Wirtschaftliche Untersuchungen,
Berichte und Sachverhalte

IW-Report 32/18

On the relevance and perspectives of commercial construction in the EU

Pekka Sagner, Michael Voigtländer

Köln, 05.09.2018

INSTITUT DER DEUTSCHEN WIRTSCHAFT

Table of contents

Abstract **3**

1 Introduction **4**

2 Relevance of investment in construction for the economy **5**

3 Back to normal? Investment in construction: pre- and post-crisis **8**

3.1 Investment in construction over time 8

3.2 Link between overall economic performance and investment in construction weakened post-crisis 10

3.3 Comparing current construction investments to pre-crisis levels 13

4 Perspectives for non-residential construction **17**

4.1 Growth perspectives in the office sector 18

4.2 A call for more infrastructure investments 24

5 Conclusion **26**

6 References **27**

List of tables **29**

List of figures **30**

A-1: Tables **31**

A-2: Figures **36**

JEL-Classification:
R33 Nonagricultural and Nonresidential Real Estate Markets
J11 Demographic Trends, Macroeconomic Effects, and Forecasts
O52 Economywide Country Studies: Europe

Abstract

This paper presents the current state of construction investments in the European Union and illustrates its development pre-, during and post- the recent economic and financial crisis. Construction investments were affected strongly by the economic turbulences caused by the crisis. In several EU member states construction investments are not yet back to pre-crisis levels. We further illustrate the importance of construction investments for the EU's gross fixed capital formation and in terms of gross domestic product. The analysis then presents potential challenges for the EU's construction sector. Based on the development of office employment in the past, and its current state, it is likely that demand for commercial construction in the form of office buildings will increase in the future. In addition, infrastructure investments must increase in order to meet the current and future needs.

1 Introduction

When it comes to construction, the residential market usually dominates public debate. This is comprehensible, as all households need shelter and therefore housing is a social need. However, the relevance of so-called non-residential construction, i.e. commercial buildings like offices, retail shops, and logistic parks, and infrastructures like schools and hospitals, should not be underestimated.

Obviously, commercial properties lay the foundation for economic activities (Just et al., 2017) and infrastructures have an impact on the quality of living. In addition, the market is quite relevant for institutional investors which intend to invest money aimed at financing pensions and the accumulation of wealth. Therefore, the non-residential market is increasingly in the focus of central banks monitoring the risks to financial stability (ECB, 2008; Benford/Burrows, 2013).

Furthermore, the non-residential construction activities are a main driver of economic growth. All in all, investments in construction are equally shared between residential and commercial/infrastructure-related investments. As the financial crisis has hit the market hard, the recovery of the construction sector is an important key for the recovery of the EU's economic growth overall.

In the following, the relevance of non-residential construction investments for the EU, each member state as well as over time, is analyzed in greater detail. Special attention is given to the contribution to growth as well as to a comparison with the residential market.

Furthermore, the outlook for future development of non-residential construction is presented. Topics like digitization, flexibility of work and online shopping seem to indicate that in the future, commercial properties in particular will lose importance. However, with regard to the office market a stronger growth is expected for the future. Also, public and private investments in infrastructure have potential for growth. This will be discussed in the last chapter. The paper concludes with a summary.

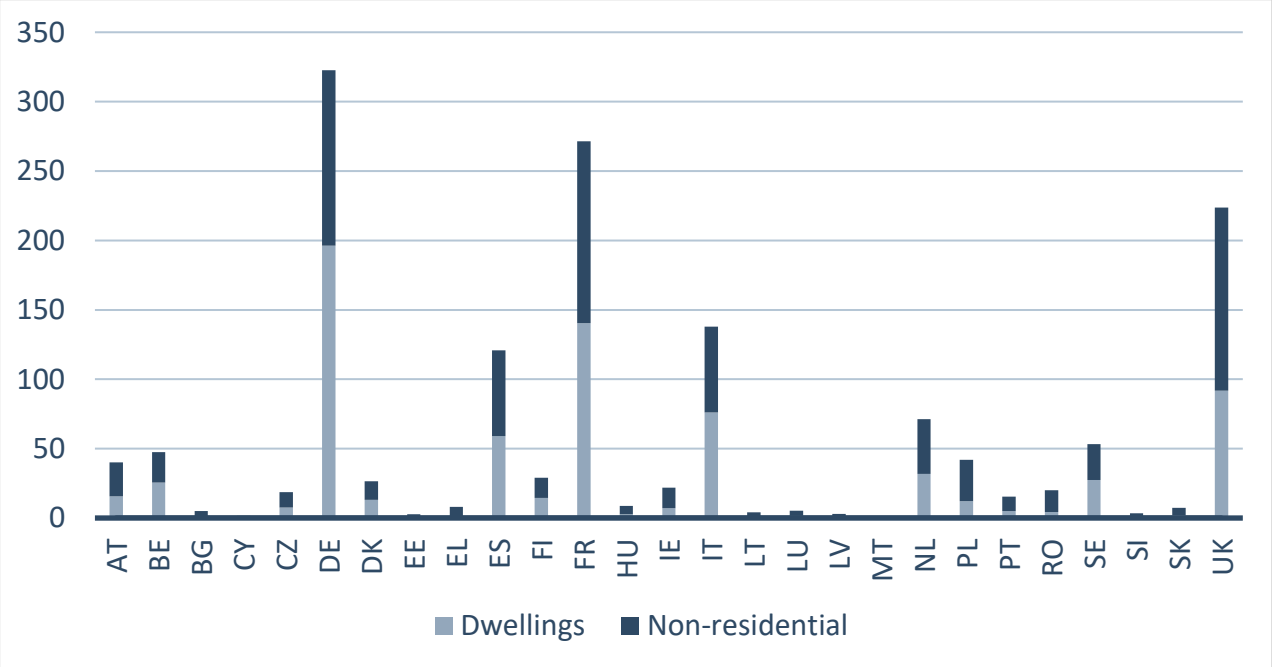
2 Relevance of investment in construction for the economy

In this section we first illustrate the current value of investments in construction in the EU member states. We do so by looking at total investment in construction and its parts: investments in the construction of dwellings and in the construction of non-residential buildings and structures. We focus on gross investment in construction which is part of a nation's gross fixed capital formation. The data is provided by Eurostat, the European Union's statistical office. Throughout the text, we use real 2010 euro whenever we focus on time trends. Therefore, time-invariant prices are considered and the indicated year-on-year change rates are not driven by inflation.

In 2017, the EU members' investment in construction spanned a wide range from 1 billion euro in Malta to 323 billion euro in Germany (see Figure 2-1). In the EU, a total of 1.5 trillion euro was invested, a real increase on the previous year of 4.3 percent. Out of the EU's total investment in the construction of buildings and other structures, 1 trillion euro – more than 70 percent – were invested by 5 countries alone: Germany, France, the United Kingdom, Italy, and Spain. German investments made up 1/5 of total EU investments, followed by France with 18 percent (270 billion euro). The United Kingdom's investments contributed 14 percent (224 billion euro) to the total EU investments in construction. Spain and Italy contributed approximately 8 and 9 percent (121 and 137 billion euro respectively).

Figure 2-1: Investments in construction by type

2017, in current billion euro



Note: No data for Croatia, latest data for Hungary and Romania is 2016.

Source: Eurostat; German Economic Institute

Total construction investments are the sum of investments that go into the construction of dwellings and investments in non-residential buildings and structures. In 2017, approximately

49 percent (746 billion euro) of the EU's total construction investment went into the construction of dwellings – 51 percent (776 billion euro) went into the construction of non-residential buildings and structures. Hence, both shares are of equivalent importance for the EU's total construction investments. For only 6 EU member states, investments in the construction of dwellings made up 50 percent or more of the total construction investments: Germany, Italy, Spain, Belgium, France, and the Netherlands – 5 out of these 6 are also among the top 6 countries with the highest total construction investments. With 61 percent of total construction investments, investments in the construction of dwellings are of special importance for the German construction sector. In 2017 Germany invested almost 196 billion euro in the construction of dwellings – 126 billion euro went into the construction of non-residential buildings and structures. For 21 EU member states non-dwelling related investments in construction make up the larger share of construction investments. For the others, investment in dwellings make up the

The highest share of investments in the construction of non-residential buildings and structures can be found in Latvia and Greece (89 and 87 percent). In these two countries investments in the construction of dwellings have since 2007 taken a nosedive while investments in the construction of non-residential buildings and structures have also decreased, but not as drastically. This results in Greece's investments in non-dwelling related construction having decreased by 61 percentage points since 2007. Similarly, Latvia's investments in the construction of non-residential buildings and structures now make up 20 percentage points more than they had in 2007. This means that dwelling related investments were of less significance than in 2007. Figure 2-2 sums up the shares of investments in construction by type of construction.

Figure 2-2: Share of investments by type of construction in total construction investments

2017, in percent

Note: No data for Croatia and Cyprus, latest data for Hungary and Romania is 2016. Dotted line for EU average.

Source: Eurostat; German Economic Institute

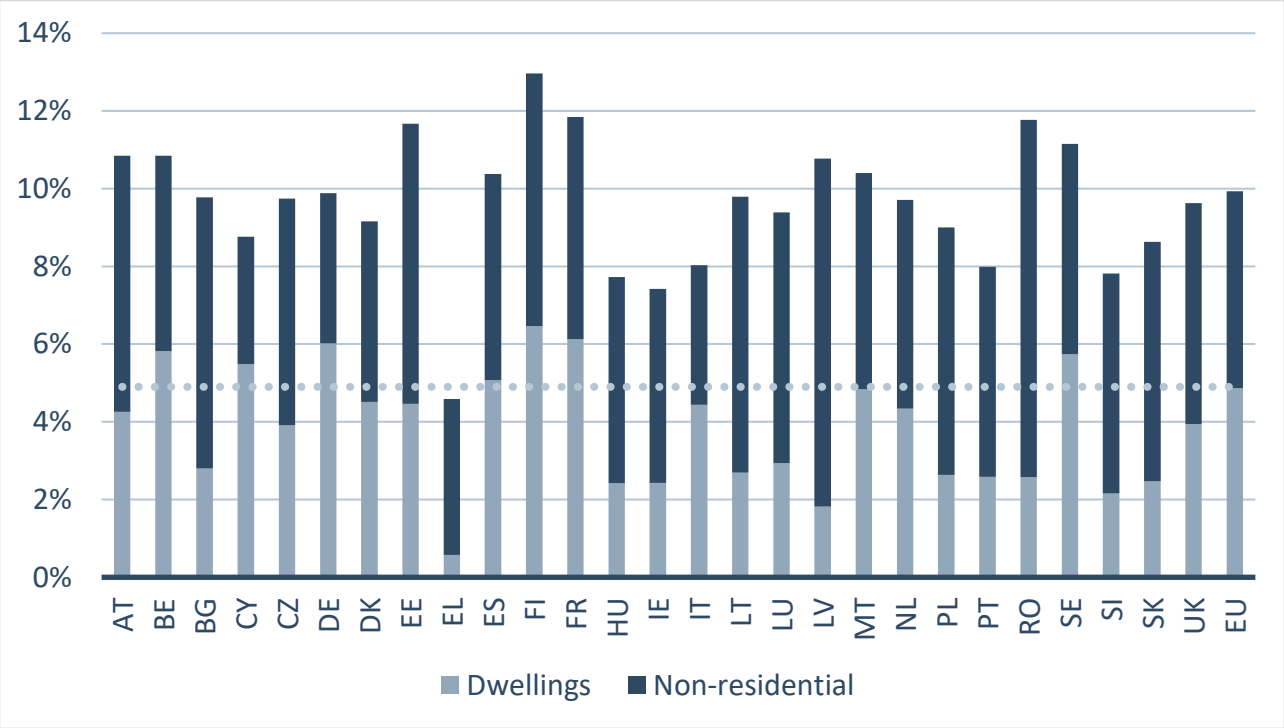
Next, we look at the importance of the investments in construction with regard to a country's gross domestic product (GDP). For the EU as a whole, investments in construction amounted to approximately 10 percent of its annual GDP in 2017 (see Figure 2-3). As already discussed above, roughly half of this 10 percent is attributed to investments in dwellings and the rest to the investments in non-residential buildings and structures. With 13 percent Finland shows the highest investment levels in the construction sector relative to GDP in 2017, followed by France, Romania (each 11.8 percent), Estonia (11.7 percent), and Sweden (11.2 percent). For Portugal (8 percent), Slovenia (7.8 percent), Hungary (7.7 percent), Ireland (7.4 percent), and Greece (4.6 percent) investments in the construction of dwellings and non-residential buildings and structures were the smallest relative to their GDP.

