Evaluating three decades of the European Capital of Culture programme: a difference-in-differences approach

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Abstract

We measure the regional impact of the European Capital of Culture programme using a difference-in-differences approach. We compare the regions of cities that hosted the event with the regions of cities that tried to host it but did not succeed. GDP per capita in hosting regions is 4.5 percent higher compared to non-hosting regions during the event and the effect persists more than 5 years after it. This result suggests that the economic dimension of the event is important and supports claims that the event serves as catalyst for urban regeneration and development.

Keywords: European Capital of Culture; Difference-in-differences.

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1. Introduction

The European Capital of Culture, a programme created in 1985, has become a widely coveted cultural event. During a whole year, a designated European city celebrates arts and culture as well as cooperation among the diverse countries that form Europe. Thirty years after its inception, the event, which began as an event to showcase cultural prowess and common bonds amongst European countries, has evolved. Today, hosting the European Capital of Culture is seen as an opportunity for urban regeneration and a catalyst for social, cultural and economic development.

This study examines the effects of hosting the programme before, during and after the event. The European Capital of Culture's effects are hard to identify, because the hosting city is likely to differ from an average or a random city. To overcome this, we use a difference-in-differences approach: we compare regions of cities that held the event and the regions of runner-up cities. The latter are the cities that manifested a clear willingness to receive the title of European Capital of Culture in a particular year. These cities entered some kind of competition with the winning city - at a national or international level, of a lobbying or formal nature - but did not see their aspirations fulfilled. The identification assumption is that the "losing" cities form a valid counterfactual for the "winning cities".

The difference-in-differences approach has been used: to assess the impact of other events such as the Olympic Games (Rose and Spiegel, 2011; Mehrotra, 2011); to quantify the impact of new large manufacturing plants on total factor productivity of incumbent plants in a region (Greenstone et al., 2010); or to measure the impact of new organizations, such as Napster (Hong, 2011). However, to the best of our knowledge, this is the first paper that applies this strategy to assess the European Capital of Culture's impact. This approach allows us to deal with the major research gaps highlighted in García and Cox (2013) by providing comparable results among different cities and years and assessing the programme's long-term effects.

After finding which cities hosted and attempted to host the European Capital of Culture, we set up a panel dataset. Due to the lack of comparable data at the city level, we analysed cities through regional data. We opted for the NUTS3 region to which the city belongs to as a unit of analysis. From here on, mentions to winning or runner-up cities refer to the region corresponding to that city. We ended up with a

panel of 145 regions with the annual data starting as early as 1984 and ending in 2012. We consider as the main indicator the GDP per capita of the region.

We find that hosting a Capital of Culture raises GDP per capita of the region by 4.5 percent. This boost starts 2 years before the event and is still present more than 5 years after it. These results are in contrast to the literature on the economic impact of mega-events, such as the Olympic Games, that typically find little or negative effects. For instance, Mehrotra (2011) finds a negative long-run impact on GDP per capita of hosting countries compared to non-hosting countries. Rose and Spiegel (2011) find that the positive effects on exports are equal for both hosting and non-hosting countries.

A recent paper by Steiner *et al.* (2015) measures the impact of hosting the European Capital of Culture on life satisfaction and on GDP. They find no impact on GDP. We improve on their study in three dimensions. First, they compare hosting regions with all other regions, whereas our control group only includes runner-up cities. Second, their unit of analysis is NUTS2. Instead, we use smaller geographic areas - NUTS3 – where the effects are likely to be concentrated. Third, while they include 28 events, we consider 52. With more events, and more precise geographic area and control group, we do find positive and significant effects of hosting the event.

This paper opens a new avenue for researching European Capitals of Culture, which can help cities to better understand the consequences of their decisions when planning their programme. It may also provide some valuable insight to the EU institutions in charge of regulating the programme and help them refine the European Capital of Culture policy.

2. European Capital of Culture

2.1 History of the programme

In 1985 the Council of Culture Ministers instituted the European City of Culture programme. The event was created to highlight the richness and diversity of European culture while at the same time emphasize its common elements in order to "bring the peoples of the Member States closer together" (Council of European Union, 1985). It was also intended to raise European awareness of the chosen city's

cultural offer. Initially, and until 1996, the programme depended on the Council of Ministers and the designation of each winner city was made by means of inter-governmental agreements. While the first cities had little time to plan the event, from Glasgow 1990 onwards, the cities would go on to enjoy a 3-5 years planning span.

