Town Twinning and German City Growth[1]

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Abstract

After World War II (WWII), town twinning became popular, notably in Germany. This was mainly a reaction to the war experience, and it was aimed at creating renewed international understanding and co-operation between German cities and cities in other countries. The contacts created by town twinning also resulted in increased international access for the cities involved. This potentially stimulates growth in these cities compared to cities that do not have (as many) twinning partners. In this DICE report article we summarize the findings of Brakman, Garretsen and Oumer (2015) on the effects of town twinning on population growth in German counties and municipalities. Our results show that German counties and municipalities that engage in town twinning often experienced significantly higher population growth than German cities that did not have twinning partners. The number or intensity of twinning relations in particular, as well as town twinning with French cities, and with neighboring countries more generally, turn out to have a positive effect on city growth. We also find that the positive population growth effects of town twinning are confined to the larger German cities.

Introduction

Shocks like the creation or abolition of national borders are associated with a change in market access. The fall of the Berlin Wall in Germany in 1989 is an example of such a shock. This created sudden economic opportunities for cities along the former border between western and eastern Germany. After the reunification, these former border cities experienced higher population growth rates than more centrally located cities within Germany (Redding and Sturm 2008; Ahlfeldt et al. 2014). Other examples of shocks are the expansion of the European Community (EC), later the European Union (EU). The increased economic integration between member countries and between new members increased market access for cities along the borders of the EU. Brakman et al. (2012) show, for instance, that cities and regions along borders that experienced EC/EU economic integration were positively affected by this change in market access, which compensates, to some extent, for the negative effect of a (peripheral) border location.

Here we look at so-called town twinning (hereafter, TT), which is another form of integration that might affect the international economic or market access of a city. TT involves co-operation, in the broadest sense, between towns or cities across national borders. Although TT has a long history, dating back to the 19th century, the heydays of TT began after WWII. The need between countries to reacquaint themselves with their former enemies was mostly felt in the post-war period, and in particularly so in Germany. We show that the increased interaction between cities that became part of TT reduce transaction costs between twinning cities, and as a result could stimulate migration to these cities. Population growth could thus be more pronounced compared to cities that had no or fewer international TT partners. To our knowledge the only empirical attempts to measure effects of TT are De Villiers, de Coning and Smit (2007) and Baycan-Levent, Akgün and Kundak (2010), both based on a survey of municipal officials that were asked whether they considered TT successful. However, a full-fledged econometric analysis is missing. Our study tries to fill this gap. We focus on Germany because Germany is the main actor in TT in post WWII Europe.

Town twinning: History, motives and theory

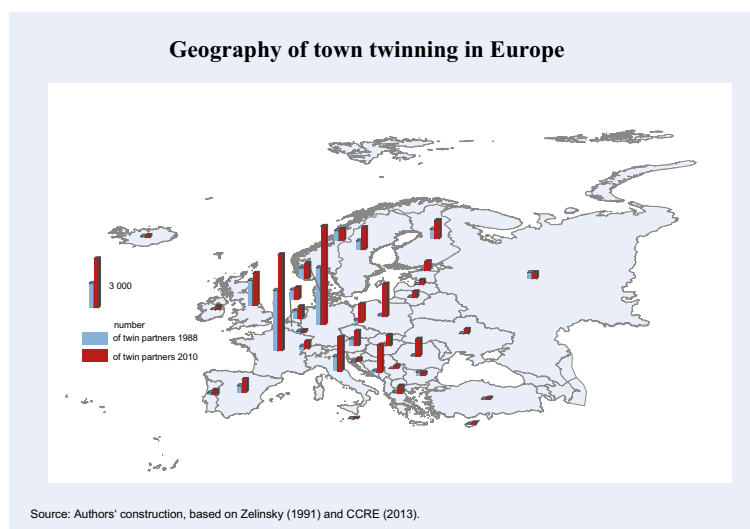TT is a relatively old phenomenon. The term was used as early as the 1850s to describe the co-operative ac-

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tivities of building transportation and other public infrastructure between, for example, the neighboring cities of Minneapolis and St. Paul, Minnesota, US (Borchert 1961). The world fairs that were initiated in the 19th century also stimulated contacts between cities (Zelinsky 1991). In the wake of these early attempts many others followed in order to enhance co-operation between cities. For example, the foundation of the International Union of Local Authorities (IULA) at Ghent in Belgium in 1913 was specifically aimed at stimulating international co-operation between cities (Zelinsky 1991). Ties between cities were also stimulated by ad hoc initiatives by city councils or private enthusiasts for more co-operations between cities (Clarke 2009).

