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## Does administrative status matter for urban growth? Evidence from present and former county capitals in East Germany

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# Does Administrative Status Matter for Urban Growth? Evidence from Present and Former County Capitals in East Germany\*

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## Abstract

Public sector activities are often neglected in the economic approaches used to analyze the driving forces behind urban growth. The institutional status of a regional capital is a crucial aspect of public sector activities. This paper reports on a quasi-natural experiment on county towns in East Germany. Since 1990, cities in East Germany have demonstrated remarkable differences in population development. During this same period, many towns have lost their status as a county seat due to several administrative reforms. Using a difference-in-difference approach, the annual population development of former county capitals is compared to population change in towns that have successfully held on to their capital status throughout the observed period. The estimations show that maintaining county capital status has a statistically significant positive effect on annual changes in population. This effect is furthermore increasing over time after the implementation of the respective reforms.

*Keywords: urban economic growth, centrality, institutions, public sector, East Germany, post-socialist cities, capital cities, county towns, county government reform*

*JEL Classification: H1, H7, P2, R1, R5*

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## **1. Introduction: Cities as Nodes in the Network of Public Sector Activities**

Roos (2004, 412) explicitly states that, when explaining agglomeration processes, economic approaches that analyze the driving forces behind urban economic growth mostly ignore the impact of public sector activities. Yet, the public sector is responsible for basic formal institutional choices within the economy and it influences the economic process through fiscal (taxes, expenditures) and regulative instruments. In the context of these public activities, one should consider that governmental units and decision makers at all regional levels frequently try to alter the spatial allocation of resources so that they are in line with specific political ideas (see e.g. Funck, 1995).

A relatively long-term and stable impact on the spatial allocation of resources can be derived by assigning the competencies of administrative functions to a specific location, thus determining its position within the governmental hierarchy or administrative ranking of locations. This assignment of functions is always linked to the decision of locating public facilities to a certain place. Given a certain function and a certain range of competencies, the larger the administrative area is, the more centralized the position of this public facility becomes. This may also be regarded as an attempt to – in the words of Krippner (1993) – “prescribe the position of a city within the hierarchy of central places”. In practice there are two ways of assigning public functions to a certain place. Firstly, it has to be considered the structure of public administration in general. In most countries, there is more than one level or tier of government. In Germany, for example, there are four governmental levels: central or federal level, state level, county level and municipal level. The “main seat” or “main domicile” of administration at each of these levels is always located in a certain place. Secondly, governments at all levels have often created “secondary domiciles” for some branches of their administration and/or regional subdivisions. For instance, the Federal Agency of Labor is located in Nuremburg rather than in Berlin, and the agency is subdivided into several regional and many local agencies.

The concentration of administrative bodies in a certain place may generate positive effects on overall local demand and produce positive externalities for private households and businesses located at this place<sup>2</sup>. As part of the debate surrounding institutions as relevant factors of local economic growth, Storper (2010, 2037-2038) mentions the importance of allocating formal

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<sup>2</sup> For details see Section 2

governmental competencies within metropolitan regions. This is in line with Krugman (1996, 19-21), who argues that political centralization (concentrating public facilities in a certain place) plays an important role in the agglomeration process. There is currently little empirical evidence for these interrelations. Carroll and Meyer (1982) found that state capitals in the US were growing faster (measured in population and infrastructure growth) than other cities. This specifically happened when state expenditures were growing dynamically. Ades and Glaeser (1995) showed that in a cross-section of 85 primate cities the populations of these cities were 42% higher when they were also national capitals. Moreover they linked this concentration of the national population in capitals to the degree of political instability and dictatorship. Using panel data from the German state of North Rhine-Westphalia, Dascher (2004) estimated that changes in a county's budget affect the rate of employment in the county seat, even when public sector employment is excluded. This is in line with the findings of Turner and Turner (2011), who estimated a significantly positive relationship between state expenditure and the income of US state capital city residents relative to residents in the rest of the governments jurisdiction. Moreover, Turner (2014) showed that government employment and government expenditures per employee decrease as distance to the state capital increases.

One approach for detecting the impact of public facilities on the local economy is to study the effects of the relocation of public facilities from one place to another. This can be regarded as a type of "natural experiment". There are several descriptive empirical studies on such "natural experiments". By applying cluster analysis, Kauffmann (2009) showed that former district capitals in the GDR that became state capitals after 1990, performed better economically than former district capitals in the GDR that lost their status after the reunification. Wilk (2004: 246-247) has shown that, in the case of the voivodship reforms in Poland in 1999, there was a "certain relationship" between losing the status of regional capital and a weakened economic position for some cities.

Relocating state or district capitals happens much more infrequently than smaller administrative reforms. The relocation of regional or county capitals allows for a broader empirical base. Using case studies from Franconia (a region in the state of Bavaria), Krippner (1993: 69) was unable to identify any negative effects for towns that lost the status of the seat of a county government (so-called "Kreisstaedte" ["county towns"]). Based on a broad survey of private businesses and households, Holtmann et al. (1998) came to the conclusion that the county reform in the German state of Saxony-Anhalt in 1993 negatively impacted cities that lost their status as county towns, and positively impacted the remaining county towns;

however, these effects were relatively insignificant, at least in the initial years following the reform. Dascher (2000a) finally compared 155 West German towns which were the seat of county government until at least 1987, with 176 former county towns (cities which lost the county seat between the late 1960s and the mid-1970s). By applying a cross-sectional regression using a broad set of control variables, he estimated that the status of being a county town positively affected local employment growth. The study did not include county towns that, in addition to being the seat of a county, were a county in their own right (“*Kreisfreie Staedte*” or “*free towns*”).