A new resolution (Council of European Union, 1990) was taken in 1990 to open the programme not only to Member States but to other European countries as well. The designation process was modified: instead of a rotating cycle, the selection should take the form of competition among aspiring cities. Every two years the Council would choose two winning cities from a pool of applicants. The hosting cities would then have a 5 or 6 year planning period.

In 1999, the European Parliament and the Council of the EU agreed to change the programme's name and instituted the "European Capital of Culture" (European Parliament and Council, 1999). While the objectives remained largely unchanged, the designation process was again redesigned.

With these new regulations, from 2005, a list was elaborated in which one or two countries were assigned a particular year in rotating turns. Each year, the designated Member States were to hold the event and, at least four years prior to the event itself, the national authorities of those countries would nominate one or several cities within their borders. A selection panel of seven independent cultural experts would evaluate the proposals and make a recommendation to the Council that would officially designate the countries' European Capitals of Culture for that year. From 2008, with the actual selection process, there are two European cities in two different countries each year, which share the title of European Capital of Culture (with the exception of 2010, when there were three).

A new decision, still in force today, was taken in 2006 (European Parliament and Council, 2006) and introduced three major updates: a monitoring panel that kept track of the progress of the designated cities and offered guidance to comply with the objectives and operational goals of the programme; the awarding of the Melina Mercouri Prize upon successful evaluation of the monitoring panel; and the obligation of the Commission to perform an ex-post evaluation assessing the success of the project measured against its set goals and the programme's objectives.

2.2 Funding and organization of the event

Through the history of the programme, cities have resorted to different sources of financing, depending on their geographical situation, their size, and other socio-political circumstances, drawing financing from national governments (average of 37% of the total budget), local and regional governments (average of 34%), and private sector sponsors (the rest). The European Commission support represents a small proportion of the total budget. It is worth noting, however, that the budgets greatly differ in size and composition across cities[1], and that even though a few trends can be noticed analysing the available data, comparison is difficult due to the varied nature of the cities and their celebrations (see García and Cox, 2013).

A variety of structures gather and manage this funding and are in charge of the organization of the event. Although at first direct administration of the event by local authorities was the norm, the most common alternative since 1995 is to institute an independent body that takes the form of a foundation or a not-for-profit organization, in order to prevent political influence. Despite this measures, local or even regional and national political influence is usually exerted during the organisation stages of the European Capital of Culture (Palmer, 2004; García and Cox, 2013).

These bodies are responsible for delivering the event and materialising the European Capital of Culture programme. Habitually, preparations take 3 to 4 years, and include the determination of the events and activities that will take place during the year; communication and publicity of the event and the programme; and infrastructure remodelling and developing in order to enable the city to host the event and attract visitors. Once more, it is difficult to spot valid trends since, due to the approach differences, these preparations, and the financial efforts made to undertake them, vary in size, intensity and form (Palmer, 2004).

2.3 Evaluation of the programme

After almost three decades of the birth of the European Capital of Culture initiative, it is clear that research is a key tool for many of the event's stakeholders (García and Cox, 2013; European Capitals of Culture Policy Group, 2010).

[1] Acording to Steiner *et al.* (2015), the budgets ranged from 5.5 million euros in Reykjavik to 59 million euros in Lille.

Some of the most ambitious research makes use of a methodology that combines the reviewing of existing literature with primary data obtained from questionnaires and interviews. A lot of the literature builds upon two major reports by Myerscough (1994) and Palmer (2004), which cover, respectively, European Capitals of Culture from 1985 to 1995 and from 1995 to 2005.

Many other works in this field use a combination of qualitative and quantitative techniques in order to explain the complex relationships present when a European Capital of Culture is organised: focus groups, face-to-face interviews, or questionnaires, as well as press review analysis. Examples that focus more on "soft data" include: Richards et al. (2002) deal with Porto and Rotterdam 2001; Hughes et. al. (2003) and Boyko (2008) focused on the inhabitants' perceptions of the event in Krakow in 2000 and Bruges 2002 respectively; and García looked into the press and image effects of the event in Glasgow 1990 (2005) and Liverpool 2008 (2006, 2010).

Another line of inquiry focuses on "hard data" and purely economic impacts, a methodology almost exclusively used to identify short-term effects. An example is the study by Herrero et al. (2006), of Salamanca 2002 where economic impact is estimated as a combination of the private spending generated by cultural tourism and the measured levels of cultural consumption and investment directly related to the event.