The share of investments in the construction of dwellings relative to GDP was highest in the following 5 Central and Northern European countries: Finland (6.5 percent), France (6.1 percent), Germany (6 percent), Belgium (5.8 percent), and Sweden (5.7 percent). The lowest share of investments relative to GDP are to be found in Ireland, Hungary (each 2.4 percent), Slovenia (2.2 percent), Latvia (1.8 percent), and lastly Greece (0.6 percent).

Finally, the share of investments in the construction of non-residential buildings and structures relative to GDP was highest in the Baltic States and Eastern Europe. In Romania investments in the construction of non-residential buildings and structures amounted to the equivalent of 9.2 percent of the country's GDP in 2017. This share was almost as high for Latvia (9 percent). The relative importance of investments in the construction of non-residential buildings and structures is very similar in Estonia (7.2 percent), Latvia (7.1 percent), and Bulgaria (7 percent). In 2017 investments in non-residential buildings and structures in terms of GDP were of less importance for Denmark (4.7 percent), Greece (4 percent), Germany (3.9 percent), Italy (3.6 percent), and finally Cyprus (3.3 percent).

Figure 2-3: Investments in construction by type in terms of GDP

2017, in percent



Note: No data for Croatia, latest data for Hungary and Romania is 2016. Dotted line for EU average.

Source: Eurostat; German Economic Institute

After illustrating the status-quo of investments in construction, we turn to a time-series analysis in the next chapter, where we focus on the development of investments in construction since 2000. We put special focus on how the individual countries' construction investments were hit by the financial and economic crisis beginning in 2008 and compare pre- and post-crisis levels of construction investments.

3 Back to normal? Investment in construction: pre- and post-crisis

3.1 Investment in construction over time

In the EU, investments in construction made up 49.5 percent of the EU's total gross fixed capital formation (GFCF) in 2017. In the period from 2000 to 2017, investments in construction amounted to an average of 52 percent of the EU's total GFCF. Investments in both the construction of dwellings and investments in the construction of non-residential buildings and structures are of utmost importance for the overall economic development of the EU.

The EU's total GFCF was severely affected by the global economic and financial crisis (ECB, 2009). From 2000 to 2007 investments were steadily and quite drastically increasing. In 2007 total GFCF had reached 2.9 trillion euro or 121 percent of the respective value in 2000 (see

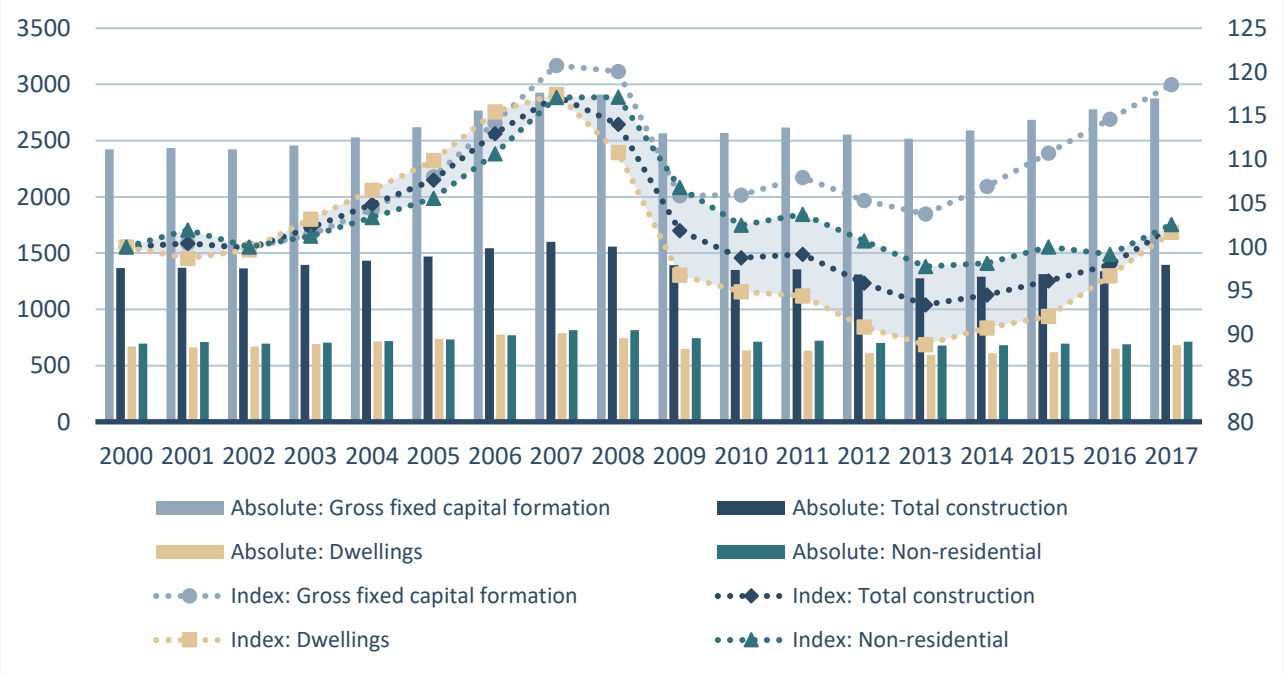
Figure 3-1). In absolute terms this meant 503 billion euro more were invested in 2007 than had been in 2000. Roughly 47 percent of this increase in total GFCF can be attributed to the investments in construction, which were 235 billion euro or 17 percent higher than in 2000.

Between 2008 and 2013 we saw a sharp decline in the EU's total GFCF. With 2.5 trillion euro in 2013 the level of GFCF was just 4 percent above its respective value in 2000. Investments in dwellings were hit the hardest during that period, falling 28 percentage points. In 2013 investments in the construction of dwellings only reached 89 percent of the level in 2000, equivalent to 596 billion euro. Similarly, investments in the construction of non-residential buildings and structures fell by 19 percentage points or 134 billion euro between 2008 and 2013. Investments in the construction of non-residential buildings and structures were at 98 percent of the level in 2000, equivalent to 680 billion euro.

In recent years, we saw a decrease in the spread between the development of investments in dwellings and investments in non-residential construction (shaded area in Figure 3-1). This is mainly due to high year-on-year growth rates in investments in the construction of dwellings. Between 2014 and 2017 investments in the construction of dwellings saw an average yearly growth of 3.5 percent, outperforming even the changes in GFCF (3.4 percent). Investments in the construction of non-residential buildings and other structures saw an average yearly increase of 1.2 percent during that time period. In 2017 total construction investments and its parts (dwellings and non-residential) have all reached levels approximately 2 percent above that of 2000.

Figure 3-1: Gross fixed capital formation and investments in construction

2000–2017, EU28, absolute values in 2010 billion euro (left axis), index 2000=100 (right axis)

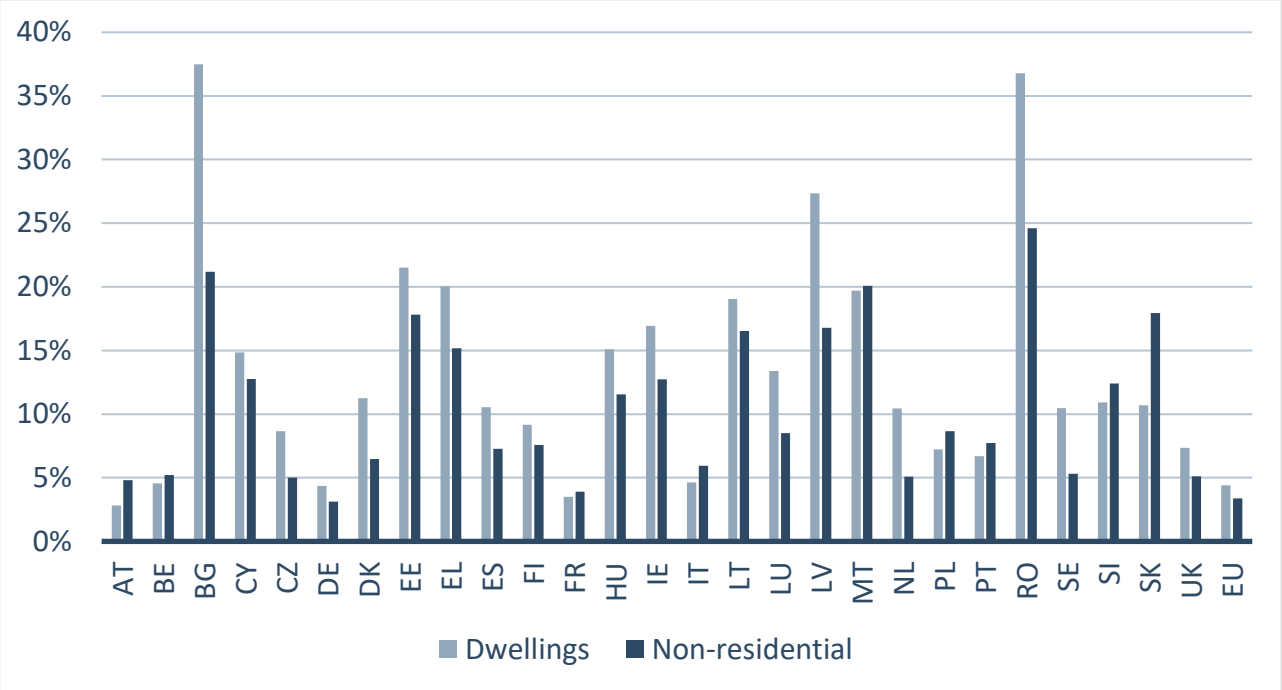


Source: Eurostat; German Economic Institute

During the time period analyzed here, investments in the construction of dwellings were more volatile (4.4 percentage points) than investments in the construction of non-residential buildings and structures (3.4 percentage points). This relationship is also reflected on the individual country level (see Figure 3-2). For 18 EU member states the volatility in the year-on-year change rate in the investments in the construction of dwellings was larger than for non-residential investments. For 9 countries investments in non-residential construction were more volatile. Volatility in both types of construction investments was highest in Bulgaria (37.5 and 21.2 percentage points) and Romania (36.5 and 24.6 percentage points). We see that the EU's most relevant construction markets indicate particularly low volatility levels, suggesting stronger resilience to economic turbulences.

