology includes the remoteness dimension in predominantly rural regions, creating two sub-categories: *rural regions close to cities* and *rural remote* (Brezzi, Dijkstra and Ruiz, 2011^[1]).

This paper provides a new method to classify small regions (TL3) based on the level of access to metropolitan areas. The proposed classification distinguishes between ‘metropolitan’ and ‘non-metropolitan’ regions. Further, the method sub-classifies ‘metropolitan’ regions in ‘large metro’ and ‘metro’ regions, based on population size of the metropolitan areas located in those regions. Similarly, ‘non-metropolitan’ regions are sub-classified in regions with access to a large city, to a small/medium city, or remote. The classification relies on a consistent concept of metropolitan area, which consists of functional urban areas (FUAs) of at least 250,000 inhabitants (OECD, 2012) (see Box 2 for details).

The purpose of the resulting classification is to help assess differences in socio-economic trends in regions – both within and across countries – by controlling for the presence/absence of metropolitan areas and the extent to which the latter is accessible by the population living in each region. The method emphasises the role of market access and rural-urban linkages and uses functional urban areas (FUAs) as the concept of reference for the classification. The method is meant to complement, rather than substitute, the existing urban-rural classification at the TL3 regional level (Brezzi, Dijkstra and Ruiz, 2011^[1]).

The concept of Functional Urban Area (FUA) was developed by the OECD in close cooperation with the European Commission (EC) to define cities and their surrounding areas of influence consistently across countries (OECD, 2012^[2]). The definition of Functional Urban Areas (FUAs) provides an internationally comparable measure of urban economic agglomerations. FUAs consist of groups of contiguous local jurisdictions (i.e. municipalities in most countries) that are aggregated based on functional criteria (see Box 2 for details). For the purpose of the proposed classification, each FUA is assigned to one

¹ Authors would like to acknowledge all delegates of the OECD Working Party on Territorial Indicators and of the Working Party on Rural Policy for their feedback on different versions of the paper. Comments and suggestions by Ray D. Bollman and by colleagues in the OECD Centre for Entrepreneurship, SMEs, Regions and Cities are also kindly acknowledged, in particular those by Rudiger Ahrend, Karen Maguire, and Joaquim Oliveira Martins.

of two categories based on FUA size: “**small/medium city**” (short for small/medium FUAs), including all FUAs larger than 50 thousand and smaller than 250 thousand; or “**metro**” (short for metropolitan FUAs), including FUAs with at least 250 thousand inhabitants.²

Combining regional data at a TL3 scale with the FUA definition into a regional typology based on access to FUAs has recently become possible given the increasing availability of grid-based population data as well as comparable sources of geographical access based on road network data. A definition based on functionality rather than on density can also help bringing a clearer meaning to the aggregation of economic variables measured at the regional scale (such as GDP).³

A classification based on FUAs has been already carried out for TL3 regions in Europe by the European Commission and classifies regions as ‘metropolitan’ or ‘non-metropolitan’ (Eurostat, 2013_[3]). The method proposed in this paper is consistent with such a classification by the European Commission and it extends it in two ways. First, it distinguishes ‘large metro’ regions (MR-L) from ‘metro’ regions (MR-M) based on the minimum population size of the FUAs located in the region (1.5 million and 250 000 inhabitants, respectively). Second, the proposed method further classifies all non-metropolitan regions (NMR) into three categories: with access to a metro (NMR-M), with access to a small/medium city (NMR-S), or remote (NMR-R).

The results show that across OECD countries 71% of the population lives in metropolitan regions – 42% in large metro regions and 29% in other metro regions. The remaining 29% of people live in non-metropolitan regions. They are distributed in regions with access to a metro (12%), with access to a small/medium city (9%), and remote (8%). Regarding the total number of regions, 37% of OECD TL3 regions are classified as metropolitan, of which 13% as large metro regions and 24% as other metro regions. The remaining 63% are divided as follows: 19% are non-metropolitan regions with access to a metro, 15% are non-metropolitan regions with access to a small/medium city, and 29% are remote regions. Annex B contains results for alternative size and share of population thresholds to show the sensitivity of the results.

The remainder of the paper is organised as follows. Section 2 provides the methodological details and the data sources used. Section 3 presents the results of the classification applied to all OECD TL3 regions where data was available. The section also compares results with those of the already existing and complementary OECD urban-rural classification. Section 4 provides some concluding remarks and identify potential future work to characterise different geographical units across OECD countries.

² Note that in older OECD studies, metropolitan areas were defined as FUAs with at least half a million inhabitants.

³ <https://ec.europa.eu/eurostat/web/metropolitan-regions/background>.

Box 1. The OECD urban-rural typology

The OECD urban-rural typology was first established in the early 1990s as a result of work for the Rural Indicators Project of the OECD Rural Development Programme. It classifies TL3 regions as “predominantly urban”, “intermediate”, and “predominantly rural”. This typology is based on three criteria:

1. Identify rural local unit⁴ according to population density. A local unit is defined as rural if its population density is below 150 inhabitants per km² (500 inhabitants for Japan and Korea to account for the fact that the national population density exceeds 300 inhabitants per km²).

2. Classify regions according to the percentage of population living in rural local unit. A TL3 region is classified as predominantly rural if more than 50% of its population lives in rural local unit. TL3 regions are classified as predominantly urban if less than 15% of the population lives in rural local units. If the share of population in rural local unit is between 15% and 50%, it is categorised as intermediate.

3. Classify regions based on the size of the urban centres. Accordingly, a region classified as rural on the aforementioned basis becomes intermediate if it has an urban centre of more than 200 thousand inhabitants (500 thousand for Japan) representing no less than 25% of the regional population. A TL3 region classified as intermediate on the aforementioned basis is classified as predominantly urban if it has an urban centre of more than 500 thousand inhabitants (1 million for Japan) representing no less than 25% of the regional population.