Despite the growing amount of literature and rising interest on the topic, there are a number of shortcomings and research gaps in European Capitals of Culture studies. The first of them has to do with the impact areas researched. Economic analysis is still predominant, while socio-cultural, political or environmental effects are featured much less predominantly in the literature (Langen and García, 2009).

Comparability of results is another issue: a great number of reports, including those of Myerscough (1994), Palmer (2004) or García and Cox (2013) have highlighted the difficulties in comparing one hosting city to another. First, due to the heterogeneity of the organizing cities in terms of size, budget, programing approaches, cultural strategies, patrimony endowment and existing amenities. Second, this is due to the heterogeneity of data and researching techniques. Since the beginning of the initiative, there has been a lack of guidelines on data collection and evaluation methods and cities have had different levels of commitment towards

gathering and analysing data. No one has attempted to evaluate the programme as a whole in a systematic way so far.

One last research gap, widely noted in the literature, is the absence of well-founded evidence of long-term effects once the event has been hosted (Langen and García, 2009; Palmer, 2004; European Capitals of Culture Policy Group, 2010). Most of the literature is unable to provide a solid evidence base for long-term effects or is directly focused only in short-term benefits. The regulation introduced in 1999 and onwards by the EU states that the event should be programmed in such a farsighted way that it spawns long-term legacies in order to promote urban development or regeneration and cities claim the title on the basis of this long-term effects. In this context, this research gap becomes more apparent than ever.

We address most of the shortcomings of the literature. First, we evaluate the average effect of the programme since its inception. Second, besides considering GDP per capita, we try to inspect the mechanisms that nurture the potential effects by also focussing on value-added and employment of particular sectors, namely *Construction; Accommodation & food services and Arts, entertainment & recreation*. Third, we evaluate the impacts more than 5 years after the event took place.

3. Methodology

In order to assess whether the European Capital of Culture programme has an economic impact, we use a difference-in-differences approach. Cities that hosted the European Capital of Culture comprise our treatment group, while the control group encompasses any candidate city that was not selected. The treatment starts, not at the year of the event, but at the year of the announcement. The European Capital of Culture is usually announced several years before the event, but this has changed throughout the history of the programme. In early stages, the host was decided 1 to 3 years in advance, whereas in more recent years it is announced 4 to 6 years before the event. We distinguish several phases:

<u>Pre-treatment</u>:

- Before the announcement

Post-treatment:

- Phase *I*: Announcement (from the year of announcement to 3 years before the event)
- Phase *II*: Pre-event (1-2 years before event)
- Phase *III*: Event (year of event)
- Phase *IV*: Short-run (1-2 years after event)
- Phase *V*: Medium-run (3-5 years after event)
- Phase *VI*: Long-run (more than 5 years after event)

The objective of this paper is to analyse the impact of the programme on a series of indicators. Following Mora and Reggio (2013), we consider a flexible specification for the dynamics of the effect, by including the dummies for the several phases of the post-treatment. For each indicator we run the following regression:

$$Ind_{i,t} = \alpha_i + \eta_t + \sum_{k=I}^{VI} \lambda^k D_{i,t}^k + \sum_{k=I}^{VI} \gamma^k \left(D_{i,t}^k \times Host_{i,t}\right) + \beta\, Ind_{i,t}^c + \mu_{i,t} \quad (1)$$

where $Ind_{i,t}$ is the the indicator for region i at time t. The regression includes city fixed effects α_i, year dummies η_t, and an error term $\mu_{i,t}$. A $\mathrm{D}_{\mathrm{i,t}}^{\mathrm{k}}$ dummy is included for every city, that takes the value 1 in phase *k* relative to the event (I to VI). Finally an interaction $\mathrm{Host}_{\mathrm{i,t}} \times \mathrm{D}_{\mathrm{i,t}}^{\mathrm{k}}$ dummy is also included for winning cities that takes the value 1 in phase *k*. The coefficients γ^k measure the impact of hosting the event in the different phases. We include $Ind_{i,t}^c$ as the indicator for the country at time t, to control for general national economic activity. As an alternative specification we consider the following regression:

$$Ind_{i,t} - Ind_{i,t}^c = \alpha_i + \eta_t + \sum_{k=I}^{VI} \lambda^k D_{i,t}^k + \sum_{k=I}^{VI} \gamma^k \left(D_{i,t}^k \times Host_{i,t}\right) + \mu_{i,t} \quad (2)$$

where we directly subtract the national indicator and use it as the dependent variable. This specification is similar to specification (1) when β=1. Although the regions are small enough not to influence the national indicators, the second specification guarantees that there is no endogeneity of the regressors.

