EIB urban loans, metropolitan growth and governance: a quantitative evaluation

Pawel Krasny*

ABSTRACT
This paper investigates the growth impact of the European Investment Bank’s (EIB) urban loans on metropolitan regions, and whether the observed change is related to the quality of government during the period 2000–10. The approach (Solow growth model) is based on the methods used in the Cohesion Policy assessment literature. The panel data used combine EUROSTAT metropolitan regions and NUTS-2 data with a database on EIB loans from 2000 to 2010. This EIB loans database has never previously been used for ex-post evaluations. To ensure the robustness of the statistical approach, we adjust our standard errors for heteroscedasticity and serial and spatial correlation and control for endogeneity, as well as for spatial spillovers. We find EIB urban lending has a positive and significant impact on growth across most of the estimations. When running the baseline estimations on subsamples and including a variable on the quality of government, EIB urban loans are found to have a negative impact on growth in new member countries and in places with lower quality regional governance. Conversely, having strong institutions seems to further enhance the ability of EIB loans to have a positive impact on growth.

ARTICLE HISTORY
Received 24 October 2016; Accepted 12 April 2019

KEYWORDS
European Investment Bank (EIB); financial instruments; local economic growth; Cohesion Policy; evaluation; governance; metropolitan regions

EIB URBAN LENDING AND THE EVALUATION OF FINANCIAL INSTRUMENTS (FIS)

In recent years, there has been increased interest in using more innovative approaches to the financing of regional and urban development initiatives in the European Union (EU), under the umbrella term of FIs, and in scaling up existing initiatives. This reflects the impact of austerity (following the 2008 banking crisis), which has accentuated a political push for alternative sources of finance and increased governments’ dissatisfaction with the use of grant-based interventions. This shift has been matched by academic research showing cases of better performance for FIs than grants for firm support initiatives (e.g., Bondonio and Martini, 2012) and reflects wider neoliberal processes and mutations. Similar efficiency claims appear in the urban and

CONTACT
(Corresponding author) pkk29@srcf.net
Economics, Policy and Governance Department, European Bank for Reconstruction and Development, London, UK.

* Dr Pawel Krasny is currently a Principal Economist at the European Bank for Reconstruction and Development (EBRD). The work for this article was carried out while he was a STAREBEI researcher at the European Investment Bank (EIB). The views in this paper are those of the author only and not of the EBRD or EIB.

© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.
regional development literature, but practical implementation cases have encountered difficulties (Dąbrowski, 2015), and the level of impact has not yet been supported by econometric analysis.

One of the key players in providing such financial support across the EU is the European Investment Bank (EIB), an institution created with the goal of providing long-term loans for projects that promote the EU’s policies (Bond, 1995). As a complementary funding mechanism to – yet distinct from – Cohesion Policy (CP), it has been at the forefront of providing finance to urban projects since the late 1980s, and these now represent over 10% of its loan portfolio (Operations Evaluation Department, 2011). Moreover, its urban policy role has been strengthened over time, with the institution becoming a key player in the EU urban agenda (EU Ministers Responsible for Urban Matters 2016). Initially focused on the transport sector, the EIB has since diversified its activities into urban development and regeneration projects, including infrastructure and urban services (Field, 2012). The objective of these projects is to improve both the attractiveness of cities and quality of life for residents. The loans have a varied range of beneficiaries and the amounts involved (capped at half the project cost) range from €25 million to over €1 billion.

Although the EIB does not offer loan subsidies, it is often able to provide better loan conditions than the market (grace periods, rates) by ‘transferring’ its credit rating advantage to riskier projects and borrowers. This has increasingly become the case in the context of economic crisis, where the EIB has tried to adopt a countercyclical role, as described by Kollatz-Ahnen (2013). However, many authors, including Kollatz-Ahnen (2013) and Clifton, Diaz-Fuentes, and Revuelta (2014), have called for the institution to have an increased role in supporting EU public spending.