Figure 3-2: Volatility by type of construction investment

2000–2017, standard deviation of year-on-year change rates in percentage points



Note: No data for Croatia, latest data for Hungary and Romania is 2016.

Source: Eurostat; German Economic Institute

3.2 Link between overall economic performance and investment in construction weakened post-crisis

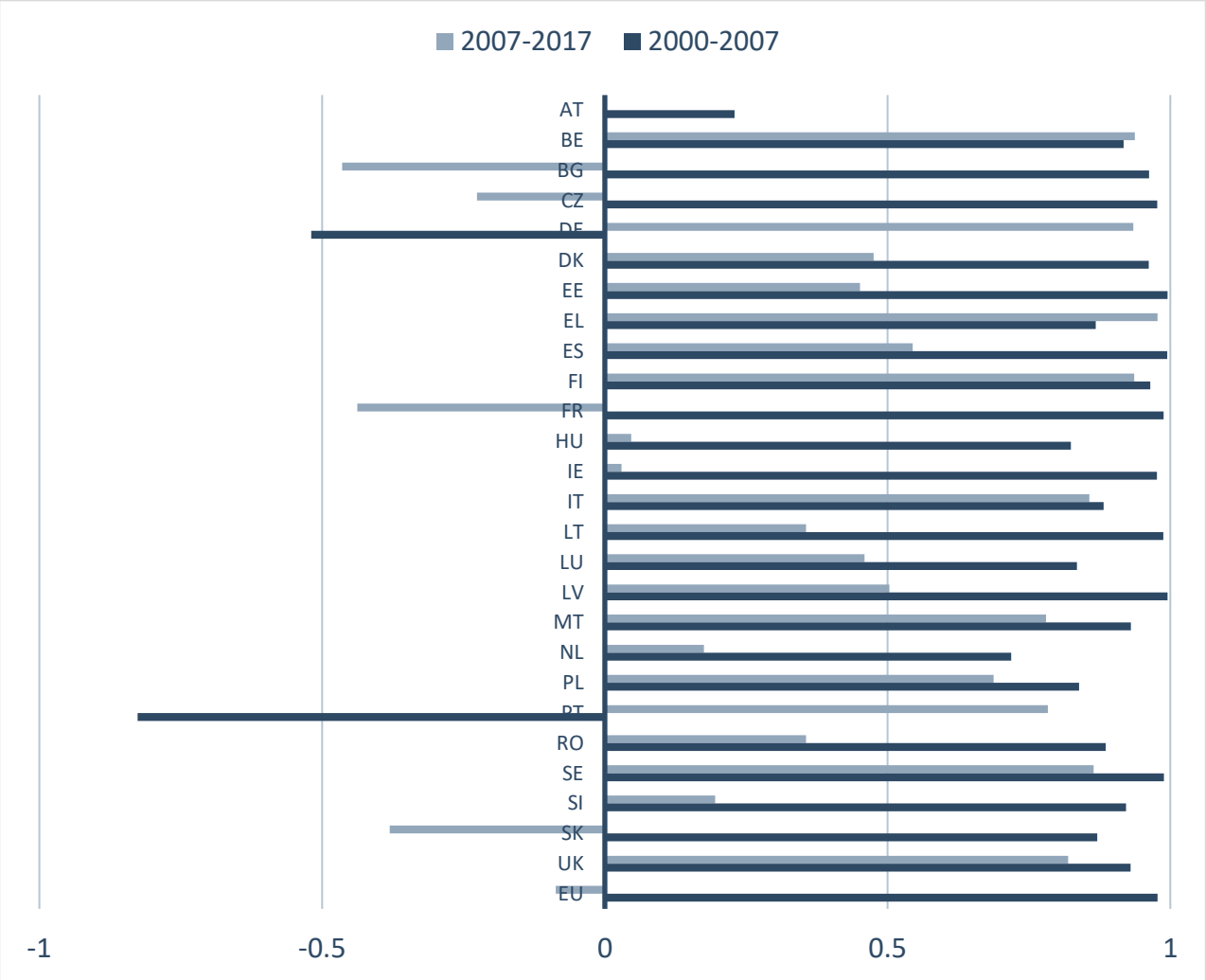
It is generally argued that there is a strong positive link between the overall economic performance of a country – usually measured as GDP – and the investment in construction (Rein/Schmidt, 2017). If the economy as a whole is in an upswing, it can be assumed that this boosts investment in construction and vice versa. While it is true that annual investments in construction are a key factor in a country's GDP, the correlation over time between the two is not necessarily high in every EU member state. Furthermore, this relationship has taken a hit during the economic crisis and since then remains weakened.

In pre-crisis years (2000–2007), we find a strong correlation between total investments in construction and a nation's GDP. Most EU countries were showing positive growth rates of real GDP while at the same time seeing a booming construction sector. The correlation between real GDP and overall investment in construction for the EU was at 0.98 during that period, which indeed is a sign of collinearity – both variables essentially are an indicator of a country's economic performance.

The correlation was higher than 0.9 for 15 member states and positive for all, except Germany and Portugal. Germany at the time saw a decline in the investment in construction while experiencing positive GDP growth. One reason for this might be the shift in real estate cycles compared to other countries (Pomogajko/Voigtländer, 2012). Portugal in the early 2000's saw high investment levels in construction, steadily decreasing until 2007 while real GDP was increasing at the time. Figure 3-3 plots the value of correlation between total construction investments and real GDP for the EU member states in the period 2000–2007.

Figure 3-3: Correlation of real investment in total construction and real GDP

2000–2007 and 2007–2017



Note: No data for Croatia and Cyprus, latest data for Hungary and Romania is 2016.

Source: Eurostat; German Economic Institute

For the period after 2007 the picture is not as clear-cut as in pre-crisis years. The relationship between overall economic performance and investment levels in construction has taken a hit during the last ten years.

For the EU as a whole, rather than the extraordinarily high correlation in pre-crisis years, we find a negligibly small correlation of -0.09 from 2007 to 2017. In fact, looking at the individual country level, we now find only 4 countries with a correlation between investments in construction and GDP of higher than 0.9: Belgium, Germany, Finland, and Greece. For the first three, we saw a decline in both GDP and construction levels during the first crisis years, after which investments and the overall economy picked up again. For Greece on the other hand, the country's annual output as well as its investment in construction took a nosedive from 2007 onwards. Data suggest however that this negative trend has bottomed out during the last few years. Between 2014 and 2017 investments in construction in Greece varied from 24

to 28 percent and GDP was constant at roughly 74 percent of its respective pre-crisis level. We find 6 more countries that showed a strong positive correlation between annual output and construction: Italy, Malta, Poland, Portugal, Sweden, and the United Kingdom, each with correlation values larger than 0.6. Out of these six countries only Italy and Portugal registered a real GDP below their 2007 values as well as investment levels in total construction that were below their 2007 counterparts. Since 2014, annual output has seen a steady rise for the two economies. Italy saw its lowest level of investment in construction in 2015, Portugal in 2014.

For the period 2007–2017 we see the striking picture that correlations between the investments in construction and GDP are a lot lower (and for several countries even negative) than they had been up to 2007. For 16 EU members the correlation was between 0.5 and -0.5. Bulgaria, the Czech Republic, France, and Slovakia showed a negative correlation between GDP and construction investments. Bulgaria's investments in construction were quite volatile between 2000 and 2017, while its real GDP steadily increased throughout the time period at hand. For the Czech Republic investment levels in construction had reached their peak in 2007 and have since then continuously been below pre-crisis levels. The Czech GDP however stagnated from 2007 until 2013 and since then has steadily increased. For France, investment in construction since the crisis has been below its 2007 value and has stagnated at around 90 percent or below since 2009. Real GDP, despite a nosedive in 2008, has since then recovered and steadily increased. The illustrations above suggest that the generally assumed strong positive link between a country's annual national output and its investments in construction was disturbed during the crisis.

One can conclude that in recent years construction has been lagging behind economic growth. One reason might be the oversupply of real estate in the 2000s which has also triggered the decline in prices (Duca et al., 2010). Consequently, in the future a disproportionately strong growth of construction can be assumed.

3.3 Comparing current construction investments to pre-crisis levels

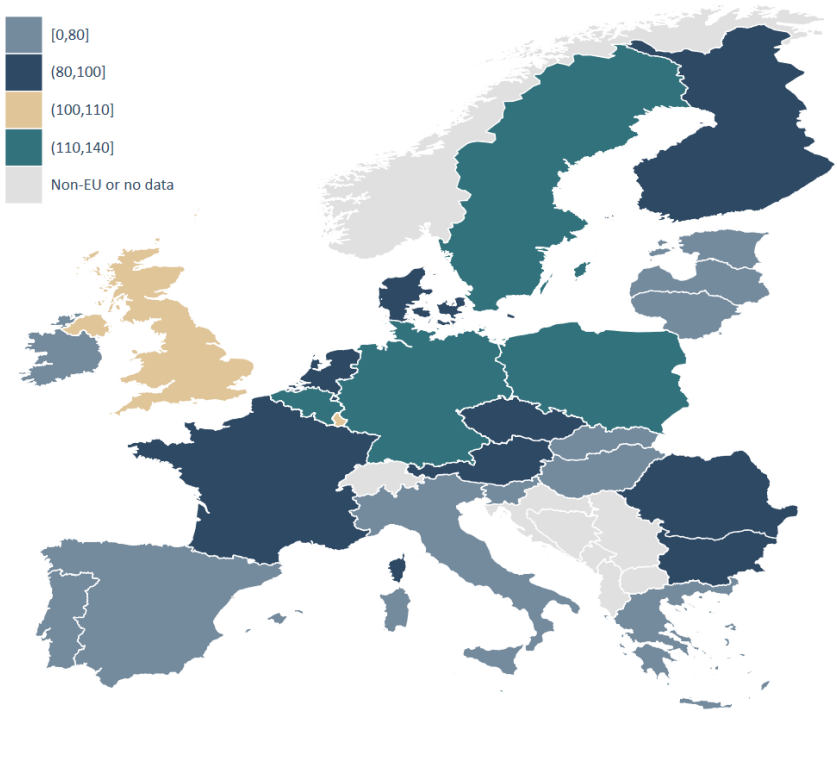
In real terms, the yearly investment in the construction of buildings and other structures in the EU amounted to 1.4 trillion euro in 2017. This is a real decline of 12.9 percent when compared with the pre-crisis year 2007. Investments in the construction of buildings are still 206 billion euro below the pre-crisis level.

While the EU's overall investment in construction is not yet back to pre-crisis levels, some member states were able to increase their investment levels after seeing a sharp decline during the overall economic downturn. In 2017 Malta, Sweden, Poland, Germany, Belgium, Luxembourg and the United Kingdom had increased total investment in construction to above pre-crisis levels. Investments in Malta were 31 percent above the 2007 level, while having experienced a sharp decline during the crisis. Out of these seven countries, the Polish construction sector was affected the least during the crisis. Investment levels were consistently above the 2007 levels and in 2017 they were 21 percent above the pre-crisis level.

17 member states registered investment levels in total construction below their respective 2007 values, ranging from 96 percent in Finland to 27 percent in Greece. The Greek construction sector has fared the worst during the last ten years. Investment levels reached their low in 2015 when only 8 billion euro were invested, corresponding to 24 percent of the pre-crisis level. In the last two years construction investments have picked up again slightly. With just short of 9 billion euro, in 2017 Greece invested roughly 27 percent of its 2007 level. Ireland, Portugal, Spain and Slovenia complete the bottom 5, each having invested less than 70 percent of the pre-crisis level. Looking at Figure 3-4 we see that it is mostly countries in Southern and Eastern Europe, including the Baltic States, that were not able to reach pre-crisis levels of investment in the construction sector in 2017.