Our approach implies three assumptions. The first is the parallel trends-assumption, by which the trends of the indicators both in the winning cities and their runner-ups are assumed to be parallel in the years prior to the announcement. We explicitly test this assumption in section 5. The second one is that the unobserved heterogeneity of the model is fixed and constant over time. Therefore unobserved heterogeneity is cancelled out through the differencing process and the estimates are free from omitted variable bias of time-invariant variables, such as natural patrimony or amenities. Another assumption of the difference-in-differences approach is the Stable Unit Treatment Value: an observation in one city should be unaffected by the assignment of the event to another city. In practice, this might not hold. On the one hand, a winner city might take national resources away from a losing city. On the other hand, a winner city might attract foreign tourists to the event, that then visit a losing city. These spillovers are hard to measure because they cannot be distinguished from other potential economic driving forces affecting the losing regions. Implicit in our analysis is the assumption that either these spillovers are negligible or the positive spillovers outweigh the negative effects, so the estimated coefficients are a lower bound for the true effect. We think this is a reasonable assumption. In the whole European Capital of Culture literature cited above we could not find any evidence suggesting that the spillovers to losing cities are sizable.

4. Data

Information about cities awarded the European Capital of Culture title is available on the European Commission website, as well as the name of competing cities from recent editions of the programme. However, we had to research in the European Capital of Culture archive in the Directorate General of Education and Culture for earlier bids and references to national and international competition among cities. To further complete this research process, we contacted the organising committees of those events for which there was lacking data. The result of this research process is shown in Table A1 in the Appendix. It is important to notice that the control group is biased towards the more recent events. In the first years, there are

many events for which there was no other competing city. We check the robustness of our results by considering only the events from 2000 onwards.

We then collected data from the Oxford Economics European Cities and Regions database. This database provides statistics for European countries in accordance to the Nomenclature of Territorial Units for Statistics in its smallest regional division (NUTS3). For this we had to match each city to its respective NUTS3. The convenience of this regional division -starting as early as 1980 in some cases-, and the consistency of the data on the indicators under study have been the major reasons for choosing it. If we were to focus on metropolitan areas, we would not measure the spillovers of hosting the event on nearby cities and villages and it would be harder to find comparable data, which would, arguably, be more prone to measurement error.

Our main analysis focuses on gross domestic product per capita, but we also consider employment and value-added of three relevant sub-sectors: i) *construction*; ii) *accommodation and food services* and iii) *arts, entertainment and recreation*. We also use data on consumer spending in: *Recreational and cultural goods and services* and *Restaurants and hotels* and its sub-components. We collect yearly data on these variables for every hosting region as well as regions whose cities bid but did not win the title. We also collect data for all the variables for the European countries that have held at least one Capital of Culture since 1985. All the variables are in logarithms. Once collected, we construct a dataset containing all the indicators for the hosting and runner-up regions.

From the dataset, we exclude those cities for which no data is available: the winning cities of Istanbul and Reykjavik and the runner-up cities of Kiev and Las Palmas de Gran Canaria. We also exclude the observations corresponding to Paphos, Valletta and Luxembourg because the country size renders the regional analysis ineffective. Finally, in the case where a region includes both the winner and a runner-up city in the same year, we consider it as the winner (Cork and Limerick in 2005).

5. Results

Figure 1 provides a graphical analysis of the evolution of the average GDP per capita of winners and runners-up, up to 10 years before the event. We highlight the

pre-treatment and the post-treatment phases up to the event. Although we do not control for any variable, we can observe a sizable post-treatment positive effect for the winners. The trend for losing cities is slightly negative but not statistically significant.