The extended OECD typology developed in 2011 sub-divides rural TL3 regions further into two sub-categories, rural close to cities and rural remote, by adding a distance criterion to urban centres according to a driving time threshold of 1 hour by car (45 minutes for North America) to the nearest population agglomeration of 50 thousand inhabitants. Figure A.1 in Annex A summarizes the method.

In Europe, TL3 regions are consistent with the NUTS3 classification adopted by Eurostat. TL3 regions are classified following the European Union (EU) grid-based regional urban-rural typology (Dijkstra and Poelman, 2014^[3]). This typology included in the 5th Cohesion Report and the 2010 Eurostat Regional Yearbook (see <https://ec.europa.eu/eurostat/web/products-statistical-books/-/KS-HA-10-001>) was approved in 2010. The EU typology uses 1 km² population grids as building blocks to identify urban settlements, with the aim of improving international comparability.

To classify TL3 regions, it first distributes local population based on the degree of build-up at the 1 km² grid-cell level. It then determines the existence of urban clusters based on density levels and cell contiguity, requiring at least 300 people per grid cell and a minimum population of 5 thousand people in each urban cluster. In the last step, it classifies TL3 regions into rural based if 50% of the population is in rural grid cells; urban if 80% of the population is in urban clusters, and intermediate otherwise. Rural and intermediate TL3 regions are further classified into close or remote based on driving time by car to a city.

In 2018, there were 389 TL2 and 2,251 TL3 regions across OECD countries.

Source: Brezzi, M., L. Dijkstra and V. Ruiz (2011), “OECD Extended Regional Typology: The Economic Performance of Remote Rural Regions”, OECD Regional Development Working Papers, No. 2011/6, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5kg6z83tw7f4-en>; https://ec.europa.eu/eurostat/statistics-explained/index.php/Regional_typologies_overview#Urban-rural_typology_including_remoteness.

Box 2. Methodology to delineate Functional Urban Areas

FUAs consist of densely populated cities and of adjacent local units with high levels of commuting (travel-to-work flows) towards the densely populated cities. FUAs are created using gridded data, thereby not relying on administrative boundaries. The method starts from the identification of urban centres through the population grid. An urban centre is a cluster of contiguous grid cells having at least 1 500 inhabitants per km² and a total population of at least 50 000 inhabitants.

The methodology to delineate FUAs consists of three main steps:

1. Identification of cities: Population grid data (either official ones provided by NSOs or publicly available estimated ones, such as the [Global Human Settlement Layer](#)) at 1 km² are used to define urban centres. Subsequently, urban centres are adapted to the local (administrative or statistical) units (i.e. municipalities) for which commuting data is available. The “city” or “core” is made up of contiguous units that have more than 50% of their populations living within an urban centre.

2. Identification of interconnected cities that are part of the same functional urban area: Two cities are considered as being part of the same FUA if more than 15% of the population of any of the two cities commutes to work to the other city. In countries where commuting distances are increasing, large urban areas are developing in a polycentric way, hosting highly densely inhabited cores that are physically separated but economically integrated.

3. Definition of the commuting zones surrounding cities: The commuting zone of the FUA groups the surrounding local units that are linked to cities by the commuting pattern of their workforce. Any municipality with at least 15% of its employed residents working in a certain urban core is considered part of the same FUA.

FUAs are defined for all OECD countries, with the exception of Israel, New Zealand or Turkey due to a lack of commuting data. Across OECD countries, there are a total of 1 130 FUAs. Overall, 69% of the total population in 33 OECD countries lived in FUAs in 2015.

Source: OECD (2012), *Redefining "Urban": A New Way to Measure Metropolitan Areas*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264174108-en>.

⁴ A local unit is an administratively or legally defined unit considered as the smallest building block for the classification. In most countries, local units correspond to municipalities. Being administrative entities, the average size of local administrative unit can change significantly across countries.

New proposed classification of TL3 Regions based on FUA boundaries

The method presented in this paper classifies TL3 regions into metropolitan and non-metropolitan according to the following criteria (Figure 1):

- **Metropolitan TL3 region (MR)**, if more than 50% of its population lives in a FUA of at least 250 thousand inhabitants. MRs are further classified according to their level of access to FUAs of different sizes into:
 - **Large metro TL3 region (MR-L)**, if more than 50% of its population lives in a FUA of at least 1.5 million inhabitants.
 - **Metro TL3 region (MR-M)**, if the TL3 region is not a large metro region and 50% of its population lives in a FUA of at least 250 thousand inhabitants.
- **Non-metropolitan TL3 region (NMR)**, if less than 50% of its population lives in a FUA. NMRs are further classified according to their level of access to FUAs of different sizes into:
 - **With access to a metro TL3 region (NMR-M)**, if more than 50% of its population lives within a 60 minute drive from a metro (a FUA with more than 250 thousand people); or if the TL3 region contains more than 80% of the area of a FUA of at least 250 thousand inhabitants.
 - **With access to a small/medium city TL3 region (NMR-S)**, if the TL3 region does not have access to a metro and 50% of its population has access to a small or medium city (a FUA of more than 50 thousand and less than 250 thousand inhabitants) within a 60 minute drive; or if the TL3 region contains more than 80% of the area of a small or medium city.
 - **Remote TL3 region (NMR-R)**, if the TL3 region is not classified as NMR-M or NMR-S, i.e. if 50% of its population does not have access to any FUA within a 60 minute drive.

Figure 1. Summary of TL3 typology criteria

Note: Metro: FUA with population larger than 250K; Large metro: FUA with population larger than 1.5 million; Small/medium city: FUA with population smaller or equal to 250K.

