Fondation idea

From States to Cities: Should Luxembourg be compared to Metropolises Rather than States? A Study of the Economic Dynamics

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Contents

Abbreviations 2
I. Introduction 3
II. Luxembourg at a Glance 6
II.1 Demographics 10
II.2 Labor market 12
II.2.1 Cross-border workers 12
II.2.2 Concentration of employment 13
II.2.3 Investment and R&D Activities 13
II.2.4 Job Creation and Social Cohesion 15
II.3 Housing 18
III. Literature Review & Methodological Issues 25
III.1 Luxembourg and the Notion of "Small States" 25
III.2 Cross-border Cooperation between Cities in Europe 28
IV. Luxembourg and Domestic Metropolises 36
IV.1 France 36
IV.2 Germany 43
V. Synthetic Indicators and Final Remarks 48
References 65

Abbreviations

ACOSS: Agence Centrale des Organismes de Sécurité Sociale (France)

ECSC: European Coal and Steal Community

EEC: European Economic Community

EMU: Economic and Monetary Union

EU: European Union

IMF: International Monetary Fund

INSEE: France's National Institute of Statistics and Economic Studies

LIEIS: Luxembourg Institute for European and International Studies

OECD: Organization for Economic Co-operation and Development

STATEC: the government statistics service of Luxembourg

WTO: World Trade Organization

I. Introduction

There are many reasons to believe that Luxembourg is an "exceptional" country. The numbers are telling. According to Eurostat, for the period 2009-2017 alone, Luxembourg increased its population by a staggering 19.67% –far above the growth experienced by the neighboring Germany (a negligible 0.6%), France (4.1%) or Belgium (5.57%). There are other cases were the magnitude of Luxembourg's growth nullifies any rationale for making international comparisons. Indicatively, we mention the GDP that for the period 2007-2017 grew by an outstanding 77.46%, leaving France (+18%) or even Germany (+30.4%) lagging far behind.

That was the main reason that led us to undertake this research. Given Luxembourg's size, could it be more meaningful to compare the Luxembourg *economy*[1] not with other states but with metropolitan regions instead? A 19.67% population growth within almost a decade seems extraordinary but if we compared it not with a national-level average but with a metropolitan region, like Munich or Lille, we might observe similar dynamics. It goes without saying that it is easier for Luxembourg (given its size) to reach a population of (approximately) 590,000 in 2017 (from a population of 493,000 in 2009) than for France, a country of almost 67 million people as of 2017 (from 64.35 million in 2009). A similar rate of increase for France would have been unimaginable.

This research nests on the substantial literature of cross-border cooperation between cities. From EU reports like the METROBORDER project to national-level reports like the LISER (2015) study, research has shown that cross-border polycentric metropolitan regions (in Europe) are an important emerging phenomenon of spatial organization that has significant development potentials (METROBORDER, 2010:7). The objective of these reports is to map and to observe and highlight the organization of the cross-border metropolises and to explore ways how to better use their potentials and development opportunities. Our aim will also be to better understand the economic structure and the dynamics within large cities (metropolises) but with an interesting twist. We will not study cross-border metropolises (like Geneva or Basel), something that has already been explored (see, *inter alia*, METROBORDER, 2010; LISER, 2015; Durand et al., 2017), but more "traditional", domestic metropolises.

The reader should have in mind that the methodologies and definitions regarding crucial terms of our study like what a "metropolis" means or what can be defined as the "center" and the "periphery" of a metropolis, adopted by different institutions (or even different studies of the same institutions), make national comparisons (let alone international comparisons like ours) an almost herculean task. In this study we used data drawn from studies with comparable methodologies to minimize any risks. For the purpose of our study, a "metropolis" will refer to a prominent/capital city that is an economic, political and societal center within a country (or a large region), while the term "metropolitan region" will refer to a metropolis and its respective hinterland. It should also be noted here that our research does not aim at being exhaustive (far from it). It serves much more as a suggestion for future research on a topic

[1] It is of great importance here to keep in mind that we propose a comparison of Luxembourg's economy with the economies of European metropolises. Given that Luxembourg is a state, there can be no comparison between Luxembourg's administrative and regulatory powers, its institutional setting and power configurations with those of a simple metropolis. Perhaps certain German metropolises like Hanover might be closer in terms of political power to Luxembourg. Still, no such comparison will be made here and we will focus exclusively on the economic dynamics.

that, to the best of our knowledge, has not attracted enough attention thus far and has the potential of uncovering hidden socio-economic dynamics. At the same time, it will help "re-attach" Luxembourg (that will stop being such an outlier) to the trend of conducting international comparisons with the prospect of identifying best practices and policy recommendations.

The rest of the document is structured as follows. In part II we try to present a brief overview of Luxembourg's economy with a special aim to identify its specificities and uncover the spillovers between the country's most important challenges. In Luxembourg, the population varies mainly as a result of migration. At the same time, the country is heavily dependent on foreign markets not just for exporting/importing goods and services but also for importing labor. Cross-border workers occupy almost 45% of the jobs in Luxembourg. As a result, the spillovers between population growth, economic growth in general and labor market dynamics in particular are very strong and, given the number of cross-border workers, great in scale. These interactions are the focus of the second part and their impact on some of Luxembourg's most pressing issues like the housing market.

In part III we deal with more methodological issues. We present a brief literature review aiming to link our contribution to existing research and try to address the elephant in the room, namely, why we propose a comparison of Luxembourg with metropolises and not with small States (something that bears the added benefit of being the dominant practice)? We argue that there are simply not enough cases of small countries in the world to permit a meaningful comparison with Luxembourg. The countries that are usually included in the "Small States category" are highly diverse, both in terms of their socio-economic trajectory and political history and in terms of geography and the structural challenges they face. We cannot group together the economies of the post-communist Baltic States that adopted parliamentarism only in the 90s with highly advanced countries (both economically and technologically) like Luxembourg. We cannot compare island-States like Malta with Luxembourg either, given the different nature of the structural challenges that they face. Island-states for example face the risk of being isolated, something that is not applicable to the case of Luxembourg, a geographically landlocked country at the heart of Europe. Following this, we briefly examine the literature on cross-border cooperation focusing mainly on the METROBORDER report (2010) and the LISER study (2015) building on it, and try to draw some parallels with our research of the (domestic) metropolises. We finally offer an explanation regarding the choice of the countries that compile our (very modest) sample, namely, data limitation and suggested cultural proximity to Luxembourg.

In part IV we try to make our case for the added value of a comparison between Luxembourg and metropolises. We employ a set of quantitative and qualitative indicators that help us prove that the growth dynamics that most French and German metropolises exhibit surpass their national-level average by far. Having also in mind that the sizes of the metropolises are much closer to Luxembourg than, say, Germany –or even Belgium–, there is a sound rationale behind our proposed change of focus from the State to the City[2]. In this section we also offer some key figures of the metropolises of our sample and try, when data permit, to identify some parallels with the case of Luxembourg –especially regarding the spillovers and growth dynamics that we

[2] And as we have seen in part III, there is also a rationale from changing the focus from the Small State to the City, given the nature of structural challenges that the world's small States face –challenges that distinguish them quite clearly from Luxembourg, reducing the benefit of a comparison between them.

have identified in part II. Unfortunately, given the data limitations for this level of analysis (the metropolis) the value of some of the findings (with regard at least our aim to make comparisons with the Luxembourgish case) is limited. Moreover, some initiatives that the French authorities have undertaken these last years with regard to the study of urban centers and metropolises (like *France Stratégie*) enabled us to explore the French cases of our study more thoroughly. Finally, we try to uncover the different dynamics *within* the metropolises, when this is possible, by examining the different development dynamics between the center and the periphery of the metropolis. Unfortunately, data constraints did not allow us to make this distinction in the empirical part of our analysis and, therefore, we treat our metropolises as a whole.

In the concluding section V that is also the empirical heart of our research, we construct a table of synthetic indicators by employing a set of four indices: population growth, dynamics of job creation and evolution of the GDP - GDP/capita, and see how each State and each metropolis of our sample "scores" in comparison to Luxembourg. The indices were chosen based on data availability and with the belief that they capture Luxembourg's economic dynamics, as described in section II. We also present our answer to our research question ("should we compare Luxembourg's economy with Metropolises instead of States?") and we reflect on the limitations of our research, including the considerable data limitations. Finally, we offer some modest guidance for future research given that, to the best of our knowledge, this is a topic that remains under-researched.

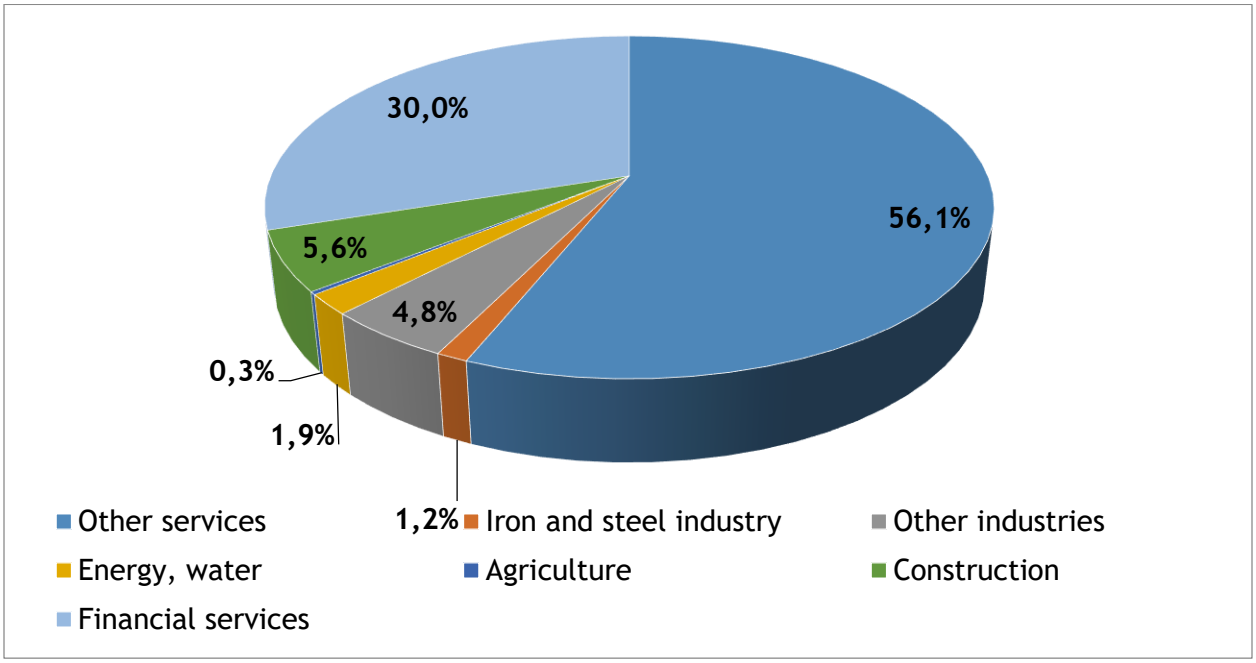
It is important to keep in mind that when we refer to Luxembourg (even when we include the term in tables comparing cities) we exclusively refer to the State and not the capital, unless we explicitly mention it.

II. Luxembourg at a Glance

Luxembourg is an advanced economy with the highest per capita income in the EU-28, reflecting the dynamic services sector, notably in banking and other financial services. The economic structure of the country is a typical example of a largely deindustrialized, service-led economy. Financial services in particular, represent 30% of the total (gross) value added as of 2015 while the service sector (as a whole) represents around 86.1% (table 1).

Table 1

Sectoral composition of the Luxembourgish economy (% of value added)

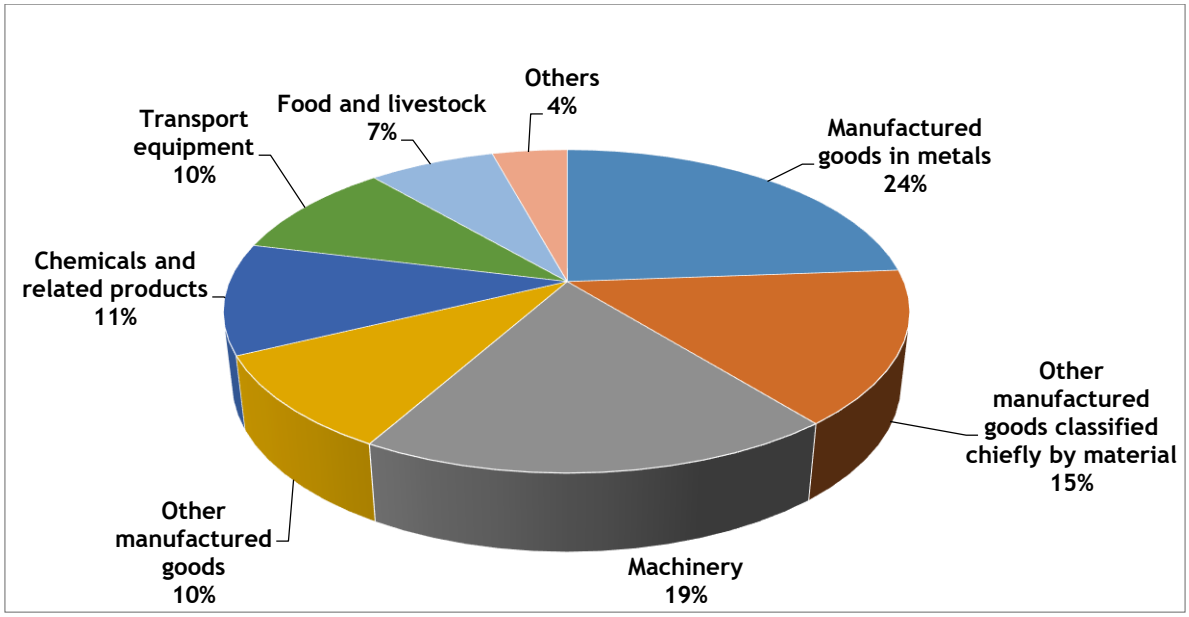


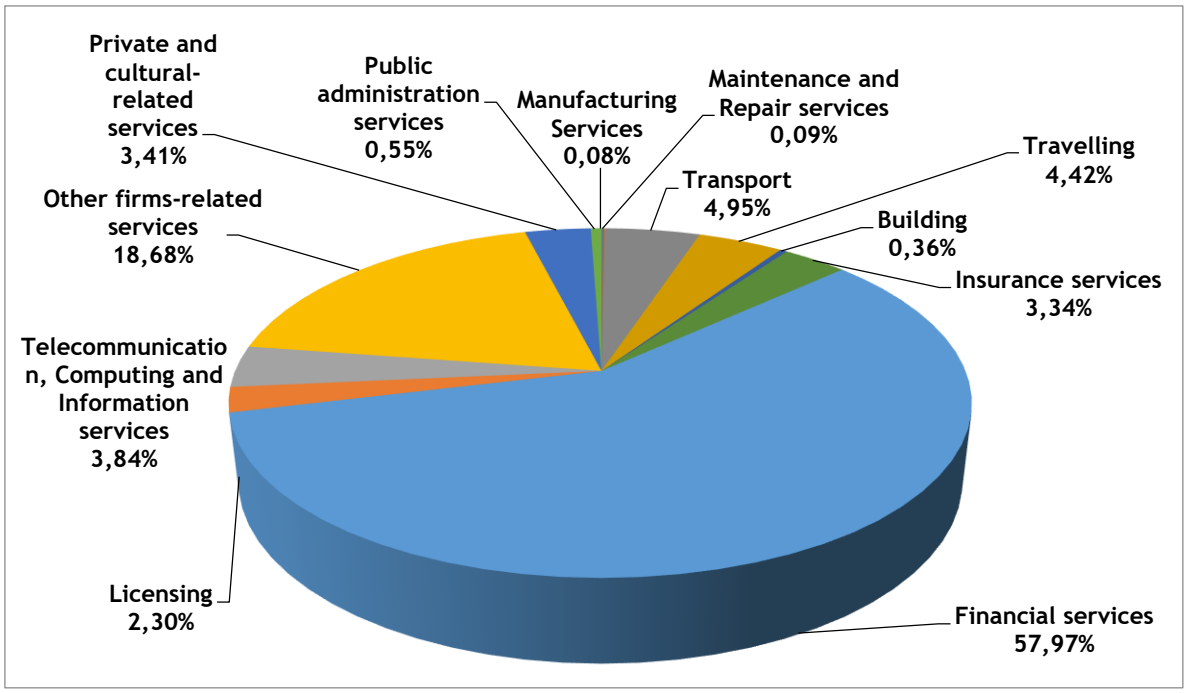
Source: STATEC

Luxembourg, being conveniently located at the heart of continental Europe and recognizing the constraints created from its small domestic market, tried already from the 19th century to join bigger "economic unions" to compensate for this disadvantage. Thus, it was integrated into the Zollverein in 1842, it formed a customs and monetary union with Belgium after World War I, it formed the Benelux union in 1944, it became a founding party of the ECSC (1951) and EEC (1957) that paved the way for the Single European Act (1986, Single Market), and joined the EMU in 1999. Being a small open economy, it relies heavily on neighboring economies for importing resources (including labor) and exporting its products (mainly services). In reality, it turns out that despite the fact that Luxembourg has a trade deficit (table 4), it is a net exporter of services (table 5).

Table 2

Exports of goods & services by category (2017, % of total value)

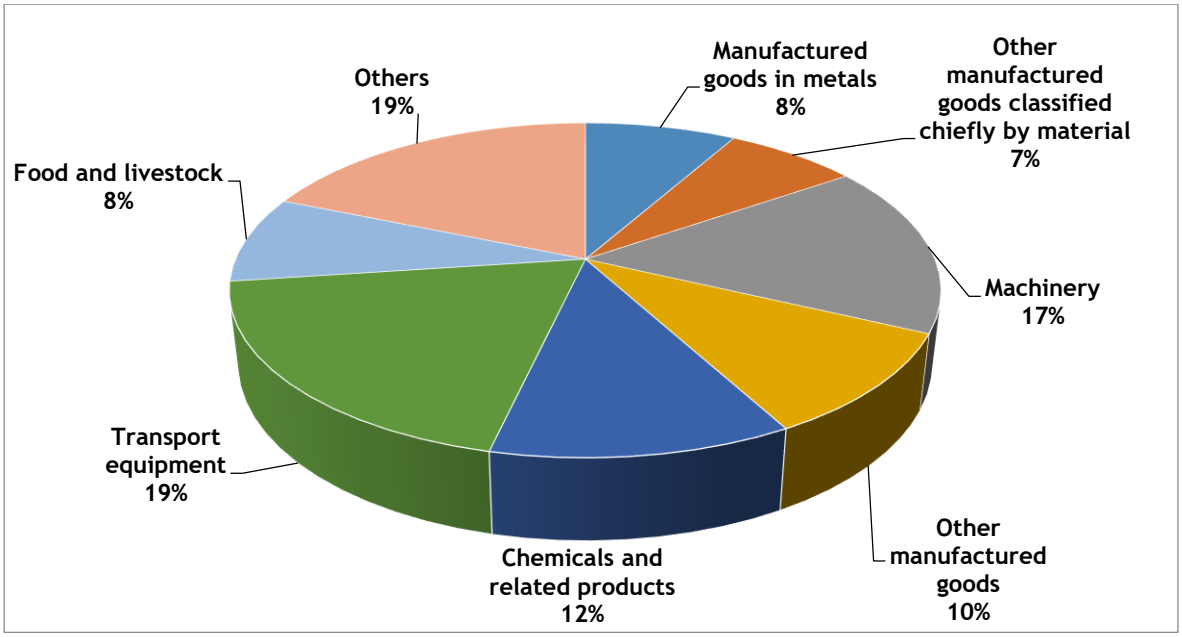


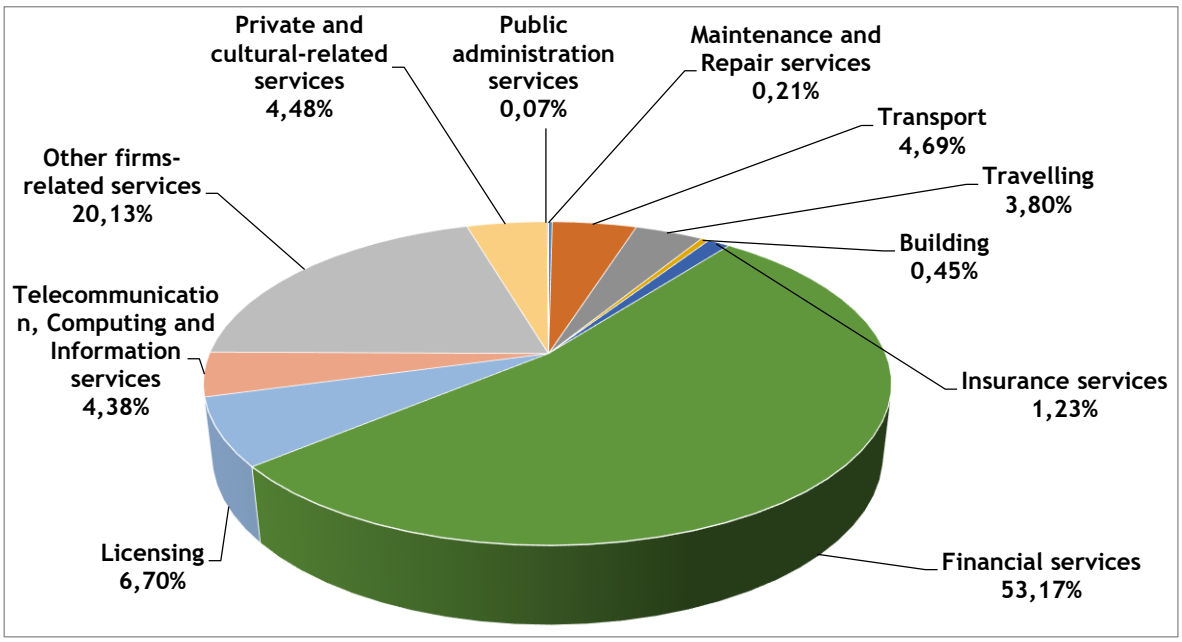


Source: STATEC

Table 3

Imports of goods & services by category (2017, % of total value)