The increased importance of EIB in the urban sector has not yet been accompanied with sufficient research on its efficiency. In-house evaluation reports (Operations Evaluation Department, 2003, 2011) have focused on case-study approaches and on an evaluation of outputs and financial success, and have concluded that the majority of projects are satisfactory or better (Operations Evaluation Department, 2011). There is also a nascent corpus of research looking at FIs used for regional development in the EU and their evaluation (see Ward & Applica sprl, 2012, for a

![Figure 1. European Investment Bank’s (EIB) loan database allocations to spatial units (€, millions).](image-url)
review). While providing case-study evidence of the benefits of such approaches, the aforementioned review supports the view that not enough research has been undertaken in this field. Moreover, the existing evaluations rarely consider the general growth impacts of FIs (as opposed to sector-specific indicators), nor do they adopt econometric comparisons across beneficiary cities. Lastly, there is a need to compare the size of the impact of FI-funded projects and grant-funded projects and this should be done using similar methodologies for each funding type.

This research is, to our knowledge, the first attempt to quantify the growth impact of EIB urban lending across EU cities. It can, however, draw on the extensive literature on the effectiveness of CP and corresponding econometric evaluations across EU regions. Indeed, despite the need to repay loans, the policy goals of EIB lending and CP grant funding are similar, because of the policy-led nature of the institution and the strong link between the approaches, particularly for co-financing cases and the Joint European Support for Sustainable Investment in City Areas (JESSICA). Moreover, both funding sources adopt a spatially targeted approach (although our data set does not show a strong correlation between the allocation of the two funding sources). This paper thus seeks to investigate the growth impact of EIB lending for cities and how results compare with CP evaluation results, including factoring in institutional elements.

Pienkowski and Berkowitz (2015) offer a good overview and meta-analysis of the existing literature assessing CP. These studies have generally ‘found a positive, although usually small impact of Structural Funds on regional growth, especially in less developed regions’ (p. 9). Positive examples include Mohl and Hagen (2010), for instance, but other studies show no statistically significant impact of CP (Dall’erba & Le Gallo, 2008) or an impact conditional on the local context, depending on the country (Le Gallo et al., 2011) or on the quality of institutions (Ederveen, de Groot, & Nahuis, 2006). Ederveen et al. also provide evidence for a general negative impact of Structural Funds. These articles highlight the benchmark role of the neoclassical growth model within CP evaluation. In this framework (Solow, 1956), the growth of a region is determined by capital accumulation, population growth and the increase in productivity (technological progress). This model does have limitations (physical capital as the main driver of growth, human capital/research and development (R&D) only included through productivity, no consideration for sectoral specialization, no consideration for spatial spillovers and core–periphery mechanisms) and underlying assumptions (convergence between regions towards a steady state). However, we base our evaluation on this model – augmenting it to mitigate some of the issues – to match grant-based CP evaluation studies and because the model’s emphasis on physical capital corresponds to the ‘bricks and mortar’ focus of the EIB’s projects. Some of the mitigations developed in the methodology section include the use of fixed effects and the inclusion of a variable that serves as a proxy for market potential evolution.

**Data and estimation strategy**

Our approach draws on EUROSTAT data and uses the EU’s metropolitan regions (individual or combined NUTS-3 urban regions – 133 in our sample) as a scale of analysis for the following reasons. First, these places of relative prosperity have the potential to affect growth on the continent. This has led to significant interest in metropolitan regions from EU policy-makers, although research shows a more diverse and ambiguous image (Dijkstra, 2009). Second, they appear to be the best scale to address the impact of projects whose impact reaches beyond the administrative limits of municipalities, which is often the case for larger infrastructure projects supported by FIs (urban transport, utilities, ‘attractiveness’ investments). Third, focusing on urban regions rather than inner cities should add relevance to the comparison with CP evaluations undertaken at the regional scale, although these are usually done at the NUTS-2 level.

Regarding the Solow framework variables (see below), we use gross domestic product (GDP) growth, population growth (as a proxy for labour supply) and patents data (as a proxy for
productivity) and complete the database with EUROSTAT NUTS-2 data for gross fixed capital formation (GFCF) as a percentage of GDP to measure non-EIB and non-CP investment.