The results of Dascher (2000a) reveal some issues with the empirical approach. The dependent variable is employment growth (excluding public sector employment) based on census data on German employment at only two points in time (1970 and 1987; see Dascher 2000a: 382). Since the West German county reforms were not accomplished in 1970, this cross-sectional approach may ignore the time dimension of adjusting growth paths, as well as mix up employment growth before and after losing county capital status. In addition, Dascher does not explicitly control for changes in the territorial size of these cities<sup>3</sup>, but the reforms at county level coincided with changes in territorial boundaries at the municipal level.

Dascher (2000b, 126-127) argued that the county reforms in East Germany after German reunification could, in general, represent a good field for testing his findings for West Germany. However he expressed severe doubts as to whether such a test could be successfully implemented since the public sector in East Germany played a key role in East German employment, at least at the turn of the 21<sup>st</sup> century. From the authors’ point of view, this has changed in the last 15 years, although the public sector in East Germany still has more employees per capita than in West Germany. Moreover, in contrast to the previous reforms in the West,<sup>4</sup> the explicit goal of county-level reforms in East Germany was to increase public-sector efficiency. This means that they were not linked to an increase in public expenditure at the municipal level. Furthermore, politicians - especially in East Germany - increasingly discussed adjusting public administration spatial patterns in light of the new socioeconomic conditions, - namely changes in demographics and rising fiscal stress within the public sector. In order to make political decisions about relocating public functions and public utilities in

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<sup>3</sup> See Dascher 2000a, 382: where he says that “... few variables were updated by the statistical offices”, but does not state explicitly which variables these were and what the sources of his empirical data were.

<sup>4</sup> The goal of West Germany’s territorial reforms in the 1960s and 1970s was mainly to adjust the level of public activities in regions lagging behind to the situation in the wealthier parts of the country, see Rosenfeld 1989, 36.

general, it would be beneficial to know more about how the localization of public utilities impacts local economic development, or at least if there is any impact at all. This is especially relevant for East Germany, where the urban hierarchy has changed drastically since 1990 and policymakers in all tiers of government are busy devising measures to support cities that have lost their economic potential. This question also has a high political relevance at the moment since there is an ongoing political debate in two East German states (Brandenburg, Thuringia) regarding plans by their state governments to reform the government at county level, including changing the administrative status of cities.

Following these explanations, this study uses data from the “laboratory” of East German county reforms to test the general hypothesis that being a capital city positively impacts urban growth. The paper is organized as follows: In Section 2, we will look at theoretical approaches for explaining how the location of public utilities within a region influences the urban economy. Section 3 presents our estimation strategy and econometric model. Some comments on our dataset and the descriptive statistics are provided in Section 4. The estimation results follow in Section 5. Finally, we draw some conclusions for future research and discuss the policy implications of our findings (Section 6).

## **1. Urban Growth and the Role of County Towns in Theory**

As previously discussed, the focus of this paper lies on understanding the implications of a city’s status (or change in status) as a “county capital” or “county town”. In Germany, this status is either determined by the state government or by the county councils. Being a county capital firstly implies that public utilities are highly concentrated within the county town. Of course, not all of a county’s public utilities have to be located within the county town. A certain degree of spatial deconcentration and the localization of some public utilities in other cities of the county is quite common. In addition, the division of competencies between the county administration and the municipal level of government may also differ from county to county. Secondly, the county’s most relevant steering or governance functions are more or less always completely situated in the county town.

The motivation is to find out what the advantages and disadvantages are for the local economy when a city is chosen to be a county capital. From a theoretical point of view, our question may be answered along the same lines as what is discussed in the literature on public



utilities in general (see e.g. Forslid 2004): Public utilities have *demand effects* and *supply effects*.<sup>5</sup> Demand effects are generated by the expenditures of a public utility for different inputs (labor and capital goods).<sup>6</sup> Supply effects arise when a public utility (making use of these inputs) generates benefits for private households or private businesses. In addition to this quite common general differentiation, the localization of the county administration within a certain city may also lead to relevant *externalities* which are not directly influenced by the functions of the county administration.

One could argue that causality works the other way round - the hypothesis being that cities, which are already economically strong and have the potential to grow and to attract people, are chosen to become county capitals.<sup>7</sup> This might have been the case when the county towns were initially selected decades or even centuries ago. But in this approach results of county reforms are observed where one former county town is chosen to be the new and future county town, while the other former county town (or towns) loses this status. Hence, at least for East Germany, there is no evidence to support this hypothesis. In some cases, policymakers even selected a city with a relatively weak economic position to become the new county capital in order to support its development.

*Demand effects* include the direct employment effects of a public utility and the multiplier effects of the employment effect resulting from the private expenditures of the employees. These are followed by positive effects on local taxes and additional employment effects resulting from higher local public spending<sup>8</sup>. Most county employees will reside within the county town or quite close to it. Therefore, the county towns benefit more from the employment effects than other municipalities within a county. The level of benefit depends on the marginal propensity to import inputs for the county administration from other municipalities or regions (see Dascher 2000a, 375-376). People visiting the city where a public utility is located create an indirect employment effect (demand for hotel rooms, restaurants, retail shops etc.). The county's governing function may particularly attract persons wanting to negotiate with, or lobby, the county authorities. Again, this indirect

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<sup>5</sup> This differentiation is quite similar to the one proposed by Dascher 2000a, 376, between benefits from the "production" and benefits from the "consumption" of publicly provided goods and services.