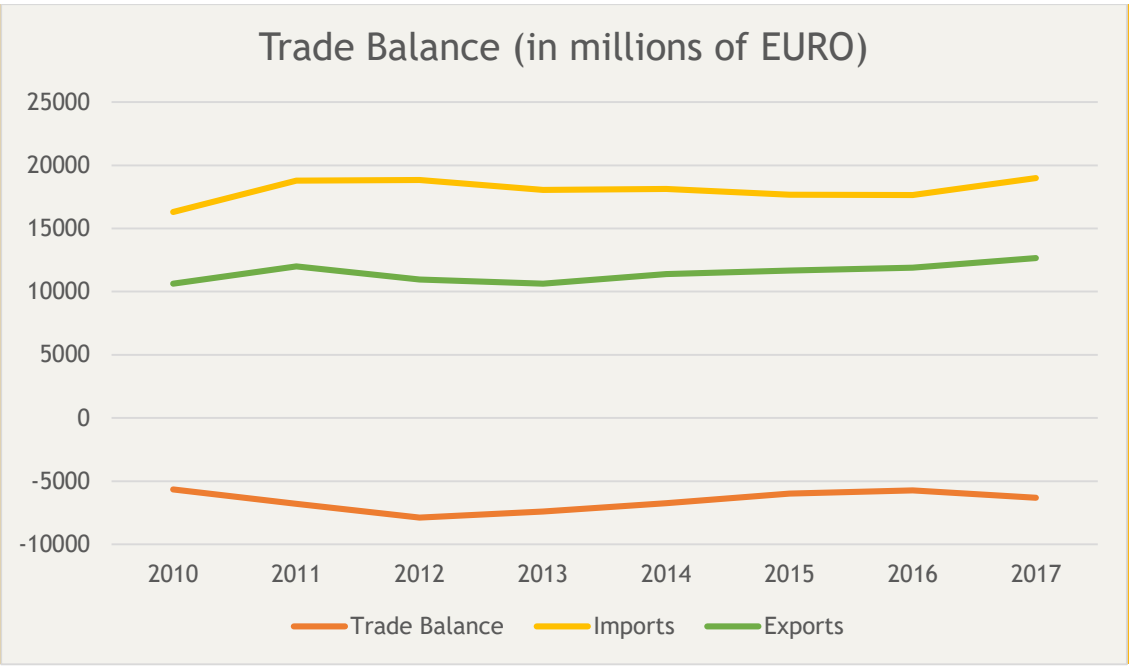




Source: STATEC

Table 4

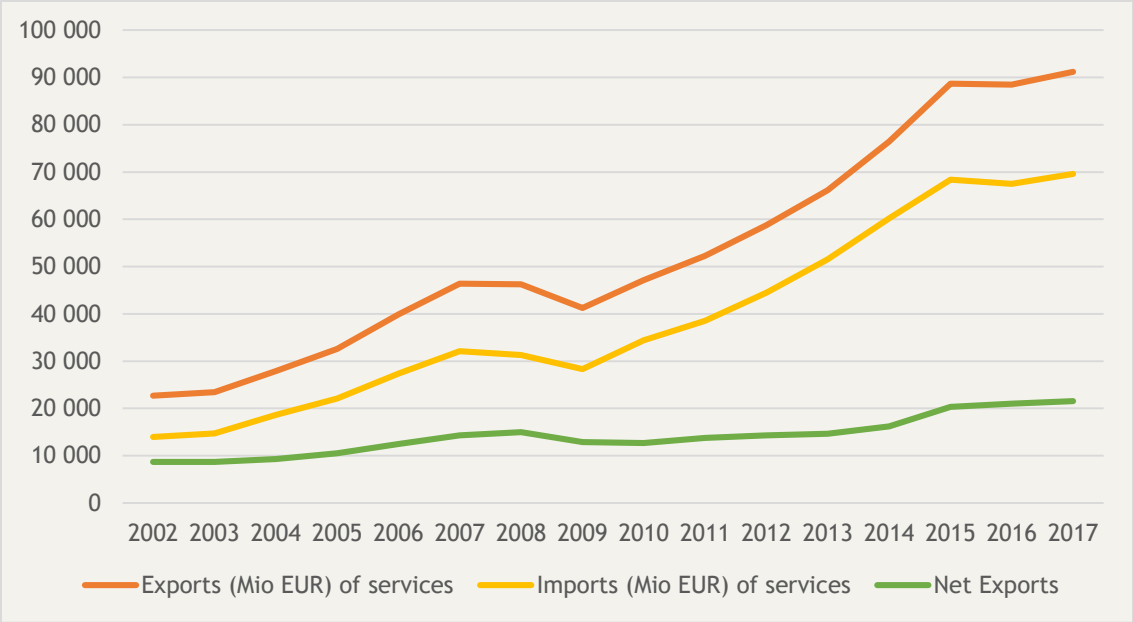
Balance of trade



Source: author's calculations, STATEC

Table 5

Net exports of services (in million EURO)



Source: author's calculations, STATEC

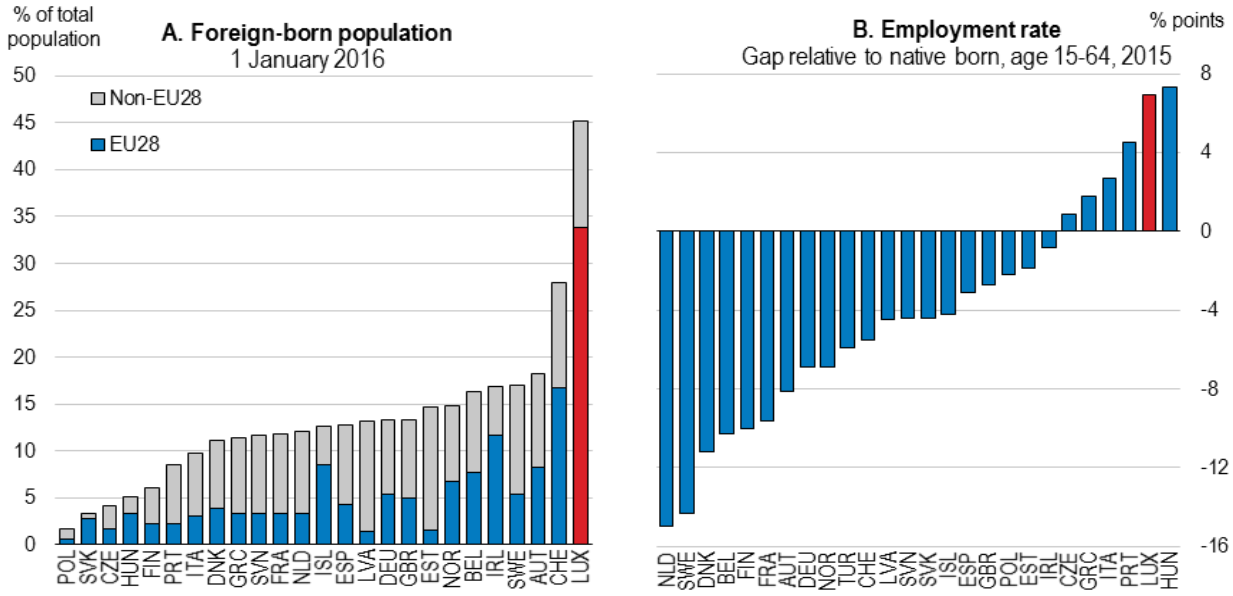
II.1 Demographics

In Luxembourg, as in other small countries (and metropolitan areas, as a matter of fact), the population varies mainly as a result of migration. The surplus of arrivals on departures is the principal reason of the population's increase. The study of population dynamics becomes, therefore, much more complicated due to the predominant weight of net migration in population growth and its volatility; volatility that is linked to economic fluctuations. In addition, given that foreign workers come mostly from the EU countries, one must not take into account economic fluctuations that occur only in Luxembourg but also in the EU (and especially –but not exclusively- the countries of the "*Grande Région*", i.e. Belgium, France and Germany).

Luxembourg is highly reliant on foreign labor, with the "*foreign-born*" accounting for a sizable (45%) part of the population (OECD, 2017:44). OECD also claims that the overall employment rate of the foreign-born is higher than that of the natives, estimating that their fiscal impact is positive, with their overall net benefit to the budget being at 2% of GDP (the highest across OECD). For the Organization, Luxembourg's ability to create jobs and the country's strong economic growth are the main determinants of these flows.

Table 6

Immigrant Population, its Origins and its Employment Rate

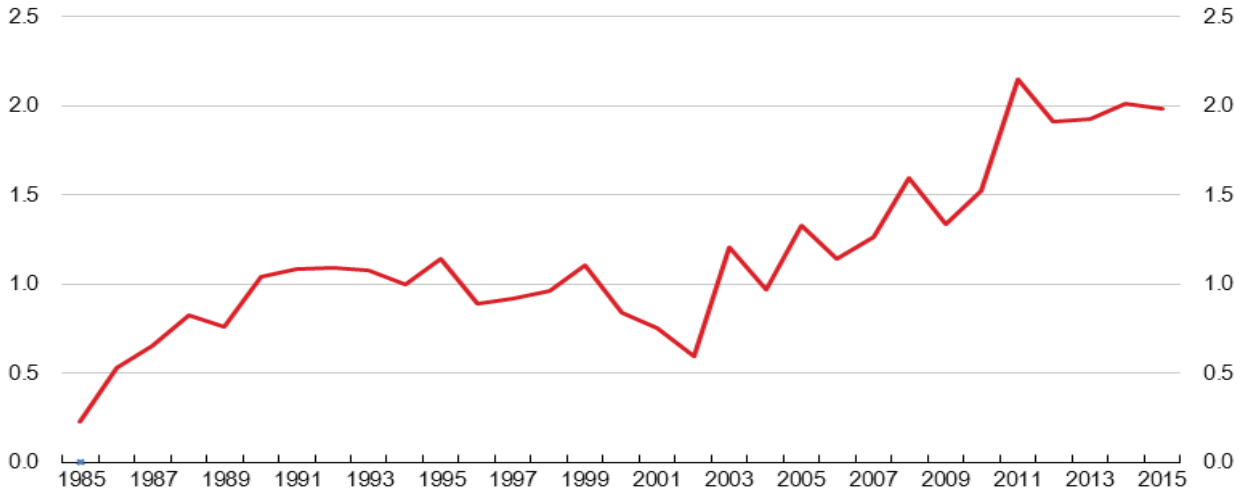


Source: OECD (2017:45)

We can also observe that this trend of attracting migrants (especially from the EU) has long-term characteristics since at least the mid-80s[3] (since Luxembourg's economic rise linked to the development of the financial center - and the services sector in general), reaching its peak in the years following 2001.

Table 7

Net Migration Flows (in % of total population)



Source: OECD (2017:45)

A recent study published by STATEC (Haas and Peltier, 2017:15) estimates that more than 80% of population growth comes from migratory flows which, in turn, are determined *inter alia* by Luxembourg's high net available income (compared to that of neighboring countries). It is telling for example that, in a period spanning from January 1960 to January 2017, Luxembourg experienced a rise in population growth of almost 89%, with population growth in the EU-28 being only around 25% (*Ibid*: 15). We can therefore argue that Luxembourg's population growth is dependent *inter alia* on the country's economic growth. Overall, Luxembourg's population growth depends on three dimensions (apart from the "traditional" births minus deaths calculation): (i) the openness of the domestic economy to foreign investments, (ii) the participation to the EU and the common market that facilitates free movement of capital and labor, and (iii) productivity growth in Luxembourg and neighboring countries.

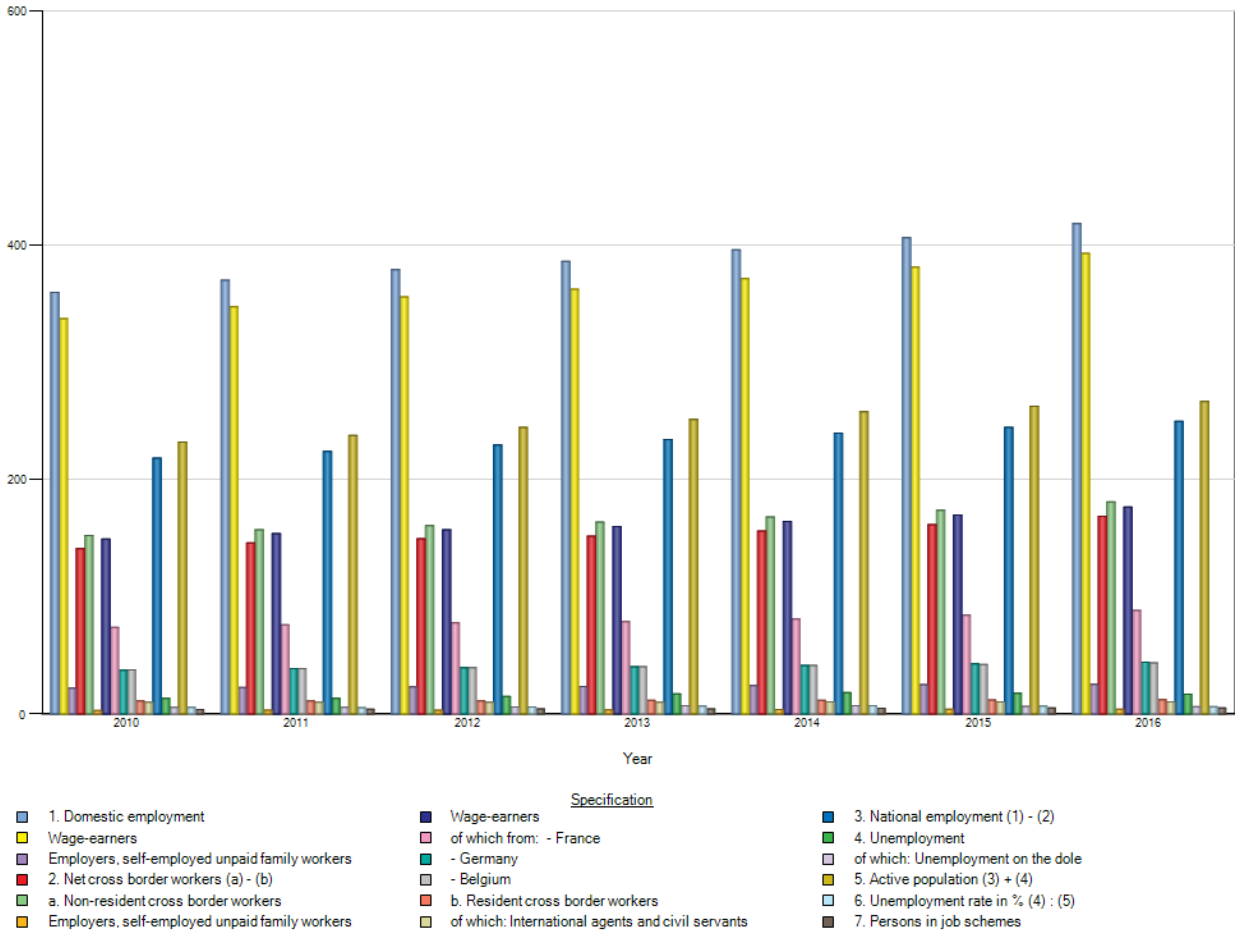
Given the uncertainty regarding economic growth in the long term, it is difficult to make safe assumptions for long term population growth in Luxembourg. STATEC's study however, sketches different possible scenarios based on different (economic) growth projections. For 2030, the reference projection forecasts "*a population of 736,000 (variant with 66% of cross-border workers) and 785,000 (scenario with 33% of cross-border workers)*", i.e. an increase of around 25% and 33% respectively compared to 1/1/2017. For 2060, four are the main scenarios: "*996,000 people in the scenario of stagnation of GDP, 1,035,000 in the scenario with 1.5% of GDP growth, 1,089,000 in the scenario with 3.0% GDP growth, 1,162,000 in the 4.5% scenario.*" (*Ibid*: 37).

[3] Although the trend became clearly dominant after the rise of Luxembourg as a financial center, it was existent already from the beginning of the 20th century, focused on industry –especially ironworks.

II.2 Labor market

Table 8

Overview of the Labor Market (in 1,000 persons)



Source: STATEC

II.2.1 Cross-border workers

An issue of great importance, and also linked to that of demographics, is the issue of the labor market condition in Luxembourg. As a recent publication of Luxembourg's Central Bank (Matha et al., 2018:5) claims, the labor market of Luxembourg is "*highly reliant on foreign workers*", with the cross-border workers coming from the *Grande Région* representing about 45% of all jobs in Luxembourg and contributing not only to tax revenues and economic output but also to the demand for products and services in Luxembourg. The total estimated spending of cross-border Household consumption in 2010 was €1 billion, with the annual average spending of the cross-border worker at €9,300. The impact of the cross-border workers in the economy has a

semi-permanent duration in the sense that most of them are employed on permanent contracts and have been working in Luxembourg for an average of 10 years, mainly in the retail and wholesale sectors and the financial sector (*Ibid*: 6). In more detail, as Hein (2018) has recently argued, the sectors in which the cross-border workers represent more than 50% of the employers have remained the same since 2009: manufacturing industry (64%), administrative services (55%), shops and garages (55%), specialized, scientific and technical activities (53%), information and communication (53%), construction (52%) and finance-insurance (50%). It is also noteworthy that almost 20% of the cross-border workers' total financial assets and liabilities are held in Luxembourg –including voluntary pensions/life insurance plans (Matha et al., 2018: 28-29).

II.2.2 Concentration of employment

IMF (2017:8) argues that Luxembourg has an economy that is less diversified, even when compared to other small countries. A very small number of firms (32) account for a significant part of employment (1/4 of total employment) – with the public sector topping the list. In more detail, the financial sector accounts for almost ¼ of GDP, and together with the real estate, wholesale and retail trade sectors account for almost 47% GDP (*Ibid*: 3). The financial and real estate sectors provide 28% and 8% of total gross value added, respectively, but account only for 10% and 1% of total employment. At the same time, the broad sector of public administration accounts for 16% of total value added but for 29% of total employment. Another sector that appears significant when examining its share of total employment is arts and entertainment (10% of total employment) is not important in terms of value added (only 2% of total gross value added) (*Ibid*: 6).

II.2.3 Investment and R&D Activities

When examining the sources of investment, IMF (*Ibid*: 8) finds that (private) investment does not come from the financial sector but from industry, trade and real estate, and concentrates mainly on construction (about 60%). The public sector has undoubtedly played an active role in the economy, either indirectly (reasonably sound fiscal policies –at least in the short-term, predictable economic environment) or more directly by supporting key industries, being the most important source of employment and a major source of investment, compensating for the relatively low private investment and supporting high output growth (*Ibid*: 3-4,12).

There are some issues however, that need to be further explored. When it comes to R&D, for example, the relatively low levels of private investment are partly compensated by the rising levels of public investment[4] but the country is still not expected to reach its R&D intensity target of 2.3-2.6% of GDP by 2020[5] (Allegrezza, 2016:142). Another point worth mentioning is the fairly limited cooperation between private firms and public-funded research institutions

[4] The state in Luxembourg finances 48% of R&D (Hein, 2017:6).
[5] For 2015, Luxembourg's R&D intensity remained at the 2012 levels, namely 1.3% of GDP (Hein, 2017:3).

(below EU average). On the other hand, recent publications have cast some doubt over the arguments regarding the state of investment in Luxembourg, indicating that the situation might be a bit more complex than IMF's estimations. Hein (2017:1) confirms that, despite the fact that over the past fifteen years the (nominal) public R&D spending has multiplied by 12 times and the public sector's research staff by 7, Luxembourg still falls short compared to other EU countries, especially if one considers the participation of business, with business R&D spending at just 0.67% of GDP (compared to a EU-28 average of 1.3%) (p.7). He argues (p.11-12) however that the low business R&D spending might be an effect of the economy's structure and that the indicators used by organizations like the IMF express a significant sectoral bias that place Luxembourg at disadvantage in international comparisons. As he (p.10) observes "*Countries where the industrial sector is more important in relative terms would be*" ceteris paribus "*more likely to display an overall indicator of private R&D intensity superior to others*". It is the sectoral composition of the Luxembourg economy that is (mainly) to blame for the low participation of enterprises in R&D spending, since an economy that is specialized in (low-intensive in R&D) services like finance/insurance will, almost by definition, have low(er) R&D intensity.

Overall, Allegrezza (2016) seems to accept IMF's views regarding the condition of R&D spending in Luxembourg, while Hein (2017) is making an argument based on the specificities of Luxembourg and its sectoral development. From our part, we tend to agree with the argument that there is indeed a sectoral bias in IMF's indicator (R&D intensity) that could make international comparisons problematic. Further study is needed, however, before one can estimate clearly the magnitude of this bias. In any case, the condition of Luxembourg's innovation ecosystem however is far from complete, with the relatively low levels of strategic public-private partnerships (in line with Freeman's and Mazzucato's conclusions[6]) being one of the most important obstacles that the State has to overcome.

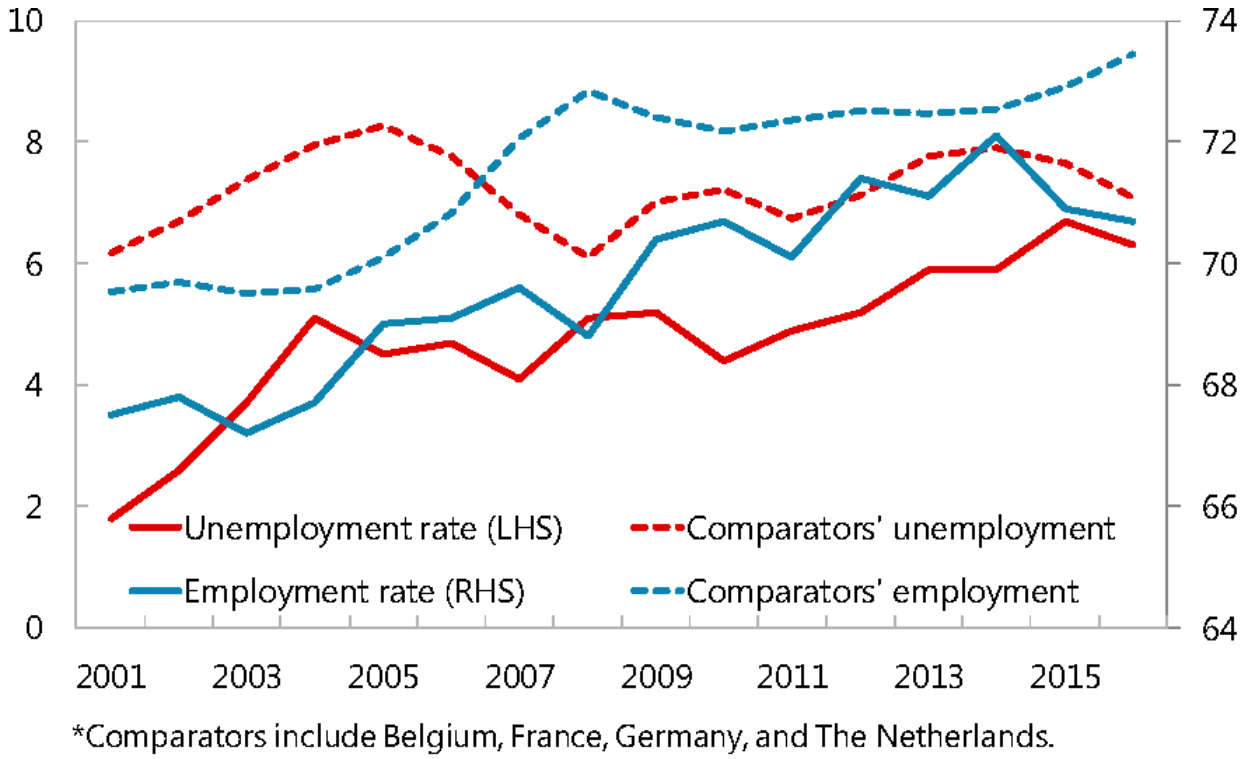
[6] Freeman (1995) was a pioneer in establishing the importance of the close cooperation between public-funded research with production (private firms) towards the goal of achieving sustainable (in the long run) innovation-led growth, while Mazzucato (2013) has pointed out, by presenting case studies like the development and successful commercialization of the Internet and iPhone, that one of the major reasons for USA's global "entrepreneurial" leadership is exactly this close cooperation between public research and private institutions – something that the EU generally lacks. It appears that even Luxembourg, a country with particularly healthy fiscal balances, is not able to escape from that EU trend.