The data on EIB loans are based on the institution’s own research and corresponds to all the projects financed in the urban sector that were completed between 2000 and 2010. The urban sector is defined by the organization and Field (2012) lists nine types of interventions though which the EIB supports cities: (1) regional and municipal capital investment programmes; (2) urban renewal and regeneration; (3) social and affordable housing; (4) health and education; (5) mobility and transport; (6) water and waste; (7) conservation and cultural heritage; (8) public and administrative/communal buildings; and (9) reconstruction after natural disasters. Table 3 in the Appendix B shows the distribution of different urban loans per country, using a simpler classification used by the bank. The EIB’s urban focus is in line with the EU’s urban agenda (see Field, 2012, p. 2) and stems from the growing importance of cities in tackling some of the main challenges faced by the EU. We were able to allocate almost half the EIB lending to corresponding metropolitan regions, and this represents over €40 billion over the 11 years considered.

Funds that could not be matched with individual metropolitan regions have been allocated to the highest possible NUTS units (-3, -2, -1, country). Our initial estimations included all the allocations but within the final specification only country funds appeared significant and thus only these were kept.

Our estimation builds on the Solow framework and its application by Mohl and Hagen (2010), and we keep the model’s variables in our estimations even when they do not seem to yield significant results (e.g., patents data). This is to align with CP assessment literature. We also include a variable on the evolution of growth in neighbouring areas, to control for spatial correlation between metropolitan regions (inverse-distance-weighted average of growth in the five closest NUTS-3 regions, corresponding to the local market potential growth) and in certain estimations include the sector composition of local economies. We estimate the contribution of lagged EIB loans to metropolitan growth, together with past GDP levels, investments (GFCF), the natural growth rate (population growth, technological progress, and time discount), education/innovation (patents data), economic structure (share of industrial and services employment), local market potential growth, EIB nationwide funding and CP funding controls. Data for the latter are obtained using yearly country allocation per head and an interaction of this variable with the distribution of funds within countries at the NUTS-2 level during the 2000–07 programming period. Having tested a number of different lags, we show the estimation for three years as this provides the best trade-off between sample size and explanatory power.

The baseline estimation equation is as follows:

\[
\ln(y_{i,t}) - \ln(y_{i,t-1}) = \beta_0 + \sum_{k=1}^{3} \beta_k \ln(\text{EIBfunds}_{i,t-k}) + \beta_1 \ln(y_{i,t-1}) + \beta_2 \ln(\text{popgrowth}_{i,t}) + g + \delta \]
\[
+ \beta_3 \ln(\text{GFCFi}_{t-1}) + \beta_4 \ln(\text{patents}_{i,t-1}) + \beta_5 \ln(\text{emplind}_{i,t-1}) + \beta_6 \ln(\text{emplserv}_{i,t-1}) + \beta_7 \ln(\text{LMPgrowth}_t) + \beta_8 \ln(\text{CPnationalfunds}_{i,t-1}) + \beta_9 \ln(\text{CPNUTS2allocatedfunds}_{i,t-1}) + m_i + \lambda_t + u_{i,t}
\]

The estimation includes city and time-fixed-effects that control for elements at the local level that do not change over time, such as the quality of governance. We also present the results from a
Table 1. Baseline regression results.