<sup>6</sup> There will always be some migration towards the county town when a city is initially declared to be a county capital or when the capital function is relocated from one town to another. Some county administration employees will always choose to reside near their workplace. This is akin to a "natural rate of migration towards a county town".

<sup>7</sup> For this line of arguments see Jacobs (1984: 142)

<sup>8</sup> For empirical evidence see Turner 2014

employment effect is followed by multiplier effects and the positive effects of increased expenditures by the local public sector in the county town.

The *supply effects* of a public utility vary according to the public tasks or functions that a public utility has to fulfill. In terms of county seat functions, some functions may produce benefits which decrease as the distance to the county town increases (“*distance sensitive functions*”; for this *distance-decay effect* see Dascher 2000a, 376; Jurion 1983; Sakashita 1987). In contrast, the benefits of other functions may spill over, more or less equally, to all of the municipalities within a county (“*distance insensitive functions*”). In the case of county-level government, most county functions should be distance insensitive, as the task of the county, within the context of the German federal system, is to explicitly reduce interregional disparities. But several county functions that are highly important for private households and firms can be characterized as distance-sensitive functions, e.g. secondary schools, adult education centers, museums, hospitals, public transport, consultancy services for private firms, public saving banks and rescue services. Private households within or close to a county town may benefit more from increased accessibility to such goods and services than people elsewhere in the county. Private businesses in the county town may also benefit more from distance-sensitive functions than businesses in other parts of the county. This again may lead to higher income and employment levels in the county towns. The advantage of having good accessibility to the county administration means that private businesses in need of special services produced for the private sector by the counties, and businesses providing services that intermediate between private firms and the county administration (e.g. lawyers) would be positively affected. As distance is also relevant for lobbying, one may assume that the local policymakers from the county town also have easier access to county-level policymakers than local policymakers from other parts of the county. It may be extremely important to have direct contact between a county administration and its clients in times of changing public regulations and/or a high degree of public impact on the private economy (for the possible channels of supply effects of a regional capital see Reichart 1993; Wilk 2004). Both conditions existed in East Germany, where the institutions for municipalities and private businesses were newly created after 1990 and where very high amounts of federal subsidies had to be allocated to municipalities and private businesses.

A positive *externality* of the county town is that, over the longer run, higher levels of government may have a tendency to orient the construction of roads and railways towards the capital (see Dascher 2000a, 378). Higher levels of government may also tend to concentrate

their financial support of local institutions, like museums or theaters, to the county capitals or to the free towns, as long as these cities are centrally located within the county. Ultimately, the factors described above may improve the position of the county town within interregional competition. Furthermore, the county administration may – at least for prestigious reasons – care more about the development of the county town than about municipalities in the political hinterland. Finally, politicians and higher-ranking civil servants are often supposed to be inclined to participate in the social and cultural life of their community. Therefore they may contribute to the formation of local networks and social capital as well as cultural amenities, making the city more attractive for other citizens and businesses

Having only discussed the positive impacts of county capitals so far, one should, of course, also take into account that there may be some negative externalities on local economic growth as well. It may be assumed that cities dominated by the public sector are much less dynamic than other cities because people within those cities have become accustomed to living off of public resources that are financed by people and businesses from other parts of the county. As Krippner (1993: 69) puts it, some of these cities may have turned into “sleeping beauties”. There is also a certain marginalization of private activities when the best space in the city is occupied by public activities. These arguments may mainly be true for cities with a very dominant public sector. In general we do not assume that the negative effects of public utilities are stronger than the positive effects.

All of the positive effects of being a county town described above may result in incentives for in-migration to a county town. Above all, the supply effects for private households may operate in this direction, as households benefit directly from all of the distance-sensitive public functions explained above. The incentive to allocate public utilities in a county town is augmented by the system of financing the county level. Financing counties in Germany does not take into account the distance between private households or businesses and the seat of the county administration, where most of the county’s public utilities are located. From the perspective of public economics, this may be interpreted as a violation of the “principle of fiscal equivalence”, which requires a spatial congruency between the people benefiting from a public service and those who are included in financing this service (see Olson 1969).<sup>9</sup>

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<sup>9</sup> Counties in Germany are mainly financed by the “county tax” (“Kreisumlage”) which municipalities in the county pay according to their fiscal capacity. As municipalities with good economic performance have a better fiscal capacity a form of indirect compensation for the advantages of being a county capital does exist, but this is

As part of a preliminary summary Hypothesis I is derived: *“The status of being a county town generally supports the private economic activities within this town and results in higher growth rates than in cities without this status.”*

As stated above, a free town is a special type of county capital status. The administration of a free town provides goods and services only for the private households and private businesses which are located within the administrative borders of the city, not for a larger area (a whole county).<sup>10</sup> Therefore, a city might be less negatively impacted by losing its “free town” status than losing its “county capital” status. But one has to consider that a free town has just one administration. This leads to a reduction in inter-administrative transaction costs and transaction costs for private households and businesses which have to contact the administration. Losing the status of a free town may, therefore, lead to negative implications (higher costs) for the private sector. In addition, free towns have more autonomy than regular county towns. This institutional setting most likely results in advantages that attract new businesses, as long as the congestion costs within the cities are relatively small. The latter is the case for most East German free towns because there is plenty of free space everywhere as a result of the general consequences of the transition process. One advantage of a city belonging to a county is that the county may contribute to reducing the “exploitation” of a core city by households and businesses in adjacent municipalities. But similar positive effects may result from other institutional settings like intermunicipal cooperation in urban and regional planning between a free town and its neighbors. In such a setting, the free town may have a stronger position for negotiating than a regular county town.