Figure 1: Average GDP per capita before the event

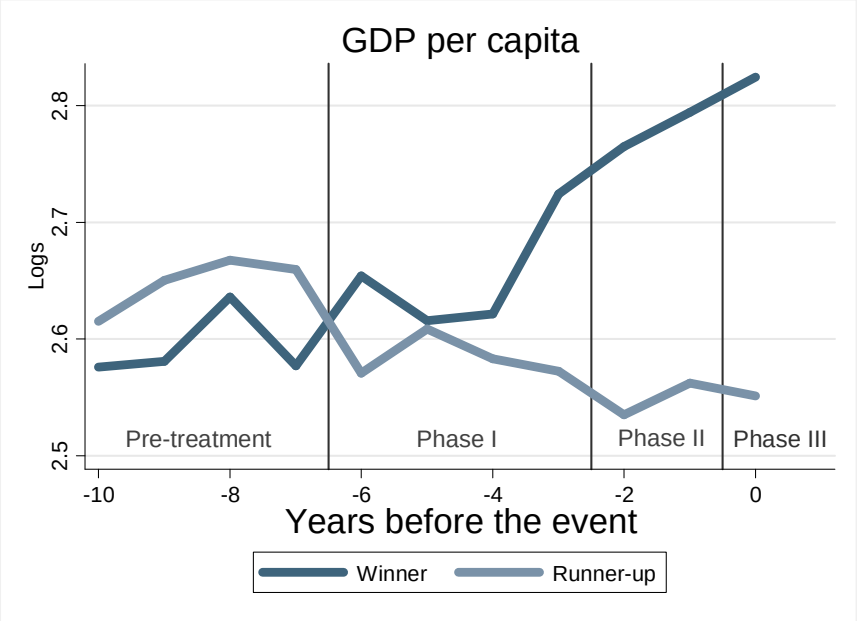

Table 1 displays the estimated effects on GDP per capita for every phase of the programme. These estimates are calculated under specifications (1) and (2), that include the fixed effects and year dummies. The inspection of Figure 1 suggests that both winners and runners-up had similar trends prior to the treatment. A statistical test confirms the parallel trends assumption. We run regressions with yearly dummies, from 10 years before the event up to the announcement date. We also include interaction dummies with winner cities. We do not reject that all the interaction coefficients are jointly equal to zero, with p-values above 0.3.

GDP per capita increases in hosting regions when measured against losing regions. This increase, significant using both specifications, ranges from 3.7 to 4.9 percent and appears in every phase from the pre-event phase onwards. When formally testing that the coefficients from Phase II to Phase VI are equal, we do not reject the hypotheses with p-values above 0.7 in the two specifications.

Table 1
Impact of hosting the European Capital of Culture on GDP per capita

	All events		Events after 2000	
Specification	(1)	(2)	(1)	(2)
Host × Phase I	0.009	0.010	0.009	0.009
	(0.66)	(0.72)	(0.60)	(0.63)
Host × Phase II	0.040	0.039	0.038	0.037
	(2.56)**	(2.54)**	(2.31)**	(2.27)**
Host × Phase III	0.047	0.046	0.042	0.040
	(2.59)**	(2.55)**	(2.16)**	(2.09)**
Host × Phase IV	0.045	0.044	0.046	0.044
	(2.44)**	(2.39)**	(2.19)**	(2.10)**
Host × Phase V	0.037	0.037	0.046	0.044
	(1.98)*	(1.99)**	(2.01)**	(1.92)*
Host × Phase VI	0.046	0.049	0.076	0.078
	(1.89)*	(2.03)**	(3.01)**	(3.07)**
Parallel trend test[$]	0.336	0.334	0.366	0.355
Within R-squared	0.93	0.05	0.92	0.04
Between R-squared	0.81	0.05	0.38	0.03
Observations	2608	2608	2295	2295
Cities	145	145	118	118
Hosting cities	52	52	37	37

Note: ** and * denotes significance at 5% and 10%. T-statistics are in parenthesis. Sample is from 1984 to 2012. GDP per capita is in logs. The standard errors are clustered by city. All regressions include year dummies. In specification (1) the national GDP per capita is included as an additional regression. In specification (2), its values are subtracted from the regional GDP per capita prior to the regression. [$]We estimate the equations adding year dummies from 10 years before the event to the announcement year. We also interact these dummies with being the winner and test the joint significance using an F-test. The p-value of the F-test reported.

When excluding the first 15 years of the event, the most interesting difference relates to the long-run coefficient. The coefficients are statistically significant and with a magnitude close to 8 percent, suggesting that the most recent events had a stronger and more long-lasting economic impact. We also divide the sample by population and level of GDP per capita and find that there are no significant differences in the sub-groups.

We ran two other sets of regressions with restricted samples: i) only keeping events that had competing cities (17 events) and ii) including only close runners up (23 cities[2]). As we restrict the sample, we estimate only one coefficient for the post treatment that includes Phase II onwards. In both cases the estimated coefficients are between 0.036 and 0.04, and statistically significant.