| Lag | (1) Adjusted SE baseline | (2) Adjusted SE baseline reduced | (3) Adjusted SE, treated only | (4) GMM, baseline | (5) GMM baseline reduced |
|-----|--------------------------|---------------------------------|-------------------------------|------------------|-------------------------|
| EIB funds per capita, metropolitan level, planned end of works year | 1 0.00202 0.00229 0.00215 0.00821** 0.0171*** | 2 0.00531** 0.00352* 0.00388** 0.00490** 0.00437*** | 3 0.00497** 0.00242** 0.00306** 0.00373* 0.00299 | | |
| EIB ST elast | 0.0123 | 0.00823 | 0.00909 | 0.01684 | 0.02446 |
| Joint signif EIB funds | 0.0320 | 0.0361 | 0.0726 | 0.00420 | 0.000324 |
| Local market potential growth | 0 0.123 | 0.299** | 0.248** | 0.192 | 0.221*** |
| GDP per capita, level | 1 −1.49e-05*** | −1.52e-05*** | −1.39e-05*** | −0.0318* | −0.0691*** |
| Population growth + g + δ^a | 1 0.0192 | −0.0148 | −0.00683 | −0.0351 | −0.00283 |
| Number of patents per a million inhabitants | 1 0.00197 | −0.00490 | −0.00191 | −0.00670 | 0.00232 |
| GFCF in proportion to GDP (NUTS-2) | 1 −0.0984** | | | −0.00326 | |
| Industry NUTS-2 employment share | 1 0.0963 | | | 0.0281 | |
| Services NUTS-2 employment share | 1 −0.316** | | | 0.00158 | |
| EIB funds per capita, country level | 1 0.00716** | 0.00877 | 0.00787 | 0.0145** | 0.00450 |
| 2 −0.0193** | −0.00976 | −0.0135 | −0.0183*** | −0.0130*** | |
| 3 0.0211*** | 0.0297*** | 0.0253*** | 0.0360*** | 0.0128** | |
| EU Cohesion Policy funds at the national level | 1 0.0306** | 0.0265** | 0.0356** | −0.0104 | 0.0149 |
| 2 −0.0587*** | −0.0550** | −0.0693** | −0.0659*** | −0.0809*** | |
| 3 0.0471** | 0.0215** | 0.0449*** | 0.0727*** | 0.0685*** | |
| National EU funds × NUTS-2 allocations for 2000–07 | 1 −0.00459 | −0.00719 | −0.0159** | 0.0128 | −0.00209 |
| 2 0.00842 | 0.0233 | 0.0350 | −0.00441 | 0.0710*** | |
| 3 −0.0311* | −0.0323 | −0.0496** | −0.0262 | −0.0910*** | |
| Observations | 441 | 863 | 566 | 590 | 863 |
| Number of groups | 64 | 133 | 83 | 90 | 133 |
| Number of instruments | 92 | 117 | | | |
| \( R^2 \) within | 0.749 | 0.715 | 0.735 | | | (Continued) |
Table 1. Continued.

| Lag | (1) Adjusted SE baseline | (2) Adjusted SE baseline reduced | (3) Adjusted SE, treated only | (4) GMM, baseline | (5) GMM baseline reduced |
|-----|--------------------------|---------------------------------|-------------------------------|-------------------|-------------------------|
| AR(1) p-value\(^b\) | 0.000180 | 8.51e-07 | 8.51e-07 | 0.276 | 0.664 |
| AR(2) p-value | 0.276 | 0.664 | |
| Hansen p-value | 0.106 | 0.162 | |

Notes: Constant and time dummies are not shown. As the EIB and Cohesion Policy (CP) funding can take a value of 0 and we are using logs, the transformation done here is \( f(x) = \ln (1 + x) \).

\(^a\)Technological progress and the time discount factor take the constant value of 5%.

\(^b\)The AR(1) test confirms the strong probability of serial correlation and justifies the adjusted standard errors approach.

*Significant at 10%, **significant at 5%, ***significant at 1%.
Table 2. Subsample estimation and institutions interaction.

|                      | (1)          | (2)          | (3)          | (4)          | (5)          | (6)          |
|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                      | Adjusted SE, | Adjusted SE, | Adjusted SE, | Adjusted SE, | Adjusted SE  | GMM with     |
|                      | ‘new EU      | ‘old’        | poor institutions | good         | with         | institutions |
|                      | members      | EU members   |              | institutions | institutions |             |
| EIB funds per capita,| −0.00543***  | 0.00289      | −0.00432***  | 0.000352     | 0.0109       | 0.0174*      |
| metropolitan level,  |              |              |              |              |              |              |
| planned end of works | 2 −0.000749  | 0.00175      | 0.00233      | 0.000185     | 0.00997*     | 0.0269       |
| year                 | 3 −0.000558  | −0.00126     | −0.00217     | −0.000632    | −0.00249     | −0.00989     |
| EIB funds × NUTS-2   |              |              |              |              |              |              |
| institutional quality | 1 −0.00239   | −0.00156     |              |              |              |              |
|                      | 2 −0.00119   | −0.00208     |              |              |              |              |
|                      | 3 0.00192    |              |              |              |              |              |
| EIB summed impact    | −0.006737    | 0.00338      | −0.00416     | −0.00095     |              |              |
| Joint signif EIB      | 0.00221      | 0.00483      | 0.00362      | 0.561        |              |              |
| funds                |              |              |              |              |              |              |
| Local market potential| 0.108        | 0.303**      | 0.281        | 0.0500       | 0.120        | 0.0913       |
| growth               |              |              |              |              |              |              |
| GDP per capita, level| −2.07e−05*** | −1.25e−05*** | −1.02e−05*** | −5.84e−06*   | −1.23e−05*** | −0.0284**    |
| Population growth + g | 0.189        | 0.0182       | .            | .            | .            | 0.0555       |
| δ)                  |              |              |              |              |              |              |
| Number of patents per | −0.00375     | −0.00769*    | −0.0402**    | −0.0575*     | −0.0313      | −0.00960*    |
| 1 million inhabitants|              |              |              |              |              |              |
| GFCF in proportion to |              |              | −0.00124     | −0.0121**    | −0.000781    | .            |
| GDP (NUTS-2)a        |              |              |              |              |              |              |
| Observations         | 195          | 668          | 235          | 315          | 550          | 550          |
| Number of groups     | 28           | 105          | 36           | 47           | 83           | 83           |
| R² within            | 0.909        | 0.715        | 0.880        | 0.692        | 0.705        |              |
| Number of instruments|              |              |              |              |              | 89           |
| AR(2) p-value        |              |              |              |              |              | 0.236        |
| Hansen p-value       |              |              |              |              |              | 0.559        |