II.2.4 Job Creation and Social Cohesion

Job creation in Luxembourg is strong but the country experiences two significant (and interlinked) challenges: (i) despite very strong net employment creation, there has been only a gradual and somewhat slow decline of unemployment rates and (ii) many of these new jobs are filled by cross-border workers[7]. Other worth mentioning aspects of Luxembourg's labor market (IMF, 2018) include the relatively weak female attachment to the market and the relatively low employment rate of residents (especially for low-skilled, young, and old workers). Some clarifications are in order. It has been almost 10 years since the recent financial crisis and unemployment rates have not yet returned to their pre-crisis levels. It is true that unemployment is low by EU standards but remains high for Luxembourg when compared to its historical levels. The unemployment was at 2% in 2001, stabilized around 4.5%-5% between 2004-2010, reached its peak in 2014 (7.1%) and, as for 2018, it remains at about 2% above the pre-crisis levels (*Ibid*: 35).

Table 9

Unemployment and Employment Rates (Unemployment rate 15-64, employment rate 20-64)



Source: IMF (2018:35)

[7] This is the result of very strong employment growth and of the fact that residents are not enough and/or not always sufficiently qualified.

The fact that this situation of persistent[8] unemployment continues despite the strong net employment creation, reveals the existence of mismatches between the qualifications of the unemployed and the skills desired by employers (a serious problems since skills shortages can –*inter alia*– reduce labor productivity and the firms' ability to innovate). The (post-crisis) unemployment rates might not have changed for the high-skilled labor but it did so for medium- and low-skilled workers and the non-natives. The fact that employment shifts towards high value-added sectors (that traditionally employ high-skilled labor) can worsen the situation for the low- and medium-skilled workers (Marcolin et al., 2016). By largely being a knowledge-based economy, Luxembourg attracts top-end firms, specializing in international services and requiring a highly skilled and adaptable workforce (OECD, 2017:58). With digitalization, innovations in financial technology and disruptive technological change affecting both job vacancies and the type of skills required, the pressure on mid-skilled workforce will increase even more. OECD (*Ibid*: 60) estimates that the "[p]*erceived mismatch*" between the qualifications of the unemployed and the skills desired by employers in Luxembourg is above the EU average and should be calculate at "*more than 45%*". This mismatch indicates the existence of educational problems (see *infra*).

A special note should be made to non-EU immigrants that account for about one-tenth of total population. Higher unemployment and lower wages in this group –many times only about 50% of the wages earned by natives (Manço, 2014) – lead to high relative poverty rates among non-EU immigrants, weakening social cohesion. Trying to capture more qualitative aspects of the integration challenges that Luxembourg faces, OECD (2017:44) notes the considerable labor market fragmentation and the modest participation of non-EU immigrants in the public life –in terms of working in the public sector, voting or participating in the public debate. In Hirschman's (1970) terms, a large part of the population lacks "*voice*". OECD's point on market segmentation is better understood if we consider that immigrants "*from different origins dominate employment in different sectors*" with "*firms tend*[ing] *to form relatively homogenous work teams*", lowering thus the "*quality of job matching*". Some authors have argued (Marchiori et al., 2015; Allegrezza, 2016) that the low participation of the non-natives to the public live (in terms of working in the public sector) might be an indication of a selection bias – perhaps as a response to the feeling of marginalization that many Luxembourgers seem to share (Allegrezza, 2016:148) (see also sub-section III.2). The State, by requiring the mastery of French, German *and* Letzebuergesch (that became the national language only in 1984) for admitting people to most jobs in the civil service, "excluded" (indirectly) the non-natives. Indeed, almost 50% of the "*national workforce*" (that excludes cross-border and foreign-born workers) "*are employed in the civil service*" (Allegrezza, 2016:148), indicating a selection bias.

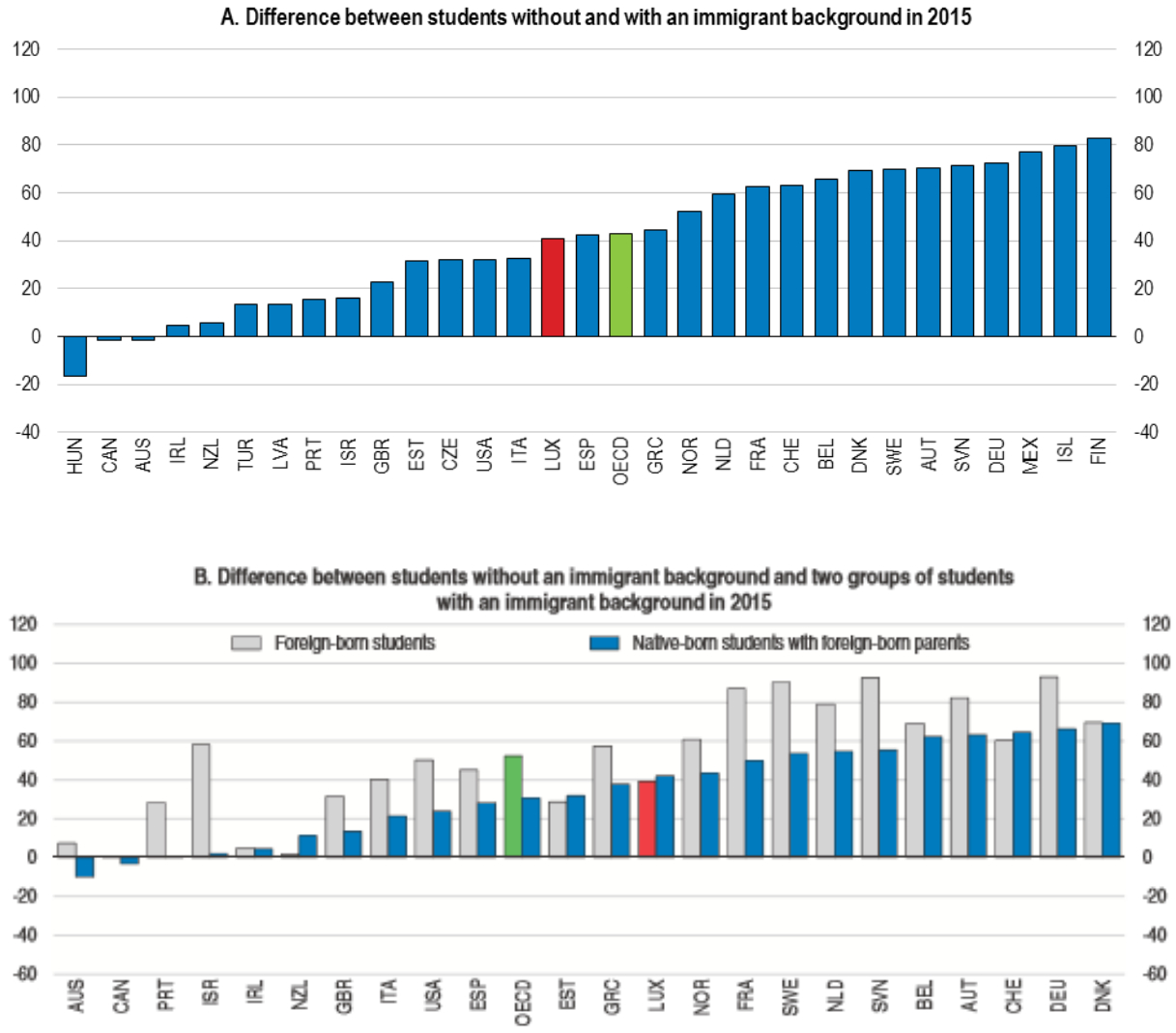
As noted earlier, an obvious way to reduce mismatches between job vacancies and skills required, and increase social cohesion by –*inter alia*– increasing social mobility, is the education system. In Luxembourg, however, despite the high public spending on education, students (when compared to other countries) fail to get higher test scores (IMF, 2017:19). For the Fund (*Ibid*: 32) education's lower performance can be (partly) explained by Luxembourg's trilingual curriculum, students' diverse population, and the challenges faced by the "*socio-economically disadvantaged*" students. Note that students with an immigrant background represent more than half (52%) of the total student population. OECD (2017:45) confirms these findings by

[8] Persistent not in the sense that it is not decreasing but in the sense that it is not decreasing fast enough –especially if we consider Luxembourg's very strong (net) employment creation.

adding that the children of immigrants underperform the children of natives, "*largely reflect*[ing] *differences in student socio-economic background*" that schools fail to fully compensate for. For OECD, addressing this issue will result to lower market fragmentation.

Table 10

PISA Score-point difference in science relative to immigrant background



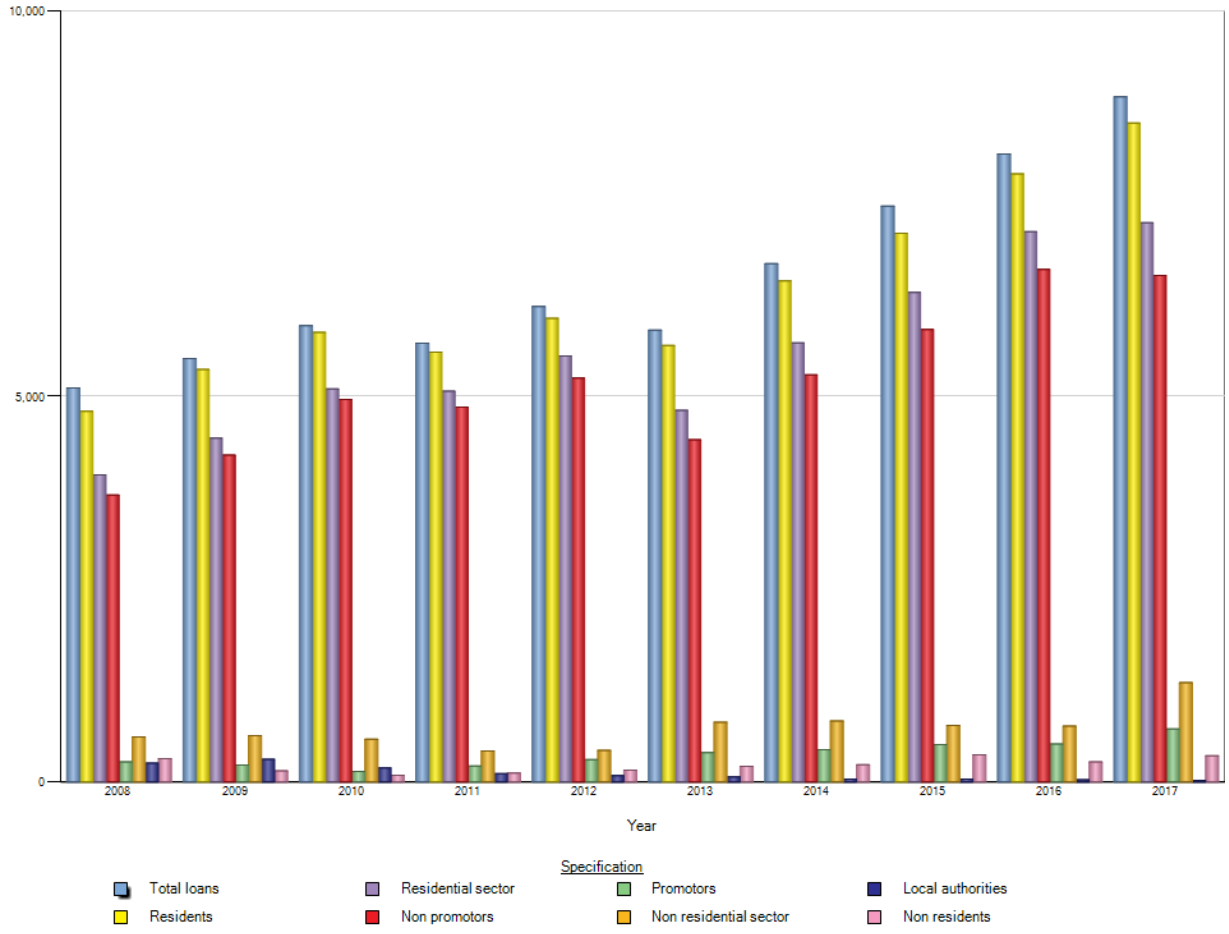
Source: OECD (2017:46)

II.3 Housing

The issue of housing in Luxembourg and especially the growing house prices, is also connected with demographics and the flow of population to the country. A recent working paper by Luxembourg's Central Bank (Ferreira Filipe, 2018:1) that investigates the interaction between residential housing prices and mortgage credit in Luxembourg since 1980, calculates that higher housing prices lead, in the long run, to an expansion of mortgage credit, which in turn leads to higher housing prices. The positive net migration to Luxembourg is, according to the author, one of the major drivers of demand for mortgage credit. IMF (2018:31) also points out the consequences of Luxembourg's tax structure as a reason of the growing levels of household debt, since the country's tax treatment of mortgage loans distorts incentives and can "*encourage high household debt*" (see also Poterba and Sinai, 2008).

Table 11

Lending for purchase of houses located in Luxembourg (in millions EUR)



Source: STATEC

On the supply-side, limitations regarding construction activity and limitations concerning dwelling availability lead to "*a structural imbalance between supply and housing demand*" (Ferreira Filipe, 2018:5) that fuels increases in housing prices. In addition, Ferreira Filipe estimates that housing prices are characterized by an overvaluation (around 6.9%) with regard to market fundamentals. It should be noted, however, that the government has already taken some measures to strengthen the resilience of banks (IMF, 2018:24). The IMF (2018:18) largely confirms these findings by mentioning the affordability problems created by continuously rising housing prices "*arising from a lack of supply in the context of a fast-growing economy and net demographic growth*", supporting also our decision to link the housing problem with that of demographics and economic developments in the *Grande Région*. IMF (*Ibid*: 22) also finds evidence of overvaluation regarding real house prices, that reached a staggering 15% "*in the years leading to the global financial crisis*" (around 2005-2008) but are now starting to gradually converge with market fundamentals. Mellouet (2016a:3) estimates that the last 10 years[9] there has been a rise of over 40% (in average) in housing prices (over 60% and over 45% for the apartments and houses for sale, respectively, and an over 40% and over 21% rise for the apartments and houses for rent). As the author notes, this rise becomes even more striking when compared to the rise observed in the neighboring countries (19% for Germany, 9% for Belgium, and a barely noticeable 0,1% rise in France). If one looks at more recent data, however, that cover the period Q1 2008 – Q1 2018, we observe a boom in Germany's and Belgium's housing market that closes –at some extend- the gap with Luxembourg, with a 38.9% rise for Germany, 27.98% rise for Belgium and 1.62% for France[10].

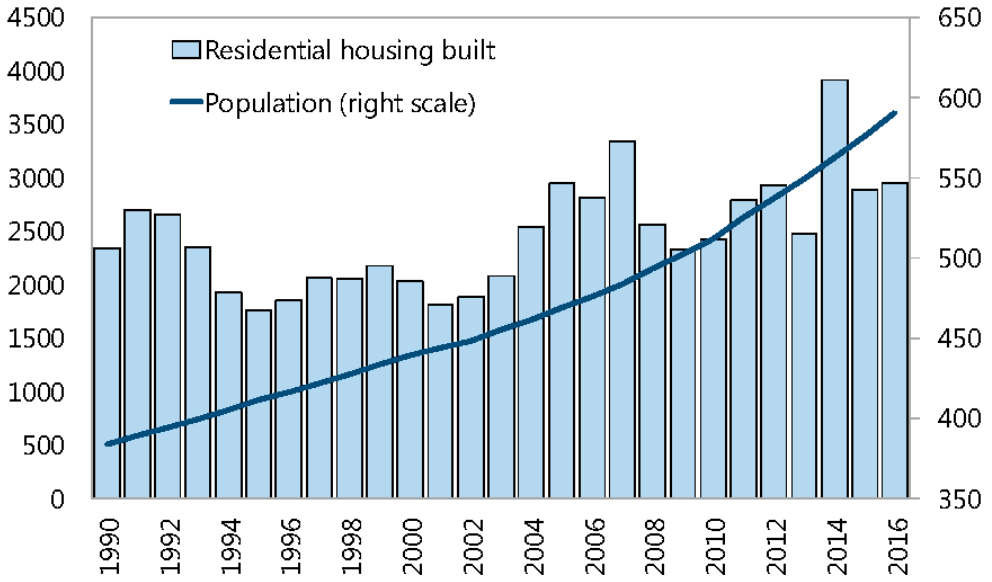
In more detail, the IMF reveals the true extend of the affordability problem by drawing attention to the impressive divergence between house prices and income/capita since 2002. IMF (2018:18-19) further estimates that "*while GNP/capita is only 1.1 percent higher than in 2002, house prices are on average 85 percent higher*". The main cause of this divergence is the combination of "*net demographic growth and a growing share of GDP accruing to cross-border commuters, in the context of a sustained growth of demand for labor.*" Equally alarming is the fact that the rental market has not kept up with these developments (see also BCL, 2018:18).

[9] Data are for 2015.
[10] Source: Statistical Data Warehouse, ECB.

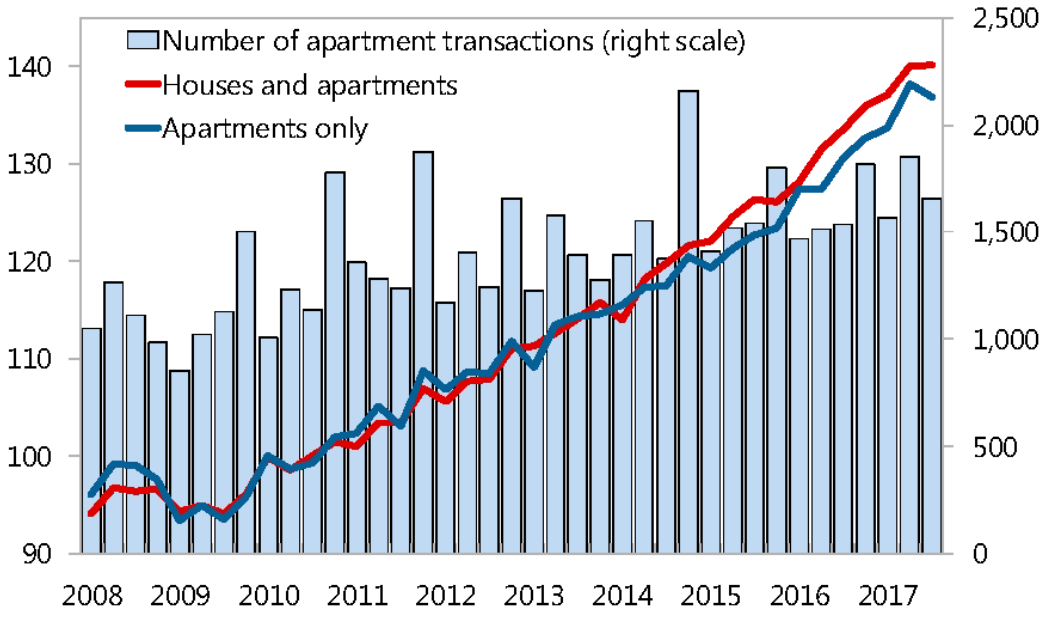
Table 12

Supply Has Not Kept Up with Demand While Transactions for Housing Have Risen

a. Construction Activity and Population Pressures (Thousands of square meters; right scale in thousands of persons)



b. National Housing Prices and Transactions (Index number, Q1 2010=100; Right scale in units)

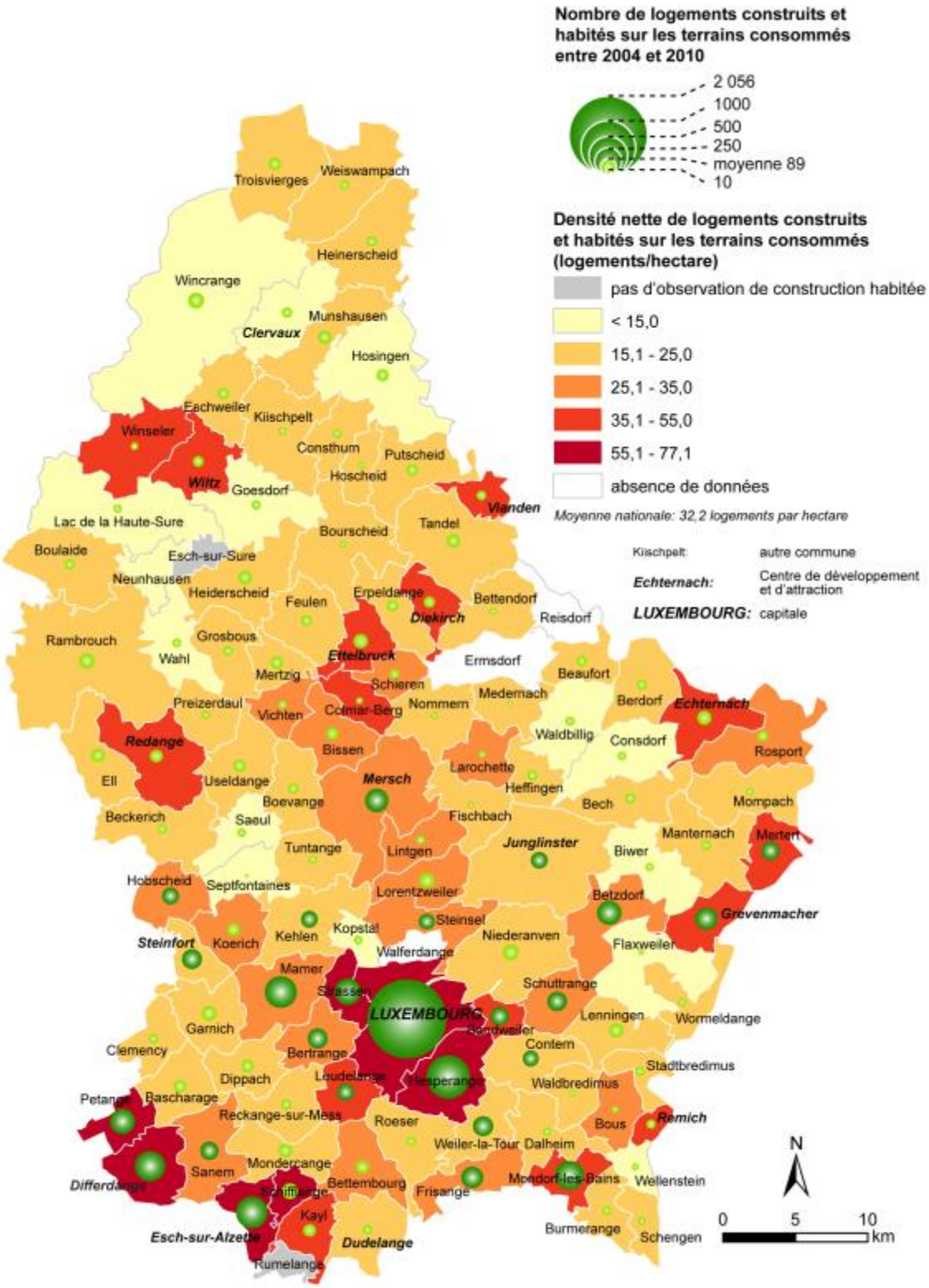


Source: IMF (2018:20)

Examining the rigidities that restrict new supply of houses, one must mention that in Luxembourg it is the municipalities that are in charge of issuing permits and decide on new construction, with zoning being complex and fragmented. Luxembourg is divided in 102 municipalities of different sizes that follow different norms and municipality rules while efforts concerning the harmonization of the various municipal *plans d'aménagement* (land-use plans) are lagging behind. The various restrictions and requirements induced upon construction make building costs heavier while it is notoriously difficult to obtain a construction permit in the first place – it takes an average of 157 days (*Ibid*: 28). The state authorities from their part cannot force municipalities into action[11].