Figure 3-4: Investments in total construction

2017, index 2007=100



Note: No data for Croatia and Cyprus, latest data for Hungary and Romania is 2016.

Source: Eurostat; German Economic Institute

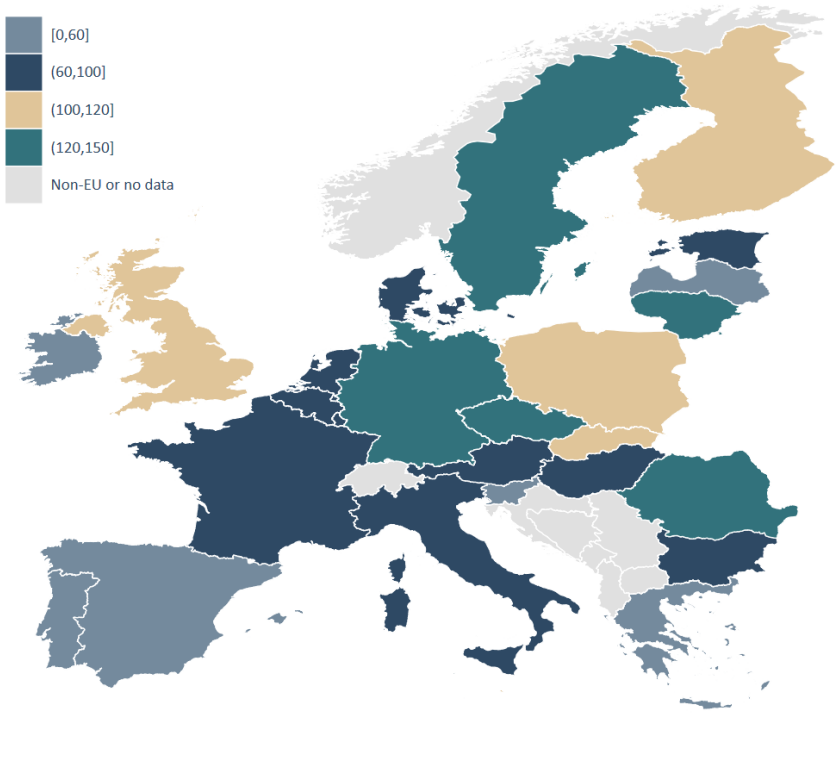
To get a more in-depth look as to how investment levels in construction have developed relative to pre-crisis levels, we again look at the two main parts that make up total construction investment. We begin by focusing on the investment in the construction of dwellings.

The EU's investments in the construction of dwellings have increased steadily since 2013, when they had reached their 10-year low of 596 billion euro. In 2017 they were at 682 billion, still 106 billion euro or 13 percent below the pre-crisis level of 788 billion euro. Looking again at the individual country level, we see that the Czech Republic invested 45 percent more than in 2007 – the highest relative increase among the members. Romania, Sweden and Lithuania follow, with 40, 35 and 28 percent above the 2007 levels. Germany completes the top 5 with

21 percent above the pre-crisis level. In total, 10 countries were able to reach an investment level in the construction of dwellings higher than in 2007. The United Kingdom, Finland and Malta, for the first time since the crisis, have registered investment levels higher than those in 2007. At the bottom of the spectrum we find Slovenia, Portugal, Ireland, Latvia and Greece. Slovenia and Portugal both invested roughly 50 percent of their respective pre-crisis level. Ireland invested only 39 and Latvia 28 percent. Greece invested merely 1 billion euro in the construction of dwellings in 2017, by far its lowest value since 2007. This equates to only 5 percent of the 25 billion euro it invested in 2007. Figure 3-5 shows that the Southern European countries have yet to reach pre-crisis levels in the construction of dwellings. For some Eastern European countries investment levels in the construction of dwellings were well beyond 2007 levels.

Figure 3-5: Investments in the construction of dwellings

2017, index 2007=100



Note: No data for Croatia and Cyprus, latest data for Hungary and Romania is 2016.

Source: Eurostat; German Economic Institute

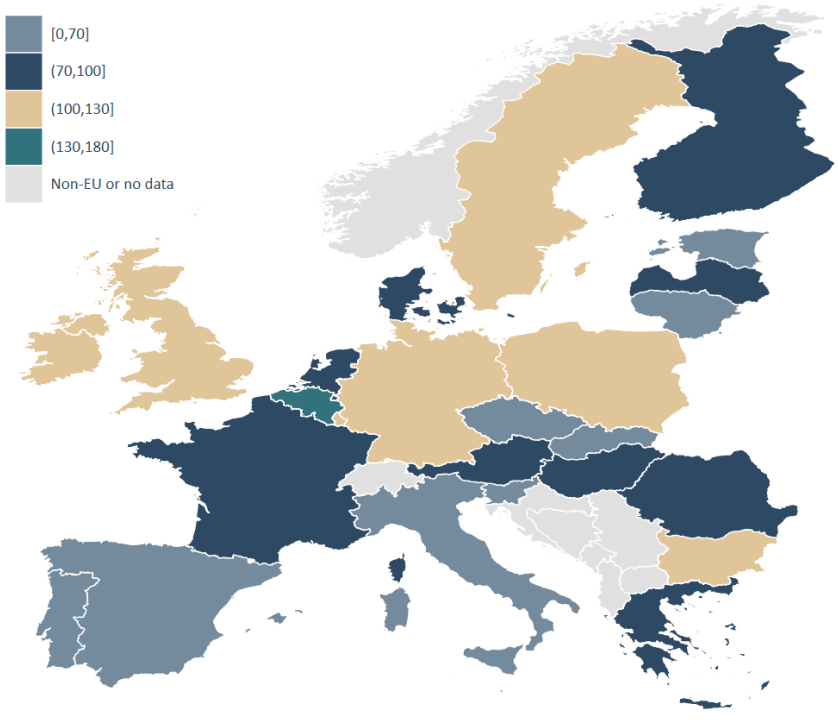
Next, we analyze the current state of investment in the construction of non-residential buildings and structures relative to its 2007 level. Total EU investment was at 88 percent of the pre-crisis level. This corresponds to 713 billion euro, roughly 100 billion euro below the 2007 level. When compared with the previous year, investment in the construction of non-residential buildings and structures increased by 3.4 percent in 2017. Malta, by far, saw the largest relative increase in investments between 2007 and 2017: 74 percent above its 2007 level. However, in 2007 Malta – unlike other EU member states – had invested the lowest amount since 2000. In addition, it has since then continuously invested more than in 2007. In total, there were 10 countries that invested more in the construction of non-residential buildings and structures than they had done in 2007.

The top 5, seeing the biggest increase relative to 2007, were Malta, Belgium, Poland, Luxembourg, and Sweden. In 2017 Belgium invested 33 percent more in the construction of non-residential buildings and structures than in 2007. Similarly to Malta's performance over the last few years, Belgium also saw investment levels well above the pre-crisis level during the last ten years. In fact, there are 6 countries that did not see a decrease in investment levels relative to their respective investments in 2007 during the last ten years. These countries are Malta, Belgium, Poland, Luxembourg, Bulgaria, and Germany.

On the other hand, 18 of the EU member states invested less in the construction of non-residential buildings and structures in 2017 than they did ten years earlier. With respect to their levels in 2007, the bottom 5 are Spain (63 percent), Cyprus (60 percent), Estonia (59 percent), Italy (58 percent) and Slovenia (52 percent). In real terms, this means that Spain invested approximately 37 billion euro less than it did in 2007. Italy invested 43 billion euro less. Together, these two are responsible for 80 percent of the 100 billion by which the EU is shy of compared to its 2007 investment levels. Figure 3-6 illustrates the findings discussed above.

Figure 3-6: Investments in the construction of non-residential buildings and structures

2017, index 2007=100



Note: No data for Croatia and Cyprus, latest data for Hungary and Romania is 2016.

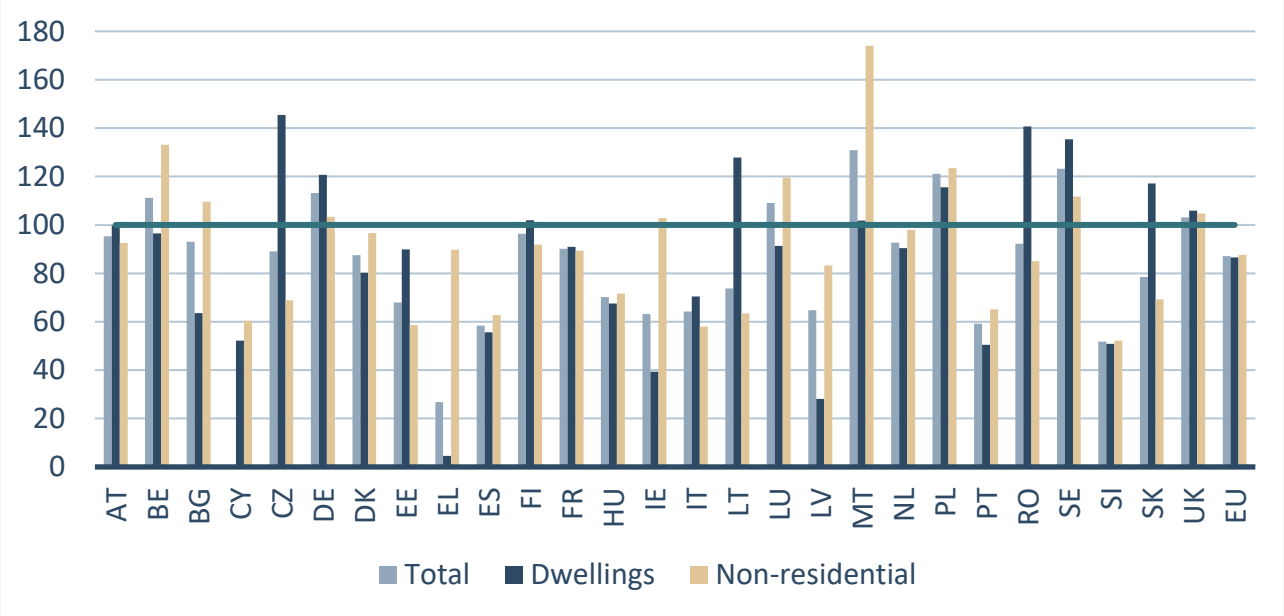
Source: Eurostat; German Economic Institute

Taking stock of the state of the investments in construction relative to pre-crisis levels, we see a very heterogeneous picture. In 2017 only 5 EU countries invested more in both the construc-

tion of dwellings and the construction of non-residential buildings and structures than they did in 2007: Malta, Sweden, Poland, Germany and the United Kingdom. For 5 countries, the investments in the construction of dwellings were above 2007 levels, while investments in the construction of other buildings and structures did not reach pre-crisis levels. These countries were Finland, Romania, the Czech Republic, Slovakia and Lithuania. For 4 EU member states investments in the construction of non-residential buildings and structures were above their 2007 level, while investments in dwellings were not – namely Belgium, Luxembourg, Bulgaria, and Ireland. This leaves 13 EU members (no data for Croatia) that registered investment levels in both the construction of dwellings as well as the construction of other buildings and structures below pre-crisis levels. Figure 3-7 illustrates the respective investment levels for all member states.