The concept of TT is rather opaque. It involves all sorts of interactions aimed at fostering mutual understanding between the inhabitants of cities that take part in the initiatives, such as: bilateral visits by officials, musical events, language courses, or exchanges of letters between schoolchildren. However, it also encompasses the sharing of technical expertise, the sharing of knowledge and advice that has more direct economic consequences (Zelinsky 1991). All of these activities can result in a form of TT. The term town twinning is adopted from the relationship that existed between the twin cities of Minneapolis and St. Paul, Minnesota, US, but increasingly was used to describe the relationship between international partner cities. As is clear from the historical overview in Zelinsky (1991), TT is very much a European phenomenon. From Zelinsky (1991, Table 3, p.12), it can be deduced that the top-20 of countries in 1988 that are involved in international twinning is dominated by EU countries (15 out of the 20), and that the leading TT countries are France, the UK and Germany that together have almost 8,500 twinning relations, which is comparable to the other 17 countries combined. Proximity is also important; most TTs take place between towns in neighboring countries (Zelinsky 1991).

The experience of WWII was a stimulus for TT initiatives. As a result, most of the TTs were between towns from countries that were enemies during WWII. Germany became the center of the twinning activities.

Figure 1

Geography of town twinning in Europe

Source: Authors' construction, based on Zelinsky (1991) and CCRE (2013).

By 2012, German municipalities had a combined total of over 5,000 international twinning partners, mostly with European partners, especially France. The TT orientation towards France is not surprising in view of the fact that France and Germany were arch-enemies in three main wars between 1870 and 1945, so post-WWII peace policies in Western Europe focused on these two countries. During the cold war an ideological dimension was added to the motives to form partnerships; TT could help to promote understanding for different ideological systems. The latter initiatives often met with distrust from more central governments (Clarke 2010), and it is questionable whether these ideological forms of TT reduced transaction costs in a way that could stimulate population growth. Figure 1 illustrates TT in European countries. The map shows that TT is most popular in Germany and France (the length of the bars is proportional to the number of TTs).

German cities involved in TT are located throughout Germany, implying that we do not focus on border effects per se, but concentrate on those cities or locations that have TT relations with foreign cities.

Town twinning in Germany

We focus our analysis on TT related to German cities. Our sample includes over 5,000 twinning relationships of over 600 German towns, cities and municipalities with locations around the world. The data cover the period from 1976 to 2007. The population data relate to the municipality level or the county level. Whenever

Table 1

	German town twinning 1976–2007, partnerships and friendships						
		All twinnings (partnership + friendship)		Partnership		Friendship	
	year	number	share	number	share	number	share
(a) Cumulative twinning towns and cities	1976	366	100%	357	98%	65	18%
	1990	419	100%	410	98%	122	29%
	2007	610	100%	579	95%	239	39%
(b) Cumulative twinning connections	1976	1502	100%	1426	95%	76	5%
	1990	3071	100%	2890	94%	181	6%
	2007	5067	100%	4565	90%	502	10%

Note: The percentages under partnership and friendship do not add up to 100% because of multiple partnerships or friendships per town.

Source: The authors (2015).

data availability permits, we use data for the lowest level of spatial aggregation. We use so called *Kreise* as the smallest spatial unit of observation. Cities within Kreise that are involved in TT are aggregated.

Table 1 shows a few summary statistics. The data for Germany cover two forms of TT relationships: partnerships and friendships. Partnership is a form of twinning in which the partners engage in activities based on contracts, whereas friendships are less far-reaching and are based on agreements with limited formal activities or projects. We therefore expect the effects of partnership TT on population growth to be relatively stronger. Table 1 shows that the number of twinning connections is larger than the number of twinning towns and cities; i.e., cities can and often do have more than one twinning relationships: 366 German towns and municipalities with complete coverage for all years had 1,502 twinning connections by 1976. This increased to 419 German towns having 3,071 twinning connections in 1990 and 610 towns having 5,067 twinning connections in 2007.