The threshold of 250 thousand inhabitants is consistent with the threshold used by Eurostat in their classification of metropolitan regions.⁵ It is also compatible with the United States definition of Major and Medium Metro Cores that include core urban counties of metropolitan areas with at least 250 thousand inhabitants.

The concept of level of access is not confined to national boundaries, thereby providing an internationally comparable measure based on accessibility. Indeed, TL3 regions can potentially be categorized as with *access to a metro or a small city* even if there are no FUAs close to the region in the same country. For example, the French TL3 region of Savoie is classified as *non-metro with access to a metro* because it is within a 60-minute drive from the FUA of Geneva in Switzerland.

The following paragraphs explain in details all the steps that should be follow to apply the classification method. The first step classifies each TL3 region as metro or non-metro. The second step creates a drive-time polygon around the FUA, i.e. a polygon showing the distance that a person could cover if they were to drive for 60 minutes from a given point. The third and final step estimates the population in each TL3 region that lives in the polygon created in the second step and estimates the area of a FUA that is contained in each TL3 region. Figure 2 provides a visual summary of all steps of the method. Such steps are explained in more detail below.

⁵ The classification can be found at: <https://ec.europa.eu/eurostat/documents/4313761/4311719/Metropolitan-region-typology-NUTS-2013.xlsx> (Last accessed: March 2019).

Figure 2. Categorization process for TL3 regions

Step 1-Classifying TL3 regions as metropolitan or non-metropolitan

The method to classify TL3 regions is based on the share of population of each region living in a metropolitan area. To do this, it is first necessary to determine the area of overlap of each TL3 region and a metropolitan area (Figure 3). Second, it is necessary to determine the number of people that live in the overlap and calculate the population of the entire TL3 region. These steps make it possible to determine the share of population of a TL3 region that live inside a metropolitan area.⁶ In cases where this proportion is greater than 50%, the TL3 region is classified as a metro region (MR). In all other cases, the TL3 region is classified as a non-metro region (NMR).

⁶ If a TL3 region is completely included in a FUA, then this percent will be 100%. For areas that partially overlap, this number will depend on how the population is distributed. For the TL3 regions of Zuidwest-Friesland (Netherlands), Overig Zeeland (Netherlands), Södermanland County (Sweden), and those intersecting the FUA of Reykjavík, Iceland, the source for population comes from administrative sources and not the population grid.

Figure 3. Intersection of FUA and TL3

The figure shows the overlap between the FUA of Toulouse, France (shaded) and the TL3 regions.

Source: OECD TL3 and FUA boundaries,
<http://www.oecd.org/cfe/regional-policy/functionalurbanareasbycountry>.

Population shares are calculated using high resolution population grids. For European countries, the source used was the GEOSTAT grid available for the year 2011 at a resolution of 1-km² (Eurostat, 2011^[4]). For non-European countries, the source was the GHS population grid for the year 2015 available at a resolution of 250x250 m². The GHS grid has a resolution of 1-km² and consists of estimates of population where people is attributed to cells based on built-up areas (Freire et al., 2016^[5]).⁷

Step 2-Create a drive-time polygon

The sub-classification of non-metropolitan regions is based on a drive-time polygon, also known as an isochrone. A drive-time polygon provides a measure of the distance covered by driving for a determined period of time from a given point by car. This measure takes into account the road infrastructure, local speed limits and natural boundaries. Drive-time polygons were created using data from Open Street Map (OSM).⁸ Figure 4 shows an example for the FUA of Oostende, Belgium.

⁷ The GHS and GEOSTAT data are available at the following links:

https://ghsl.jrc.ec.europa.eu/ghs_pop.php;

<https://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/population-distribution-demography/geostat>

⁸ To calculate the drive-time polygon, the OSRM R package was used (R Core Team, 2018^[8]).

Figure 4. Drive-time polygon (isochrone)

The figure shows a drive-time polygon (isochrone) for the FUA of Oostende, Belgium. It shows the distance covered by driving 45 and 60 minutes from the population weighted centroid of the FUA.

Source: Open Street Maps.

The steps required to build a drive-time radius are:

- Select a geographic point of reference. The point must be a coordinate with a latitude and longitude. For this exercise the population weighted centroid of the core of each FUA is used as the point of reference.⁹

Use the point of reference to calculate the distance (on any direction) that a person could travel under ideal driving conditions.

Calculate the area of intersection between the drive-time polygon and the TL3 region.

Step 3- Sub-classifying metropolitan and non-metropolitan TL3 regions

After creating drive-time polygons, the next step is to examine the percentage of the population within each TL3 region that lives inside the polygon. Finally, the last step is to determine if the FUA is located in the TL3 region. This is done by calculating the percent of a FUA's area that is located within a TL3 region's boundaries.

Metropolitan TL3 regions are sub-classified into large metro and metro regions.

- **Large metro TL3 region (MR-L)**, if more than 50% of its population lives in a FUA of at least 1.5 million inhabitants.
- **Metro TL3 region (MR-M)**, if the region is not a large metro TL3 region and 50% of its population lives in a FUA of at least 250 thousand inhabitants.

⁹ A population weighted centroid is the weighted average of points in a given polygon. In cases where the centroids are located outside of the polygon, the centroid is placed inside the polygon using the closest Euclidean distance.

Non-metropolitan TL3 regions are classified as:

With access to a metro TL3 region (NMR-M), if more than 50% of its population lives within a 60-minute drive of a metropolitan area; or if the TL3 region contains more than 80% of the area of a FUA of at least 250 thousand inhabitants.¹⁰

With access to a small/medium city TL3 region (NMR-S), if the TL3 region is not a NMR-M TL3 region and more than 50% of its population lives within a 60 minute drive of a functional urban area of less than 250 thousand people; or if the TL3 region contains more than 80% of the area of a FUA of less than 250 thousand inhabitants.