Construction activity is highly clustered around the capital that results into land scarcity in the region. In other areas, however, land for housing is (comparatively) ample. This "asymmetry" is an indicator of the municipalities' different responses to rising demand for accommodation (and also the disparity of economic patters).

[11] Municipalities have communal autonomy, enshrined in the Constitution.



Auteurs: V. Feltgen, C. Pouget, Pôle de recherche GEODE, CEPS/INSTEAD, 2013.
Fond de carte: ACT, GEODE, CEPS/INSTEAD, 2007.
Données statistiques: Ministère du Logement - Observatoire de l'Habitat (Base consommation foncière 2004-2010, Base population 2012).

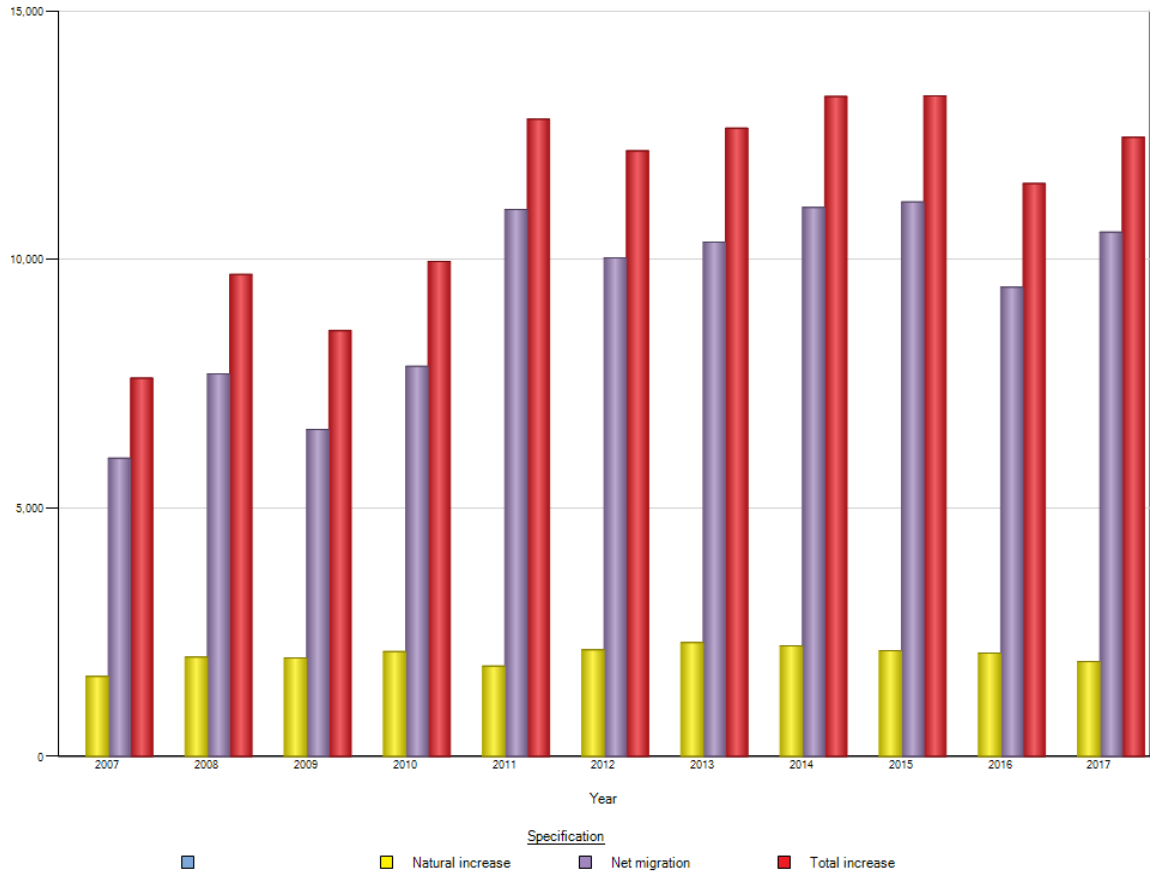
Source: Observatoire de l'Habitat

Another interesting fact is that 92% of the land available for construction is under private ownership. Public actors cannot, therefore, significantly increase the supply of space for accommodation. Ownership of land is also concentrated, indicating land withholding and possible speculation activity: the land-owners (that also do not respond to the higher demand for housing) keep the land in the hope that prices will continue to rise (see also Mellouet, 2016a, esp. p.7). A (somewhat related) problem that exacerbates Luxembourg's affordability and accommodation problem is the lack of social housing, which represents less than 1% of total housing, a percentage very low both in absolute terms and when compared to other EU countries (IMF, 2018:28).

For Mellouet (2016a:4) demographic dynamics are at the center of both Luxembourg's housing problem and the country's economic development. She estimates that in the last 15 years, Luxembourg has experienced an over 30% increase of its population, with the number of foreigners rising by 66% (a social group that now represents 48% of the total population, with net migration explaining 80% of population growth).

Table 13

Natural and Migratory Movements of the Population (2007-2017)



Source: STATEC

In the face of all these findings, a central question emerges: why housing market in Luxembourg does not work as it should? Why supply does not respond to price increases, with demand outstripping new construction? In fact, not only there are no significant increases in supply, but there is strong evidence of a less than optimal use of the existing houses, with Sarah Mellouet (2016b:3) arguing that the phenomenon of "*under-occupation*" seems to have become the "*normal*" state of affairs in Luxembourg since it applies to more than 60% of residents (with 38,5% being the Eurozone average).

Speculation is definitely one part of the answer. Carr (2015:23) seems to agree with our conclusion by arguing that "*almost all the developable land that is no longer owned by public entities* (…) *is in the hands of developers. All parties have been involved in, and driven, a great deal of speculation.*" Carr also claims that "[t]*his institutional setting is* (…) *cultivating* ***scarcity***", making it "*almost impossible*" for many people to "*acquire affordable property*". Another part of the answer is what can be called municipalities' "selection bias". We argue that municipalities' incentives are structured in a way that make local councils prefer commercial rather than residential use of developable land. A closer look at municipalities' fiscal affairs reveals that the greater share of municipalities' tax income (about 92% in 2016) comes from corporation operating on their region (IMF, 2018:29-30). Further evidence of this selection bias is the fact that the commercial use of land faces much weaker administrative and regulatory constraints that the residential use of developable land. Unless these "tax biases" are not reduced, there will be little hope of increasing supply of residential real estate. This seems unlikely, however, since this selection bias "couples" with Luxembourg's long-established policy to promote the country as a financial and commercial center of the *Grande Région*.

III. Literature Review & Methodological Issues

III.1 Luxembourg and the Notion of "Small States"

Before moving on to the main part of our analysis, the comparison of Luxembourg to metropolitan cities, we will first explore how the scientific literature treats the special case of Luxembourg.

In a book edited by Briguglio, the authors describe the economic structure of nine[12] European small states. Briguglio (2016:1) claims that these states share three important similarities that permit us to group them together, namely: (i) a small domestic market, (ii) limited natural resources and (iii) limited economic diversification. As a result, they are all dependent on international trade and, consequently, highly exposed to external shocks.

We can safely say that all these conditions apply particularly to Luxembourg. According to the International Chamber of Commerce, the country was in 2017 the 3rd most open economy in the world (right after Singapore and Hong Kong) while for the IMF (2018), its limited diversification is striking, even when compared to other small countries (see sub-section II.2). Recognizing the constraints created from its small domestic market (that reduced the country's ability to produce goods/services and its ability to capture benefits from economies of scale), Luxembourg tried already from the 19th century to join bigger economic unions to compensate for this disadvantage. Thus, it was integrated into the Zollverein in 1842, it formed a customs and monetary union with Belgium after World War I, it formed the Benelux union in 1944, it became a founding party of the ECSC (1951) and EEC (1957) that paved the way for the Single European Act (1986, Single Market), and joined the EMU in 1999. Moreover, the country's population has been, historically, a big supporter of the European economic and political integration. According to the latest Eurobarometer Survey (June 2018), 93% of the respondents feel that they are citizens of the EU –the highest percentage across EU Member-States, while 71% remain optimistic about EU's future (the second highest score after Ireland's 84%).

For Alesina et al (2005:1504) there is no doubt that trade openness can have a significant positive impact on growth and competitiveness for a small country, noting at the same time that international trade means crossing national borders – something that entails significant costs. As a matter of fact, "*even in the absence of explicit trade policy barriers, crossing borders is indeed costly* (…) *This is true both for trade in goods and financial assets.*" This is an (additional) reason that justifies Luxembourg's willingness to abandon part of its (so hardly won) sovereignty and form customs and monetary unions with other countries instead of just promoting liberal trade policies. And indeed, almost all authors of Briguglio's (2016) collected volume agree (in line with our argument for Luxembourg, see sub-section II.1) on the fact that the biggest benefit these 10 small states enjoy from participating[13] in the EU, is the participation in the Single Market that guarantees the free movement of goods/services, capital

[12] Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta, Slovenia, FYROM, Montenegro. The authors also decided to study the case of Iceland along with the nine states mentioned.
[13] FYROM and Montenegro are included albeit being just candidates for membership while Iceland is also included because it is highly integrated into the EU and was –for a time- candidate for EU membership.

and people (something very important for Luxembourg since, as we have seen, a large share of its workforce consists of cross-border workers).

But is this "small countries grouping" a really good way of looking at these countries? For Hague and Harrop (2004:69), authors of one of the most widely used textbooks on comparative politics, the goal of the comparative approach is to "*broade*[n] *our understanding of the political world, leading to improved classifications and giving potential for explanation and even prediction*". Based on this definition of the objective of the comparative approach we will argue that the "small countries grouping" is not just "bad science" (see *infra*) but it is also unhelpful (policy-wise) since it confuses more than it clarifies and obscures the very significant divergence and differences within the "group". Also based on Hague and Harrop's definition we will try to develop our distinctive comparative approach, one that tries to compare Luxembourg not with countries but with major (European) cities.

The grouping of states such as Luxembourg into the "small countries" category is problematic for many reasons. First of all, the very notion of "small". In a LEIS (2008) Conference in Schengen, it was argued that the meaning of "smallness" has changed significantly through the years, even if one considers limited time spans, like the last 20 or 30 years, with different criteria "dominating" the discussion of what justifies the characterization of "small" in front of a state. In fact, the participants of the conference reached the almost unanimous conclusion (*Ibid*: 20) that "*discussions of numbers and definitions of size are to a large extend arbitrary*". It appears that (self)perception matters more than objective criteria (population, territory, etc.). Even in Briguglio's (2016:3) volume, one can find countries with very different population sizes and densities while, in terms of land area, there are states ranging from a modest 316km^2 (Malta) to an impressive (considering that we are talking for a group of "small states") 102,775km^2 (Iceland) – a land area almost as big as that of England.

If one examines the other criteria used by the various authors of Briguglio's (*Ibid*: 3-13) volume, the results are equally dissatisfying. No matter the criterion one uses: indebtedness, deficits (with Luxembourg and Slovenia being the only countries with surpluses in the group), GDP growth, wages and competitiveness levels (only Luxembourg and Iceland score higher –in both dimensions– than the EU-28 average, with the rest of countries scoring bellow the EU-28 average), unemployment levels and the importance of the financial sector or GDP/capita, the result is still the same. The differences are much greater than the similarities. Even in the case of the biggest disadvantage that these countries had to face when they decided to participate in the EU (lack of "voice"), Luxembourg is still an outlier since it hosts a number of EU institutions that, as Allegrezza (2016:141) notes, boost employment and generate "*direct, indirect and income multiplier effects on the economy.*" In their effort to include many cases, the authors made any comparisons between them meaningless.

A national "economy" is a complex phenomenon, especially in an era of globalization and high capital mobility. It is not just about the transactions of economic agents since these transactions do not happen in a vacuum. They take place in a very specific setting that is determined, *inter alia*, by each nation's institutional arrangements, the prevailing political culture and, as in the case of Luxembourg, the participation in international or regional organizations like the WTO and the EU/EMU, and the impact that this participation has on the domestic governance. One cannot group together the economies of the post-communist Baltic States (like Estonia and Lithuania) that adopted parliamentarism only in the 90s or Balkan states

(like Montenegro), with highly advanced countries (both economically and technologically), like Luxembourg, that have a long-established history of parliamentarism. The differences on their stages of development, and their social and political governance are too great to ignore. OECD (2018) and the Commonwealth Secretariat (2018) in their surveys make considerable effort to tackle these problems by including only states at similar stages of development, facing similar developmental challenges, with similar population sizes and land areas. One should also take into account that their "lists" of small states are compiled almost exclusively by island states (see *infra*). It appears that there are not enough cases of highly developed small states that could be compared to Luxembourg and produce interesting results for drawing conclusions and help design meaningful policy recommendations.

To be fair, Briguglio (*Ibid*: 3) himself acknowledges this fact by admitting that "*the* (…) *states considered* (…) *are* ***not*** *a homogenous group*" (emphasis added) and (*Ibid*: 16) that they "***var***[**y**] *considerably*" (emphasis in original) in many respects. It appears that the only important common characteristic that the European small states have is their high trade openness (i.e. high exposure to external shocks). We can, therefore, say that all the small open states are price-/ regime-takers but, apart from that, we do not go any further. A point worth mentioning here is that the characteristic of vulnerability to external shocks applies to all open economies, regardless of their size. During the recent financial crisis for example, countries that were not exposed to toxic bonds suffered a recession also because they based their development on an export-led strategy (and thus they were highly integrated to the international trade system). At the same time, the contagion of the crisis that started in the US to the UK was so quick because the country is so deeply integrated to the financial system. It goes without saying, however, that we cannot expect the same level of resilience to external shocks from a small country.

The "right" grouping of countries is always a highly controversial issue, not only for small states. Given the limited cases available, an ideal grouping is like the Quest for the Holy Grail –it may never appear. Nonetheless, we should always be in a position to justify our choices. Take the example of four Southern European countries, namely Greece, Italy, Portugal and Spain. These countries share a series of historical similarities that permit us to group them together in distinction from the northern European countries. As Huntington (1991) argued, Greece, Spain and Portugal belong to the third wave of democratization. In addition, the literature on southern Europe suggests that it is methodologically legitimate to treat the study of the political, social and economic system of these countries (including Italy) as an "area study". In the literature concerning the welfare state, for example, it is the consensus view that these states form a separate "version" of capitalism (Rhodes, 1996; Castles, 2006). For Ferrera (1996) these countries constitute the south European welfare state model[14]. A similar hypothesis is made by the literature concerning the transition to (and the establishment of) democracy in southern Europe, with a series of scholars (Gunther et al., 1995; Gunther et al., 2006) arguing that our selected countries are distinct from other western democracies. Many authors coming from different disciplines have supported this argument. See for example Malefakis (1995) in history or Tsoukalis (1981) in economics. Briguglio's sample does not have the same characteristics. The decision of the authors in Briguglio's volume to compensate for these shortcomings by including small states that are located in the same region (Europe) and not just small states in general (that would include, for example, Barbados or the Solomon Islands

[14] The south European welfare state model is characterized, in a nutshell, by high cost and low quality of services.

– making thus the comparison even more problematic) is not enough. All these characteristics, the historical and socio-political similarities that make it methodologically legitimate to group our four South European countries together (an area study), are clearly absent in the case of the "small states" group.

One could make the argument that a comparison between Malta and Luxembourg (that could potentially include Cyprus as well) is not that arbitrary. Both of these states have similar magnitudes in terms of population and territory, they are the most open economies (integrated to international trade) in the EU (Cyprus does not score equally well here but it is still above EU-28 average) and have approximately the same levels of financial depth. One should not overlook the fact however, that Malta (and Cyprus) are island-states and so they face structurally different challenges (like the risk of being isolated), something that clearly does not apply to Luxembourg, a geographically landlocked country with a workforce consisted (by almost 50%) by cross-border workers. Hopefully, our proposed comparative approach will shed some more light here.

III.2 Cross-border Cooperation between Cities in Europe

Fortunately, there has been a number of studies at the EU level that try to tackle the issue of intra-regional cooperation between metropolitan regions and the potential benefits of cross-border cooperation between European cities. The focus of these studies is not identical with ours but we might be able to draw some "methodological parallels" or some indicators that will help advance our study.

The METROBORDER report by ESPON and the University of Luxembourg (2010:7)[15] aims to map and increase understanding of the "*organization and the positioning of the cross-border metropolises and to explore ways* [in order to] *(better) use their potentials.*" The main benefit of increasing cooperation between cross-border metropolitan regions is, according to the report (p.9), an opportunity to address the main shortcoming of these regions – that of achieving "critical mass" (see also Decoville et al., 2015:9 ff). In fact, this is (one of) the main reason(s) for comparing Luxembourg with metropolises rather than countries: its limited demographic size and its economic connectivity are both characteristics shared with the regions examined by the METROBORDER report and are not usually found (in such magnitudes) when examining countries. On top of that, and while "traditional" administrative and economic barriers like citizenship and currency fluctuations are not existent in the context of EU/EMU, another similarity that Luxembourg (and Switzerland) share with (domestic) metropolises (but not with any other EMU Member-States) is that they do not have "*absolute language barriers*" (ESPON, 2010:11). Commuters from France, Germany and Belgium do not face any linguistic challenges when they commute to the multilingual Luxembourg (or Geneva) – challenges that, say, an Italian would face if s/he wished to work in France. In fact, the METROBORDER (p.12) study concludes that "*taking into account* (…) *the demographic and economic weight* [Luxembourg] ***is*** *comparable*" with "*classical metropolises*" (emphasis added).

[15] From here on ESPON (2010)

In more detail, the report (*Ibid*: 17) provides further arguments that justify our decision to compare Luxembourg with metropolises by describing them as "*cross-roads of economic flows, political power, and infrastructure*" – a description that fits almost perfectly with our understanding of Luxembourg. And these metropolises – like Luxembourg – have only to gain by pooling resources[16] together and coordinating efforts. For the report, one of the most important metropolitan "*functions*" to be considered when examining the "*metropolitan quality*" of regions and cities is the "*gateway function*", meaning the connectivity of a city/region or, in other words, "*a high degree of accessibility*" (ESPON, 2010:25-26). If the number of cross-border workers is an indicator of the country's connectivity, then Luxembourg's score regarding its gateway function is very high if we consider that cross-border workers constitute a staggering 45% of its labor force. Indeed, the METROBORDER report confirms (although using somewhat outdated data –for 2006 and 2009) that in Luxembourg this "*phenomenon is* (…) *most developed*" (*Ibid*: 38) when compared with every other metropolitan area examined. It should be noted however that there are still serious problems regarding Luxembourg's transport infrastructure. The METROBORDER report finds, for example, that (*Ibid*: 158) while connection to Paris is relatively good, the connections to Brussels, Strasbourg and Basel are less than optimal. Other indicators that have been used to capture cross-border integration are disparities of GDP/capita and (relative) unemployment rates (see also Decoville et al., 2015:39). It should be always kept in mind however that the availability of data (especially flow data) is limited. As the report concludes: in terms of "*methodology and data there is still much to be discussed*" (ESPON, 2010: 32-33). We couldn't agree more.

A very good summary of the main indicators defining the strength of cross-border integration is given in table 14.

Table 14

Synthesis Indicator for Cross-border Interactions and Convergence

	Interactions		Convergence	
Cross-border metropolitan areas	**Cross-border commuters**	**Cross-border public transport**	**Similarity of GDP per capita**	**Foreign citizenship of residents**
Luxembourg	5	5	1	5
Saarbrucken	3	3	5	2
Basel	4	4	2	3
Strasbourg	1	1	5	1
Geneva	4	4	2	4
Lille	3	1	5	3

1=very weak, 2=weak, 3=moderate, 4=strong, 5=very strong

Source: modified from ESPON (2010:43)

[16] These resources can be tangible and/or intangible. From financial resources to the transfer of skills and know-how, this coordination of competencies and funds will improve the quality of the provided services and benefit innovative activities through a process of "*cross-fertilisation*" (Decoville et al., 2015:9). At the same time however, and as the authors observe (*Ibid*: 11), the "*cross-border cooperation initiatives do not replace the logic of competition between territories* (…) *but* [aim to strengthen] *new forms of relations and management*".

If we decide to dig a bit deeper, the LISER study by Decoville et al. (2015) that builds on the METROBORDER report, provides us with more recent data. Regarding the statistical data on the number of foreigners living in a border region who have the nationality of that region, the upward trend is clear.

Table 15

Evolution of Number of Residents from Neighboring Countries within the Different Cross-border Areas

Case Study	Population	2000	2006	2012	Difference (2000-2012)	Difference 2000-2012, %
Geneva-Annemasse	CH citizens in FR border region	2554	4125	5566	3012	117.9%
	FR citizens in CH border region	18746	20349	25600	6854	36.6%
The Greater Region	BE citizens in LU	14800	14197	16926	2126	14.4%
	DE citizens in LU	10052	8639	12049	1997	19.9%
	FR citizens in LU	19979	20386	31456	11477	57.4%
	LU citizens in BE border region	1439	1711	1812	373	25.9%
	LU citizens in DE border region	1671	3915	8341	6670	399.2%
	LU citizens in FR border region	1280	1584	1902	622	48.6%
Basel-St. Louis-Lorrach	CH citizens in DE border region	3304	3938	4507	1203	36.4%
	CH citizens in FR border region	878	861	928	50	5.7%
	DE citizens in CH border region	11111	17019	25093	13982	125.8%
	DE citizens in FR border region	1329	1613	1649	320	24.1%
	FR citizens in CH border region	1729	1871	2361	632	36.6%
	FR citizens in DE border region	3397	3426	3837	440	13.0%

Source: modified from Decoville et al. (2015:43), author's calculations

Regarding the issue of economic inequalities, the picture is more complex. While the LISER study (*Ibid*: 44) argues that (in all regions examined) GDP/capita has increased in absolute terms (though at different rates), and despite European efforts to increase convergence between regions, "*inequalities in wealth creation persist and are even growing in some cases, in **absolute terms**.*" After all, a "*high intensity of interactions between two border regions does not systematically lead to more equal levels of territorial development*" (*Ibid*: 48) – see also table 18.