Table 2

	Top 40 German twinning partners (98 percent), 2012								
rank	Partner country	# of twins	%	Cum. %	rank	Partner country	# of twins	%	Cum. %
1	France	2054	36.41	36.41	21	Greece	34	0.60	92.27
2	Britain	440	7.80	44.21	22	Ukraine	32	0.57	92.84
3	Poland	417	7.39	51.60	23	Nicaragua	26	0.46	93.30
4	Italy	364	6.45	58.06	24	Romania	26	0.46	93.76
5	Austria	304	5.39	63.45	25	Lithuania	24	0.43	94.19
6	Hungary	251	4.45	67.90	26	Croatia	23	0.41	94.59
7	Czech Rep.	168	2.98	70.87	27	Latvia	21	0.37	94.97
8	USA	168	2.98	73.85	28	Luxemburg	20	0.35	95.32
9	Netherlands	167	2.96	76.81	29	Portugal	18	0.32	95.64
10	Russia	121	2.15	78.96	30	Slovenia	18	0.32	95.96
11	Belgium	120	2.13	81.08	31	Slovakia Republik	16	0.28	96.24
12	Denmark	89	1.58	82.66	32	Estonia	15	0.27	96.51
13	Israel	79	1.40	84.06	33	Belarus	13	0.23	96.74
14	Turkey	76	1.35	85.41	34	Norway	13	0.23	96.97
15	Switzerland	72	1.28	86.69	35	Ireland	12	0.21	97.18
16	China	63	1.12	87.80	36	Burkina Faso	11	0.20	97.38
17	Finland	61	1.08	88.88	37	Bosnia&Herzegowina	10	0.18	97.55
18	Sweden	57	1.01	89.90	38	Bulgaria	10	0.18	97.73
19	Japan	53	0.94	90.83	39	Ruanda	7	0.12	97.85
20	Spain	47	0.83	91.67	40	Serbia	7	0.12	97.98

Source: Authors' calculation from the data.

Out of over 2,000 German cities and towns, 366 had at least one twinning connection in 1976, and 610 cities and towns had a twinning relationship in 2007 (see table 1). Even after aggregating into the municipalities/counties or Kreise a large number of German Kreise do not have a town twinning connection. We also look at the intensity of twinning, that is, the number of TT relations per city. The number of towns with a higher than average number of TT is approximately 120.

When it comes to the geography of the German TT counterparts, Table 2 shows that 36 percent of all German TTs are with French cities; while over 90 percent of TTs are with European countries, including Russia.

Within Germany, the twinning activities are historically concentrated in the western part of Germany, as Figure 2 illustrates.

Model

We apply a simple regression to determine if TT stimulates population growth:

$$popgrowth_{mt} = \beta\ twinning_{mt} + \gamma(twinning_{mt}\ x\ partners_{mt}) + D_t + D_l + \varepsilon_{mt}$$

where $popgrowth_{mt}$ is annual population growth of German municipality (or county) m at time t; $twinning_{mt}$ indicates whether a twinning relationship between a German municipality with an international partner city exists. It equals 1 if the municipality has one or more international twinning partner(s) and 0 otherwise. We also include the number of partners explicitly assuming that the larger the number of partners, the larger the reduction in transaction costs; the value of $twinning_{mt}$ then equals the number, n, of international partners. The variable $partners_{mt}$ refers to a particular country or group of countries with which TT exists, like for instance, only the sub-sample of French TT partner cities.

Treating $twinning_{mt}$ as a binary dummy variable refers to what might be called the extensive margin of TT (is there any TT at all?), whereas treating $twinning_{mt}$ as the actual number of TT partners then refers to the intensive margin (how much TT is going on, the "volume" of TT relationships so to say).

Estimation Results

The Baseline Results

Table 3 presents some of the key results (Brakman, Garretsen and Oumer 2015, provides an array of sensitivity analyses). The columns indicated by dummy=1 capture whether TT exists at all (extensive margin), columns with intensity = n capture the intensity of TT and use 'n', the number of TT relationships, explicitly. We also differentiate between partnerships and friendships, as the ties between cities in a partnership are thought to be stronger.