Notes: Constant and time dummies, as well as EIB national allocations and Cohesion Policy (CP) funding are not shown.

aSome of the model’s variables are dropped when they are not significant in both subsample estimations.

*Significant at 10%, **significant at 5%, *** significant at 1%.
reduced estimation that drops GFCF and employment shares, which significantly improves sample size (64–133). When possible, we also run this restricted estimation on the subsample of metropolitan regions that have received EIB funding, to investigate selection bias. In the first stage of our panel fixed-effects estimations, we adjust the standard errors for heteroscedasticity and serial and spatial correlation, using a method from Driscoll and Kraay (1998) and the STATA xtsscc command (Hoechle, 2007). We then proceed with system generalized method of moments (GMM) estimations (xtabond2 from Blundell & Bond, 1998) to control for endogeneity, but this approach does not allow subsample estimations.

**Baseline results**

Table 1 presents the main findings. The estimations have a strong explanatory power in showing changes within given metropolitan regions over time. GDP levels are significant and show the expected sign, although the size of beta-convergence seems small when looking at the adjusted standard errors method. While the model’s controls are rarely significant, controls for national EIB funding and CP support play a significant role.

Each estimation shows a positive impact of EIB funding on growth, ranging from 0.008 to 0.02. The difference between the restricted and the baseline estimation is relatively small and so is the estimation focusing on metropolitan regions. The GMM approach shows a somewhat higher impact of EIB funds, meaning that endogeneity could lead to an underestimation of impact. As a benchmark on CP evaluation, Mohl and Hagen (2010) find short-term elasticities on Objective 1 funding (destined to the poorest regions) ranging from 0.003 to 0.006. The bigger impact in our estimations is partially due to the smaller scale used, allowing better targeting of benefits, but it may also be related to stronger requirements and incentives from the EIB for the projects to be financially sound (Dabrowski, 2015). Furthermore, EIB funds may have a better ability to leverage private investment that increases the total amount spent on projects. Lastly, we should bear in mind that EIB amounts are smaller than CP funding, so a higher elasticity does not imply a higher aggregate impact.

**Subsample and institutional estimations**

As a robustness check, we consider subsamples of countries and distinguish between old and new EU members. The results, presented in the two first columns of Table 2, show that the observed overall positive impact of EIB loans is driven by old member states’ metropolitan regions, while their impact on growth is negative in the new member states. This could be due to specific characteristics not accounted for or projects that are different in nature (see Table 3 in Appendix B – the distribution of loans does not strongly differ between old and new member states). It may also be due to lower quality projects in those regions due to lower administrative capacity at the local level and weaker governance (Rodriguez-Pose, 2010), as found in the case of CP evaluation (Ederveen et al., 2006).