Remote TL3 region (NM-R), if the region is not a NMR-M or a NMR-S region.

¹⁰ The 80% rule is applied to avoid the situation where an FUA covers most of the territory of a TL3 and yet the region is classified as remote. This rule only affects less than half of one percent of the population across OECD countries.

Results

Table 1 summarizes the results and Figures 4-6 contain maps of the resulting classification by regions of the world. Across OECD countries, 71% of the population lives in metropolitan TL3 regions (MR), out of which 42% lives in large metro regions (MR-L) and 29% in metro regions (MR-M). Of the remaining 29% of people that live in non-metropolitan regions (NMR), 12% live in regions close to a metro (NMR-M), 9% in regions close to a small/medium city (NMR-S), and 8% in remote regions (NMR-R) (Table 1). All OECD countries, with the exception of Iceland, have at least one metropolitan TL3 region that is classified as MR.

The results confirm there is no one-to-one correspondence between the rural-urban and proposed typologies, although there is considerable overlap in predominantly urban and metropolitan regions and between predominantly rural and non-metropolitan regions. While 402 out of 502 urban regions were classified as metropolitan, 849 out of 990 rural regions were classified as non-metropolitan. The proposed typology reallocates 657 intermediate regions into 254 metropolitan and 403 non-metropolitan regions.

The countries with the highest share of population living in metropolitan regions are: Luxemburg (100%)¹¹, Korea (89%), the United States (84%), Australia (70%), and Germany (68%). Conversely, the lowest rates occur in Slovakia (25%), Switzerland (50%), and Slovenia (41%). Geographically, the share of people in European countries that live in metropolitan regions (59%) is 20 percentage points lower than in non-European countries in the OECD (79%). While the results highlight a spatial concentration of population within specific TL3 regions across OECD countries, some countries have a significant share of population living in non-metropolitan remote regions such as Norway (34%) and Estonia (21%).

Regarding the total number of regions, 37% of OECD TL3 regions are classified as metropolitan, out of which 13% are sub-classified as large (MR-L) and 24% as metro (MR-M). The remaining 63% are non-metropolitan and are distributed as follows: 19% are close to a metro (NMR-M), 15% are close to a small/medium city (NMR-S), and 29% are remote (NMR-R). In Japan and Korea, over 65% of all TL3 regions are metropolitan regions, while in the United States, Great Britain, and Denmark and Germany the share is over 50%. On the contrary, in countries such as Canada, Greece, and Norway over 50% of regions are classified as non-metropolitan remote regions.

To check the sensitivity of the classification to changes in population and driving-time thresholds, Annex B presents a sensitivity analysis showing results obtained by defining a metropolitan area as a FUA of at least 100 and 500 thousand inhabitants (instead of 250 thousand) and using drive-time polygons of 45 and 60 minutes. Using the threshold of 500 thousand with a 60-minute drive-time threshold lowers the percent of population in the OECD living in a metro TL3 region from 70% to 61%.

¹¹ Luxemburg only has one TL3 region.

Table 1. Distribution of population and number of TL3 regions by category, 2015*Metro areas > 250 000 inhabitants; 60-minute drive time.*

Country	Population Living in TL3 Regions (%)					Number of TL3 Regions				
	Metropolitan Regions		Non-metropolitan Regions			Metropolitan Regions		Non-metropolitan Regions		
	Large (MR-L)	Metro (MR-M)	Metro (NM-M)	Small and Medium (NM-S)	Remote (NM-R)	Large (MR-L)	Metro (MR-M)	Metro (NM-M)	Small and Medium (NM-S)	Remote (NM-R)
AUS	56.8	13.8	1.1	7.0	21.3	4	6	1	8	31
AUT	31.3	23.5	21.1	12.0	12.1	5	6	8	7	9
BEL	22.4	23.8	50.9	2.5	0.4	4	6	29	4	1
CAN	43.4	22.5	6.1	3.9	24.1	28	31	20	14	200
CHE	0.0	50.3	24.6	18.6	6.5	0	6	8	9	3
CHL	40.5	29.8	2.4	20.4	6.8	5	9	2	16	22
CZE	24.6	32.3	0.0	43.1	0.0	2	4	0	8	0
DEU	30.7	37.0	23.1	5.8	3.4	62	145	130	34	31
DNK	35.4	33.4	30.4	0.0	0.7	4	3	3	0	1
ESP	35.1	33.8	8.3	20.8	2.0	4	16	6	23	10
EST	0.0	42.6	0.0	36.3	21.1	0	1	0	2	2
FIN	0.0	46.1	3.3	20.9	29.7	0	3	1	4	11
FRA	25.8	40.2	11.6	12.4	10.0	10	31	17	19	24
GBR	35.4	32.5	22.4	4.0	5.7	50	52	44	7	20
GRC	39.6	9.6	0.0	22.4	28.5	7	1	0	13	31
HUN	30.2	20.3	11.1	36.3	2.1	2	4	3	10	1
IRL	39.4	14.2	0.0	28.6	17.8	2	1	0	3	2
ISL	0.0	0.0	0.0	86.4	13.6	0	0	0	4	4
ITA	22.5	24.1	22.9	25.3	5.1	6	17	30	42	15
JPN	54.8	29.6	14.6	0.4	0.5	11	21	13	1	1
KOR	68.3	21.2	7.4	3.1	0.0	7	6	3	1	0
LTU	0.0	46.5	0.0	34.5	19.1	0	2	0	4	4
LUX	0.0	100.0	0.0	0.0	0.0	0	1	0	0	0
LVA	0.0	31.0	0.0	58.7	10.3	0	1	0	4	1
MEX	34.1	30.8	10.4	5.5	19.3	14	49	28	17	101
NLD	21.7	31.7	25.6	21.0	0.0	6	8	16	10	0
NOR	0.0	42.4	16.8	6.6	34.1	0	4	3	2	10
POL	16.1	33.6	12.7	28.3	9.3	8	21	10	24	9
PRT	26.3	21.1	20.8	16.5	15.3	1	2	6	6	10
SVK	0.0	25.8	10.3	63.9	0.0	0	2	1	5	0
SVN	0.0	40.6	40.5	11.6	7.3	0	2	6	2	2
SWE	22.2	33.5	2.9	16.5	24.9	1	3	1	5	11
USA	59.2	25.0	6.6	2.4	6.9	31	59	18	15	56
OECD	41.9	28.9	12.3	8.8	8.1	274	523	407	323	623

Source of population data: GHS population grid. https://ghsl.jrc.ec.europa.eu/ghs_pop.php.