Figure 2a and 2b   **Geographical distribution of German twinning and time trends**
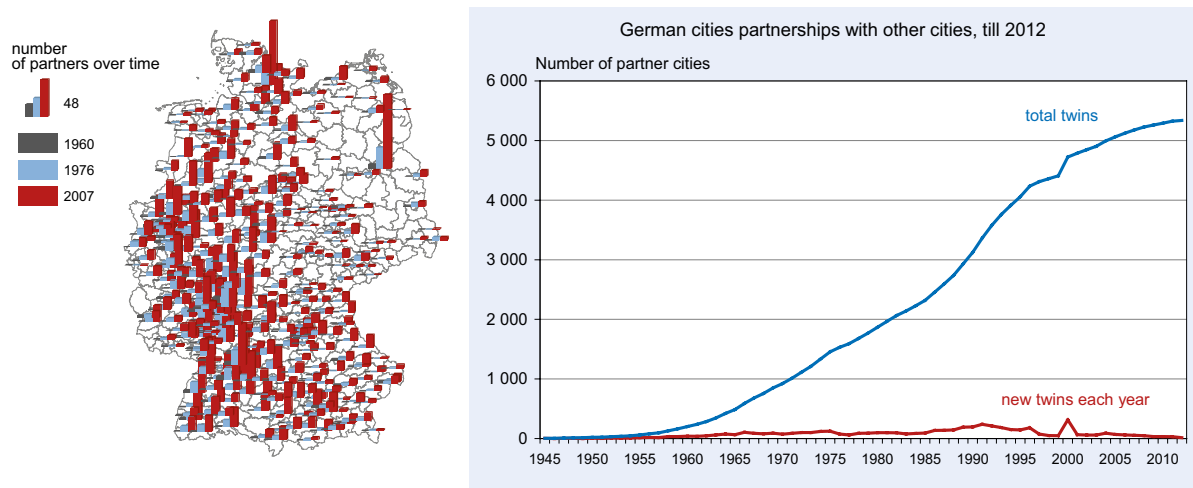
Source: Authors' calculation from the data.

Table 3

	Twinning with France, IV estimates[1]					
	partnership + friendship		partnership + friendship		partnership + friendship	
	(dummy=1)	(intensity=n)	(dummy = 1)	(intensity = n)	(dummy = 1)	(intensity = n)
Variables	(1)	(2)	(3)	(4)	(5)	(6)
$Twinning_{mt}$	-0.720***	-0.0734***	-0.737***	-0.153***	-0.745***	-0.154***
	(0.106)	(0.0163)	(0.108)	(0.0261)	(0.109)	(0.0262)
$Twinning_{mt} \times France_{mt}$	1.997***	0.163***	2.049***	0.324***	2.076***	0.326***
	(0.280)	(0.0327)	(0.287)	(0.0526)	(0.290)	(0.0529)
Year effects	yes	yes	yes	yes	yes	yes
Location fixed effects	yes	yes	yes	yes	yes	yes
Observations	11,191	11,191	11,191	11,191	11,191	11,191
R-Squared	0.074	0.071	0.072	---	0.072	---
Note: Standard errors in parentheses; ***P < 0.01; **P < 0.05; *P < 0.1						

Source: The authors (2015).

[1] We also address the issue of reverse causality, namely, whether TT stimulates population growth, or whether stronger economic performance and hence population growth are formalized in TT activities. We use data on the WWII destruction of German cities as instruments. Specifically, the level of destruction of residential houses, number of people killed, tax revenue loss and tons of rubble resulting from bombing of the German towns and cities during WWII are used as instruments. In columns (1)–(2) we use all instruments, subsequently we drop "number of people killed" in columns (3)–(4), and also drop "tons of rubble" in columns (5)–(6). This also applies to Table 4. The motivation for these instruments is that cities that experienced WWII destruction directly or more intensively in particular, are more motivated to strengthen ties between former enemies in order to increase mutual understanding and prevent future wars. The data for the instruments are obtained from Brakman, Garretsen and Schramm (2004).

As France is by far the most important twinning partner of Germany, we show France separately in Table 3; *partners_mt* in equation (1) is represented by *France_mt*, which stands for the (share of) TT partners between Germany and France.