We thus want to test whether better quality of local government is related to better outcomes from EIB lending and explain the observed difference by running the estimations on two samples of cities, based on their government quality rank (above (4) or below (3) the median), and by interacting EIB loan amounts with a measure of government quality ((5) and (6)). The data come from Charron, Lapuente, and Dykstra (2012), who construct a quality of government index at the NUTS-2 level based on survey data. There is an endogeneity problem in using a data set that was constructed at the end of our period of study (in 2009), but it is, to our knowledge, the only source of information of this type at a subnational level. Furthermore, the reverse causality could be somewhat mitigated by our use of a higher geographical scale and by the slow speed of institutional change. Another limit to this data set is that the values collected at the
regional level may not reflect those at the metropolitan regions level. As the index is focused on a survey assessing the delivery of education, healthcare and law enforcement services, it is plausible that delivery will be broadly similar across a region and that regional results are driven by metropolitan areas where the centres of decision and accountability are located. Besides, these data are initially used to simply generate two groups of cities: it is likely that those regions that are in the top half for quality of governance will contain cities with better institutions.

While EIB loans have no significant impact in the 'good government' sample, EIB loans have a significant negative impact on the cities with a poorer quality of governance. Moreover, in the GMM estimations with the interaction, we find evidence that better government quality enhances the impact of EIB loans on growth. In both cases, due to the reduced sample size and limits with the variables used, it is not possible to draw a definite conclusion, but the results hint that metropolitan regions with better governance reap more growth benefits from EIB urban lending.

**Conclusions**

This paper has provided significant evidence that in metropolitan regions receiving EIB lending has a positive impact on growth when looking at the whole sample. However, in regions with weaker governance the impact is found to be negative, meaning that the aggregated positive results may be driven by what happens in older member states and regions with better institutions. In investigating this, the paper has delivered a first set of quantitative results regarding the effectiveness of EIB lending, a specific type of FI available to EU cities that complements CP funding. With respect to the latter, we show that non-grant, repayable financial support has a similar impact on growth to Cohesion Funding and that similar implementation issues may be found in both cases, where local institutions influence the funds’ effectiveness.

These results shed light on the wider move towards non-grant-based urban development initiatives in the EU, including those initiated within CP (JESSICA). While there is scope for a further deployment of FIs in CP, the institutional constraints need to be considered or FIs could contribute to the divergence between cities/metro-regions. Two important ways of mitigating this would be technical assistance (TA) and more stringent lending conditionality that helps deliver better projects and creates incentives for change (this could be supported by TA to avoid putting an excessive burden on places with weaker institutions). Nevertheless, grant-based approaches will still remain important for the lagging cities/regions that would otherwise struggle to find adequate funding for their urban development initiatives because they are too high risk or too low return. Considering EIB, the results show that there is scope for the institution to have a positive role as the provider of EU-wide stimulus packages, such as the Junker Plan, with a caveat regarding the distributional impacts of such initiatives. For national and EU policy-makers the recommendations suggest cautious support for institutions providing FIs, in order to channel the funds where they have the most impact and provide support to those places that require more institutional support to reap more benefits from FIs.

More research is needed to quantitatively investigate the impact of EIB lending and other FIs and this would require better data at the metropolitan level across all EU countries (including governance data). Furthermore, more quantitative information regarding local policies and public spending should lead to more robust estimates (even if these are to a certain extent captured by GFCF and CP funding variables), as EIB loans are often used as part of wider urban development initiatives that contribute to the observed impact. Further research in the field could consider alternative estimation methods, following CP literature (see Pienkowski and Berkowitz, 2015, for an overview of methods), and investigate further the link between loan effectiveness and local governance, to see whether the same mechanisms are at play as in the case of grants and FIs. This could lead to further research on the interaction between CP initiatives and EIB lending, especially in the case of co-financing or JESSICA.
ACKNOWLEDGEMENTS

The author thanks Professor Peter Tyler, PhD supervisor, and Professor Brian Field, from the EIB. The author gratefully acknowledges the support of the European Investment Bank (EIB) and of the EIB Institute for research funding, multiple stays at the institution’s headquarters, discussions with the Regional and Urban Division staff and the provision of data on urban loans.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

FUNDING

This work was supported by the European Investment Bank (EIB) [grant number STAREBEI funding].

REFERENCES

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87, 115–143.

Bond, P. D. R. (1995). Aspects of the European Investment Bank’s experience in wastewater management. *Water Science and Technology*, 32(11), 97–104, ISSN 0273-1223. doi:10.1016/0273-1223(96)00122-9.

Bondonio, D., & Martini, A. for DG Regional and Urban Policy (2012). ‘Counterfactual impact evaluation of cohesion policy: Impact, cost-effectiveness and additionality of investment subsidies in Italy’.