Figure 4. Categorization of TL3 regions: North America and Chile

Metro areas > 250 000 inhabitants; 60-minute drive time.

Figure 5. Categorization of TL3 regions: Europe*Metro areas > 250 000 inhabitants; 60-minute drive time.*

Figure 6. Categorization of TL3 regions- Asia and Oceania

Metro areas > 250 000 inhabitants; 60-minute drive time.

The difference between the classification proposed in this paper and the OECD TL3 urban-rural typology consists of three main points (see Table 2).

First, the method presented in this paper classifies TL3 regions in terms of their level of access to dense markets instead of density levels. In contrast, the urban-rural typology depends on population density and on city size only to re-classify a PR as “Intermediate” when such a region contains an urban centre of at least 200 thousand people. For the EU grid-based rural-urban typology, the classification depends on population density (determined at the 1-km² grid cell level) and urban population size, including both urban centres (made up of contiguous cells with a density of 300 people or more each and a total population of 50 thousand people or more) and/or urban clusters (Eurostat, 2013).

Second, the two methods rely on different thresholds, which are in turn measured at different scales. This implies that there is no one-to-one correspondence between any of the categories of the two methodologies. In fact, TL3 regions in the Intermediate category are split between Metropolitan and Non-metropolitan TL3 regions, while a strong correlation can be expected between the classification of predominantly urban and metropolitan region on the one hand, and of predominantly rural and non-metropolitan on the other. The reason is that although urban regions that contain a FUA of 250 thousand people will all be classified as metropolitan, there can be urban regions with small/medium FUAs that will be classified as non-metropolitan as they fail to meet the 250 thousand threshold. On the other hand, rural regions that have access to a large FUA and/or contain part of commuting zones will be classified as metropolitan.

Lastly, although both methodologies use a similar distance threshold, the role of access to an urban core in determining the categories only matters for predominantly rural regions in the urban-rural typology, while it cuts across all categories in the proposed methodology. Furthermore, the method presented in this paper makes a distinction between access to urban areas of different sizes; while the urban-rural typology does not distinguish between access from a remote region to a large or a small city. This distinction can prove useful in settings where the focus is on rural-urban linkages and the role of market access, as the question in this case is not only whether regions have access, but to what type of markets they have access to.

Table 2. Comparison OECD TL3 urban-rural typology and proposed classification

	Categories		First tier		Second tier	
	First tier	Second tier	Determinants	Thresholds	Determinants	Thresholds
OECD TL3 urban-rural	3 categories: Predominantly Urban (PU); Intermediate (IN); Predominantly Rural (PR).	2 categories (of PR): Close and Remote.	Population density; population size in the case of PRs with a city of more than 200 thousand people (adding 25% of the regional population or more). For EU (grid-based) urban-rural typology: Population density and population size.	PR if 50% of population lives in rural local units (areas with density below 150 inh..km ² or 300 for Japan and Korea); PU if less than 15% of people live in rural local units; IN otherwise. For EU (grid-based) urban-rural typology: PR if 50% of population lives in rural grid cells (1 km ² cells with less than 300 people); PU if 80% of population lives in urban cluster cells (contiguous 1 km ² cells with more than 300 people and at least 5 000 people); IN otherwise.	Distance from PR region to closest centre of an urban centre. For EU (grid-based) urban-rural typology: Distance from a PR or IN to the centre of an urban centre.	60 minute drive (45 minutes for North America). For EU (grid-based) urban-rural typology: 45 minute drive by at least half of the residents of the region.
New TL3 based on access to FUAs	2 categories: Metropolitan (MR) and non-metropolitan (NMR).	2 categories (of MR): MR-L = large metropolitan region ; MR-M= metropolitan region. 3 categories (of NMR): NM-M = With access to a metro ; NM-S= with access to small/medium city; NM-R=Remote.	Presence of urban centre; Functional ties to urban centre.	MR if 50% population lives in FUA of at least 250 thousand people; NMR otherwise.	Distance from centroid of a (large or small/medium) FUA.	MR-L: 50% of regional population lives in a FUA of at least 1.5 million inhabitants; MR-M: 50% of regional population lives in a FUA of at between 250 thousand and 1.5 million inhabitants. NM-M: 50% of regional population is within a 60 minute drive from a FUA of at least 250 thousand inhabitants or if the TL3 region contains more than 80% of the area of a FUA of more than 250 thousand inhabitants; NM-S: 50% of the regional population has access to a FUA of less than 250 thousand inhabitants or if the TL3 region contains more than 80% of the area of a FUA of less than 250 thousand inhabitants; NM-R otherwise.

Concluding remarks

This paper provides a method to classify TL3 regions based on their level of access to functional urban areas of different size. Developing a statistically robust and internationally comparable system of classification of territorial units has been a topic where the OECD has provided guidance and a contribution to the design of regional development policies for over twenty years.