Table 3 shows that the combination of TT with France has a positive effect; that is, the sum of *twinning_mt* and *twinning_mt x France_mt* is positive. [4]

The literature suggests that large urban locations are not only more efficient than smaller ones, but that they also have an advantage in innovation, and their economies can grow faster than smaller locations, see also Ludema and Wooton (1999) who show that trade liberalization initially benefits larger agglomerations. We therefore define German municipalities that are smaller than the median population size as small, and those that are larger than the median population size as large. Differentiating between large and small municipalities reveals that the results especially work for large cities (please note that instead of France, we now include neighboring countries), see Table 4. Only the results

for large cities are significant from a statistical point of view.

Conclusions

Although TT has been around for a long time, it really took off after WWII. In the post-WWII period, TT was aimed at political reconciliation and enhancing mutual understanding between former enemies, particularly in the case of Germany. If successful, TT could be looked upon as reducing the economic distance between the cities involved in such initiatives, which can be seen as a way of stimulating the growth of the cities involved in TT. Existing research on TT is largely descriptive and we add to this literature by explicitly focusing on the quantitative consequences of TT. In the case of Germany, in other words, we estimate whether TT stimulates population growth in the cities that are involved in TT.

We focus on Germany because it became the main actor in TT after WWII. Applying a difference-in-differences approach, and distinguishing between the extensive margin of TT (whether TT exists at all for a given city) and the intensive margin (the number of TT relations), our results show that German counties and municipalities that engage in town twinning often experienced

[4] Please note that care is required in interpreting the coefficients. We discuss in the text whether the net effect of TT and TT with France is positive, that is $d(popgrowth)/d(twinning) = \beta + \gamma \times partners > 0$, where *partners* (France) is measured as a share. We would like to thank Eckhardt Bode for pointing this out.

Table 4

	Twinning with neighboring countries, IV estimates (small vs. large German cities)					
	partnership + friendship		partnership + friendship		partnership + friendship	
	(dummy=1)	(intensity=n)	(dummy = 1)	(intensity = n)	(dummy = 1)	(intensity = n)
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Small municipalities					
$Twinning_{mt}$	-0.0420	-0.0641	-0.0418	-0.0683	-0.0221	-0.0570
	(0.351)	(0.0752)	(0.351)	(0.0770)	(0.359)	(0.0789)
$Twinning_{mt} \times$ $Neighbor_{mt}$	0.595	0.0885	0.595	0.0938	0.565	0.0797
	(0.482)	(0.0935)	(0.482)	(0.0957)	(0.495)	(0.0980)
Year effects	Yes	yes	yes	yes	yes	yes
Location fixed effects	Yes	yes	yes	yes	yes	yes
Observations	4,588	4,588	4,588	4,588	4,588	4,588
R-Squared	0.055	0.053	0.055	0.052	0.055	0.055
	Large municipalities					
$Twinning_{mt}$	-0.856***	-0.0992***	-0.908***	-0.145***	-0.911***	-0.148***
	(0.0632)	(0.00832)	(0.0655)	(0.0112)	(0.0655)	(0.0114)
$Twinning_{mt} \times$ $Neighbor_{mt}$	1.465***	0.167***	1.549***	0.235***	1.554***	0.240***
	(0.0804)	(0.0122)	(0.0849)	(0.0166)	(0.0851)	(0.0168)
Year effects	yes	yes	yes	yes	yes	yes
Location fixed effects	yes	yes	yes	yes	yes	yes
Observations	4,526	4,526	4,526	4,526	4,526	4,526
R-Squared	0.306	0.376	0.192	0.376	0.182	0.181

Note: Standard errors in parentheses; ***$P < 0.01$; **$P < 0.05$; *$P < 0.1$

Source: The authors (2015).

significantly higher population growth than those that did not have twinning partners. The number or intensity of twinning relations in particular, as well as town twinning with French cities, and with neighboring countries more generally, turn out to have a positive effect on city growth. We also find that the positive population growth effects of town twinning are confined to the larger German cities. Town twinning can facilitate the relocation or migration of workers and firms to more optimal locations. As cities get more productive, they are likely to grow faster.

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