Charron, N., Lapuente, V., & Dykstra, L. (2012). Regional governance matters: A study on regional variation in quality of government within the EU. *Regional Studies*, 48(1), 68–90.

Clifton, J., Díaz-Fuentes, D., & Revuelta, J. (2014). Financing utilities: How the role of the European Investment Bank shifted from regional development to making markets. *Utilities Policy*, 29, 63–71. doi:10.1016/j.jup.2013.10.004

Dall’erba, S., & Le Gallo, J. (2008). Regional convergence and the impact of European Structural Funds 1989–1999: A spatial econometric analysis. *Papers in Regional Science*, 82(2), 219–244.

Dąbrowski, M. (2015). “Doing more with less” or “doing less with less”? assessing EU Cohesion Policy’s financial instruments for urban development. Regional studies. *Regional Science*, 2(March), 73–96. doi:10.1080/21681376.2014.999107

Driscoll, J., & Kraay, A. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *The Review of Economics and Statistics*, 80(4), 549–560.

Dijkstra, L. (2009). Metropolitan regions in the EU. *Regional Focus*, 1, 1–9.

Ederveen, S., de Groot, H., & Nahuis, R. (2006). Fertile soil for structural funds? A panel data analysis of the conditional effectiveness of European Cohesion policy. *Kyklos*, 59(1), 17–42.

EU Ministers Responsible for Urban Matters. (2016). Urban Agenda for the EU: Pact of Amsterdam. Amsterdam: Dutch Presidency. Retrieved from https://ec.europa.eu/regional_policy/sources/policy/themes/urban-development/agenda/pact-of-amsterdam.pdf

Field, B. (2012). *Urban policy paper, European investment bank*. Luxembourg. unpublished.

Hoeflea, D. (2007). Robust standard errors for panel regressions with cross-sectional dependence. *The Stata Journal*, 7(3), 281–312.

Kollatz-Almen, M. (2013). European intervention mechanisms for growth: Budget and the European investment bank. *Global Policy*, 4, 41–49. doi:10.1111/1758-5899.12053

Le Gallo, J., Dall’erba, S., & Guillaum, R. (December 2011). The local versus global dilemma of the effects of structural funds. *Growth and Change*, 42(4), 466–490.
Mohl, P., & Hagen, T. (2010). Do EU Structural Funds promote regional growth? New evidence from various panel data approaches. *Regional Science and Urban Economics, 40*(5), 353–365. doi:10.1016/j.regsciurbeco.2010.03.005

Operations Evaluation Department, EIB. (2003). EIB financing of Urban development projects in the EU. Operations Evaluation Department, EIB. (2011). Evaluation of EIB financing of urban infrastructure projects in the European Union, Synthesis report.

Pienkowski, J., & Berkowitz, P. for DG Regional and Urban Policy (2015). Econometric assessments of cohesion policy growth effects: How to make them more relevant for policy makers? Regional Working Paper 2015, WP 02/2015.

Rodriguez-Pose, A. (2010). ‘Do institutions matter for regional development?’ IMDEA working paper series in economics and social sciences 2010/02.

Solow, R. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics, 70*(1), 65–94.

Ward, T., & Applica sprl. for DG Regional and Urban Policy. (2012). The use of the ERDF to support Financial engineering instruments. Expert evaluation network delivering policy analysis on the performance of Cohesion Policy 2007–2013.

**APPENDIX A**

Table A1. Estimation sample: metropolitan regions and countries included in the estimation