[2] These are one or two cities per event that we could identify as being close runners up. There are in bold in Table A1. In some cases one or two cities went on to the preselection phase in the later years, when a two-phase selection process was stablished. In other cases there was only one or two cities competing with the winner.

Table 2 gives the estimated effects that the programme has on the value-added and employment of three economic sectors related to the celebration of the event: *Construction*; *Accommodation & food services* and *Arts, entertainment & recreation.* Unfortunately, no conclusions can be drawn on the mechanism through which hosting the event raises GDP per capita, as none of the coefficients is significant. As a robustness test we also used Expenditure on: i) *Restaurants and hotels* and ii) *Recreational and cultural goods and services*. The results are reported in Table A3 in the Appendix and again point to no statistically significant differences between hosting and non-hosting regions. On one hand, it might suggest that the GDP per capita increase is due to an increase in general economic activity and is not linked to a development of a particular sector. On the other hand, it could be simply due to measurement error, which becomes a more serious problem when using more disaggregated data both by region and by sector.

Table 2
Impact of hosting the European Capital of Culture
on value added and employment per sector

	Construction		*Accomodation & Food services*		*Arts, entertainment & recreation*	
	V.A.	Emp.	V.A.	Emp.	V.A.	Emp.
Host × Phase I	-0.055	-0.024	0.005	-0.014	0.009	-0.105
	(-1.62)	(-1.02)	(0.16)	(-0.49)	(0.27)	(-0.65)
Host × Phase II	-0.059	-0.016	0.027	0.012	-0.022	-0.114
	(-1.55)	(-0.52)	(0.93)	(0.4)	(-0.56)	(-0.63)
Host × Phase III	-0.054	-0.011	0.044	0.032	-0.024	-0.126
	(-1.38)	(-0.35)	(1.33)	(1.12)	(-0.57)	(-0.63)
Host × Phase IV	-0.056	-0.009	0.024	0.044	-0.045	-0.069
	(-1.24)	(-0.23)	(0.68)	(1.33)	(-1.05)	(-0.33)
Host × Phase V	-0.016	-0.023	-0.014	-0.005	-0.080	-0.082
	(-0.31)	(-0.49)	(-0.38)	(-0.12)	(-1.77)*	(-0.42)
Host × Phase VI	-0.005	-0.034	0.020	0.023	-0.026	-0.057
	(-0.06)	(-0.54)	(0.48)	(0.5)	(-0.47)	(-0.25)
Within R-squared	0.68	0.69	0.72	0.68	0.77	0.21
Between R-squared	0.31	0.06	0.47	0.20	0.28	0.14
Observations	2891	2901	2891	2900	2891	2900
Cities	145	145	145	145	145	145
Hosting cities	52	52	52	52	52	52

Note: ** and * denotes significance at 5% and 1%. T-statistics are in parenthesis. Variables are in logs. The standard errors are clustered by city. The regressions are based on specification (1) and include year dummies as controls.

6. Conclusion

The European Capital of Culture programme does have an impact in hosting regions. When compared to runner-up regions, Capitals of Culture see a significant increase in GDP per capita. This increase is sizable in magnitude and may justify the will of the cities to host the event. The impact has a similar size through all of the programme's stages, from the pre-event phase to more than 5 years after the event.

These results are in contrast to the literature on the economic impact of mega-events, such as the Olympic Games, that typically find little or negative effects (Mehrotra, 2011 or Rose and Spiegel, 2011). While most of these papers focus on the aggregate effects, this paper is concerned only with the regional impact. However, these differences are most likely due to the fact that the European Capital of Culture is a very different type of event. It involves lower costs than mega-events, and usually the program is created around the already existing cultural patrimony of the city. Also, the benefits of hosting the Capital of Culture last for a year, while for the mega-events, they are usually concentrated in a period up to a month, which puts strain on the capacity constrain.

Ideally, one would want to understand the mechanisms behind this positive economic effect. Upon studying the individual impacts of the relevant economic sectors involved in the organisation of a European Capital of Culture, we are unable to determine the specific source of increased economic activity. Part of the problem might be due to the heterogeneity of the characteristics of the event in different cities. It might also be attributed to measurement error. We have tried to gather more data that could allow us to inspect the mechanism, but comparable data is not available at a regional level or a city level with a long enough time series.

Another open question is whether there is new growth in winning cities that spills over neighbouring regions or whether the growth is mainly due to a redistribution of growth from other cities. The difference-in-differences approach can be used to measure spillover effects from winners to losers by comparing neighbouring regions of winning cities with neighbouring regions of losing cities. In future research we will be able to address this question.