Taking these considerations into account Hypothesis II is derived: *“The status of being a free town will ceteris paribus support the private economic activities within this town more than the status of being a county town.”*

### **3. Estimation Strategy**

The basic estimation is roughly based on the formal setup presented in Dascher (2000a: 379ff). A dummy variable is used to account for the “distance-sensitive utility” towards a

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not perceived by the private households and therefore not integrated into the decisions they make regarding their location.

<sup>10</sup> Of course, free towns often produce externalities for adjacent municipalities as well.

“capital good”. One may argue that a dummy insufficiently measures the actual distance between city  $i$  and the current county capital, but in the case of East German counties, differences in distances between former and current county capitals are usually almost irrelevant (less than 50km driving distance in most cases). Hence a dummy that captures whether the distance to the capital stays at zero or increases is in the authors’ view a sufficient measure.

The main difference between our approach and Dascher’s is that this paper uses panel data and *difference-in-differences* (DiD) to estimate the effects of changes in administrative status as a form of policy measure. Although DiD is a very popular methodology with respect to all kinds of “natural experiments”, as far as the authors are aware, this is the first time it has been applied to a setting where the administrative hierarchy of towns changed over time. Thus, in contrast to all previous studies, this is the first attempt to really compare urban growth before and after losing capital status through the use of a control group of towns that consistently maintain regional capital status.

Based on the reflections above, we constructed a baseline two-way fixed effects model with the following formula:

$$popgr_{it} = \mu_i + \lambda_t + cap_{it}\beta + v_{it}$$

The left hand variable is the annual population growth rate:  $popgr_{it} = \frac{pop_{it} - pop_{it-1}}{pop_{it-1}}$ . Though population growth is hardly equivalent to economic growth, there are four good reasons to rely on this variable. First, population growth doubtlessly is in line with a distance-sensitive utility function, where the individual is better off living in the capital than in the political hinterland due to better access to certain public goods and services. Second, population size is the most common measure for identifying a city’s position within urban hierarchies. An individual’s decision to move to or leave a city should be strongly correlated with the city’s economic situation. This is often expressed by the term “voting by feet” (see Tiebout 1956: 418ff). Third, urban population development has a strong relevance for policy, especially for small and medium sized cities in East Germany which face massive emigration and demographic change. Last but not least, population size is the only indicator that has been constantly available for East German municipalities since 1990. Due to the amount of administrative reforms after the German reunification, a lot of municipal data, for example on employment and income, for the early 1990s has not been reported by the German Statistical

Office. Using other endogenous variables would delimitate the benefits of the panel data approach used in this paper.

As stated above, the exogenous variable of interest is a DiD estimator  $cap_{it} = cap_i * loss_t$ , which takes on the value of zero after town  $i$  loses its county seat, and the value of one if the town maintains its status. The estimator does not distinguish between the status of a free town and a county capital. If a free town loses its former status and becomes a county capital, the dummy variable remains at one, if it becomes incorporated within a county without becoming the capital, it takes on the value of zero. As stated above, free towns play a special role within the German administrative hierarchy. Most of them differ fundamentally from the regular medium-sized county towns in our sample. This issue is addressed by computing regressions based on different samples that include and exclude free towns. A regression only based on free towns is additionally computed. Therefore  $cap_{it}$  is changed in such a way that it takes on the value of zero for cities that lose free towns status but still maintain county capital status. In this case, with respect to Hypothesis II, the explanatory variable of interest is free town status rather than county seat status.

With regard to the other variables in the model,  $\lambda_t$  defines year-fixed effects, controlling for any overall time variant trend. Due to the limited amount of data for the early 1990s no further control variables that account for e.g. regional industrial structure, infrastructural accessibility, or human capital are included in the regression. Instead this important factor is addressed by using town-fixed effects  $\mu_i$ , assuming that effects of this kind are usually more or less time-invariant (at least for the observed period).

The panel dataset not only allows us to distinguish between former county capitals before and after they lose administrative status, we are also able to observe, how the effect of this loss develops over time. Based on general equilibrium theory, one may assume that the difference in population growth between former and present county capitals will decline over time, since the urban hierarchy reaches a new stable equilibrium. However, based on anecdotal knowledge, the relocation of public utilities and administrative bodies can be a very slow process. Furthermore, the loss of county capital status might affect future decisions about the allocation of certain public utilities or amenities relating to county-level administration. Therefore, the effect of losing capital status is likely to remain for a long time and might even increase as years go by.

To account for the time dimension of  $cap_{it}$  we partition it into five year periods resulting in the following regression model:

$$popgr_{it} = \mu_i + \lambda_t + \sum_{p=1}^n cap_{it}^p \beta + v_{it}$$

The dummy estimator  $cap_{it}^p$  now only takes on the value of zero within defined periods the after town  $i$  has lost its county seat. In all other cases its value is one. Thus  $cap_{it}^{p_1}$  only takes on the value of zero between year one and year five after the loss of the county seat,  $cap_{it}^{p_2}$  between year six and year eleven and so forth.

Bertrand, Duflo and Mullainathan (2004) showed the importance of using cluster-robust standard errors in DiD regressions based on panel data, adjusting for serial correlation. Following Cameron and Miller (2015: 323) the standard errors in all of our models are clustered on cities.