| Country | Metropolitan regions a | Country | Metropolitan regions a |
|---------|------------------------|---------|------------------------|
| AT      | Graz, Innsbruck, Linz, Salzburg, Wien | LT      | Kaunas, Vilnius |
| BE      | Antwerpen, Brussels, Charleroi, Gent, Liège | LU      | Luxembourg |
| BG      | Plovdiv, Sofia, Varna | LV      | Riga |
| CZ      | Brno, Ostrava, Pizen, Praha | MT      | Valletta |
| DK      | Aalborg, København, Odense, Århus | NL      | Breda, Eindhoven, Heerlen, Tilburg |
| EE      | Tallinn | PL      | Bialystok, Bielsko-Biały, Bydgoszcz – Toruń, Częstochowa, Gdańsk, Katowice, Kielce, Kraków, Lublin, Łódź, Poznan, Radom, Rzeszów, Szczecin, Tarnów, Warszawa, Wrocław |
| ES      | A Coruña, Barcelona, Bilbao, Cádiz – Algeciras, Donostia-San Sebastián, Las Palmas, Oviedo – Gijón, Palma de Mallorca, Pamplona/Iruña, Santa Cruz de Tenerife, Sevilla, Vigo, Zaragoza | RO      | Brasov, Bucuresti, Cluj-Napoca, Constanța, Craiova, Galati, Iași, Timișoara |
| FI      | Tampere | SE      | Göteborg, Malmö, Stockholm |
| FR      | Amiens, Angers, Avignon, Bordeaux, Brest, Caen, Clermont-Ferrand, Dijon, Grenoble, Le Mans, Lille – Dunkerque – Valenciennes, Lyon, Marseille, Montpellier, Mulhouse, Nancy, Nantes, Nice, Orléans, Paris, Reims, Rennes, Rouen, Saint-Etienne, Toulon, Toulouse, Tours | SI      | Ljubljana, Maribor |
| HU      | Budapest, Debrecen, Miskolc | SK      | Bratislava, Kosice |
| IE      | Cork, Dublin | UK      | Aberdeen, Belfast, Bournemouth, Brighton and Hove, Bristol, Cardiff, Coventry, Derby, Edinburgh, Exeter, Glasgow, Kingston upon Hull, Leicester, London, Manchester, Newcastle upon Tyne, Norwich, |
Table A1. Continued.

| Country       | Metropolitan regions<sup>a</sup> |
|---------------|----------------------------------|
|               | Nottingham, Portsmouth, Sheffield, Southampton, Stoke-on-Trent, Sunderland, Swansea |

Note: <sup>a</sup>The EUROSTAT database provides information for 306 regions, but missing data reduce the sample size to 64–133 cities depending on estimations. The later sample, excluding data on gross fixed capital formation (GFCF) and sectoral employment, is also presented.

Appendix B

Table B1. Funding allocated to identified metropolitan regions in the studied sample, per country and per urban subsector

| Lending amounts (€, millions) | Composite infrastructure | Education | Health | Solid waste | Transports | Urban development | Water, sewerage |
|-------------------------------|--------------------------|-----------|--------|------------|------------|------------------|----------------|
| Austria                       | 256                      | 485       | 55     | 84         | 809        | 211              |
| Belgium                       | 150                      |           | 325    | 50         | 384        |
| Cyprus                        | 65                       | 50        | 30     | 10         | 100        |
| Denmark                       | 420                      | 177       | 700    | 287        | 50         |
| Finland                       | 347                      | 1439      | 465    | 5865       | 129        | 280              |
| France                        | 759                      | 775       | 116    | 885        | 1885       | 2667             |
| Greece                        | 58                       |           | 2410   | 1550       |
| Ireland                       | 194                      |           | 60     |            |
| Italy                         | 960                      | 416       | 137    | 130        | 2112       | 2314             | 804 |
| Luxembourg                    |                          | 421       |        |            |            |
| Netherlands                   |                          | 100       |        |            |            | 315              |
| Portugal                      |                          | 140       | 1372   | 5          | 185        |
| Spain                         | 60                       | 560       | 372    | 8580       | 1522       | 617              |
| Sweden                        | 92                       | 808       | 51     | 1906       | 21         | 61               |
| UK                            | 629                      | 1651      | 195    | 4648       | 652        | 1070             |
| Old members subtotal          | 1020                     | 3754      | 6230   | 1264       | 29434      | 9654             | 6744 |
| Distribution of lending in old member states | 2% | 6% | 11% | 2% | 51% | 17% | 12% |

Bulgaria          15  149
Czech Republic    198  95  786  280  150
Estonia           25  47  25  52  19
Hungary           85  37  1310  135  194
Malta             40
Poland            50  13  39  1801  894  797
Romania           112  9  1297  25
Slovakia          4  2  12  21
New members subtotal 248  334  125  46  5246  1388  1166
Distribution of lending in new member states 3% 4% 1% 1% 61% 16% 14%

Note: Includes amounts spent in metropolitan regions that do not have sufficient data to be included in all or certain estimations.