The proposed classification can represent a valuable tool to analyse socio-economic trends across different types of TL3 regions in a consistent way across countries. It also allows the richness of data available at the TL3 level across OECD countries to be linked with the presence of cities of different sizes, taking into account at the same time their economic extent. For example, all socio-economic indicators available in the OECD Regional Database at the TL3 scale could be aggregated by country – or by the entire OECD – using the classification proposed in this paper. This would allow to assess, among many other things, how trends in GDP per capita, population, employment or productivity are different in OECD countries between different types regions. For example, the evolution of the average gap in GDP per capita between metropolitan regions and remote regions in the last twenty years could be consistently documented across countries.

The proposed classification of non-metropolitan areas should not be considered as an attempt to define functional areas outside FUAs. Such complementary definition is part of ongoing work on the definition of Labour Market Areas (Munro, Alasia and Bollman, 2011^[4]) and functional economic regions that can provide an additional tool for territorial analyses.

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Annex A. Decision trees TL3 extended typology and FUA definition

Figure A.1. Decision tree OECD TL3 extended typology

Source: Brezzi et al (2011).

Figure A.2. Decision tree FUA definition

Source: Elaboration based on OECD (2012).

Annex B. Sensitivity analysis. Classification results with different population and drive time thresholds

Table B.1. 100 thousand inhabitants (metro threshold) with 45 minute drive

Country	Population Living in TL3 Regions					Number of TL3 Regions				
	MR		NMR			MR		NMR		
	MR-L (%)	MR-M (%)	NM-M (%)	NM-S (%)	NM-R (%)	MR-L	MR-M	NM-M	NM-S	NM-R
AUS	56.8	20.8	1.1	0.0	21.3	4	14	1	0	31
AUT	31.3	24.4	9.6	0.0	34.7	5	6	5	0	19
BEL	22.4	40.5	34.7	0.5	1.9	4	13	22	1	4
CAN	43.4	28.6	1.4	0.0	26.6	28	41	10	0	214
CHE	0.0	43.8	44.4	0.0	11.8	0	7	12	0	7
CHL	40.5	48.5	0.0	2.7	8.3	5	23	0	2	24
CZE	24.6	28.1	44.5	2.8	0.0	2	3	8	1	0
DEU	30.7	42.8	15.9	0.5	10.1	62	177	86	4	73
DNK	35.4	33.4	0.0	0.0	31.2	4	3	0	0	4
ESP	35.1	37.4	24.0	1.2	2.4	4	23	18	3	11
EST	0.0	42.6	24.9	11.5	21.1	0	1	1	1	2
FIN	0.0	67.0	0.0	0.0	33.0	0	7	0	0	12
FRA	25.8	48.4	10.7	0.0	15.0	10	44	13	0	34
GBR	36.5	38.8	14.5	0.0	10.2	51	63	28	0	31
GRC	38.2	21.8	1.5	9.1	29.4	6	7	1	6	32
HUN	30.2	31.3	21.5	12.6	4.4	2	8	4	4	2
IRL	39.4	14.2	17.7	10.8	17.8	2	1	2	1	2
ISL	0.0	86.4	0.0	0.0	13.6	0	4	0	0	4
ITA	22.5	31.7	34.4	2.1	9.2	6	33	41	5	25
JPN	54.8	32.2	12.4	0.0	0.5	11	23	12	0	1
KOR	68.3	24.1	7.6	0.0	0.0	7	7	3	0	0
LTU	0.0	54.8	21.0	5.2	19.1	0	3	2	1	4
LUX	0.0	100.0	0.0	0.0	0.0	0	1	0	0	0
LVA	0.0	50.6	27.0	12.1	10.3	0	2	2	1	1
MEX	34.1	35.9	9.1	0.0	20.9	14	64	22	0	109
NLD	25.7	63.8	10.6	0.0	0.0	8	23	9	0	0
NOR	0.0	51.8	0.0	3.2	45.0	0	6	0	1	12
POL	16.1	35.1	28.7	7.0	13.0	8	24	20	7	13
PRT	26.3	29.8	21.2	0.0	22.7	1	5	6	0	13
SVK	0.0	11.2	88.8	0.0	0.0	0	1	7	0	0
SVN	0.0	40.6	15.2	0.0	44.2	0	2	2	0	8
SWE	22.2	46.4	6.4	0.0	24.9	1	7	2	0	11
USA	59.2	27.2	6.7	0.0	6.9	31	69	23	0	56
OECD	42.0	33.9	13.0	0.8	10.3	276	715	362	38	759