#### 4. Dataset and Descriptive Statistics

The dataset consists of municipal-level data for the time period from 1991 to 2013 which is freely available from the Federal Statistical Office of Germany (Destatis). Observations from 2012 were dropped due to irregularities within the dataset caused by the German population census in 2011. In order to make the sample of cities more homogenous, towns with an initial population size (in 1990) of less than 20,000 were also excluded. These towns probably lost their administrative status because they were “too small”. Deciding whether they should maintain or lose their capital status in these cases might have been endogenous. Finally, the sample consists of 113 East German towns which are, or have been, county capitals or free towns. Of the 86 county capitals in the sample, 42 ultimately lost their status within the observed period. In contrast, 44 held on to their county seat status. Only two of the 27 free towns were unsuccessful in maintaining any kind of capital status. Seven lost their free town status and became capitals of the counties into which they were incorporated. Most of the county reforms were implemented during the mid-1990s (Brandenburg 1993, Mecklenburg-West Pomerania 1994, Saxony 1994/1996, Saxony-Anhalt 1994, Thuringia 1994) but there were also some later reforms in Saxony-Anhalt in 2007, in Saxony in 2008 and in Mecklenburg-West Pomerania in 2011.

[Insert *Figure 1* around here]

As stated in Section 2, the inclusion or exclusion of free towns seems crucial for the analysis. In terms of the characteristics in which free towns differ from regular county towns, there are strong indications that the decision to maintain or lose administrative status has, in this case, not been totally exogenous. Free towns are generally much larger than most of the other small and medium sized towns in our sample and thus generate different agglomeration externalities and competitive advantages. Excluding free towns results in a relatively homogenous sample of cities with a population of between 20,000 and 72,000 inhabitants in 1990. Hence an additional matching of the sample is not considered necessary (or possible) in order to control for any kind of selection bias. Moreover one can reject the hypothesis of a biased selection given how the remaining capitals were chosen. As stated in Section 1, the political intention of reducing the number of counties, and consequently relocating county capital functions, was to increase administrative efficiency and not to subsidize the more central and thriving towns. Looking at the political decision-making processes, in the face of fears by local politicians that their town would lose its economic base, there are serious indications that, in many cases of county mergers, the town with less economic potential was successful in maintaining its county seat status<sup>11</sup>. If the selection of capitals was biased in this way, this would strengthen rather than impair the estimation results.

One of the crucial characteristics of the dataset is that variables are adjusted to the constant territorial boundaries of 2013.<sup>12</sup> During the observed period, not only did the counties and county capitals change, but many of the cities in our sample dramatically increased in size. This means that territorial reforms at the municipal level may not distort the measurement of local population growth. Additionally, since most of the cities in East Germany have increased their territories since 1990, the impact of suburbanization should play less of a distorting role.<sup>13</sup>

*Figure 2* compares the mean population growth rates between both groups of present and former capitals over time. One must acknowledge that speaking of “growth” in the case of East German cities after 1990 is rather euphemistic. Apart from very few exceptions, almost

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<sup>11</sup> Just one anecdotal example is the case of the county Leipziger Land, which was formed in 2008. Here the county seat was given to Borna instead of the more central and potentially more competitive city of Grimma.

<sup>12</sup> For the method of territorial adjustments see Kauffmann (2015)

<sup>13</sup> After the end of the socialist economy, suburbanization was a major force of urban development in East Germany since the spatial borders of the cities were more or less “frozen” under the old regime. See Franz (1998:12)



all East German towns have had to deal with urban shrinkage. Nonetheless we observe that the group of former capitals had, on average, higher rates in population change in the early 1990s but was outperformed by the group that was successful in maintaining capital status after the implementation of county reforms during the first half of the 1990s.

[Insert *Figure 2* around here]

This picture, though less clear, remains true when free towns are excluded from the sample (*Figure 3*). Another insight of this comparison is that the effect of the early county reforms (1993-1996) seems to be higher than the effect of the later reforms (2007-2011). While the mean rate of population change of the former county seats significantly decreased after 1996, both lines have followed a more or less parallel trend since 2007.

[Insert *Figure 3* around here]

The comparison is less conclusive for the 27 free towns (*Figure 4*). The group of existing free towns has, on average, higher population growth rates throughout the observed period. Although the difference between the two groups increases in the wake of the early reforms, both follow a more or less similar trend after the start of the new millennium.

[Insert *Figure 4* around here]

## 5. Estimation Results

*Table 1* reports the estimation results for the baseline model. A significant positive effect of the capital status DiD estimator on annual population growth for the samples including and excluding free towns can be observed. The coefficient is higher and more significant when free towns are included, indicating an annual population growth rate that (when all other factors hold constant) is more than 0.38 percentage points higher when a town holds a county seat. For the sample that excludes free towns, the county-seat effect still takes on a value of additional 0.25 percentage points. The estimator of the free town status in the third sample also indicates a higher annual growth rate of more than 0.36 percentage points for free towns compared to former free towns. But in contrast to the county capital estimators in sample (1) and (2), the coefficient is not statistically significant. In conclusion,  $H_0$  in the case of alternative Hypothesis I can be rejected, but no clear conclusion can be drawn for Hypothesis II. On the one hand, the results seem to support the hypothesis, since the effect of maintaining

county capital status is also greater when free towns are included in the sample (1). But due to the small number of free towns and the possible selection bias for losing free town status, the idea that free town status produces no growth effect at all cannot be ultimately rejected.