Figure 3-7: Construction investments relative to pre-crisis levels

2017, index 2007=100



Note: No data for Croatia, latest data for Hungary and Romania is 2016.

Source: Eurostat; German Economic Institute

4 Perspectives for non-residential construction

Based on the data discussed above, a rise in construction activities seems to be likely. However, the data make it possible only to analyze developments in the past, and extrapolating might be wrong given structural changes. There are many structural changes being discussed at the moment. One is the crowding-out of local retailers by online retailers, reducing the demand for retail space (see for example: Ibanez / Pennington-Cross, 2013). Another is the idea that digitization allows for more flexibility like working outside offices (Groen et al., 2017). It is beyond the scope of this paper to analyze the impact of structural changes on the construction sector in depth. Nevertheless, we address two examples of non-residential construction segments in which growth is likely: office markets and infrastructure.

4.1 Growth perspectives in the office sector

In general, office demand is driven by office employment (Rabianski/Gibler, 2007). Thus, if office employment has a growth perspective, construction investments will be triggered as well. In the following, we analyze the development and current state of office employment in the EU.

In order to identify the number of persons employed in office jobs, we select economic areas where office employment is most prevalent. Using the Statistical Classification of Economic Activities in the European Community (NACE Rev. 2) we identify 17 such economic activities. We are aware that most economic sectors include some form of office employment, e.g. controlling in retail. However, we refrain from including those sectors in our analysis. The data does not make it possible to filter out the share of office employees in these economic sectors and hence changes in employment in these sectors cannot necessarily be attributed to changes in office employment. The sectors included in our analysis are mainly part of the service industry and, among others, include information service providers, the insurance industry, the public sector, and financial service providers. The most recent data is for 2015.

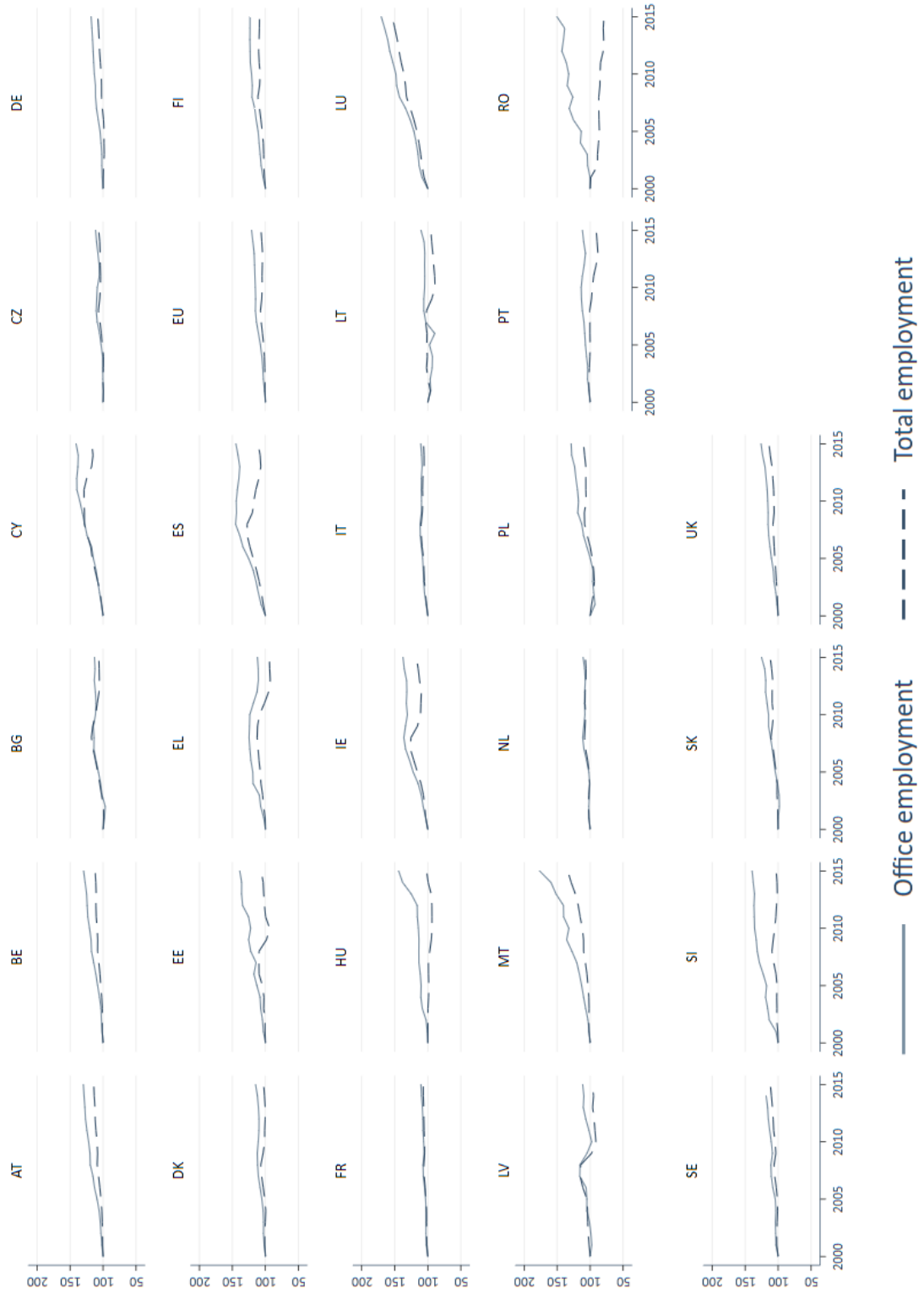
Applying this method, we find a total of 72 million office employees for the EU in 2015. Hence, 31 percent of the EU's 230 million employees work in an office. The share of office employees in the total workforce has increased steadily by a total of 3.7 percentage points since 2000 (see Figure 4-1). The absolute number of persons in office employment increased by a total of 12 million during that time – ergo 21 percent. This increase is partly driven by an increase in population. However, looking at the development of the total employment in the EU, we see that the total number of employed persons has increased by just 7 percent during the time period analyzed here.

On the individual country level, we find that office employment developed more dynamically than total employment in all EU member states between 2000 and 2015 (see Figure 4-1). The spread between the change in office employment in terms of the respective level in 2000 and the increase in total employment was by far the largest in Romania (71 percentage points) – which is explained by a large rise in the share of office employees and a decrease in the total number of employees – it was lowest in France (3 percentage points).

The highest share of office employment can be found in Belgium (42 percent), the Netherlands (38 percent), and the United Kingdom (37 percent). We find that it is mainly Eastern European countries that show the lowest share of office employment among all EU countries. The countries with the lowest share of office employees are the Czech Republic (24 percent), Bulgaria (22.3 percent) and Romania (16.6 percent). Office employment saw the biggest increase in relevance in Hungary, where the share of office employment in total employment increased by 9 percentage points between 2000 and 2015. For Malta and Slovenia office employment increased by 8 percentage points during that time. The smallest increase in the share of office employment occurred in Belgium, the Netherlands, France, Italy, and the Czech Republic, where the share of persons employed in an office was only 1 percentage point higher in 2015 than in 2000. Figure A-2.1 in the appendix illustrates these changes in a spatial dimension.

Figure 4-1: Office employment and total employment

2000–2015, index 2000=100



Note: No data for Croatia, latest data for Hungary and Romania is 2016. Data for Sweden's office employment is 2014.

Source: Eurostat; German Economic Institute

With the exception of one country, all EU member states indicate a positive correlation between the year-on-year change in office employment and total employment. This means that for most EU countries the development in office employment was in lockstep with the development in total employment. For Romania the number of people employed in an office job increased between 2000 and 2015 while the total number of persons employed decreased during that time, explaining the negative correlation between the two.

Table 4-1 also includes index values for the number of persons employed in office jobs as well as overall employment. We find that the number of persons employed in an office job in the EU increased by 21 percent relative to the level in 2000. The largest increase in the number of office employees occurred in Malta (76 percent), Luxembourg (70 percent) and Romania (50 percent). The lowest increase in the total number of office employees can be found in the Netherlands (11 percent), France and Lithuania (each with 10 percent). What is striking here is that the number of persons employed in an office job increased for all EU member states while the total number of employed persons decreased in 5 member states: Greece (6 percent), Lithuania (5 percent), Latvia (4 percent), Portugal (9 percent) and Romania (21 percent). The Romanian workforce decreased significantly during the time period at hand. In fact, many Romanians are seeking better work opportunities in other countries and in 2016, around 3 million Romanians lived abroad (United Nations, 2018).

Table 4-1: Office employment

Country	Share at total		Correlation of yearly growth in total employment and office employment	Index in 2015 (2000=100)		Y-o-Y change in office employment	
	2000	2015		Office	Total	Mean	Standard Deviation
AT	26.5	30.2	0.81	130	114	1.8	0.9
BE	36.3	42.0	0.86	129	112	1.7	0.8
BG	21.0	22.3	0.72	113	106	0.8	2.2
CY	27.9	33.6	0.83	141	117	2.3	1.7
CZ	23.4	24.4	0.76	111	107	0.7	1.5
DE	27.8	30.5	0.47	118	108	1.1	0.7
DK	27.0	30.2	0.77	115	103	0.9	1.2
EE	21.1	27.6	0.25	139	106	2.3	2.8
EL	24.1	28.6	0.84	112	94	0.8	3.2
ES	23.7	30.9	0.88	145	111	2.5	2.8
FI	26.6	30.2	0.78	123	109	1.4	1.3
FR	35.3	36.4	0.94	110	107	0.7	0.9
HU	22.1	31.2	0.81	144	102	2.5	3.0
IE	26.2	30.7	0.85	138	117	2.2	2.4

IT	27.4	28.5	0.95	111	106	0.7	1.1
LT	23.4	27.1	0.28	110	95	0.8	5.0
LU	27.5	30.5	0.93	170	154	3.6	2.0
LV	24.8	28.7	0.81	111	96	0.8	4.4
MT	26.7	35.2	0.43	176	134	3.9	3.1
NL	36.3	37.5	0.92	111	107	0.7	1.6
PL	21.9	25.6	0.59	129	110	1.7	3.1
PT	22.4	27.6	0.80	112	91	0.8	1.5
RO	8.8	16.6	-0.15	150	79	2.8	4.4
SE	29.9	32.1	0.27	118	112	0.5	3.1
SI	22.7	30.8	0.59	139	103	2.3	2.6
SK	26.4	29.4	0.39	125	112	1.5	1.5
UK	33.3	36.8	0.78	126	114	1.5	0.8
EU	27.5	31.2	0.93	121	107	1.3	0.8

Note: Shares and changes in percent, standard deviation in percentage points. Data for Sweden is 2014.