This way of analysing the European Capital of Culture programme has the benefit of studying it as a whole through the entirety of its history. Despite the

positive conclusion, much has to be done still if the potential of the European Capital of Culture is to be fully materialised, in particular in terms of its cultural ambitions. Planners and European institutions alike should aim at creating stronger links between the cultural and economic dimension of the event. The spillage effects of this effort will increase the size of the programme's impact and it will enable cities to develop their cultural tissues along with their economies.

As a tool for better planning, more research needs to be done to provide further evidence for the long-term claims of the hosting cities and regions. The availability of the list of runner's up opens a new avenue for European Capital of Culture researchers that can apply a difference-in-differences strategy to other data.

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Appendix

Table A1:

Summary of winner and other candidate cities

Year of event	Year of announcement	Winner	Other candidate cities
1985	1984	Athens	
1986	1985	Florence	
1987	1985	Amsterdam	
1988	1985	Berlin	**Bonn, Munich**
1989	1986	Paris	
1990	1986	Glasgow	Bath, Bristol, Cardiff, Cambridge, Leeds, Liverpool, Swansee, Edinburgh
1991	1989	Dublin	Cork
1992	1988	Madrid	
1993	1988	Antwerp	**Liège**
1994	1989	Lisbon	
1995	1989	Luxembourg	
1996	1989	Copenhagen	
1997	1992	Thessaloniki	**Estambul, Budapest**
1998	1993	Stockholm	**Prague**
1999	1993	Weimar	**Nüremberg**
2000	1995	Avignon	
2000	1995	Bergen	
2000	1995	Bologna	
2000	1995	Brussels	
2000	1995	Helsinki	
2000	1995	Krakow	
2000	1995	Reykjavik	
2000	1995	Prague	
2000	1995	Santiago de Compostela	
2001	1998	Porto	
2001	1998	Rotterdam	
2002	1998	Bruges	**Mons**
2002	1998	Salamanca	Granada, Barcelona, Valencia
2003	1998	Graz	
2004	1998	Genoa	
2004	1998	Lille	
2005	2001	Cork	Galway, Limerick, Waterford
2006	2002	Patras	
2007	2004	Luxembourg	
2007	2004	Sibiu	
2008	2004	Liverpool	Birmingham, Bristol, Cardiff, Newcastle, Oxford, Belfast, Bradford, Brighton, Canterbury, Inverness and the Highlands, Norwich
2008	2004	Stavanger	
2009	2005	Linz	
2009	2005	Vilnius	
2010	2006	Essen	**Görlitz-Zgorzelec**, Bremen
2010	2006	Istanbul	**Kiev**
2010	2006	Pécs	Budapest, Debrecen, Miskolc, Győr, Kaposvár, Kecskemét, Sopron, Székesfehérvár, Veszprém
2011	2007	Turku	Jyväslylä, Lahti, Mänttä, Oulu,Rovaniemi, Tampere
2011	2007	Tallin	**Tartu**, Haapsalu, Pärnu, Rakvere
2012	2008	Maribor	Celje, Koper, Ljubljana
2012	2008	Guimarães	
2013	2008	Marseille	Amiens, Lyon, Saint-Etienne, Strasbourg, Bordeaux, Nice, Toulouse
2013	2008	Košice	Bratislava, Nitra, Trencin, Banska Bystrica, Martin, Trnava, Dolny Kubin, Presov
2014	2009	Riga	**Cesis, Liepaja**, Jurmala
2014	2009	Umea	**Lund**, Gavle, Uppsala
2015	2010	Mons	
2015	2010	Plzeň	**Ostrava**, Hradec Králové,
2016	2011	San Sebastián	**Córdoba**, Alcalá de Henares, Burgos, Cáceres, Cuenca, Málaga, Murcia, Oviedo, Las Palmas de Gran Canaria, Pamplona, Santander, Segovia, Tarragona y Zaragoza
2016	2011	Wrocław	Białystok, Bydgoszcz, Gdańsk, Katowice, Lublin, Łódź, Poznań, Szczecin, Toruń, Warszawa
2017	2012	Aarhus	**Sønderborg**
2017	2012	Paphos	**Nicosia,** Limassol
2018	2012	Leeuwarden	**Eindhoven, Maastricht**
2018	2013	Valletta	

Note: in bold are the cities identified as close runner's up.