[Insert *Table 1* around here]

*Table 2* reports on the results of the second estimation which describes the development over time of the difference in population change between present and former county towns (or free towns). In all three samples the capital/free town effect is insignificant in the initial five years after the respective county reform, but the coefficients obviously grow over time. For the county capital estimator in sample (1) and (2), their value is at its highest 16 or more years after the respective county seat relocation. In precise terms, this means that population growth is about 0.58 percentage points (0.9 percentage points when free towns are included in the sample) higher for towns holding a county seat compared to towns which lost this seat more than 15 years ago. These findings are in line with anecdotal knowledge about the realization of county seat relocations. The administrative bodies and public utilities were mostly relocated in more than one step. Indeed, in some cases it took more than 15 years before all administrative functions were finally relocated and concentrated in the present county capital.

[Insert *Table 2* around here]

Comparing present with former free towns (sample 3), quite a different temporal pattern can be observed. The difference is insignificant and almost irrelevant (4%) in the first five years after free town status is lost. This is followed by a much higher disparity, indicating more than 200% lower annual population growth rates for former free towns six to ten years after the loss of status. The difference then moderately decreases over the following time periods, but remains high and significant. Again these results have to be treated with caution regarding the small sample size and the possible selection bias.

## **6. Conclusions**

The estimation results show a statistically significant and economically relevant positive effect on annual population growth of East German cities when county capital status is maintained after a county reform. The existence of regional governmental and administrative units seems to be an important factor in local development. This is consistent with the

hypothesis that the status of being a county capital positively affects a city's private sector as well as household utilities and hence leads to stronger population growth than in cities without any capital status. The estimates also show that the differences in population development between present and former county towns distinctly increase over time after the respective county reform has been implemented. This finding illustrates that the county seat relocations not only led to short term adjustments in population growth, but fundamentally changed the growth patterns of towns.

Of course capturing changes in the geographical allocation of governmental and administrative functions using a capital city dummy is a very crude measure that does not take into account the number of administrative functions that were really relocated. However, since there is a tendency to compensate for the loss of capital status by maintaining some administrative functions in the former capital, the real effect might even be greater. For a more detailed analysis of the effects of specific governmental and administrative functions, a more detailed database, as well as in-depth case study analysis might be helpful. Unfortunately the former is difficult to come by for East Germany. The conclusions that Holtmann et. al. (1998) drew from their case studies on ten former and present county capitals in the state of Saxony-Anhalt is that the real economic effects of losing the county seat were actually very low. But as this study was done only four years after the respective reforms were implemented, they could not account for long-term effects. A revaluation of these case studies would be interesting but difficult to achieve.

From a policy perspective, the results above are grist to the mill for those local politicians who fear substantial negative effects from losing county seat status. The aim of the territorial reforms in East Germany was to increase the efficiency of administration and public services. Economic side effects of relocating county capital functions did not play an important role within these objectives. In future cases of county reform, policymakers should be aware that relocating capital functions can indeed affect the local economy and agglomeration dynamics. Hence they should consider carefully, which city is in greater need of getting an extra boost by having a county seat status. Concentrating administrative and governmental functions in the more central and "economically strong" cities would perhaps foster interaction and common dynamics between the private and the public sector, but this would also marginalize the more peripheral, "economically underdeveloped" cities.