Source: Eurostat; German Economic Institute

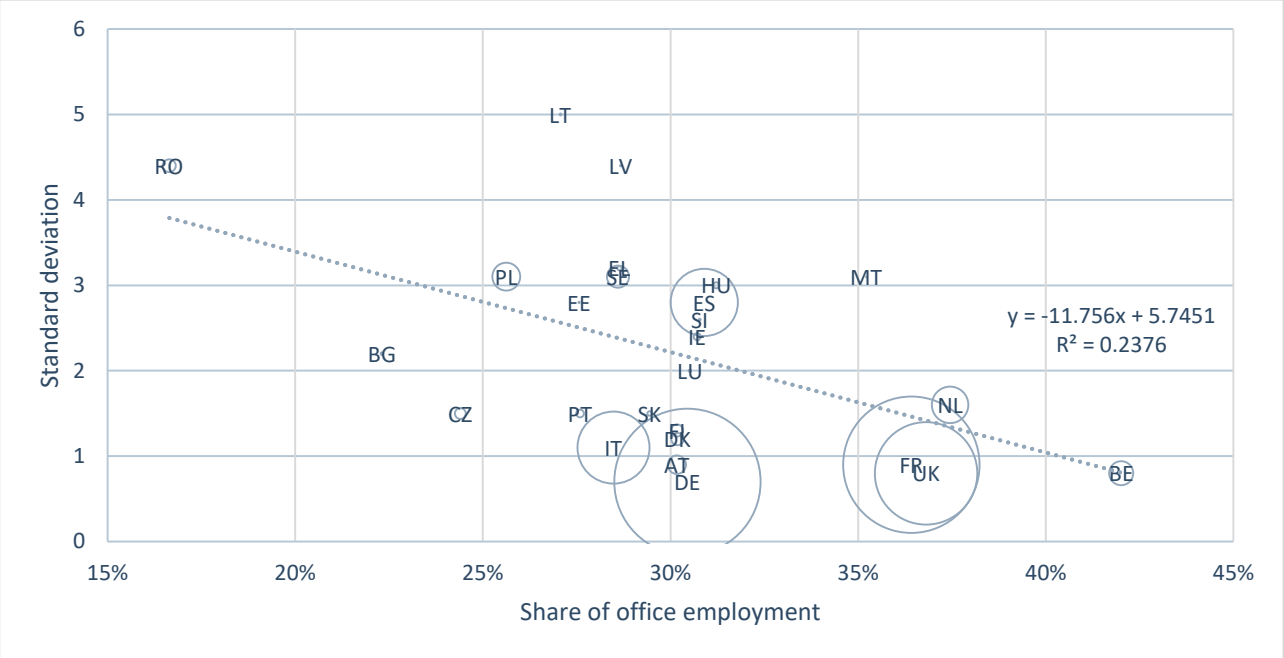
In a next step, we focus on how stable the increase in office employment was during the time period analyzed. The standard deviation of office employment can be seen as a measure of how sensitive an economy's service industry is to economic disturbances. By and large, we find that countries with a higher share of office employment in 2015 were less subject to strong variation in the yearly change rates of office employment, as indicated by the negative slope of the linear trend line in Figure 4-2.

Year-on-year change in office employment was most volatile in Latvia, Lithuania and Romania with an average standard deviation of 4.6 percentage points and an average of 24 percent of the countries' work force being employed in an office job. The lowest variation in the yearly change of office employment can be found in the United Kingdom, Belgium and Germany. In these three countries the share of office employment was at 36 percent of the total persons employed – the standard deviation was at 0.8 percentage points.

The circle size in Figure 4-2 represents the countries' respective total investments in construction in 2015 and serves as an indicator as to how the EU's most relevant construction markets – and in turn biggest economies – have fared regarding the volatility in the change of the share of office employment. The top 5 show an average volatility of 1.3 percentage points, mainly driven by Spain's high volatility in the year-on-year change in the share of office employment (2.8 percentage points).

Figure 4-2: Standard deviation of year-on-year change in office employment

2000–2015



Note: No data for Croatia and Cyprus, latest data for Sweden is 2014. Standard deviation in percentage points, share of office employment at total employment in percent; circle size represents the total construction investments in 2015.

Source: Eurostat; German Economic Institute

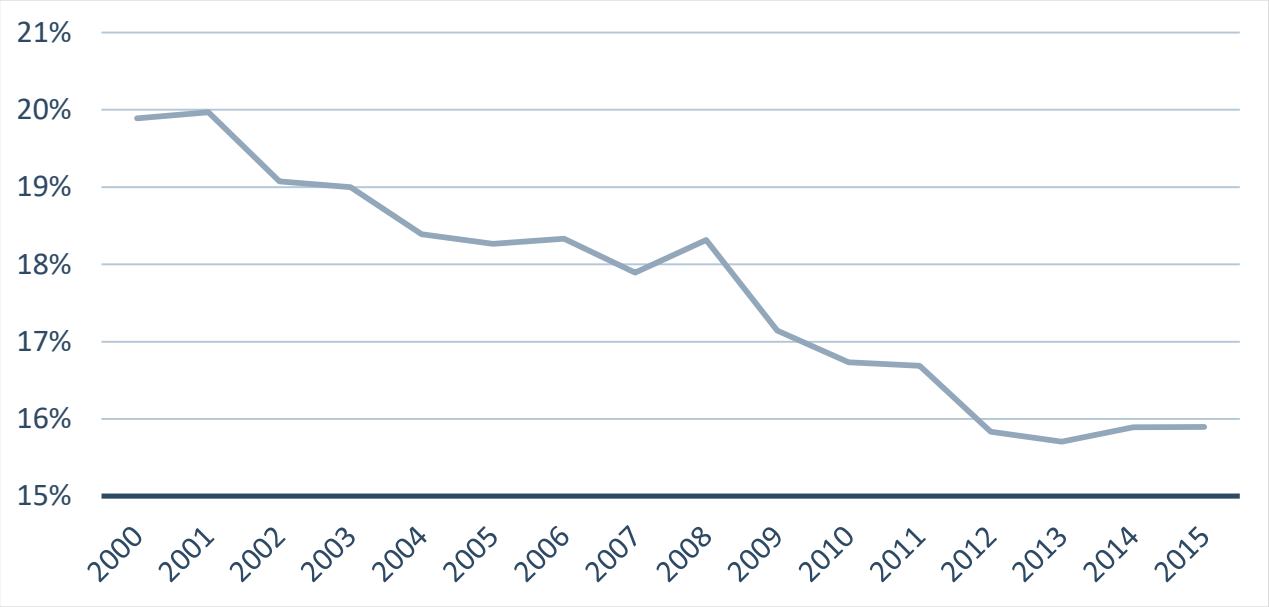
Analyzing a longer time horizon, it is well established in the literature that a convergence process regarding the EU countries' wealth – in terms of GDP per capita in purchasing power parity – took place; it was however immensely disrupted by the financial and economic crisis (Diermeier et al., 2018). The EU's member states became more and more similar in several other aspects as well, e.g. labor force participation rate, unemployment rate.

In the following step we analyze whether the EU members became more similar regarding the share of office employment at the total labor force. As we already saw, the share of office employment in total employment increased for all EU countries. Hence convergence in the share of office employment can only have occurred if the share of office employment for the countries with an initially low level of office employment increased faster than that of the countries with an initially high share of office employment. Knowing this, it suffices for our purposes here to check whether the across-country differences in the share of office employment have decreased over time.

Following Sala-i-Martin (1996), we do so using the coefficient of variation, calculated as the standard deviation in the share of office employment across EU member states divided by the mean for the whole EU in a year. Applying this measure, we find that EU countries became more similar regarding the share of office employment at total employment.

Figure 4-3: σ-convergence in the share of office employment in the EU

2000–2015, coefficient of variation



Note: Earliest data for Croatia is 2008, latest data for Sweden is 2014.

Source: Eurostat; German Economic Institute

Figure 4-3 illustrates that the share of office employment in the EU has not only increased, as seen in the discussion above, but the EU became more homogeneous regarding the share of office employment in the individual countries. The coefficient of variation was at 20 percent in 2000 and has since then continuously decreased (with the exception of the slight increase from 2007 to 2008 when data for Croatia became available). In 2015 the coefficient of variation of the share of office employment was four percentage points lower than in 2000, indicating convergence.

The development of office employment and its disproportionate growth can be attributed to an economic structural change. It is well accepted that in all economies the service sector grows faster than the industrial sector. This is due to productivity growth in the industrial sector, enabling firms to produce more with less staff. But what is more, in the service sector especially business-related sectors are growing, e.g. IT services, business consulting services or other knowledge-related services. To a greater extent, innovations are at the root of economic growth, as for instance (Florida, 2014) points out. Innovations, respectively, are more likely if intelligent people work together on related issues. That is why an increasing number of clusters of economic activity can be observed, like the famous Silicon Valley. The new geographic economy attributes this to knowledge spill-overs and scale effects (Krugman, 1991). (Moretti, 2013) describes the outcome of this structural change for the United States, but it is also applicable to Europe. As working together and exchanging ideas are at the root of success, cities as the natural place for exchange are expected to benefit continuously from migration (Glaeser, 2012). What is more, offices are the typical type of building to bring together employees

and to exchange ideas. This is also mirrored in new trends like co-working spaces, which are aimed at bringing different employees from different companies together to foster the creation of new ideas (Capdevila, 2015).

The expected increase in office demand will be mitigated by demographics as the labor force is shrinking (European Commission, 2018). However, as people concentrate on cities and as especially in Southern and Eastern Europe the share of office employees is still on a moderate level, the demographic burden is likely to be compensated. For Germany, Deschermeier/Voigtländer (2017) calculated that office demand will increase especially in Berlin, Munich, and Frankfurt, even if the share of office workers remains constant in the future.

4.2 A call for more infrastructure investments

Beyond investments in the construction of office buildings, several other investment types are becoming increasingly relevant for the EU. The need for infrastructure investments in the EU was acknowledged in the "Juncker Plan" (European Commission, 2014). These investments include but are not limited to social infrastructure investments like education, health and long-term care, as well as affordable housing, all of which are not at sufficient levels in order to meet the population's (future) needs (Fransen et al., 2018).

A well-structured infrastructure system is one of the main pillars of any society. Good infrastructure, in terms of roads as well as railways and airways, allows business transitions to be carried out in an efficient manner and enables citizens to travel more easily. Infrastructure investments in residential areas, like bigger shops, smaller convenience stores, automobile repair shops, etc. must accompany the construction of dwellings. Infrastructure raises a country's efficiency while at the same time making it more attractive to live in. We see that the recent financial and economic crisis is being overcome in several EU member states. To ensure long-term prosperity it is necessary for the policy makers to allow for a fruitful infrastructure investment environment.