Table 16

GDP/capita Differentials (in PPP – at current price levels)

Case Study	Country	GDP/capita			
		2000	2006	2011	2000-2011 difference
Basel-St.Louis-Lorrach	DE	22223	26699	30195	35.87%
	FR	20600	23927	25600	24.27%
	CH	77787	82263	87087	11.96%
Geneva-Annemasse	CH	48168	53402	60839	26.31%
	FR	20662	23339	22582	9.29%
The Greater Region	BE	16531	19285	20776	25.68%
	LU	46500	63800	66700	43.44%
	DE	14864	17914	20161	35.64%
	FR	18223	21394	21519	18.09%

Source: author's calculations, data drawn from Decoville et al. (2015:45)

One of the most interesting observations here is that if we look at the evolution of the GDP/capita growth for the period 2000-2011, Luxembourg stops being such an extraordinary case. There are other cases (metropolitan regions) –especially for Germans and, to some extent, also Belgians and Swiss, that exhibit similar growth rates (see section V).

When one looks at GDP/capita however, must always have in mind that, at least for the cases under examination, this measure might lead to misinterpretation since cross-border workers will contribute towards wealth creation in one side of the border but spend the bulk of their income in the other side of the border[17] (something not applicable to "traditional" metropolises). The result is, as the LISER study observes having in mind the case of Luxembourg and the French neighboring departments, that "*the average living conditions are higher than expected* (…) *in the region which emits more cross-border* [workers], *and lower in the one which polarizes the flows*" (*Ibid*: 44).

Finally, regarding labor market conditions, the study (*Ibid*: 46) argues that apart from differences in remuneration, the differences in unemployment levels between regions can become an opportunity for inhabitants of cities with higher unemployment levels. This is not different from the role of a "traditional" (domestic) metropolis that acts as a source of employment for population in neighboring areas. And this is the role that Luxembourg has been playing for the last decades with regard to neighboring population, with the difference that this population is not domestic but comes from the Greater Region.

[17] And also, mechanically, cross-border workers contribute to the numerator (GDP) but not to the denominator (population).

Table 17

Evolution of the Labor Market (2006-2013)

Case Study	Country	NUTS 2 (totally or partially incorporated in the cross-border urban area)	Economically active population. Evolution 2006-2013 (%)	Unemployment Rate (%)			Employ-ment evolution 2006-2013 (%)
				2006	2013	Difference (%)	
Basel-St.Louis-Lorrach	DE	Freiburg	3.2	5.5	2.9	-2.6	6.1
	FR	Alsace	3.3	6.6	9.7	3.1	-0.1
	CH	Nordwestschweiz	9.7	4	4.1	0.1	9.6
Geneva-Annemasse	CH	Région lémanique	10.2	7.3	5.5	-1.8	8.5
	FR	Rhône-Alpes	4.9	7.7	8.4	0.7	4.1
The Greater Region	BE	Prov. Luxembourg	11	7.7	7.9	0.2	10.7
	LU	Luxembourg	22.6	4.7	5.8	1.1	21.1
	DE	Trier	4.1	6.2	3.1	-3.1	7.7
		Saarland	0.8	9.5	6.2	-3.3	4.8
	FR	Lorraine	-0.3	9.9	12.2	2.3	-2.9

Source: modified from Decoville et al. (2015:47)

From table 14, one can observe that the most integrated cross-border regions of Europe are the metropolitan regions of Luxembourg, Basel and Geneva (something that has also been made clear by the LISER study). Regarding cross-border labor flows, studies have estimated (Durand et al., 2017:8) that in 2012 around 53,517 cross-border workers were commuting daily to Basel (53% from Germany, 47% from France), 63,386 to Geneva Canton (mostly from France) and 166,021 to Luxembourg (50% France, 25% Germany, 25% Belgium). Table 18 can offer a complement to table 14 with regard to these three cross-border areas.

Table 18

Employment and Inhabitants in the three Cross-border Areas of Basel, Geneva and Luxembourg

Case study	Basel			Geneva		Luxembourg			
Border region	CH	DE	FR	CH	FR	LU	FR	BE	DE
Inhabitants 2007	554,757	238,063	51,423	525,177	348,884	476,200	677,362	204,328	347,630
Employment 2007	327,384	77,069	13,237	293,507	98,047	306,213	254,973	71,681	119,453
Ratio job/capita 2007	0.59	0.32	0.26	0.56	0.28	0.64	0.38	0.35	0.34
Inhabitants 2012	570,943	235,636	55,877	555,983	387,466	524,900	687,434	214,698	352,023
Employment 2012	375,725	79,791	14,190	319,285	100,701	352,273	247,112	71,041	125,923
Ratio job/capita 2012	0.66	0.34	0.25	0.57	0.26	0.67	0.36	0.33	0.36

Source: Durand et al. (2017:10)

By looking at the table, one immediately observes that this strong employment growth that we have already mentioned (see sub-section II.2) for the case of Luxembourg, is not a uniquely, Luxembourgish phenomenon but in fact it is comparable with the situation in Geneva and Basel. Another interesting fact is that this (employment) growth benefits not only the local population but the cross-border workers as well (as was the case for Luxembourg). The development opportunities however are not the same for all parties involved. The result is deeper integration without greater convergence (see the ratio differences between cities, table 18). Durand et al. (2017:6) seem to agree with the METROBORDER and LISER reports in that cross-border differences do create opportunities but are not so optimistic when examining the ability to capture the benefits of these opportunities and the resulting distribution of these benefits. The interactions that are formed between the parts of a cross-border region after years of cooperation are not just a source of opportunity but a source of vulnerability as well since they depend on a high degree of openness. Regarding the distribution of benefits from cross-border cooperation, the authors argue that it is the elite groups that enjoy the most from the integration process, with "*the differentials* [potentially offering] *a benefit for a specific population of a border region that can sometimes be at the expense of another specific population in the neighboring border region*". The authors seem to agree with the LISER and METROBORDER conclusions (cited above) that "ec*onomic integration does not reduce socio-spatial inequalities within the EU*" (*Ibid*: 12).

By studying the cases of Basel, Geneva and Luxembourg, Durand et al. (2017:11) discover an interesting phenomenon, where "*individuals* [and firms] *exploit the differences existing between both sides of a border to maximize their utility*". This process leads to a "*functional specialization of space* (…) *that tend*[s] *to increase over time*" –something that can have a sizeable impact on the housing market. In more detail, the authors develop a center-periphery model to demonstrate the effects of this functional specialization of space, with the metropolitan core being the center of economic activity, pole that attracts business and skilled labor force, and the surrounding (peripheral) areas being gradually transformed into residential regions ("*residential suburban extensions*") due to (relatively) ample and cheaper land. As a

result, a large part of population -along with firms that specialize in "*space consuming activities*" like recreational areas- move to the periphery in order to lower living expenses (and sunk costs) at the expense of time needed to get to work, while business is concentrated in the core, where the economic conditions (along with the tax environment) are friendlier. These are dynamics that we will "re-discover" in the study of our own set of metropolises (section IV).

The sentiments regarding the impact of cross-border integration, also differ considerably between regions. Normally, the peripheries that "export" labor tend to see the cross-border integration as an opportunity, while the region that "imports" labor tends to be indifferent. At the same time, counter-forces are also in place. The authors (*Ibid*: 14) present the case of North Lorraine as a "*typical example*", where the residential housing market has been expanding at the outskirts of cities, aiming at cross-border workers, with the less wealthy being "*concentrated in the older urban fabric*". At the same time, there are differences in terms of the economic resources available since income from taxes on business (or income) are collected on one side of the border –leaving the part that faces the biggest socio-economic challenges with less resources. These trends lead to Euroscepticism that, for the authors, can explain the high support for Marine Le Pen during the 2017 French Presidential elections (in the Department of Moselle, Le Pen achieved 42.34% in the second round– above the national average of 33.9% for the second round) despite the strong presence of cross-border workers. The authors find similar behavior in the case of Geneva (*Ibid*: 14-15), with the Genevan Citizen Movement (that scored 13.4% in the 2015 local elections) "*advocate*[ing] *that priority* [should] *be given to Genevans for recruitment and criticis*[ing] *policies that favour cross-border workers*". Note here that the selection bias that we identified with regard to civil service employment in Luxembourg (see sub-section II.2) might be precisely an example of these forces in action. The authors agree with our conclusions that some people have the feeling of being left behind, making them more susceptible to influences of this kind. Basel by contrast does not experience this type of tensions. For the authors (*Ibid*: 15) it is because Basel does not experience some of the challenges that Luxembourg or Geneva face –especially regarding the transport infrastructure, while "*the differences in* [the] *socio-economic situation between the* [population residing in] *the Swiss, German and French border regions* [are] *not so important*" as the Luxembourgish or Genevan cases.

The point to which we would like to draw attention to is that **when we start treating (and comparing) Luxembourg as a city (and to cities) we see that the Grand Duchy stops being such an "exceptional" case and other, comparable cases emerge in terms of the main socio-economic indicators**. We also observe that the group of cases with witch Luxembourg is now compared is much more homogenous than the previous one (small states) so comparisons will be easier and have the potential of being more instructive and fruitful. The comparisons will be made in two rounds. In the first round, we will compare Luxembourg with the states of the Greater Region. In the second round, we will compare Luxembourg with "traditional" metropolises: Lille, Lyon, Bordeaux, Frankfurt, Hamburg and Munich, that are hubs of economic and political power, and (like the cases of Geneva and Basel) attract neighboring populations but (this time) the population is local (the cross-border dimension is absent). It should be noted here that our sample does not aim at being exhaustive (far from it). It serves much more as a suggestion for future research on a topic that, to the best of our knowledge, has not attracted enough attention thus far and has the potential of uncovering hidden socio-economic dynamics. At the same time, it will help "re-attach" Luxembourg (that will stop being such an outlier) to

the trend of conducting international comparisons with the prospect of identifying best practices and policy recommendations.

IV. Luxembourg and Domestic Metropolises

In an effort to strengthen our decision to compare Luxembourg's economy with those of European metropolises, we must first examine if there is indeed something "exceptional" to the dynamics these metropolises exhibit. That is, our approach will be valid only to the extent that metropolises exhibit growth dynamics that are well above the national-level averages of their respective countries. This section aims at "sketching the basics" of each metropolis but, most importantly, at showcasing the sometimes exceptional growth that these metropolises experience when compared to their national-level average. In this section we also offer some key figures of the metropolises of our sample and try, when data permit, to identify some parallels with the case of Luxembourg –especially regarding the spillovers and growth dynamics that we have identified in section II.

IV.1 France

France Stratégie, an institution attached to the French Prime Minister, aims to contribute to the identification of the main "paths forward" for France and the medium and long-term objectives of the country's economic, social, cultural and environmental development. Under the aegis of this institution -and with the collaboration of INSEE- various reports have been published regarding metropolitan France and the development of the nation's urban areas. The data for the French cities of our sample come almost exclusively from these reports.

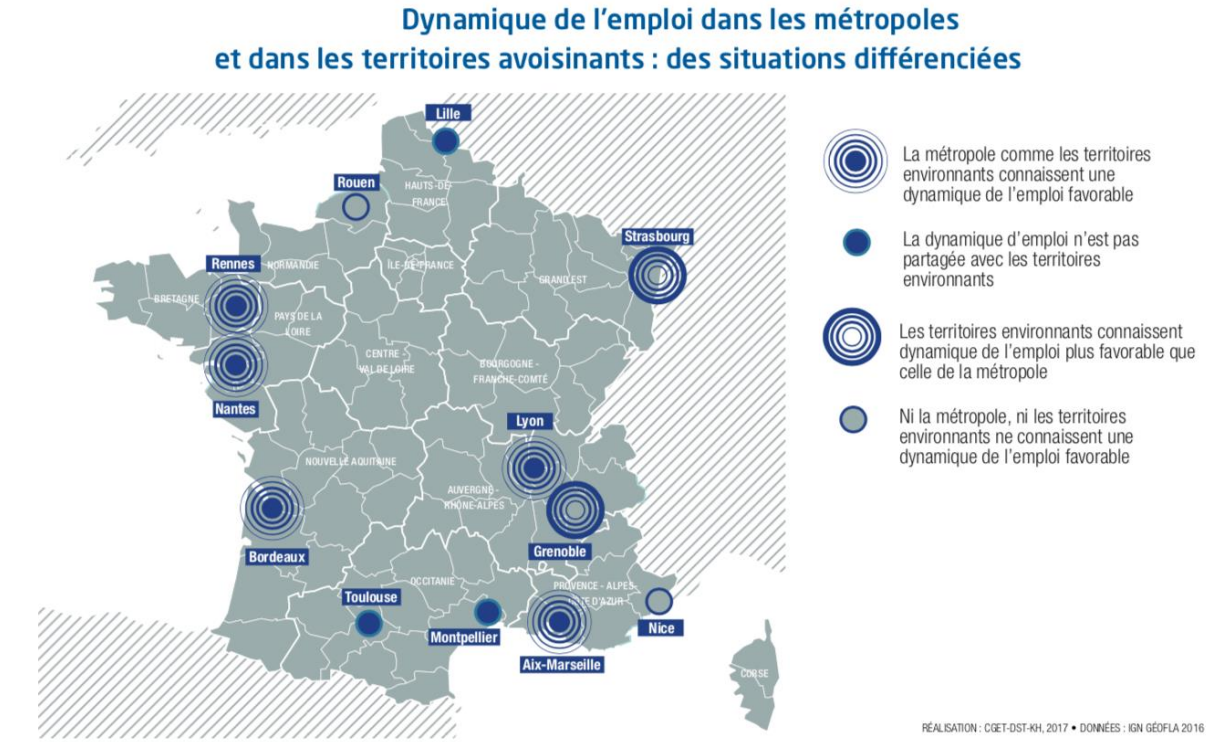
The State-Metropolis Pact of 2016, recognizing the fact (that we identified in sub-section III.2) that the development opportunities (and challenges) that a metropolis creates do not simply affect the local population but also the adjacent territories, stressed the need to strengthen the cooperation between metropolises and the surrounding territories. The French government, recognizing the fact that the development opportunities are not the same for all parties involved (sub-section III.2), tried with the territorial reforms of 2014 and 2015 to widen the skills of the metropolises and give them the means of supporting their economic growth, focusing on the territorial balance of the regions and on the social cohesion of the departments (Altaber and Le Hir, 2017:1).

In a report published by *France Stratégie* in 2017, Altaber and Le Hir examine a number of prominent French cities regarding their economic dynamism and their regional influence in employment. For the purpose of our analysis we will focus on three of them: Lille, Lyon, and Bordeaux[18]. We will exclude Paris from our analysis for the same reasons that are stated in the METROBORDER report (ESPON, 2010:32): in terms of size, population, economic dynamism (it accounts –along Île-de-France- for almost 30% of the French GDP) and financial depth it constitutes a "*league of its own*". In addition, Paris is a very strong pole that pulls resources (mainly labor) from neighboring cities, including metropolises: 0.9% of the total employment of France's 41 most important metropolitan and large urban areas work in Paris (Brutel, 2011:[2]).

[18] The report also includes Aix-Marseille, Grenoble, Montpellier, Nantes, Nice, Rennes, Rouen, Strasbourg and Toulouse.

The Altaber and Le Hir results reveal a development pattern very similar to Durand et al. (2017:11) center-periphery model that we've examined in sub-section **III.2**. The analysis of the dynamics reveals significant disparities between these major cities, with growth being systematically stronger at the fringes of the urban areas and, at the center, a determinant role of the "competitive base" sectors (manufacture, business services, wholesale trade) that explains much of the "extra" performance of the metropolises.

Regarding the (very important for Luxembourg) issue of the spillovers, the analysis produces mixed results: some metropolises share their employment dynamics with neighboring regional territories (mostly Lyon but also Bordeaux), some develop (relatively) isolate (Lille) and there is also the –somewhat unique- case of Strasbourg and Grenoble (that are generally treated as outliers) where the employment dynamic is stronger in the surrounding areas than in the center.



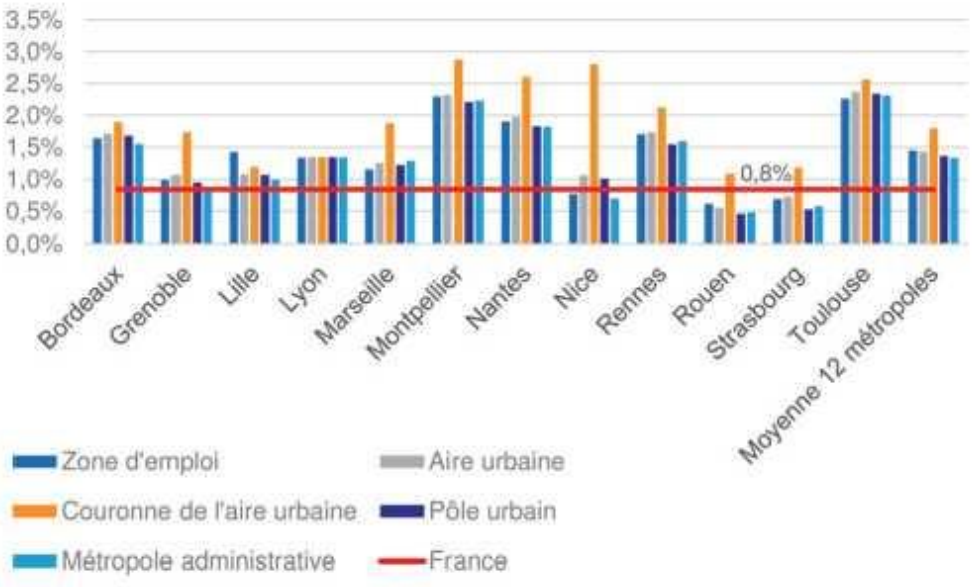
Source : CGET/France Stratégie

In France, urban areas that are similar (in terms of population) to Luxembourg (i.e. with a population of over 500,000) provide home for the 43% of national population and concentrate 46% of jobs (with Paris weighting for 50% and the provincial metropolises for the other half). To further stress the importance of these metropolises for France's economy we mention that, according to OECD (2013), between 2000 and 2010, three quarters of the country's growth was generated in these areas. Moreover, since 2006, this is the only category of territories were employment increased (Altaber and Le Hir, 2017:2).

The authors of the *France Stratégie* report (*Ibid*: 4) find that, overall, the "*metropolitan dynamic*" is obvious: in average, in areas of employment encompassing the twelve metropolitan areas studied, average employment growth the years 1999-2014 was 1.4% per year against 0.8% on the whole territory. However, this does not mean that all metropolises enjoy a similar dynamism –on the contrary. As table 19 shows, the performance among the 12 is mixed.

Table 19

Average annual growth rate of employment by perimeter between 1999 and 2014



Source: Altaber and Le Hir (2017:5)

If we look at table 19, we observe somewhat of a paradox. While employment is concentrated on the poles, it appears more dynamic in the fringes. In all metropolises studied (with the exception of Lyon where growth is equivalent), the rate of employment growth in the years 1999-2014 was higher in the crowns than in the poles. On average in the 12 metropolises, the average annual growth in employment was 1.8% in crowns versus 1.4% in the poles. For the authors (p.5) this dynamism is linked to the growth of the population in the crowns –remember the functional specialization of space that we observed in sub-section III.2 where the urban pole becomes the economic hub of the metropolis, specializing in the competitive advantages of the city, and the periphery ("crowns" of the metropolis) becomes a residential area with firms specializing in space consuming activities and recreation areas moving there in order to reduce living expenses and sunk costs, at the expense of time needed to get to work[19]. An INSEE

[19] In accordance with the pattern that we have identified in sub-section III.2, home-work journeys have become more time-consuming. In 2014, almost 50% of the non-residents working in Lille traveled more than 26.4 km to work (+2.8 compared with 2006) –this observation holds for all provincial metropolises according to the INSEE study (Baëhr et al., 2018: [3]). The preferred medium of transport to and from MEL is still the car in 2014 (66.5%), an observation that holds (though to a smaller extend) for the rest of our sample: Bordeaux (62.6%), Lyon (49.9%). In the case of MEL, the recent amelioration of public transport makes it more attractive to people, especially younger ones. In 2014 it represented 18% of trips to/from the European Metropolis of Lille, signifying

brief (Floch and Levy, 2011), examining data since 1990 confirms this trend. In France, jobs are increasingly being concentrated in large urban centers while households are moving away from it. In 2008 (metropolitan) urban centers and their suburban area cover 46% of the territory and more than 80% of population and jobs. At the same time, the brief notes the high variation of metropolises (also in terms of size and how the line between poles/crowns is designed) that cause discrepancies between measurements.

Table 20

Zoning in urban areas in 2008 and evolutions between 1999 and 2008

	2008							Évolutions (en %)		
Catégorie du zonage 2010*	**Population**		**Surface**		**Densité**	**Emploi**		**Population**	**Surface**	**Emploi**
		en %		en %			en %			
Grands pôles urbains (1)	36,513,532	58.8	43,362	8.0	842.1	17,945,057	70.0	8.8	21.7	16.8
Couronnes des grands pôles urbains (2)	11,566,682	18.6	155,817	28.6	74.2	2,856,676	11.2	39.1	41.5	48.5
Communes multipolarisées des grandes aires urbaines (3)	3,207,765	5.2	51,451	9.5	62.3	862,783	3.4	45.3	50.1	60.6
Espace périurbain (2+3)	14,774,447	23.8	207,268	38.1	71.3	3,719,459	14.5	40.4	43.5	51.2
Espace des grandes aires urbaines (1+2+3)	51,287,979	82.6	250,631	46.1	204.6	21,664,516	84.5	16.3	39.2	21.5
Autres catégories	10,846,887	17.4	293,316	54.0	37.0	3,931,413	15.4	-24.8	-19.4	-21.0
France métropolitaine	**62,134,866**	**100.0**	**543,947**	**100.0**	**114.2**	**25,595,929**	**100.0**	**6.2**	_	**12.3**

* see definitions: Floch and Levy, 2011:[2]
Population and employment in workforce; area in km²; density in inhabitants per km².
Field: France métropolitaine.
Source: Insee, censuses of the population in 1999 and 2008.