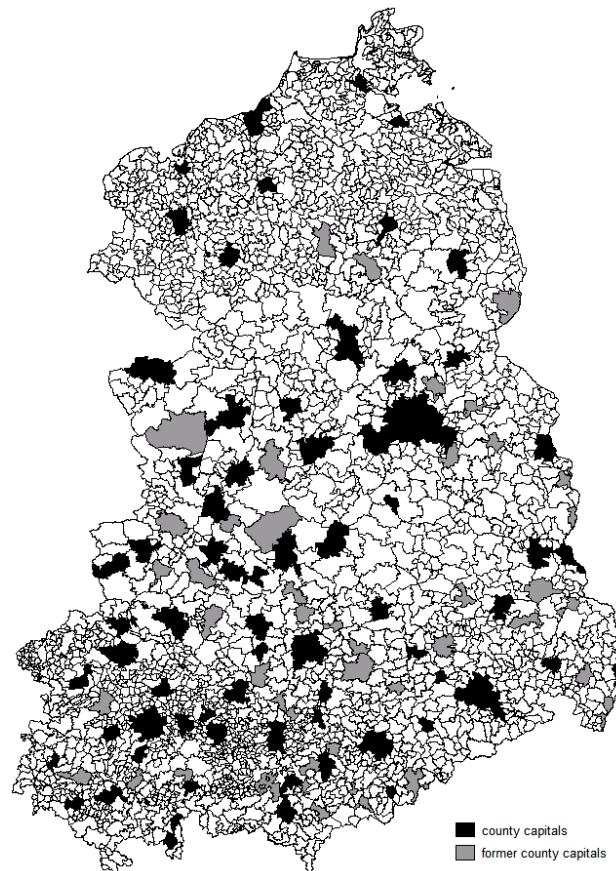
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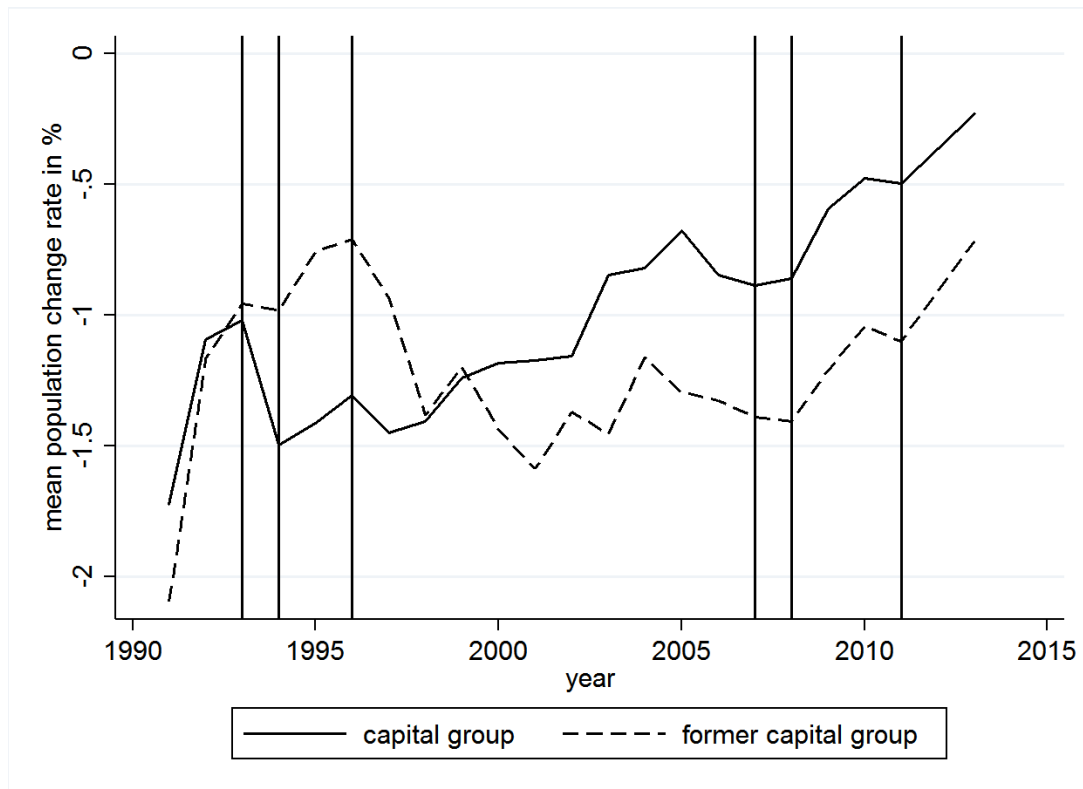
## Appendix: Figures and Tables

**Figure 1: Sample of 113 present and former East German county capitals (including free towns) in the territorial boundaries of 2013**



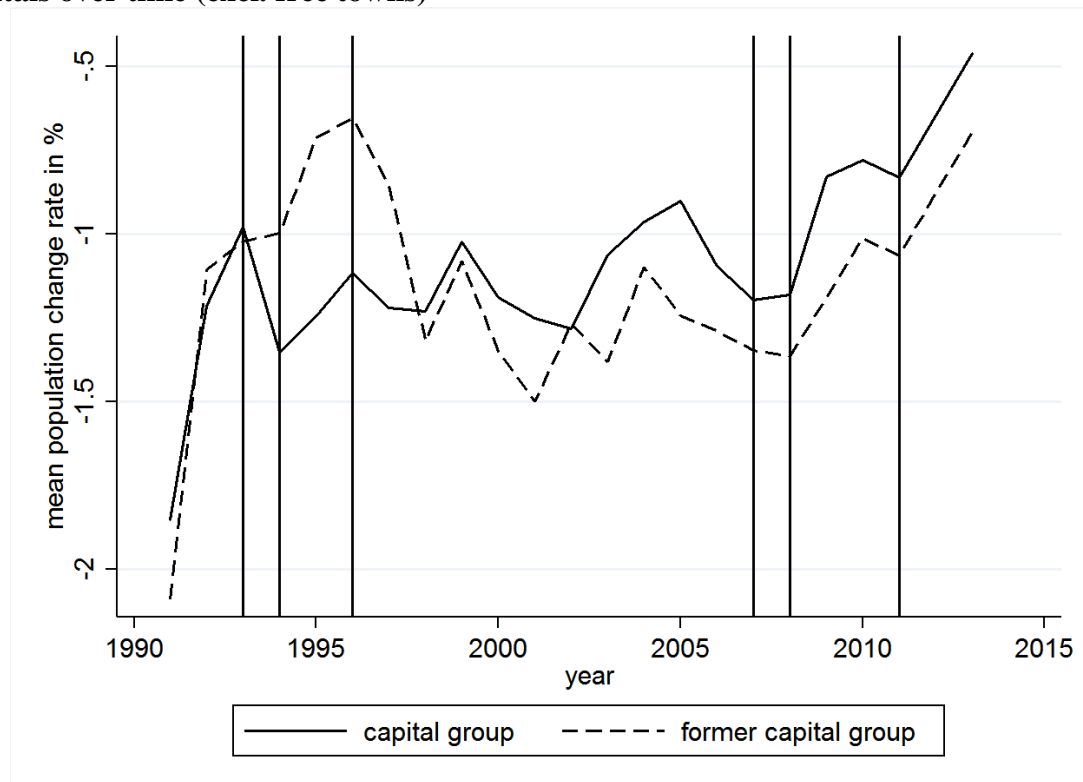
Own map based on the German Federal Agency for Cartography and Geodesy (2013)

**Figure 2: Average population development of present and former East German county capitals over time (incl. free towns)**