Table B.2. 100 thousand inhabitants (metro threshold) with 60 minute drive

Population Living in TL3 Regions						Number of TL3 Regions				
Country	MR		NMR			MR		NMR		
	MR-L (%)	MR-M (%)	NM-M (%)	NM-S (%)	NM-R (%)	MR-L	MR-M	NM-M	NM-S	NM-R
AUS	56.8	20.8	1.1	0.0	21.3	4	14	1	0	31
AUT	31.3	24.4	32.2	0.0	12.1	5	6	15	0	9
BEL	22.4	40.5	35.7	1.0	0.4	4	13	24	2	1
CAN	43.4	28.6	3.9	0.0	24.1	28	41	24	0	200
CHE	0.0	43.8	49.6	0.0	6.5	0	7	16	0	3
CHL	40.5	48.5	3.3	0.0	7.7	5	23	3	0	23
CZE	24.6	28.1	44.5	2.8	0.0	2	3	8	1	0
DEU	30.7	42.8	22.8	0.3	3.4	62	177	129	3	31
DNK	35.4	33.4	30.4	0.0	0.7	4	3	3	0	1
ESP	35.1	37.4	24.9	1.2	1.5	4	23	20	3	9
EST	0.0	42.6	24.9	11.5	21.1	0	1	1	1	2
FIN	0.0	67.0	3.3	0.0	29.7	0	7	1	0	11
FRA	25.8	48.4	16.8	0.0	9.0	10	44	24	0	23
GBR	36.5	38.8	19.0	0.0	5.7	51	63	39	0	20
GRC	38.2	21.8	1.5	10.1	28.5	6	7	1	7	31
HUN	30.2	31.3	23.8	12.6	2.1	2	8	5	4	1
IRL	39.4	14.2	17.7	10.8	17.8	2	1	2	1	2
ISL	0.0	86.4	0.0	0.0	13.6	0	4	0	0	4
ITA	22.5	31.7	39.8	1.8	4.1	6	33	53	4	14
JPN	54.8	32.2	12.4	0.0	0.5	11	23	12	0	1
KOR	68.3	24.1	7.6	0.0	0.0	7	7	3	0	0
LTU	0.0	54.8	21.0	5.2	19.1	0	3	2	1	4
LUX	0.0	100.0	0.0	0.0	0.0	0	1	0	0	0
LVA	0.0	50.6	27.0	12.1	10.3	0	2	2	1	1
MEX	34.1	35.9	11.1	0.0	19.0	14	64	33	0	98
NLD	25.7	63.8	10.6	0.0	0.0	8	23	9	0	0
NOR	0.0	51.8	10.9	3.2	34.1	0	6	2	1	10
POL	16.1	35.1	36.0	3.6	9.2	8	24	27	4	9
PRT	26.3	29.8	27.5	0.0	16.4	1	5	8	0	11
SVK	0.0	11.2	88.8	0.0	0.0	0	1	7	0	0
SVN	0.0	40.6	52.0	0.0	7.3	0	2	8	0	2
SWE	22.2	46.4	9.6	0.0	21.7	1	7	3	0	10
USA	59.2	27.2	6.7	0.0	6.9	31	69	23	0	56
OECD	42.0	33.9	15.5	0.6	8.0	276	715	508	33	618

Table B.3. 250 thousand inhabitants (metro threshold) with 45 minute drive

Population Living in TL3 Regions						Number of TL3 Regions				
Country	MR		NMR			MR		NMR		
	MR-L (%)	MR-M (%)	NM-M (%)	NM-S (%)	NM-R (%)	MR-L	MR-M	NM-M	NM-S	NM-R
AUS	56.8	13.8	1.1	7.0	21.3	4	6	1	8	31
AUT	31.3	23.5	5.1	5.5	34.7	5	6	2	3	19
BEL	22.4	23.8	47.6	4.2	1.9	4	6	25	5	4
CAN	43.4	22.5	1.9	5.6	26.6	28	31	7	13	214
CHE	0.0	50.3	14.9	23.1	11.8	0	6	3	10	7
CHL	40.5	29.8	0.0	21.3	8.3	5	9	0	16	24
CZE	24.6	32.3	0.0	43.1	0.0	2	4	0	8	0
DEU	30.7	37.0	13.8	7.9	10.6	62	145	75	44	76
DNK	35.4	33.4	0.0	0.0	31.2	4	3	0	0	4
ESP	35.1	33.8	6.3	22.5	2.4	4	16	4	24	11
EST	0.0	42.6	0.0	36.3	21.1	0	1	0	2	2
FIN	0.0	46.1	0.0	20.9	33.0	0	3	0	4	12
FRA	25.8	40.2	5.3	13.7	15.0	10	31	5	21	34
GBR	35.4	32.5	16.3	5.7	10.1	50	52	31	9	31
GRC	39.6	9.6	0.0	21.4	29.4	7	1	0	12	32
HUN	30.2	20.3	0.0	45.1	4.4	2	4	0	12	2
IRL	39.4	14.2	0.0	28.6	17.8	2	1	0	3	2
ISL	0.0	0.0	0.0	86.4	13.6	0	0	0	4	4
ITA	22.5	24.1	11.8	32.4	9.2	6	17	12	50	25
JPN	54.8	29.6	14.6	0.4	0.5	11	21	13	1	1
KOR	68.3	21.2	7.4	3.1	0.0	7	6	3	1	0
LTU	0.0	46.5	0.0	34.5	19.1	0	2	0	4	4
LUX	0.0	100.0	0.0	0.0	0.0	0	1	0	0	0
LVA	0.0	31.0	0.0	58.7	10.3	0	1	0	4	1
MEX	34.1	30.8	7.9	6.2	21.0	14	49	17	19	110
NLD	21.7	31.7	23.4	22.6	0.6	6	8	14	11	1
NOR	0.0	42.4	5.9	6.6	45.0	0	4	1	2	12
POL	16.1	33.6	4.6	31.6	14.1	8	21	3	26	14
PRT	26.3	21.1	14.5	15.4	22.7	1	2	4	5	13
SVK	0.0	25.8	0.0	74.2	0.0	0	2	0	6	0
SVN	0.0	40.6	9.8	5.4	44.2	0	2	1	1	8
SWE	22.2	33.5	2.9	16.5	24.9	1	3	1	5	11
USA	59.2	25.0	6.6	2.4	6.9	31	59	18	15	56
OECD	41.9	28.9	8.9	9.9	10.4	274	523	240	348	765