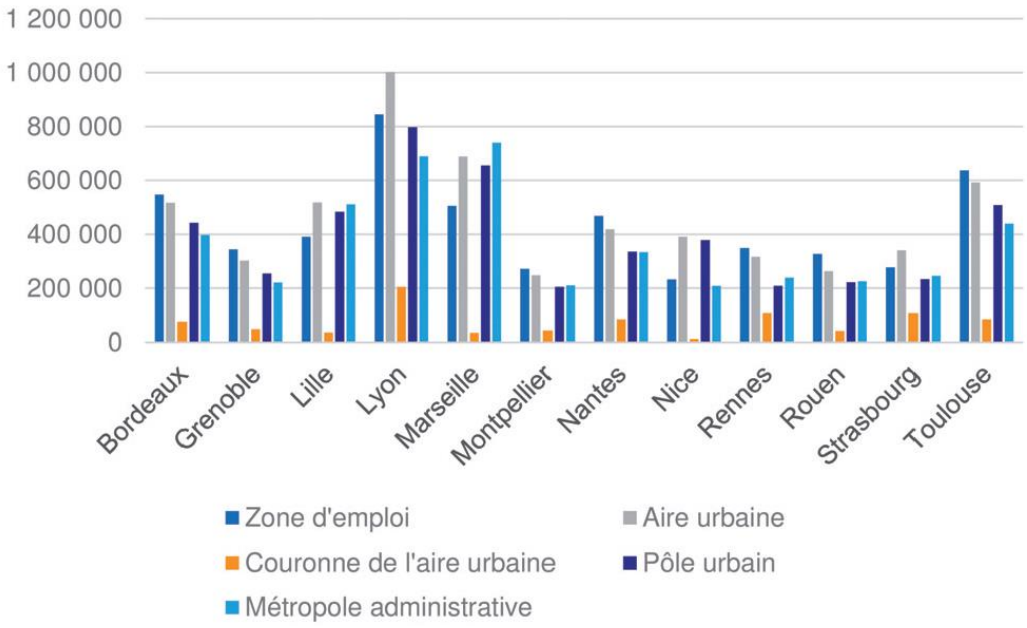
Regarding Lyon and Bordeaux in particular, the study claims that these metropolises have expanded their perimeter by more than 50% in the decade 1998-2008 (with Lille maintaining the same perimeter since 1998). The brief argues, however, that the territorial expansion does not explain population growth, the main driver of which is attributed to job creation (Floch and Levy, 2011:[2]) –another similarity with the case of Luxembourg. Between 1998 and 2008, the large urban centers earn about 2 million jobs but their resident labor force increases by only 1.3 million and, thus, depend on labor that comes from other territories. It is also interesting to note the magnitude of the population growth, a magnitude that brings in mind the case of the Grand Duchy.

a 3.4% increase from 2006 (*Ibid*: [4]). In the case of Luxembourg, as of 2017, the average distance "house-to-work" for a resident was 13km (34 minutes) and for the cross-border workers that live in France, Belgium and Germany, 34km (54 minutes), 42km (51 minutes) and 40km (49 minutes) respectively. At the same time, car is still the preferred medium of transport (Ministère du Développement Durable, 2018:12).

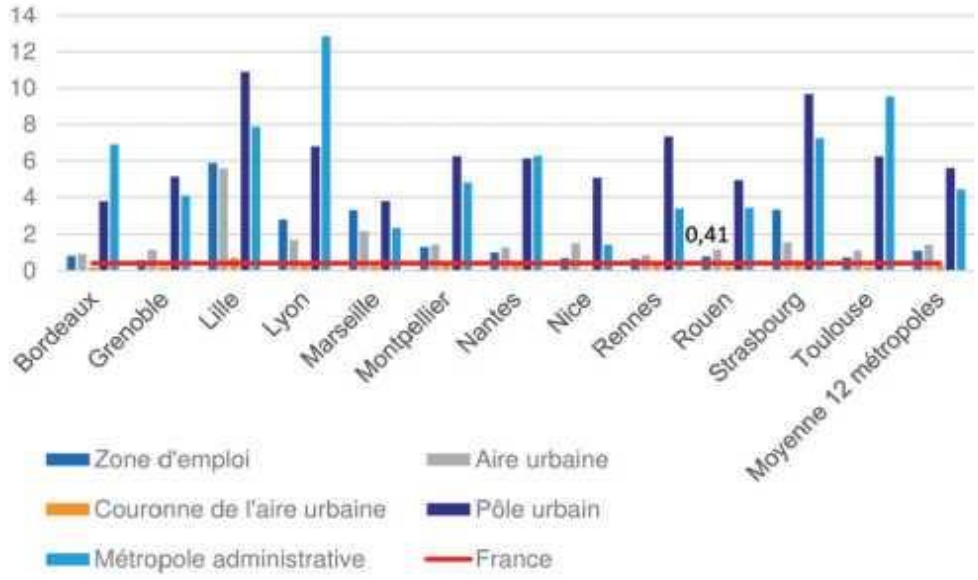
Tables 21a and 21b compare the number and density of jobs in these metropolises. We immediately observe that the larger the area, the bigger the number of jobs and, most importantly, that the concentration of the jobs is stronger at the poles of the metropolises rather than the fringes.

Table 21

21a Number of jobs (at the workplace) in 2014



21b Density of employment in 2014 (in jobs / hectare)

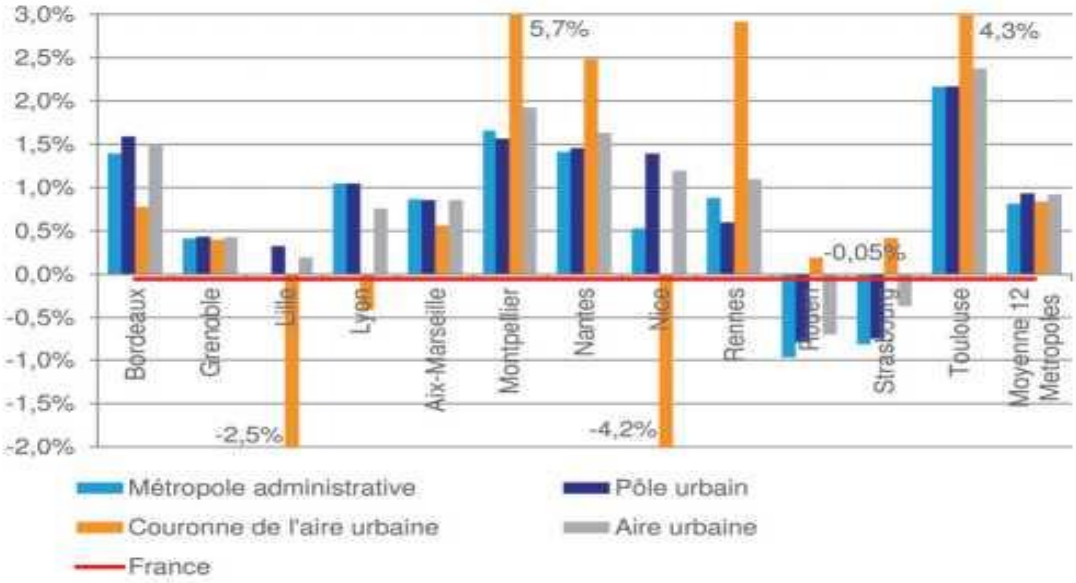


Source: Altabar and Le Hir (2017:5)

The number and density of employment, however, varies between metropolises –variations that, as the authors claim (*Ibid*: 5), are mostly the result of the "*extent of the perimeter of each metropolis*". The Lyon metropolis for example, has a higher employment density than the urban pole simply because it is included in the latter. On average, job density in the metropolises (4.4 jobs / hectare) is similar to that of urban poles (5.6 jobs / hectare) and nearly ten times higher than the average density employment in France (0.47 jobs / hectare). The similarities with the Luxembourgish case are striking. We observe that when we examine the aggregate magnitudes of a state like France the difference is significant (sometimes even impressive) but if we focus on the more comparable magnitude of a metropolis, the similarities in the job-creation dynamics are noticeable.

Table 22

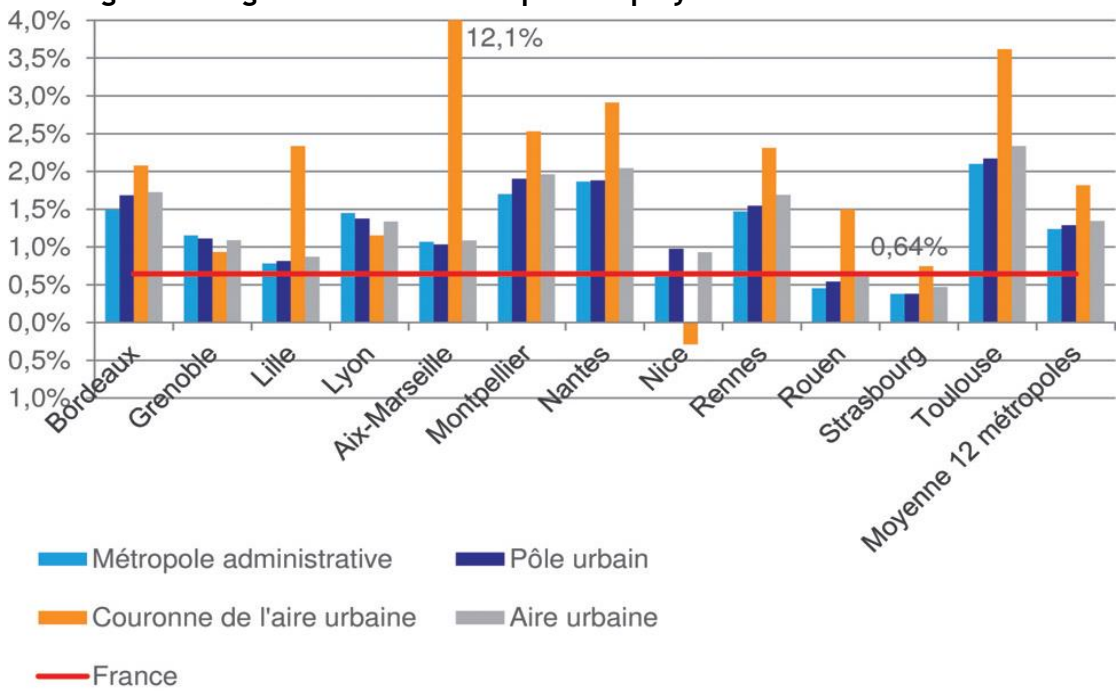
Average annual growth rate of salaried employment in the competitive base between 2004 and 2010



Source: Altaber and Le Hir (2017:6)

Table 23

Average annual growth rate of total paid employment between 2004 and 2010



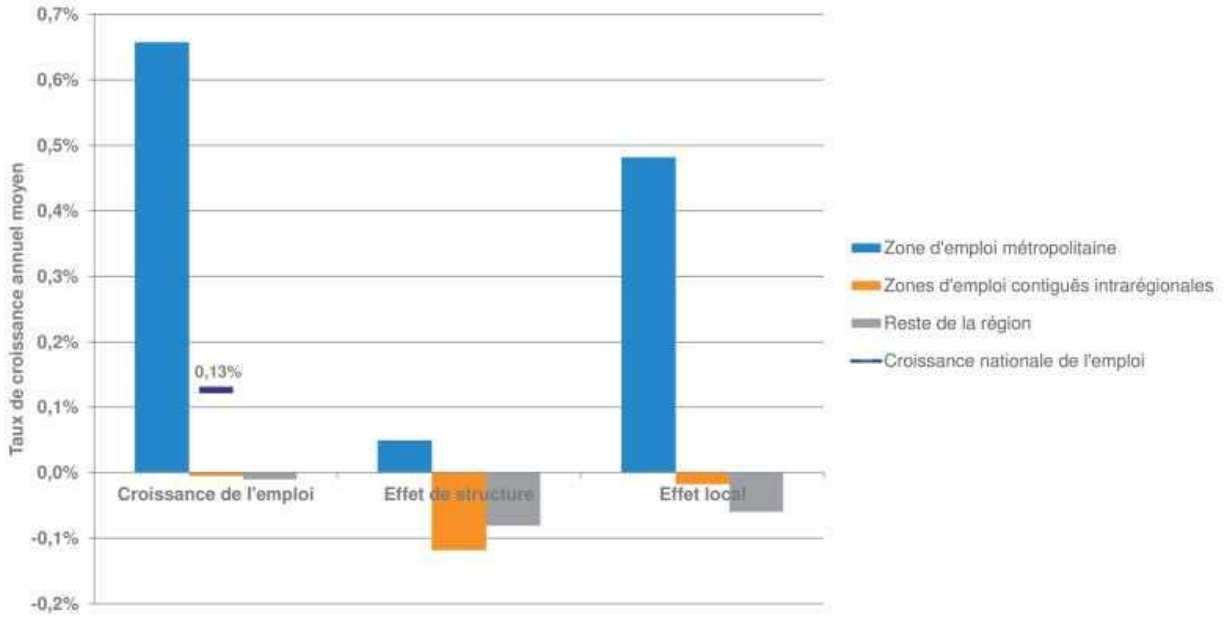
Source: Altaber and Le Hir (2017:6)

By looking at table 22 we can easily observe that (*Ibid*: 6) the annual growth rate of wage employment in the competitive base is largely above the national average, regardless of the perimeter of the metropolitan areas considered. In the years 2004-2010 salaried employment (in the competitive base sectors) grew from 0.8% to 0.9% per year in urban areas whereas at the national level it exhibited a marginal reduction (-0.05%).

Overall, the authors (*Ibid*: 7) conclude that metropolises can indeed exert a positive influence on employment growth in the nearby territories (if we limit the notion of "nearby territories" to the crowns of the poles) –and they did but from the first decade of 2000 these effects have diminished. Salaried employment did exhibit a growth of 0.65% per year in the 12 metropolises examined between the years 2009-2014 and stagnated in other regional employment areas. Based on the data of *France Stratégie*, our conclusion is that our sample of metropolises is indeed quite diverse –a diversity that is mainly originating from the different regional settings within which each metropolis is embedded. However, in terms of magnitudes, they are quite similar with Luxembourg's –especially if one looks at the gap with the (French) national average.

Table 24

The average dynamics of an employment zone of a metropolis and the other employment zones of its region of belonging (average over the twelve cities over the period 2009-2014)



Note: decomposition of the average annual growth rate of salaried employment over the period 2009-2014 from a shift-share decomposition method based on a disaggregated economy in 38 sectors.

Employment growth = national average of employment growth + structural effect + local effect. The peripheral employment zones (EZs) include the employment zones of the metropolitan area outside the employment zone of the metropolitan area and outside the contiguous employment zones.

Employment zones are weighted by their weight in employment in their category; and the horse employment areas are underweighted according to their part in the region. The job considered concerns salaried employment only.

Source: Altabar and Le Hir (2017:8)

IV.2 Germany

None of the German cities have a population larger than 3.5 million (the population of Berlin). In that aspect they exhibit some similarities with Luxembourg in the sense that, in order to boost their economic performance, they depend on resources out of their borders –international borders in the case of Luxembourg and administrative/city borders in the case of German cities. In that respect, the German cities of our sample are also similar with the French. The difference between Lille (than incorporates 90 municipalities) and Frankfurt/Rhein-Main (that and incorporates a staggering 445 municipalities) might seem huge but it becomes a bit watered down when we consider population scales. Lille for example, had (as of 2016) 2.6 million

inhabitants, while the Frankfurt/Rhein-Main metropolitan region (that extends over 3 federal states) consist of around 2.64 million (for the same year). The magnitudes, at least regarding their population size, are comparable.

Table 25

Population density (people/km^2)

METROREG/YEAR	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Hamburg	422	424	425	424	425	427	430	433	437	454
München	462	468	473	475	479	485	493	500	506	527
Frankfurt am Main	576	577	577	578	580	584	589	595	601	614
Lyon	515	518	523	528	534	540	545	551	557	568
Bordeaux	140	141	143	144	146	147	149	151	154	158
Lille - Dunkerque – Valenciennes (**LDV**)	447	447	447	448	449	449	451	452	453	455
Luxembourg	183	186	189	193	196	201	206	211	216	-

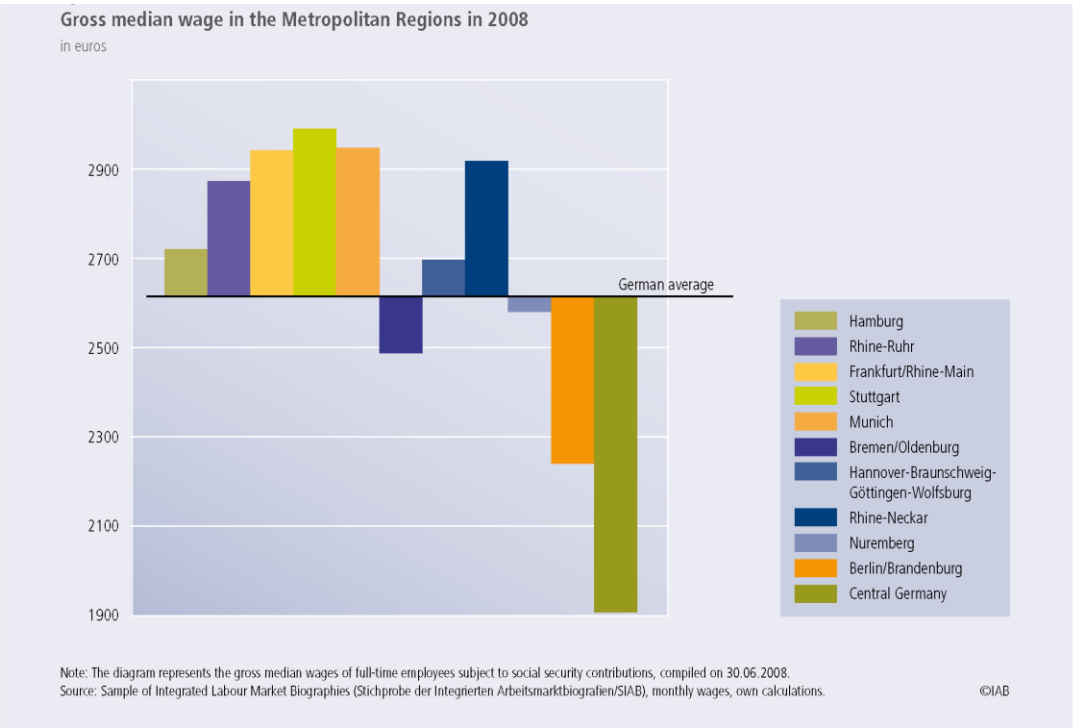
Source: Eurostat

In an effort to tackle the challenges posed by globalization and achieve sustainability, German cities developed a method of regional cooperation that was gradually institutionalized, especially from the 50s on: metropolitan regions. These metropolitan regions (and their governance) was not imposed by the federal state. Instead, they were the result of a bottom-up process that was based on existing cooperation structures.

The German European metropolitan regions are defined as "*big economic areas with one or multiple urban nuclei*" and were designed as "*engines of social, economic and cultural development*" emphasizing "*good accessibility at the European and international level*" (IKM, 2006:2). Somewhat schematically, we may argue that they have two main goals: to strengthen cooperation within the region (facilitate the work of companies, engage stakeholders and the civil society, etc.) and to enhance competitiveness –nationally and internationally (metropolitan regions compete for companies and skilled labor, striving for economic dynamism and sustainability). These metropolitan regions have, in order to increase cooperation, to solve a number of challenges with most prominent among them traffic and transportation problems (especially in low density areas) and frictions in the housing market. The focus on the needed expansion of transport infrastructure in particular (*Ibid*:2-3), concerns rail, road, air and water connections for persons and goods. Towards this aim of contributing to socio-economic growth and development, metropolitan regions have to mobilize resources and create synergies that led them to the creation of various cooperation platforms.

In an effort to "capture" the effectiveness of German Metropolitan Regions in their object of promoting (socio-economic) development, Burghardt et al. (2012) compare the regional wage level in eleven German metropolitan regions considering the wage an "*important indicator of wealth and economic performance*" (p.91). Taking as a reference value the 2008 nationwide monthly gross median wage (€2,615), the authors discover substantial differences among metropolitan regions.

Table 26

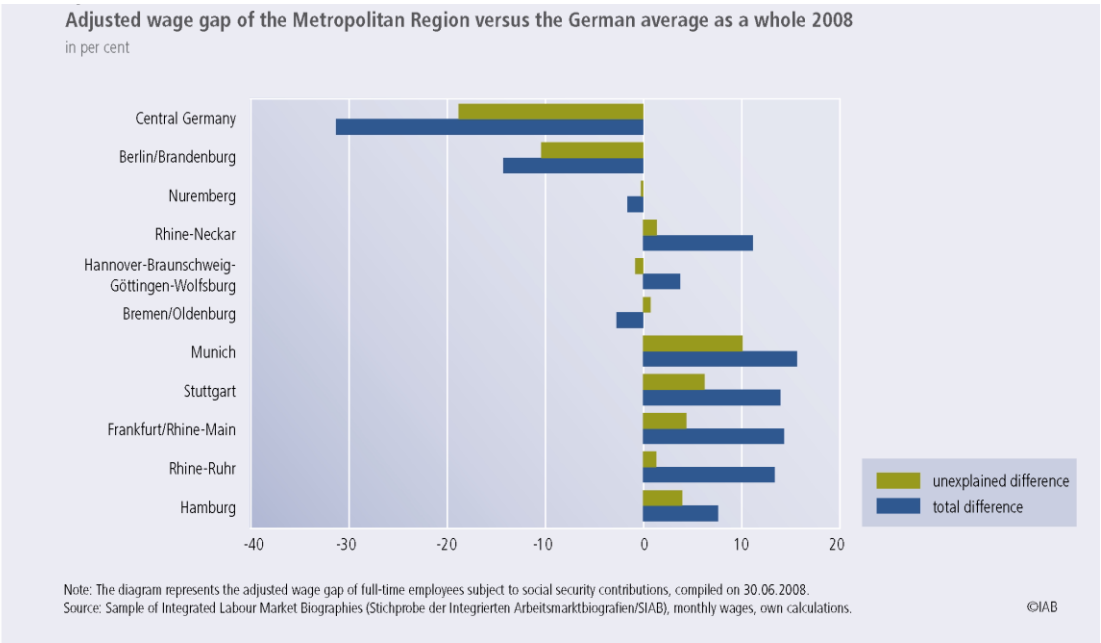


Source: Burghardt et al. (2012:94)

By observing closer table 26 we notice that in Germany's western metropolitan regions the monthly gross wage oscillates from around €2,489 (Bremen/Oldenburg) to about €2,991 (Stuttgart, for the reference year 2008). From the group of western German metropolises, only in Bremen/Oldenburg and Nuremberg do the full-time employed (that are subject to social security contributions) earn less than the national average. On the other hand, all metropolises that comprise our sample (Munich, Frankfurt/Rhein-Main and Hamburg) are included in the group of metropolises that the region-average is above the national average. Part of these wage differences is due to differences in the economic structures of these regions. Munich for example, that has a 15% higher regional average compared to the national one[20], also has the highest proportion of employees in intensive, knowledge-based sectors. The authors argue, however, that even when subtracting these factors, employees in the metropolitan region of Munich earn 10% more than the national average. The average monthly wage for Frankfurt/Rhein-Main and Hamburg (after the authors control for the factors discussed) ranges from 4% to 6% above the national (*Ibid*: 93).

[20] The monthly average wage for Central Germany region (i.e. the region with the lowest incomes), in contrast, is 30% lower than the average nationwide wage. If one subtracts differences in employment structure, the gap amounts to -19% (Burghardt et al., 2012:94).