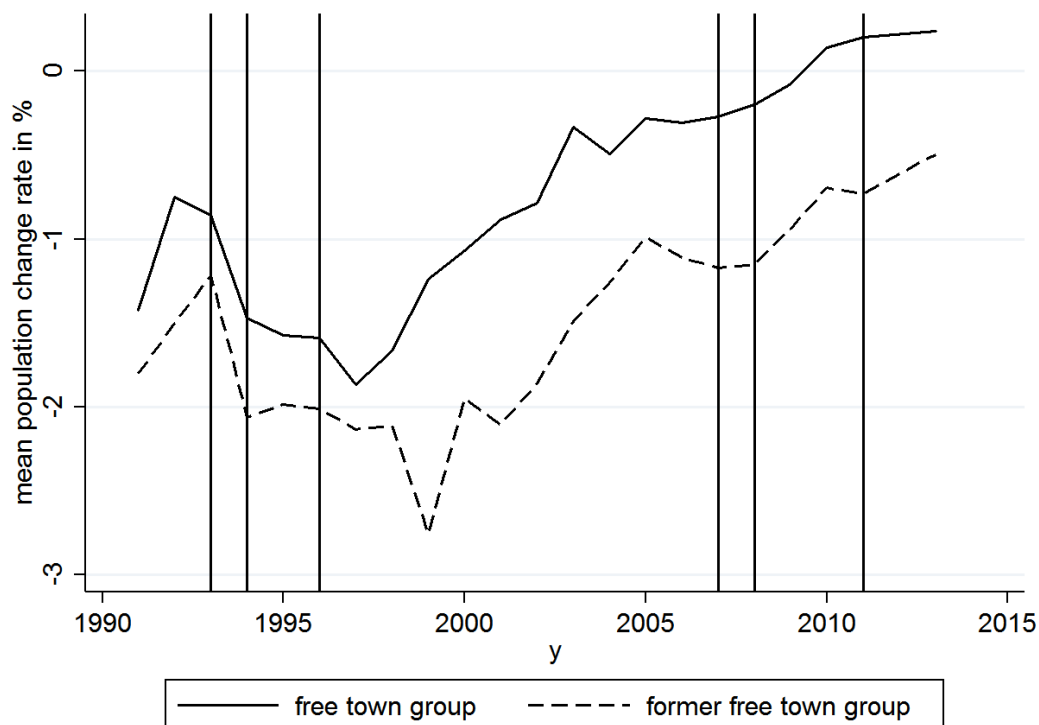
Own graph based on data from the German Statistical Office, adjusted to 2013 municipal boundaries

**Figure 3: Average population development of present and former East German county capitals over time (excl. free towns)**



Own figure based on data from the German Statistical Office, adjusted to 2013 municipal boundaries

**Figure 4: Average population development of present and former East German free towns over time**



Own figure based on data from the German Statistical Office, adjusted to 2013 municipal boundaries

**Table 1: Estimation Results – impact of county capital status on annual population growth**

| Sample             | All towns (1)       | Excl. free towns (2) | Only free towns (3) |
|--------------------|---------------------|----------------------|---------------------|
| Capital/free town  | 0.386***<br>(0.115) | 0.251**<br>(0.116)   | 0.367<br>(0.237)    |
| Town fixed effects | yes                 | yes                  | yes                 |
| Year fixed effects | yes                 | yes                  | yes                 |
| Observations       | 2486                | 1870                 | 626                 |
| R-squared          | 0.147               | 0.135                | 0.427               |

Notes: Database is a panel of 113 former and present East German county capitals for a period of 22 years (1991-2013, excluding 2012). In sample (2) the number of towns is reduced to 86, sample (3) covers 27 free towns. Capital is a dummy that takes on the value of one if a town holds a county seat, and takes on the value of zero after the town loses this seat. For sample (3) the dummy indicates the loss of free town status instead of county seat status. Standard errors are heteroscedasticity-robust and adjusted for a clustering of cities. \* denotes significance at the 10% level, \*\* at 5% level and \*\*\* at 1% level.



**Table 2: Estimation results – development of the impact of county capital status on annual population growth over time**

| Sample              | All towns (1)       | Without free towns (2) | Only free towns (3) |
|---------------------|---------------------|------------------------|---------------------|
| Capital 1-5 years   | 0.232<br>(0.133)    | 0.213<br>(0.129)       | 0.042<br>(0.244)    |
| Capital 6-10 years  | 0.589***<br>(0.165) | 0.3062**<br>(0.152)    | 2.143***<br>(0.397) |
| Capital 11-15 years | 0.762***<br>(0.158) | 0.416***<br>(0.156)    | 1.72***<br>(0.44)   |
| Capital 16+ years   | 0.891***<br>(0.178) | 0.583***<br>(0.185)    | 1.411***<br>(0.218) |
| Town fixed effects  | yes                 | yes                    | yes                 |
| Year fixed effects  | yes                 | yes                    | yes                 |
| Observations        | 2486                | 1870                   | 626                 |
| R-squared           | 0.1645              | 0.1408                 | 0.4806              |

Notes: Database is a panel of 113 former and present East German county capitals for a period of 22 years (1991-2013, excluding 2012). In sample (2) the number of towns is reduced to 86, sample (3) covers 27 free towns. Capital 1-5 years is a dummy that takes on the value of zero in the first five years after county capital status is lost. Capital 6-10 years takes on the value of zero between years six to ten after the loss and so on. For sample (3) the dummies indicate the loss of free town instead of county seat status. Standard errors are heteroscedasticity-robust and adjusted for a clustering of cities. \* denotes significance at the 10% level, \*\* at 5% level and \*\*\* at 1% level.



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