Table B.4. 500 thousand inhabitants (metro threshold) with 45 minute drive

Population Living in TL3 Regions						Number of TL3 Regions				
Country	MR		NMR			MR		NMR		
	MR-L (%)	MR-M (%)	NM-M (%)	NM-S (%)	NM-R (%)	MR-L	MR-M	NM-M	NM-S	NM-R
AUS	56.8	8.1	0.0	13.8	21.3	4	2	0	13	31
AUT	31.3	9.0	1.8	23.2	34.7	5	2	1	8	19
BEL	22.4	24.8	47.1	3.8	1.9	4	7	24	5	4
CAN	43.4	17.7	2.8	9.5	26.6	28	22	7	22	214
CHE	0.0	29.6	11.4	49.3	9.7	0	4	2	14	6
CHL	40.5	11.6	0.0	39.6	8.3	5	3	0	22	24
CZE	24.6	22.7	0.0	52.7	0.0	2	2	0	10	0
DEU	30.7	20.3	10.4	27.8	10.7	62	73	50	140	77
DNK	35.4	0.0	0.0	33.4	31.2	4	0	0	3	4
ESP	35.1	17.5	3.1	41.9	2.4	4	8	1	35	11
EST	0.0	42.6	0.0	36.3	21.1	0	1	0	2	2
FIN	0.0	28.4	0.0	38.6	33.0	0	1	0	6	12
FRA	25.8	22.4	3.2	34.1	14.5	10	12	3	43	33
GBR	36.5	23.2	10.6	18.9	10.8	51	37	19	34	32
GRC	38.2	9.6	1.5	21.4	29.4	6	1	1	12	32
HUN	30.2	0.0	0.0	65.4	4.4	2	0	0	16	2
IRL	39.4	0.0	0.0	42.8	17.8	2	0	0	4	2
ISL	0.0	0.0	0.0	86.4	13.6	0	0	0	4	4
ITA	22.5	15.2	6.7	46.4	9.2	6	9	7	63	25
JPN	54.8	19.9	16.4	7.7	1.2	11	16	9	9	2
KOR	68.3	11.3	13.4	7.0	0.0	7	3	4	3	0
LTU	0.0	26.5	0.0	54.4	19.1	0	1	0	5	4
LUX	0.0	100.0	0.0	0.0	0.0	0	1	0	0	0
LVA	0.0	50.6	0.0	39.1	10.3	0	2	0	3	1
MEX	34.1	22.1	6.1	16.6	21.1	14	30	11	43	111
NLD	25.7	20.7	33.5	19.5	0.6	8	6	16	9	1
NOR	0.0	23.9	0.0	31.0	45.0	0	2	0	5	12
POL	16.1	20.1	3.1	45.0	15.6	8	12	2	35	15
PRT	26.3	16.7	12.5	21.8	22.7	1	1	3	7	13
SVK	0.0	11.2	0.0	88.8	0.0	0	1	0	7	0
SVN	0.0	25.0	9.8	21.1	44.2	0	1	1	2	8
SWE	22.2	29.9	2.9	20.0	24.9	1	2	1	6	11
USA	59.2	19.0	5.1	9.8	6.9	31	36	8	48	56
OECD	42.0	19.0	7.6	20.8	10.6	276	298	170	638	768

Table B.5. Half million inhabitants (metro threshold) with 60 minute drive

Population Living in TL3 Regions						Number of TL3 Regions				
Country	MR		NMR			MR		NMR		
	MR-L (%)	MR-M (%)	NM-M (%)	NM-S (%)	NM-R (%)	MR-L	MR-M	NM-M	NM-S	NM-R
AUS	56.8	8.1	0.0	13.8	21.3	4	2	0	13	31
AUT	31.3	9.0	10.4	37.2	12.1	5	2	4	15	9
BEL	22.4	24.8	49.9	2.5	0.4	4	7	27	5	1
CAN	43.4	17.7	5.9	9.0	24.1	28	22	14	29	200
CHE	0.0	29.6	27.7	36.1	6.5	0	4	7	12	3
CHL	40.5	11.6	0.9	40.2	6.8	5	3	1	23	22
CZE	24.6	22.7	0.0	52.7	0.0	2	2	0	10	0
DEU	30.7	20.3	22.2	22.9	3.9	62	73	110	124	33
DNK	35.4	0.0	0.0	53.5	11.0	4	0	0	5	2
ESP	35.1	17.5	9.8	35.6	2.0	4	8	5	32	10
EST	0.0	42.6	0.0	36.3	21.1	0	1	0	2	2
FIN	0.0	28.4	0.0	38.6	33.0	0	1	0	6	12
FRA	25.8	22.4	6.8	34.3	10.8	10	12	6	47	26
GBR	36.5	23.2	20.0	14.6	5.7	51	37	38	27	20
GRC	38.2	9.6	1.5	22.4	28.5	6	1	1	13	31
HUN	30.2	0.0	4.2	63.5	2.1	2	0	1	16	1
IRL	39.4	0.0	0.0	42.8	17.8	2	0	0	4	2
ISL	0.0	0.0	0.0	86.4	13.6	0	0	0	4	4
ITA	22.5	15.2	22.2	35.0	5.1	6	9	24	56	15
JPN	54.8	19.9	17.0	7.7	0.5	11	16	10	9	1
KOR	68.3	11.3	13.4	7.0	0.0	7	3	4	3	0
LTU	0.0	26.5	0.0	59.8	13.7	0	1	0	6	3
LUX	0.0	100.0	0.0	0.0	0.0	0	1	0	0	0
LVA	0.0	50.6	0.0	39.1	10.3	0	2	0	3	1
MEX	34.1	22.1	8.2	16.4	19.3	14	30	18	46	101
NLD	25.7	20.7	43.9	9.7	0.0	8	6	21	5	0
NOR	0.0	23.9	10.9	31.0	34.1	0	2	2	5	10
POL	16.1	20.1	8.1	46.3	9.3	8	12	6	37	9
PRT	26.3	16.7	21.9	19.8	15.3	1	1	6	7	10
SVK	0.0	11.2	10.3	78.5	0.0	0	1	1	6	0
SVN	0.0	25.0	34.5	33.1	7.3	0	1	5	4	2
SWE	22.2	29.9	6.5	16.5	24.9	1	2	2	5	11
USA	59.2	19.0	5.2	9.7	6.9	31	36	9	47	56
OECD	42.0	19.0	11.5	19.3	8.3	276	298	322	626	628