Table 27



Source: Burghardt et al. (2012:97)

It appears, when we look at both tables 26 and 27, that the west-east division is present in the metropolitan region level as well as the national. We must have these differentials in mind when analyzing German metropolises, especially in order to avoid the danger to assume that our (very) modest sample is representative of Germany as a whole. We decided, however, to include only metropolises from parts of Germany that never experienced a communist past. The reason behind this is straight-forward: we expect metropolises that were part of the communist block until 1990 to face different structural challenges than those faced by metropolises that –like Luxembourg- were part of the western sphere since the aftermath of World War II.

There are, of course, big differences between German metropolitan regions other than wages, regarding *inter alia*, the size of the land area, the number of the inhabitants/density, the economic structure, even the number of the federal states included that can range from one (as the case of Munich) to multiple (like the case of Frankfurt/Rhein-Main). Note that these regions are not additional administrative structures but rather platforms of regional cooperation that have *ad hoc* governance structures (based on the specificities of each region) and the authority to define their own borders.

Table 28

Metropolitan Regions	Population (in mill)[21]	Area (in km^2)[22]	GDP/capita (in euros)[23]
Hamburg	5.1	28,300	70,100
Munich	5.9	25,500	80,300
Stuttgart	5.3	15,400	74,400
Hannover Braunschweig Gottingen Wolfsburg	3.8	18,600	68,800
Frankfurt/Rhein-Main	5.6	14,800	76,600

Source: Initiativkreis Europäische Metropolregionen in Deutschland

In a nutshell, we observe a very interesting divergence among the metropolises of our sample of countries (France and Germany). The metropolises examined here are far from being characterized as a homogenous group (especially for the case of Germany), with some of them exhibiting growth trends that are above the national-level average and some (sometimes considerably) below.

[21] Data for 2014.
[22] Data for 2014.
[23] Data for 2013.

V. Synthetic Indicators and Final Remarks

Without repeating the points made in the previous subsections, in this section we will present our most important findings –by using harmonized data from Eurostat[24]- having in mind the spillovers we identified in section II with reference to Luxembourg.

In section II (especially sub-sections II.1 and II.2) we argued that Luxembourg, being a small sovereign state, is highly dependent on foreign labor –with the foreign-born being a sizeable part of its population. At the same time, Luxembourg's population growth is dependent on the country's economic growth (also relative to its neighbors) –with the cross-border workers accounting for about 45% of all jobs in Luxembourg. The situation in our sample of French and German metropolises is less clear-cut given the fact that those working in the metropolises are still French (or German) citizens/residents and do not come from abroad. Existing data, therefore, of the people that travel to work but do not live in the same area are not always available –especially for long periods. Still, if we take wages or employment creation as a sign of economic performance, we have already observed in the above sections that our sample of metropolises surpass the national averages –in some cases by far. The strong economic performance of our metropolitan regions attracts not only local workers but also workers from neighboring regions, a situation that resembles the Luxembourgish case only this time, the "borders" that these people cross are not national but regional/administrative. In addition, if we decide to group these regions together –instead of taking their nation-averages as a whole-, we observe that the growth that Luxemburg experiences stops, in a degree, being so "exceptional".

The lack of data may sometimes blur the picture yet they still offer a scientific (and political) platform for further research. In what remains, we will aim at a "2-rounds" comparison in order to test our main argument, namely, that Luxembourg's economy should be compared not with states but with (European) Metropolises. In the first round we will compare Luxembourg's national averages with the national averages of France and Germany. In the second round, we will compare Luxembourg with the French and German metropolises that form our sample, in an effort to underline the resemblances between them despite the big differences observed when one focuses on the national-level averages (of the same countries). In our comparisons we will focus only on the benchmarks that we have identified earlier, namely, population growth, dynamics of job creation and evolution of the GDP - GDP/capita.

[24] The definitions of metropolises –and thus their respective administrative and geographical limits- might differ between Eurostat and those accepted by *France Stratégie* or IKM, something that might create inconsistencies and limits our ability to offer clear-cut comparisons. For an overview of the EU definitions and the problematic regarding data limitations see ESPON (2010) and Decovile et al. (2015).

Table 29

Population on 1 January (total, in millions)

29a States

STATE/YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2008-2016 difference
Germany	82.21	82	81.8	80.22 (b)	80.33	80.52	80.77	81.19	82.17	-0.05%
France	64	64.35	64.65	64.97	65.28	65.6	65.94	66.45 (b)	66.73 (p)	4.27%
Luxembourg	0.48	0.49	0.50	0.51	0.52 (b)	0.53	0.54	0.56	0.57 (b)	18.75%

Source: author's calculations, Eurostat

29b Metropolises & Luxembourg (total, in millions)

METROREG/YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2008-2016 difference
Lille (LDV)	2.56	2.57	2.57	2.57	2.58(p)	2.59	2.60	2.60(p)	2.60(p)	1.56%
Lyon	1.69	1.70	1.72	1.744	1.76(p)	1.77	1.80	1.82(p)	1.84(p)	8.87%
Bordeaux	1.42	1.43	1.44	1.463	1.48(p)	1.50	1.52	1.54(p)	1.56(p)	9.86%
Frankfurt am Main	2.52	2.53	2.53	2.50(b)	2.52	2.54	2.57	2.60	2.64	4.76%
Hamburg	3.18	3.18	3.19	3.11(b)	3.13	3.15	3.17	3.20	3.24	1.88%
München	2.62	2.64	2.65	2.64(b)	2.69	2.73	2.76	2.80	2.84	8.39%
Luxembourg	0.48	0.49	0.50	0.51	0.52	0.53	0.54	0.56	0.57	18.75%

b break in time series
p provisional
Source: author's calculations, Eurostat

The conclusions regarding population growth are clear-cut. In the last decade, no metropolis from our sample managed to exhibit a rate of increase in its population bigger (or even similar) to that of Luxembourg. The growth rate of the populations varies greatly, ranging from a modest (below the national-average growth rate of France) 1.56% for LDV[25] to a significant (far above the nation-level average) growth of 9.86 for Bordeaux. The interesting is that all the German metropolises of our sample surpass the (negative) Germany-level average by far although the growth rates still vary significantly, ranging from a 1.88% for Hamburg to a 8.93% for Munich. Still, and despite the fact that most of our metropolises manage to surpass the nation-average significantly, not one of them manages to come close to Luxembourg's 18.75% growth rate for the period 2008-2016.

[25] Lille-Dunkerque–Valenciennes.

What is, perhaps, more interesting is the fact that even if we calculate only the population growth of the metropolitan center (excluding the metropolitan periphery), the magnitudes remain the same (with the exception of the LDV).

29c Metropolises & Luxembourg (total, in millions)

METROREG/YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2008-2016 difference
Lille (LDV)	2.56	2.57	2.57	2.57	2.58(p)	2.59	2.60	2.60(p)	2.60(p)	1.56%
Lille (Pôle urbain)*	*1.01*	*1.02*	*1.02*	*1.02*	*1.02*	*1.03*	*1.04*	*1.04*	*1.04(p)*	*3.03%*
Lyon	1.69	1.70	1.72	1.744	1.76(p)	1.77	1.80	1.82(p)	1.84(p)	8.87%
Lyon (Pôle urbain)*	*1.52*	*1.53*	*1.55*	*1.56*	*1.58*	*1.60*	*1.62*	*1.64*	*1.66(p)*	*9.10%*
Bordeaux	1.42	1.43	1.44	1.463	1.48(p)	1.50	1.52	1.54(p)	1.56(p)	9.86%
Bordeaux (Pôle urbain)*	*0.83*	*0.84*	*0.84*	*0.85*	*0.86*	*0.88*	*0.89*	*0.90*	*0.92(p)*	*9.91%*

p provisional
Source: author's calculations, *INSEE (Communes des Grands Pôles des Aires Urbaines de Lille, Lyon et Bordeaux)

Table 30 GDP Growth

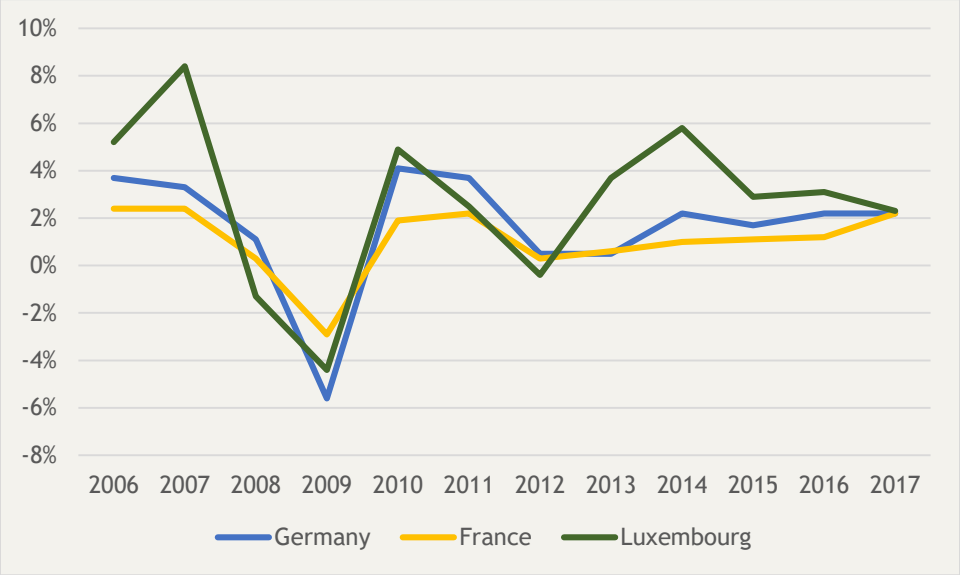
Real GDP growth rate - Percentage change on previous year

30a STATES

STATE/YEAR	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Germany	3.7	3.3	1.1	-5.6	4.1	3.7	0.5	0.5	2.2	1.7	2.2	2.2
France	2.4	2.4	0.3	-2.9	1.9	2.2	0.3	0.6	1	1.1	1.2(p)	2.2(p)
Luxembourg	5.2	8.4	-1.3	-4.4	4.9	2.5	-0.4	3.7	5.8	2.9	3.1	2.3

p provisional
Source: Eurostat

30b Real GDP growth rate - Percentage change on previous year



Source: author's calculations

In terms of annual percentage change of real GDP (table 30a) there seems to be, at least since 2006, a convergence between Luxembourg and the other two states of our sample. If one looks at the difference of GDP (measured in PPS) over the last decade (2007-2017) there is no doubt that Luxembourg is a clear outlier with an increase of 35.96% since 2007 (table 30c).

30c 2007-2017 difference in GDP growth (in million PPS)

STATE/YEAR	2007	2017	2007-2017 difference
Germany	2,471,413	3,058,960	23.77%
France	1,798,504	2,091,945	16.32%
Luxembourg	33,222	45,170	35.96%

Source: author's calculations, Eurostat

Again, the size of Luxembourg's economy is an explanatory factor behind this increase. It goes without question that it is "easier" *caeteris paribus* for the Luxembourgish GDP (of 33,222 million euros in 2007) to reach 45,170 million in a decade than for Germany's economy of 2,471,413 million euros (2007) to achieve similar growth in a decade. Therefore, perhaps tables 30a and 30b are better suited to capture our countries' growth dynamics regarding their real GDP growth.

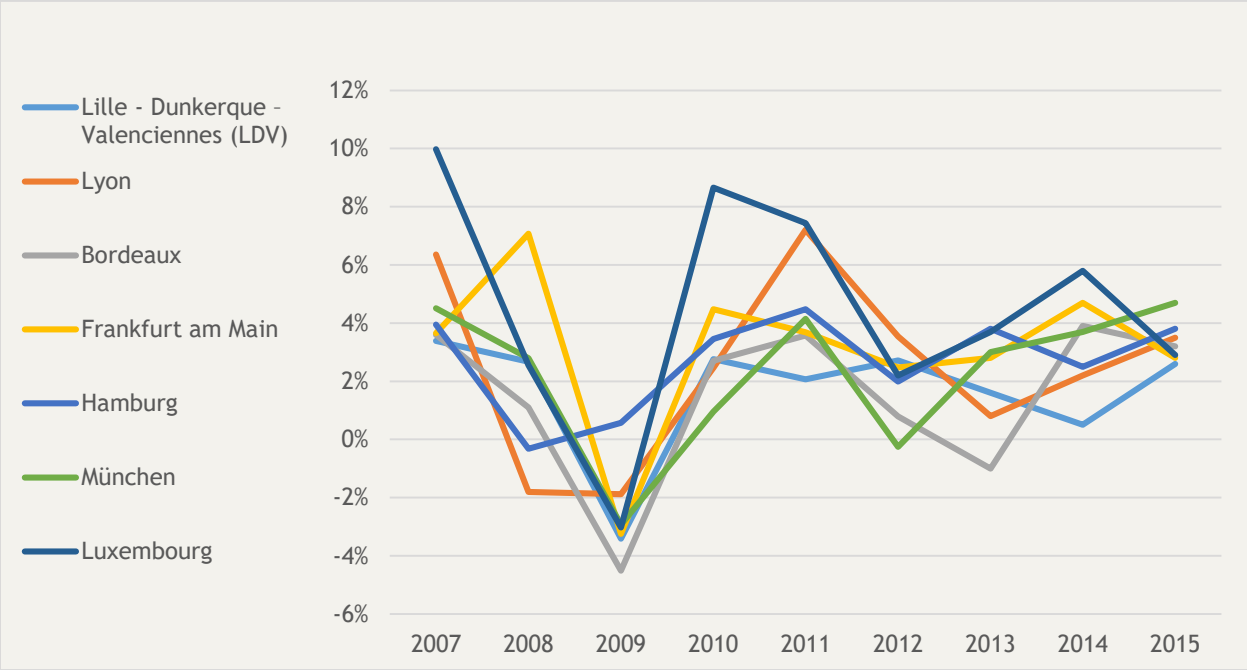
30d Metropolises & Luxembourg

Real GDP growth rate - Percentage change on previous year

METROREGION/YEAR	2007	2008	2009	2010	2011	2012	2013	2014	2015
Lille-Dunkerque-Valenciennes (LDV)	3.38%	2.67%	-3.41%	2.75%	2.06%	2.72%	1.60%	0.50%	2.60%
Lyon	6.36%	-1.81%	-1.89%	2.47%	7.21%	3.54%	0.80%	2.20%	3.50%
Bordeaux	3.60%	1.10%	-4.51%	2.71%	3.57%	0.80%	-1.00%	3.90%	3.20%
Frankfurt am Main	3.66%	7.07%	-3.25%	4.47%	3.68%	2.47%	2.80%	4.70%	2.80%
Hamburg	3.95%	-0.32%	0.57%	3.46%	4.48%	1.99%	3.80%	2.50%	3.80%
München	4.51%	2.80%	-2.93%	0.96%	4.14%	-0.26%	3.00%	3.70%	4.70%
Luxembourg	9.97%	2.56%	-3.02%	8.66%	7.43%	2.19%	3.70%	5.80%	2.90%

Source: author's calculations, Eurostat

30e Real GDP growth rate - Percentage change on previous year



Source: author's calculations

30f 2006-2015 percentage change in GDP by metropolitan regions (in million PPS)

METROREG/YEAR	2007	2015	2007-2015 difference
Hamburg	123,544	143,586	16.22%
München	137,365	165,872	20.75%
Frankfurt am Main	119,55	134,851	12.80%
Lyon	60,068	73,751	22.78%
Bordeaux	39,778	46,721	17.45%
LDV	63,45	69,661	9.79%
Luxembourg	33,222	44,094	32.73%

Source: author's calculations, Eurostat

At a lower level of analysis (that of the metropolis) we observe a similar pattern. Luxembourg is still an outlier (with a 32.73% change) yet other metropolises have managed to somewhat close the gap –especially Lyon (with 22.78%) and Munich (with 20.75%). The interesting here is that the French and German metropolises' exhibit mixed performances when compared with the national-level averages of the percentage change in GDP. While Lyon and Bordeaux have a performance greater than France's (as a whole), LDV, Frankfurt and Hamburg exhibit a worse than the German-average, with only Munich (at 20.78%) exhibiting a performance very close to that of Germany as a whole. Unfortunately, we lack more recent data for the metropolises and, thus, we are unable to fully capture these dynamics.

Table 31

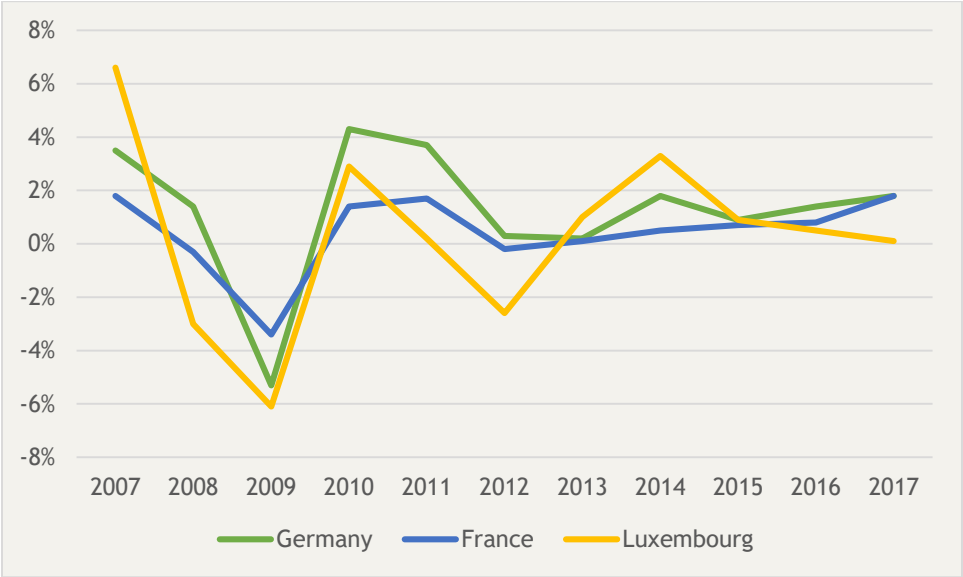
Real GDP/capita Growth (chain linked volumes, percentage change on previous period)

31a STATES

STATE/YEAR	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Germany	3.5%	1.4%	-5.3%	4.3%	3.7%	0.3%	0.2%	1.8%	0.9%	1.4%	1.8%
France	1.8%	-0.3%	-3.4%	1.4%	1.7%	-0.2%	0.1%	0.5%	0.7%	0.8%(p)	1.8%(p)
Luxembourg	6.6%	-3.0%	-6.1%	2.9%	0.2%	-2.6%	1.0%	3.3%	0.9%	0.5%	0.1%

p provisional
Source: author's calculations, Eurostat

31b Real GDP/capita, chain linked volumes, % change on previous year



Source: author's calculations

Yet again we observe a similar pattern if we focus on the annual change of the GDP/capita between the states of our sample (table 31a). If one focuses on the percentage change over the last decade however, observes an interesting phenomenon (table 31c).

31c 2007-2017 percentage change in real GPD/capita, chain linked volumes (2010), euro per capita

STATE/YEAR	2007	2017	2007-2017 difference	2008-2013 difference
Germany	32,100	35,500	10.59%	9.23%
France	31,400	32,300(p)	2.87%	-0.32%
Luxemburg	84,400	81,800	-3.08%	-4.76%

p provisional
Source: author's calculations, Eurostat

Luxembourg experiences negative growth with -3.08% (or -4.76% for the 2008-2013 period) lagging far behind Germany that exhibits an impressive 10.59% increase (9.23% for the 2008-2013 period) or even France (with a modest increase of 2.87% -or negative growth for the 2008-2013 period). Further study is, of course, needed before one reaches sound conclusions. Our intuition however, is that behind Luxembourg's relatively poor performance there are some structural factors operating. In the decade under examination, the world economy suffered its biggest crisis since the Great Depression. Luxembourg, as a service-led economy that specializes in finance/insurance (see section II) and is deeply embedded in world economy (see section III) was one of the countries that felt disproportionately strong the impact of the crisis (something

that can be also seen from table 31b, where, in 2009, Luxembourg experienced the most dramatic fall)[26].

31d METROPOLISES & LUXEMBOURG

GDP/capita in thousand euros

METROREG/YEAR	2008	2009	2010	2011	2012	2013	2008-2013 difference
Hamburg	40561	39179	40132	42014	42879	44213	9.00%
München	52351	50974	52034	55995	56898	57760	10.33%
Frankfurt am Main	48773	46388	47645	49938	49935	50914	4.39%
Lyon	41078	39509	40797	41717	42360	42477	3.41%
Bordeaux	30141	30102	30926	31802	32064	31318	3.91%
LDV	27501	26592	26847	27959	27779	28114	2.23%
Luxembourg	79435	75463	80356	84637	84831	87736	10.45%

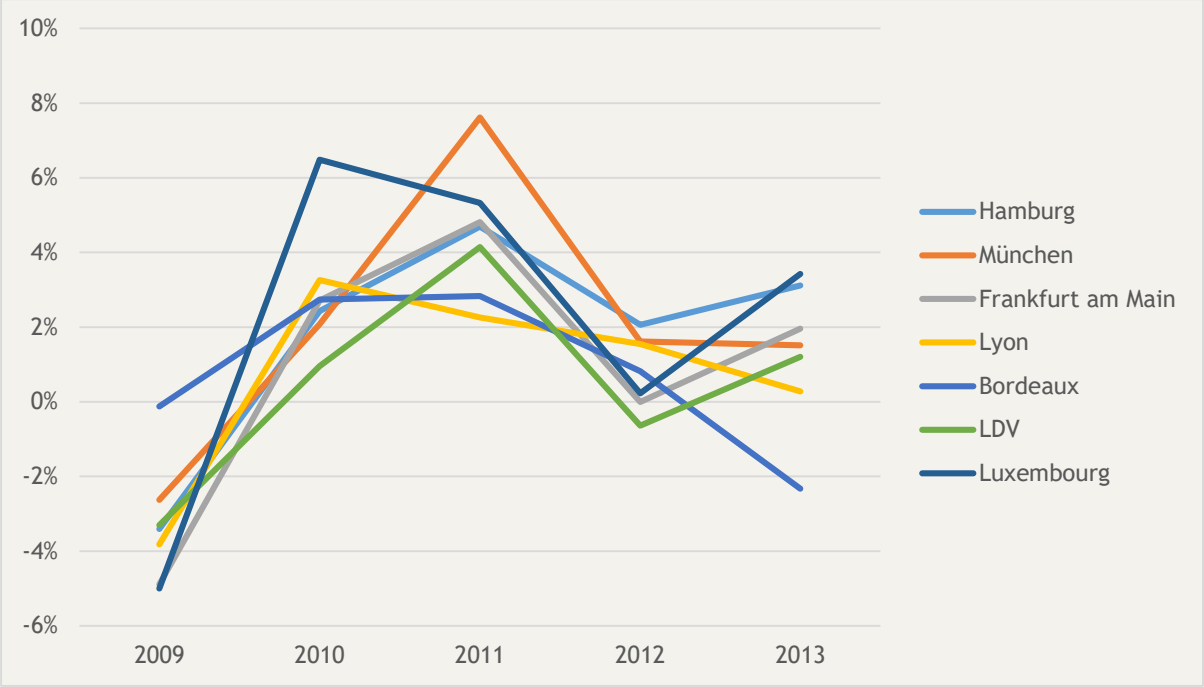
Source: author's calculations

At the lower level of analysis, that of the metropolis, we observe that regarding its GDP/capita growth Luxembourg behaves as an ordinary metropolis, with an increase of 10.45% for the period 2008-2013, identical with that of Munich (10.33%) and very close to that of Hamburg (9%). The French metropolises of our sample cluster around an increase of 4%.[27]

[26] Another explanatory factor might be the productivity growth in Luxembourg that is very low, maybe due to the high initial level of productivity –especially in the financial sector.