Table A2
Data description

Indicator	Cross-sectional mean and standard deviation at time of event	
	Winners	Runners-up
Gross domestic product per capita Millions of Euros, 2005 Prices, logs.	3.131 (0.619) [31]	2.954 (0.631) [48]
Gross value added:		
Accommodation & food services Millions of Euros, 2005 Prices, logs	12.682 (1.078) [33]	12.164 (1.376) [51]
Arts, entertainment & recreation Millions of Euros, 2005 Prices, logs	11.857 (1.001) [33]	11.475 (1.095) [51]
Construction Millions of Euros, 2005 Prices, logs	13.089 (1.140) [33]	13.088 (1.170) [51]
Workplace employment		
Accommodation & food services Persons, Thousands, logs	9.450 (0.764) [32]	9.188 (0.984) [51]
Arts, entertainment & recreation Persons, Thousands, logs	8.383 (0.757) [32]	8.235 (0.910) [51]
Construction Persons, Thousands, logs	9.951 (0.707) [32]	9.607 (0.909) [51]
Expenditure:		
Recreational and cultural goods and services Millions of Euros, 2005 Prices, logs	13.462 (0.934) [25]	13.156 (1.172) [37]
Restaurants and hotels Millions of Euros, 2005 Prices, logs	13.345 (1.004) [25]	12.937 (1.293) [37]
Population Persons, Thousands, logs	13.353 (0.686) [31]	13.006 (0.765) [48]
Workforce Persons, Thousands, logs	12.616 (0.565) [28]	12.152 (0.765) [48]
ILO unemployment rate Percentage	8.615 (4.646) [28]	8.929 (4.103) [48]

Source: *Oxford Economics European Cities and Regions database.* Cross-sectional mean reported. Standard-errors in brackets. Number of city observations in square brackets.

Table A3
Impact of hosting the European Capital of Culture on other variables

	Expenditure		*Others*		
	Restaurants and hotels	Recreational and cultural goods and services	Population	Workforce	Unemployment rate
Host × Phase I	-0.009	-0.015	-0.012	-0.007	-1.233
	(-0.74)	(-1.43)	(-1.41)	(-0.49)	(-2.17)**
Host × Phase II	0.002	-0.005	-0.011	0.004	-0.732
	(0.12)	(-0.38)	(-1.23)	(0.32)	(-1.43)
Host × Phase III	0.016	0.007	-0.011	0.010	-0.657
	(1.06)	(0.44)	(-0.93)	(0.64)	(-1.09)
Host × Phase IV	0.007	-0.001	-0.015	-0.013	-0.279
	(0.4)	(-0.03)	(-1.12)	(-0.75)	(-0.42)
Host × Phase V	0.011	0.004	-0.027	-0.045	-0.929
	(0.57)	(0.24)	(-1.53)	(-1.75)*	(-1.16)
Host × Phase VI	0.027	0.022	-0.023	-0.046	-2.163
	(1.29)	(1.2)	(-0.8)	(-1.41)	(-1.93)*
Within R-squared	0.94	0.98	0.61	0.65	0.788
Between R-squared	0.45	0.29	0.06	0.05	0.443
Observations	2118	2118	2899	2319	2317
Cities	141	141	145	145	145
Hosting cities	50	50	52	52	52

Note: ** and * denotes significance at 5% and 1%. T-statistics are in parenthesis. Variables are in logs expect for unemployment rate. The standard errors are clustered by city. The regressions are based on specification (1) and include year dummies as controls

Table A4
Impact of hosting the European Capital of Culture on GDP per capita, restricted sample

	Only events with runners-up		Only close runners-up	
Specification	(1)	(2)	(1)	(2)
Host × Phase I	-0.006	-0.007	0.002	0.003
	(-0.46)	(-0.48)	(0.16)	(0.18)
Host × Phase II- VI	0.036	0.036	0.040	0.039
	(1.73)*	(1.70)*	(5.27)**	(5.19)**
Within R-squared	0.93	0.05	0.92	0.04
Between R-squared	0.83	0.01	0.79	0.05
Observations	2027	2027	1325	1325
Cities	110	110	75	75
Hosting cities	17	17	52	52

Note: ** and * denotes significance at 5% and 10%. T-statistics are in parenthesis. Sample is from 1984 to 2012. The close runner's-up are identified in bold in Table A1. GDP per capita is in logs. The standard errors are clustered by city. All regressions include year dummies. In specification (1) the national GDP per capita is included as an additional regression. In specification (2), its values are subtracted from the regional GDP per capita prior to the regression.