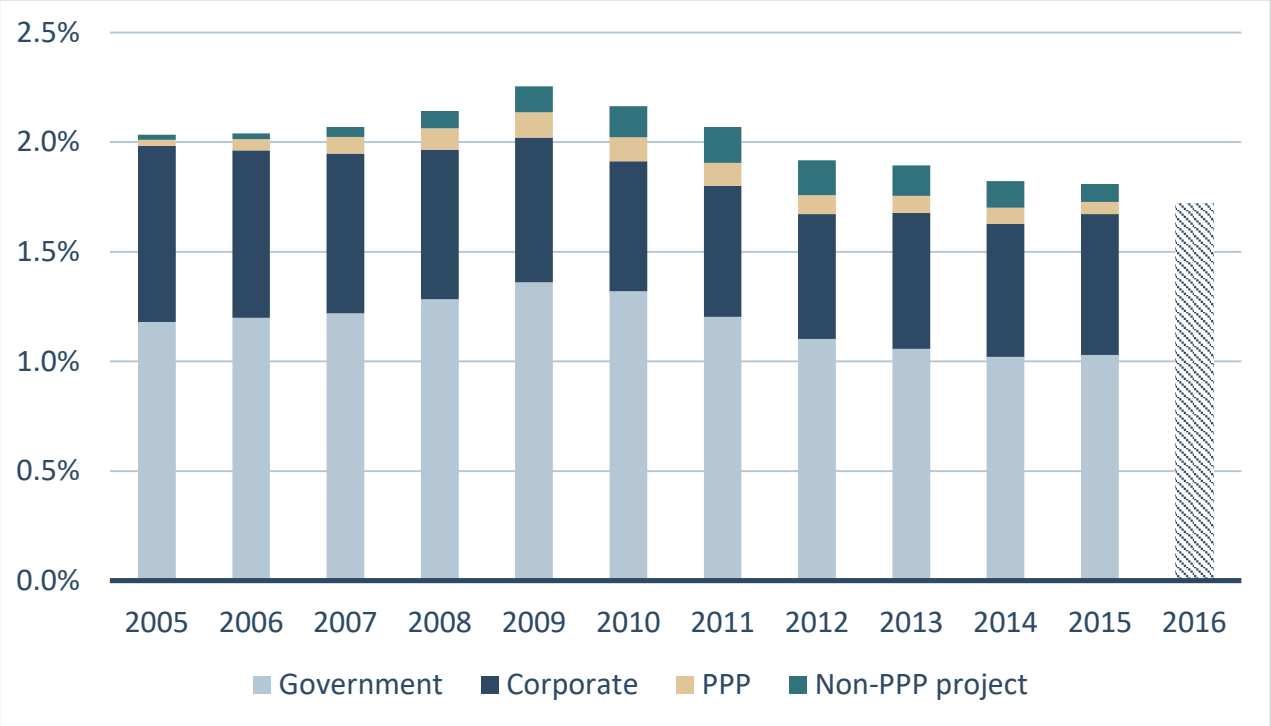
Total infrastructure investments are the sum of investments from the following sources: government, corporate, public private partnership (PPP) and non-PPP (Wagenvoort et al., 2010). In contrast to investments in construction, infrastructure investment reached its peak in 2009 (see Figure 4-4). Since then infrastructure investment in the EU has steadily declined. This trend seems to have bottomed out in recent years as investment levels were at 1.8 percent of GDP in 2014 and 2015. This corresponds to 80 percent of the 2.2 percent invested in 2009.

The largest share of infrastructure investments is investments from government entities, which made up 59 percent on average from 2005 until 2015. Roughly 1/3 of infrastructure investments were provided by corporations. The rest of the infrastructure investments stem from PPP and non-PPP projects (4 and 5 percent respectively). During crisis years, the share of corporate infrastructure investments in total infrastructure investments decreased from 35

percent in 2007 to 28 percent in 2010. Since then corporate investments have picked up again, reaching 35 percent in 2015.

Figure 4-4: Infrastructure investment in the EU by source

2005–2016, in percent of GDP



Note: Based on EIB Infrastructure Database. No data for Belgium, Croatia, Lithuania, Poland, Romania and the UK. 2016 figures are preliminary. PPP: public private partnership. Assessment for 2016 is based on information for the following countries only: Bulgaria, Germany, Estonia, Ireland, France, Austria, Slovakia, Slovenia, and Finland.

Source: EIB, 2017

For both the world and the EU, several studies show that there is an infrastructure investment gap that must be closed in order to guarantee the sufficient provision of much-needed infrastructure (EIB (2016), Woetzel et al. (2016)). According to the European Investment Bank's investment report, 1/3 of European municipalities say that investments in the past 5 years were below the level needed (EIB, 2017). Among the major obstacles that prevent sufficient levels of infrastructure investment are fiscal constraints as well as regulatory and political uncertainty.

To combat this trend of underinvestment, easier market access for institutional investors and mid- and long-term planning to ensure a fruitful investment environment should be brought to the forefront of policy makers' decisions. As noted by the OECD (2011), it will not be possible to close the gap in infrastructure investments by relying solely on traditional sources. A greater recourse to private sector finance becomes more important. Investment is hampered however by increasing regulations for traditional sources of private capital, as credit growth is inhibited by regulations like Basel III (Naceur/Roulet, 2017).

In addition, bank regulation capital requirements are tightening more severely for commercial real estate than for housing (Basel Committee on Banking Supervision, 2017). However, such distortions tend to induce overinvestments which result in an unsound economic development (Demary/Neligan, 2018).

5 Conclusion

In this paper, we presented the current state of European investments in construction. Furthermore we showed how construction investments fared in comparison to overall GFCF, noting that construction investments are still below their peak levels in 2007 for both investments in dwellings and the construction of non-residential buildings and structures. During the time period analyzed, investments in the construction of dwellings were more volatile both for the EU as a whole and for most EU member states. The generally assumed strong link between construction investments and overall economic performance took a hit during the economic and financial crisis. In the period before 2007 construction investments and real GDP showed a strong positive correlation for almost all EU member states. This relationship – for many countries and especially for the EU as a whole – did not prevail during crisis years.

The EU faces several challenges regarding construction investments. We focused on challenges for the commercial construction sector. Analyzing the share of office employees in the EU, we found that the share of office employment at total employment increased in all EU member states. Given the lower share of office employment in Eastern and Southern European countries, it is likely that the demand for office space will further increase in the future, making larger investments in non-residential construction necessary. Infrastructure investments in the EU have steadily decreased since 2009. Several entities noted that infrastructure investments were below the needed levels in the past. The resulting investment gap can only be bridged if public as well as private investors, e.g. in form of pension funds, increase their investment activities in infrastructure.

Thus, investments in the construction of commercial buildings as well as infrastructure are necessary for promoting growth and equal opportunities in the EU. Policy makers, especially with respect to big cities, tend to favor the construction of housing over commercial real estate. Building sites are rare, but in order to guarantee the sustainable development of cities, homes, workplaces, and infrastructure are equally important.

Member states of the EU should acknowledge the relevance of commercial real estate and infrastructure investments for the overall economic well-being. This explicitly does not include new subsidies which might result in painful bubble problems, but it does imply a level playing field for all kinds of construction activities.

6 References

Basel Committee on Banking Supervision, 2017, High-level summary of Basel III reforms, Basel, Basel

Benford, James / Burrows, Oliver, 2013, Commercial Property and Financial Stability, in: Bank of England Quarterly Bulletin, 53. Jg., Nr. 1, S. 48–58

Capdevila, Ignasi, 2015, Coworking Spaces and the Localized Dynamics of Innovation in Barcelona, in: International Journal of Innovation Management, 19. Jg., Nr. 3, S. 1–25

Demary, Markus / Neligan, Adriana, 2018, Are Green Bonds a Viable Way to Finance Environmental Goals? An Analysis of Chances and Risks of Green Bonds, Köln, IW-Report, Nr. 28, Köln

Deschermeier, Philipp / Voigtländer, Michael, 2017, Auswirkungen des demografischen Wandels auf die Büroimmobilienmärkte in Deutschland, in: IW-Trends, 44. Jg., Nr. 4, S. 39–55

Diermeier, Matthias / Jung, Markos / Sagner, Pekka, 2018, Economic crisis slows European convergence, in: IW-Kurzbericht 30

Duca, John V. / Muellbauer, John / Murphy, Anthony, 2010, Housing markets and the financial crisis of 2007–2009: Lessons for the future, in: Journal of Financial Stability, 6. Jg., Nr. 4, S. 203–217

ECB, 2008, Commercial property markets. Financial stability risks, recent developments and EU banks' exposures, Frankfurt am Main

ECB, 2009, Monthly Bulletin May 2009

EIB, 2016, Restoring EU Competitiveness, Luxembourg

EIB, 2017, From recovery to sustainable growth, Luxembourg

European Commission, 2014, Communication from the Commission to the European Parliament, the Council, the European Central Bank, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. An Investment Plan for Europe

European Commission, 2018, The 2018 Ageing Report. Economic and budgetary projections for the EU Member States (2016-2070), Luxembourg

Florida, Richard, 2014, The Rise of the Creative Class--Revisited: Revised and Expanded, New York

Fransen, Lieve / Del Bufalo, Gino / Reviglio, Edoardo, 2018, Boosting investment in social infrastructure in Europe. Report of the High-Level Task Force on Investing in Social Infrastructure in Europe, Luxembourg

Groen, Willem Pieter de / Lenaerts, Karolien / Bosc, Romain / Paquier, Felix, 2017, Impact of digitalisation and the on-demand economy on labour markets and the conse-quences for employment and industrial relations, Brussels, Brussels

Just, Tobias et al., 2017, Wirtschaftsfaktor Immobilien 2017. Gutachten für den Deutschen Verband für Wohnungswesen, Städtebau und Raumordnung e.V. und die Gesellschaft für Immobilienwirtschaftliche Forschung e.V., Berlin, Berlin

Krugman, Paul, 1991, Increasing Returns and Economic Geography, in: Journal of Political Economy, 99. Jg., Nr. 3, S. 483–499

Moretti, Enrico, 2013, The New Geography of Jobs, Boston

Naceur, Sami Ben; Roulet, Caroline, 2017, Basel III and Bank-Lending: Evidence from the United States and Europe

OECD, 2011, Pension funds investment in infrastructure: A survey. International Futures Programme Paris

Pomogajko, Kirill / Voigtländer, Michael, 2012, Co-movement of house price cycles – a factor analysis, in: International Journal of Housing Markets and Analysis, 5. Jg., Nr. 4, S. 414–426

Rabianski, Joseph S. / Gibler, Karen M., 2007, Office Market Demand Analysis and Estimation Techniques: A Literature Review, Synthesis and Commentary, in: Journal of Real Estate Literature, 15. Jg., Nr. 1, S. 37–56

Rein, Stefan; Schmidt, Christian, 2017, Deutschlands Sonderrolle im Bausektor. Die Bauwirtschaft im europäischen Vergleich, Bonn

Sala-i-Martin, Xavier, 1996, The Classical Approach to Convergence Analysis, in: Economic Journal, 106. Jg., Nr. 437, S. 1019–1036

United Nations, 2018, World Migration Report 2018

Wagenvoort, Rien / Carlo de, Nicola / Kappeler, Andreas, 2010, Infrastructure finance in Europe: Composition, evolution and crisis impact, 15. Jg., Nr. 1, S. 16–39

Woetzel, Jonathan / Garemo, Nicklas / Mischke, Jan / Kamra, Priyanka / Palter, Rob, 2016, Bridging Infrastructure Gaps. Has the world made progress?, in: McKinsey & Company

List of tables

Table 4-1: Office employment 20
Table A-1.1: Construction investments in the EU 31

List of figures

Figure 2-1: Investments in construction by type 5
Figure 2-2: Share of investments by type of construction at total construction investments 6
Figure 2-3: Investments in construction by type in terms of GDP 8
Figure 3-1: Gross fixed capital formation and investments in construction 9
Figure 3-2: Volatility by type of construction investment 10
Figure 3-3: Correlation of real investment in total construction and real GDP 12
Figure 3-4: Investments in total construction 14
Figure 3-5: Investments in the construction of dwellings 15
Figure 3-6: Investments in the construction of non-residential buildings and structures 16
Figure 3-7: Construction investments relative to pre-crisis levels 17
Figure 4-1: Office employment and total employment 19
Figure 4-2: Standard deviation of year-on-year change in office employment 22
Figure 4-3: σ-convergence in the share of office employment in the EU 23
Figure 4-4: Infrastructure investment in the EU by source 25
Figure A-2.1: Change in the share of office employment 36

A-1: Tables

Table A-1.1: Construction investments in the EU

Notes: Absolute investments in 2010 billion euro; average change in percent; standard deviation in percentage points