[27] As we noted **in sub-section III.2**, when one looks at GDP/capita, must always have in mind that (in the case of Luxembourg) this measure might lead to misinterpretation since cross-border workers will contribute towards wealth creation in one side of the border but spend the bulk of their income in the other side of the border (also, mechanically, cross-border workers contribute to the numerator (GDP) but not to the denominator (population)) –something not applicable to "traditional" metropolises. GNP might be a better indicator here.

31e Real GDP/capita, percentage change on previous year



Source: author's calculations

The percentage annual change of GDP/capita growth over 2009-2013 seems to indicate a pattern of gradual convergence, however data of a longer time span are needed before one can reach reliable conclusions.

Table 32

JOB CREATION / LABOR MARKET DYNAMICS

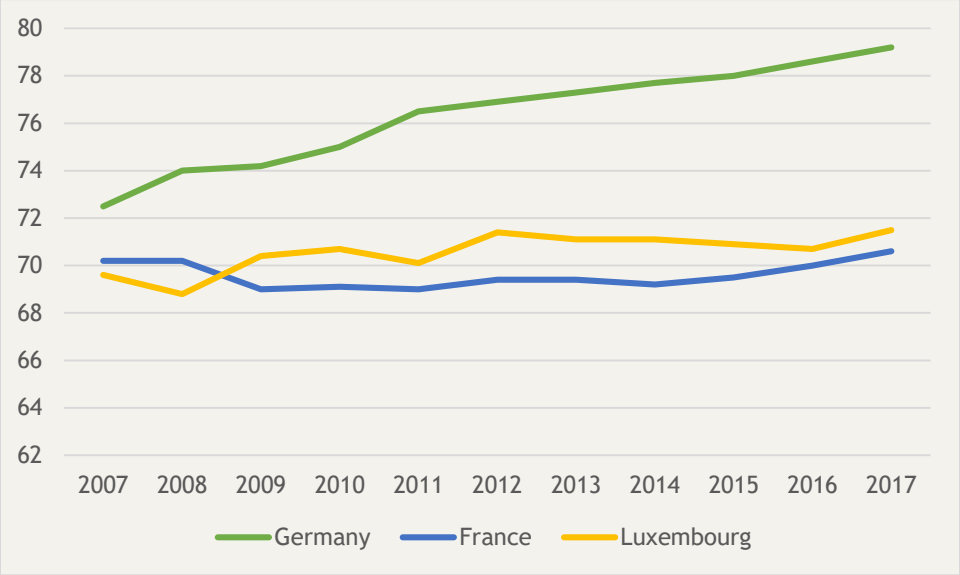
32a STATES

Employment rates of total active population aged between 20 and 64, in %

STATE/YEAR	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Germany	72.5	74	74.2	75	76.5	76.9	77.3	77.7	78	78.6	79.2
France	70.2	70.2	69	69.1	69	69.4	69.4	69.2	69.5	70	70.6
Luxembourg	69.6	68.8	70.4	70.7	70.1	71.4	71.1	71.1	70.9	70.7	71.5

Source: Eurostat Labour Force Survey

32b Employment rates of total active population between 20 and 64 years, in %



Source: author's calculations, Eurostat

In terms of its employment rates, Germany constantly outperforms the other two countries of our sample. France and Luxembourg seem to follow a similar path, with Luxembourg marginally outperforming France.

METROPOLISES & Luxembourg

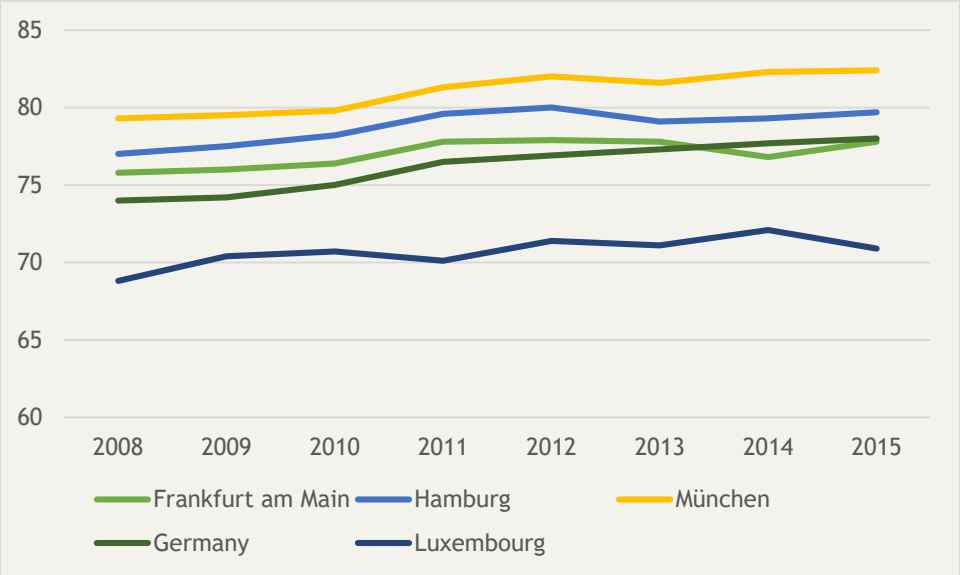
In an effort to tackle the problem of missing values in Eurostat regarding our group of the French metropolises, we separated our sample in two parts: one that draws data mainly from Eurostat and deals with the cases of Luxembourg and the German metropolises, and one that draws data mainly from ACOSS and compares the French metropolises with Luxembourg. For the same reason, we also include unemployment levels to capture the same dynamics, with similar results.

32c Employment rates – 20-64 years and over (in %), German metropolises & Luxembourg

METROREGION/YEAR	2008	2009	2010	2011	2012	2013	2014	2015
Lille (LDV)	-	-	-	-	-	-	-	-
Lyon	-	-	-	-	-	-	-	-
Bordeaux	-	-	-	-	-	-	-	-
Frankfurt am Main	75.8	76.0	76.4	77.8(b)	77.9	77.8	76.8	77.8
Hamburg	77.0	77.5	78.2	79.6(b)	80.0	79.1	79.3	79.7
München	79.3	79.5	79.8	81.3(b)	82.0	81.6	82.3	82.4
Luxembourg	68.8	70.4	70.7	70.1	71.4	71.1	72.1	70.9

b break in time series
Source: Eurostat

32d Employment rates – 20-64 years and over (in %)



Source: author's calculations

In terms of its employment rates, the German metropolises that form our sample outperform significantly Luxembourg, giving a picture similar with the one we observed when we examined the national-level average. Moreover, the metropolises of Hamburg and Munich exhibit a performance above their national-average, with Frankfurt's performance being very close to (albeit marginally better than) Germany's average.

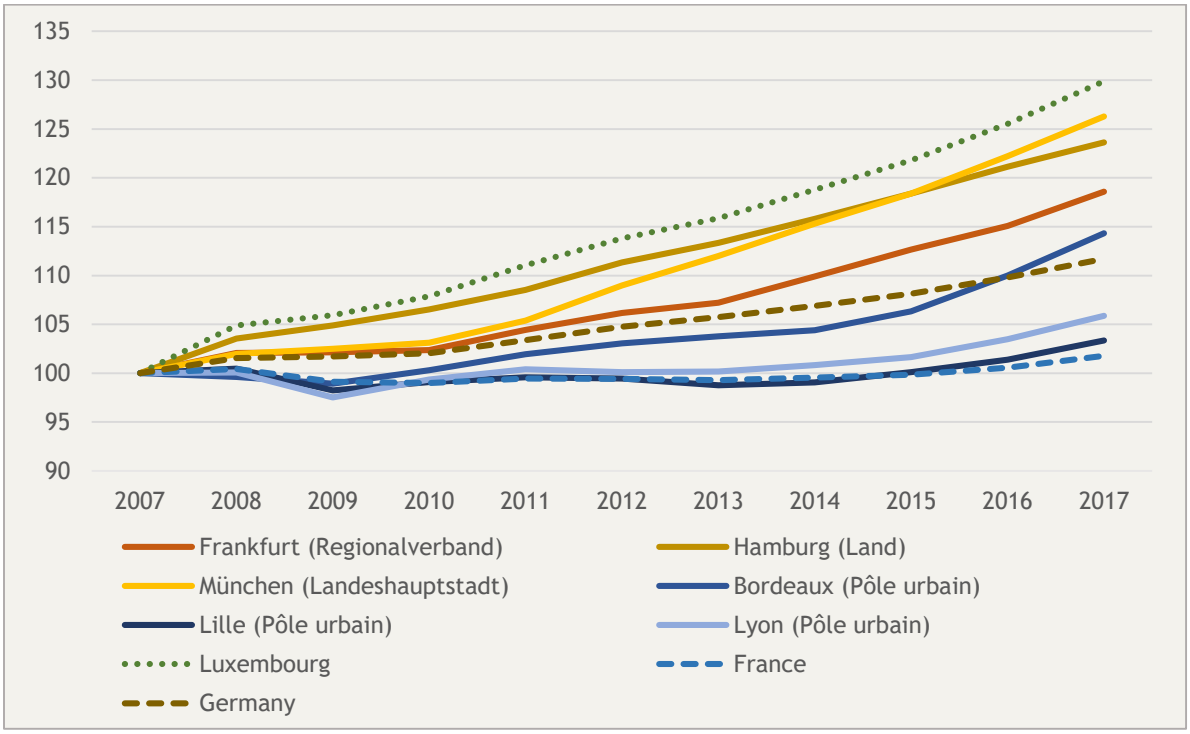
33a Salaried employment (in thousand)

METROREG/YEAR	2007	2017	2007-2017 difference
Frankfurt (Regionalverband)	970	1 150	18.60%
Hamburg (Land)	771	953	23.60%
München (Landeshauptstadt)	673	850	26.30%
Bordeaux ("Pôle urbain")	301	344	14.30%
Lille ("Pôle urbain")	362	374	3.30%
Lyon ("Pôle urbain")	389	412	5.90%
Luxembourg	313	406	29.90%
France	24 647	25 082	1.80%
Germany	35 798	39 983	11.70%

Source: author's calculations, Arbeitsagentur (in Germany: Gemeinden des Reginalverbands Frankfurt, Land Hamburg, Landeshauptstat München), ACOSS (in France: Communes des Grands Pôles des Aires Urbaines de Lille, Lyon et Bordeaux), STATEC, AMECO.

Note: The selection of communes aims to describe the job growth in the centers of the six metropolitan regions, depending on available data.

33b Salaried employment (2007=100)



Source: author's calculations, Arbeitsagentur, ACOSS, STATEC, AMECO

The rise of salaried employment (measured in thousands) has been outstanding in Luxembourg over the period 2007-2017, leaving both Germany (with a significant growth of 11.7%) and France (with a significantly lower 1.8% growth) lagging far behind (table 33a). At the metropolis level, however, those differences disappear almost entirely (at least with regard to the German metropolises of our sample). As a matter of fact, Munich exhibits a growth as impressive as Luxembourg's 26.3%, with Hamburg following closely (23.6%), leaving the French metropolises –with the exception of Bordeaux that is close to Frankfurt (14.3% and 18.6%, respectively)- far behind. If we turn to the graph (table 33b), we observe a process of gradual convergence between Luxembourg and the German metropolises. It would be interesting to see if this trend will continue.

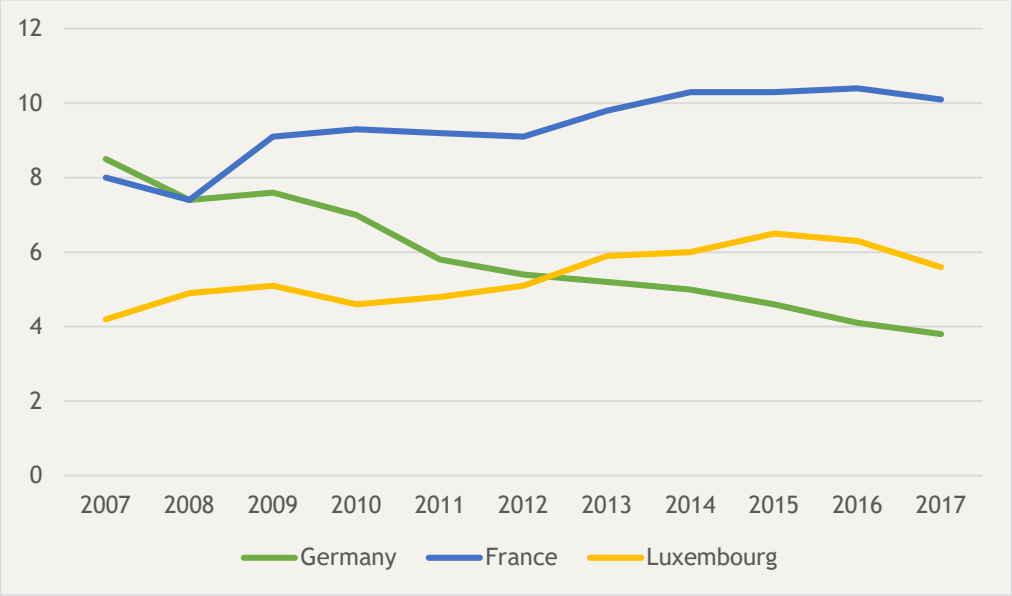
34a STATES

Unemployment rates as a percentage of total active population

STATE/YEAR	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Germany	8.5	7.4	7.6	7	5.8	5.4	5.2	5	4.6	4.1	3.8
France	8	7.4	9.1	9.3	9.2	9.1	9.8	10.3	10.3	10.4	10.1
Luxembourg	4.2	4.9	5.1	4.6	4.8	5.1	5.9	6	6.5	6.3	5.6

Source: AMECO, Eurostat

34b Unemployment rates, % of active population (total)



Source: author's calculations

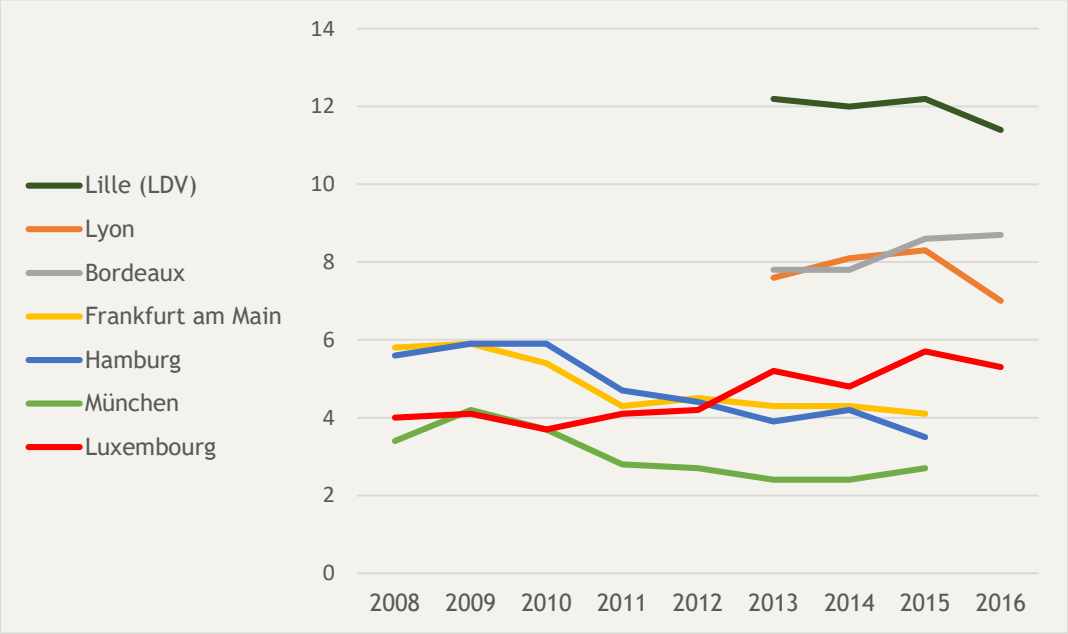
34c Metropolises & Luxembourg

Unemployment rates - 25 years and over (in %)

METROREGION/YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016
Lille (LDV)	-	-	-	-	-	12.2	12.0(b)	12.2	11.4
Lyon	-	-	-	-	-	7.6	8.1(b)	8.3	7.0
Bordeaux	-	-	-	-	-	7.8	7.8(b)	8.6	8.7
Frankfurt am Main	5.8	5.9	5.4(b)	4.3(b)	4.5	4.3	4.3	4.1	-
Hamburg	5.6	5.9	5.9(b)	4.7(b)	4.4	3.9	4.2	3.5	-
München	3.4	4.2	3.7(b)	2.8(b)	2.7	2.4	2.4	2.7	-
Luxembourg	4.0	4.1(b)	3.7	4.1	4.2	5.2	4.8	5.7(b)	5.3

b break in time series
Source: Eurostat

34d Unemployment rates -25 years and over (in %)



Source: author's calculations

After the empirical evidence presented here, our central question re-emerges: "should" Luxembourg's economy be compared with states or with metropolises? Given the limitations of our study we are unable to give a definite answer to this question. The most important limitation is our dataset. Data limitations prohibit a reliable analysis of the trends examined here for long periods. Sometimes the statistics were outdated and the problem of missing values (especially at the metropolis level) is ever-present. At the same time, definitions differ (sometimes dramatically) and in terms of methodology (and data) there is still much to be discussed. A similar or more ambitious project on the same topic should not be undertaken with light-heartedness.

A critical issue that we were unable to capture (mainly due to data limitations) was that of the internal dynamics in the metropolis, the developmental differences within the metropolitan center and the periphery. We were able to (partially) capture these dynamics in the case of Luxembourg (section II) and the cases of our (French and to some extend the German) metropolises individually (section IV). Unfortunately, we were unable to do so in a coherent and systematic way in our empirical analysis (section V) that would use the same methodology/definitions and for a reasonably long of period of time that would have made an international comparison fruitful.

A final but equally important limitation is our sampling. We have already noted in section III that our sample does not aim at being exhaustive (far from it). It serves much more as a suggestion for future research on a topic that, to the best of our knowledge, has not attracted enough attention thus far and has the potential of uncovering hidden socio-economic dynamics. Indeed, a full study would contain a sample of at least 40 European metropolises and longer time spans than those used here. Moreover, it would definitely take into account more states (including Belgium, the country that together with Luxembourg, France and Germany form the Greater Region). In the case of Belgium and Brussels, for example, we observe some interesting trends that shed new light to our results.

Table 35

Population growth

STATE	2008-2016 difference	METROREG	2008-2016 difference
Germany	-0.05%	**Hamburg**	1.88%
France	4.27%	**München**	8.39%
Belgium	6.00%	**Frankfurt**	4.76%
Luxembourg	18.75%	**Lyon**	8.87%
		Bordeaux	9.86%
		LDV	1.56%
		Brussels	15.38%

Source: author's calculations, Eurostat

As we observe from table 35, with the addition of Belgium, Luxembourg is no longer an exceptional case when compared to metropolises since Brussels, with an equally impressive 15.38% population growth, manages to close the gap with Luxembourg almost entirely, providing further support for our main argument.

Table 36

GDP[28] growth

STATE	2007-2017 difference	METROREG	2007-2015 difference
Germany	23.77%	**Hamburg**	16.32%
France	16.32%	**München**	20.75%
Belgium	23.07%	**Frankfurt am Main**	12.80%
Luxembourg	35.96%	**Lyon**	22.78%
		Bordeaux	17.45%
		LDV	9.79%
		Brussels	19.35%
		Luxembourg	32.73%

Source: author's calculations, Eurostat

At the same time, when we look at the GDP growth over the period 2007-2017 (for states) and 2007-2015 (for metropolises), Belgium/Brussels do not challenge our results. In any case, much more thorough research is needed before we may reach safe conclusions. We will, therefore, settle with a compromise: when studying the economy of the Grand Duchy, one must look at *both* countries and metropolises if s/he wants a more complete picture.

When we examined our set of indicators, we observed that Luxembourg remained a clear outlier in both population growth and real GDP growth rate (tables 29-30). At the same time however, we observed that despite the fact that Luxembourg remained an exceptional case when compared to both states and metropolises, the magnitude of this "exceptionality" differed (was significantly reduced at the metropolis level, especially regarding population). In terms of population growth, Luxembourg achieved an 18.75% growth over the period 2008-2016 with France (the country with the second biggest growth rate in our sample) following with a 4.27%. When we examined the metropolis level, it was Bordeaux that managed to somewhat close the gap by achieving a growth of almost 10% for the same period. Looking at the percentage change of GDP on previous year, Luxembourg seems to exhibit similar patters with those of both the states and metropolises of our sample (tables 30b and 30e).

When we examined the GDP/capita growth, we observed a very interesting phenomenon: Luxembourg was the worst performer among the three states of our sample, exhibiting a negative growth of -3%, below France's 2.9% and Germany's 10.6% over the period 2007-2017 (table 31c). On the other hand, at the metropolis level, Luxembourg behaved as an ordinary metropolis for the period 2008-2013[29] (table 31d – see also 31e), with a growth identical to that of Munich and close to that of Hamburg, leaving the (lower) growth of the French metropolises behind. Unfortunately, data limitations prohibit us from fully uncovering these interesting dynamics. When it comes to labor dynamics (un/employment levels), Luxembourg behaves again as an ordinary metropolis –and this time not even among the best performers, being

[28] Measured in million PPS.
[29] Note that the time-periods considered here differ.

constantly outperformed by both Germany[30] and the German metropolises of our sample, being placed between the German and French metropolises but much closer to the French (tables 32a-32d, see also tables 34a-34d). In terms of employment growth, Luxembourg behaves as an ordinary metropolis, with Munich and Hamburg exhibiting a growth rate similar (yet somewhat slower) to that of Luxembourg.

Overall, when looking at the indicators used here (and given the limitations of our research), Luxembourg behaved as a unique case, as a state, and as an ordinary metropolis. We therefore argue that all concepts are useful when examining the Grand Duchy[31]. At the same time, we have observed that even in the cases where Luxembourg retained its "outlier" status, the magnitude of this "exceptionality" is reduced (most of the times) at the metropolis level.

[30] Note that the ageing problematic (the reduction of active population) might be a bias favoring Germany. As a matter of fact, Luxembourg presents a much stronger job creation dynamic than that of Germany's.

[31] As we noted in section I, it is of great importance here to keep in mind that we propose a comparison of Luxembourg's economy with the economies of European metropolises. Given that Luxembourg is a state, there can be no comparison between Luxembourg's administrative and regulatory powers, its institutional setting and power configurations with those of a simple metropolis.

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