Country	Asset	Index 2000=100		Absolute (% of GDP)		Mean change		Standard deviation
		2007	2017	2007	2017	2007–2013	2014–2017	2007–2017
AT	Total	98.8	94.2	35.1 (11.2)	33.5 (10.9)	-1.0	1.2	3.13
	Dwellings	92.7	92.6	13.4 (4.3)	13.4 (4.3)	-0.1	0.8	2.26
	Non-residential	102.9	95.2	21.7 (6.9)	20.1 (6.6)	-1.6	1.5	4.13
BE	Total	118.3	131.5	39.6 (10.7)	44 (10.8)	1.3	1.7	2.31
	Dwellings	125.2	120.9	24.2 (6.3)	23.3 (5.8)	-1.4	2.5	3.69
	Non-residential	109.7	146.0	15.5 (4.4)	20.7 (5)	4.9	0.9	5.24
BG	Total	223.6	208.1	4.6 (12.9)	4.3 (9.8)	1.8	-1.7	17.10
	Dwellings	415.9	264.3	1.8 (5)	1.1 (2.8)	-13.0	23.1	35.83
	Non-residential	173.3	189.8	2.8 (7.9)	3.1 (7)	8.2	-5.7	22.02
CZ	Total	134.7	120.1	20.9 (13.2)	18.6 (9.7)	-1.4	2.2	5.24
	Dwellings	157.1	228.5	6.1 (4.1)	8.9 (3.9)	2.8	12.2	10.60
	Non-residential	126.6	87.1	14.8 (9.1)	10.2 (5.8)	-3.1	-2.9	4.46
DE	Total	85.0	96.2	239.3 (9)	270.9 (9.9)	0.9	1.6	2.95
	Dwellings	83.6	100.9	136.5 (5.1)	164.7 (6)	1.2	2.3	3.83

	Non-residential	86.8	89.7	102.7 (3.8)	106.2 (3.9)	0.6	0.5	2.78
DK	Total	120.2	105.2	27.5 (11.8)	24.1 (9.2)	-4.5	4.6	7.37
	Dwellings	144.2	115.6	14.9 (6.5)	11.9 (4.5)	-7.0	7.1	10.91
	Non-residential	99.2	95.8	12.6 (5.3)	12.2 (4.6)	-1.5	2.3	5.92
EE	Total	267.5	181.8	3.3 (21.5)	2.2 (11.7)	-0.6	-2.5	16.74
	Dwellings	498.5	448.1	1 (6.1)	0.9 (4.5)	-5.7	11.7	18.07
	Non-residential	225.7	132.5	2.4 (15.4)	1.4 (7.2)	1.5	-7.2	20.14
EL	Total	133.3	35.7	33.6 (14.7)	9 (4.6)	-12.0	-6.0	12.66
	Dwellings	163.9	7.5	24.8 (10.8)	1.1 (0.6)	-19.8	-25.1	16.52
	Non-residential	86.3	77.5	8.8 (3.8)	7.9 (4)	-0.8	0.3	14.82
ES	Total	150.9	88.2	217.1 (21.1)	126.9 (10.4)	-8.9	3.8	7.50
	Dwellings	148.6	82.7	116.7 (11.7)	64.9 (5.1)	-10.5	5.8	9.55
	Non-residential	153.9	96.6	99.7 (9.3)	62.5 (5.3)	-7.0	2.3	6.69
FI	Total	123.7	119.3	25.6 (13.8)	24.7 (13)	-0.6	3.1	7.17
	Dwellings	120.2	122.4	11.9 (6.5)	12.1 (6.5)	-0.6	2.8	10.17
	Non-residential	127.3	117.0	13.7 (7.3)	12.6 (6.5)	-0.1	3.5	8.88
FR	Total	123.4	111.2	277 (13.2)	249.7 (11.9)	-0.9	0.4	3.23
	Dwellings	124.8	113.4	139.8 (6.7)	127.1 (6.1)	-1.1	0.7	3.58

	Non-residential	121.9	109.0	137.1 (6.5)	122.5 (5.7)	-0.6	0.0	3.27
HU	Total	120.8	84.7	12 (11.6)	8.4 (7.7)	-3.6	-2.3	10.30
	Dwellings	136.2	92.0	4 (4)	5 (2.4)	-8.4	12.5	14.29
	Non-residential	113.5	81.4	8.1 (7.6)	5.8 (5.3)	-1.8	-6.2	12.47
IE	Total	152.0	96.1	25.9 (18.6)	16.4 (7.4)	-10.9	11.6	16.19
	Dwellings	152.8	60.1	14.4 (11.1)	5.7 (2.4)	-18.2	13.2	18.94
	Non-residential	153.2	157.5	11.3 (7.5)	11.6 (5)	-3.5	13.2	15.97
IT	Total	120.2	77.2	201.6 (11.6)	129.4 (8)	-5.3	-1.3	3.88
	Dwellings	125.7	88.5	100.4 (5.8)	70.7 (4.4)	-4.1	-1.0	4.05
	Non-residential	115.2	66.8	101.3 (5.8)	58.7 (3.6)	-6.6	-1.6	4.62
LT	Total	253.2	186.6	4.7 (17.3)	3.5 (9.8)	-0.6	1.6	14.49
	Dwellings	229.5	293.5	0.7 (2.8)	0.9 (2.7)	2.4	8.5	14.21
	Non-residential	258.1	163.6	4 (14.5)	2.6 (7.1)	-0.6	-0.2	16.99
LU	Total	125.7	137.1	4.2 (10.8)	4.6 (9.4)	1.3	1.2	7.34
	Dwellings	182.1	166.3	1.6 (4)	1.4 (2.9)	6.0	-1.8	15.00
	Non-residential	106.3	127.1	2.6 (6.8)	3.2 (6.5)	0.0	2.9	9.30
LV	Total	302.5	195.9	3.7 (20.3)	2.4 (10.8)	-3.2	1.7	16.26
	Dwellings	195.5	55.0	1 (7.2)	0.3 (1.8)	-5.4	-3.6	23.63

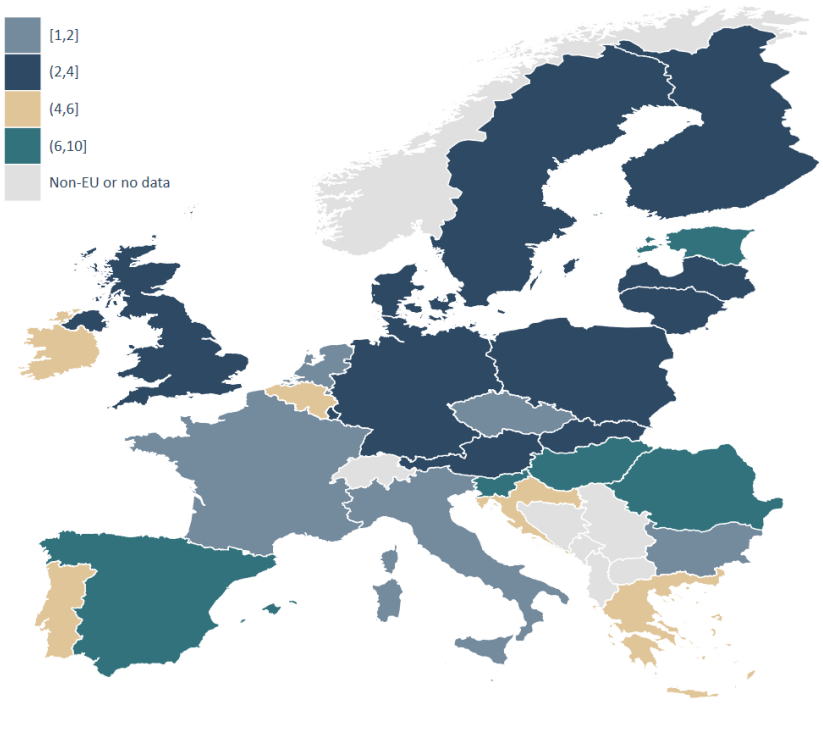
	Non-residential	300.7	250.4	2.6 (13.1)	2.1 (9)	-1.9	3.0	16.47
MT	Total	153.5	200.8	0.8 (12.3)	1 (10.4)	-2.7	17.0	19.33
	Dwellings	237.6	241.9	0.5 (7.4)	0.5 (4.9)	-9.8	26.8	22.14
	Non-residential	100.5	174.9	0.3 (5)	0.5 (5.6)	3.9	12.3	23.21
NL	Total	110.3	102.2	80.1 (12.1)	74.2 (9.7)	-3.8	7.1	7.70
	Dwellings	114.5	103.6	41 (6.3)	37.1 (4.3)	-7.8	14.7	12.91
	Non-residential	106.3	104.0	39 (5.9)	38.2 (5.4)	-0.4	2.4	5.32
PL	Total	126.4	153.1	37 (11.8)	44.8 (9)	4.6	0.8	6.58
	Dwellings	139.5	161.2	11.5 (3.7)	13.3 (2.6)	2.9	2.6	7.71
	Non-residential	122.5	151.3	25.5 (8.2)	31.5 (6.4)	5.3	0.4	8.21
PT	Total	82.8	49.1	24.7 (13.2)	14.6 (8)	-8.4	2.6	7.68
	Dwellings	68.9	34.8	9.7 (5.2)	4.9 (2.6)	-10.9	2.0	6.92
	Non-residential	97.6	63.6	14.8 (8)	9.7 (5.4)	-6.5	2.9	9.35
RO	Total	334.9	309.0	23.5 (18.3)	21.7 (11.8)	8.5	8.7	28.38
	Dwellings	104.1	146.4	3 (2.4)	4.2 (2.6)	9.0	10.8	20.44
	Non-residential	346.9	295.0	20.5 (16)	17.5 (9.2)	8.8	8.5	30.62
SE	Total	154.7	190.5	37.3 (9.7)	46 (11.1)	-0.8	9.0	6.61
	Dwellings	189.4	256.5	16.9 (4.3)	22.9 (5.7)	-2.2	15.5	12.52

	Non-residential	135.1	151.0	20.5 (5.4)	22.9 (5.4)	0.7	3.9	5.17
SI	Total	128.4	66.5	5.7 (14.9)	3 (7.8)	-6.2	1.0	13.43
	Dwellings	143.0	72.8	1.6 (4.2)	0.8 (2.2)	-6.7	0.5	11.58
	Non-residential	123.6	64.4	4.1 (10.7)	2.1 (5.7)	-5.9	1.5	15.07
SK	Total	148.6	116.7	8.6 (13.1)	6.7 (8.6)	-2.5	1.5	12.06
	Dwellings	82.0	96.0	1.7 (2.5)	1.9 (2.5)	4.8	0.1	9.65
	Non-residential	183.2	126.9	6.9 (10.6)	4.8 (6.2)	-4.4	2.7	16.02
UK	Total	117.4	121.1	187.6 (10.3)	193.5 (9.6)	-1.0	4.1	5.97
	Dwellings	114.6	121.4	75.9 (3.8)	80.4 (3.9)	-2.8	7.2	8.69
	Non-residential	115.0	120.4	111 (6.5)	116.2 (5.7)	0.3	2.9	5.20
EU	Total	117.2	102.1	1601.5 (12.2)	1394.8 (9.9)	-2.6	2.3	4.06
	Dwellings	117.5	101.7	788 (6)	682.2 (4.9)	-3.6	3.5	4.93
	Non-residential	117.1	102.6	813.9 (6.2)	713 (5.1)	-1.7	1.2	3.78

A-2: Figures

Figure A-2.1: Change in the share of office employment

2000–2015, change in percentage points



Note: No data for Cyprus; earliest data for Croatia is 2008; latest data for Sweden is 2014.

Source: Eurostat; German Economic Institute