Economic development beyond the metropolis

Local autonomy and interdependencies in the polycentric environment of Swiss small and medium-sized towns

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Preface and Acknowledgements

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List of abbreviations

AL   Swiss Alternative left party

BFS   Schweizerisches Bundesamt für Statistik (Swiss Federal Statistical Office)

CSP   Swiss Christian-social party

ESPON   European Observation Network for Territorial Development and Cohesion

EU15   15 member countries of the European Union

FSO   Swiss Federal Statistical Office

GPS   Swiss green party

ICA   Institutional Collective Action

KIBS   Knowledge-intensive business sector

MUR   Monocentric Urban Region

OECD   Organisation for Economic Co-operation and Development

PUR   Polycentric Urban Region

RIS   Regional Innovation System

SMSTs   Small and medium-sized towns

SPS   Swiss Social-democratic party

Introduction

Economic development is an essential aspect of local politics. A growing or shrinking local economy directly affects municipalities and their budgets, whether it is by a change in tax returns, commuter flows or regional influence. Despite its large impact on the local level of municipalities, economic development is an interdependent process (Feiock & Scholz 2010; Ansell 2002; Savitch and Vogel 2009; Toedtling & Trippl 2005). From a vertical perspective, higher administrative entities can play an important role in steering regional economic development, with implications at the local level. From a horizontal perspective, economic development often takes place in functional regions that do not always correspond to the institutional borders of municipalities and produces economic spill-overs. A municipality can benefit or suffer from development in nearby cities or municipalities without taking any action (Meijers & Burger 2017). These interdependent dynamics of economic development have concrete local implications, and they raise the question of the role of local autonomy of municipalities. To address this question, this thesis seeks to examine whether the local level can actively shape its economic development.

Switzerland is an ideal case for studying the autonomy and interdependencies of the local level in economic development due to its high vertical and horizontal fragmentation (Sellers & Lidström 2007). Two factors particularly affect vertical and horizontal interdependence: 1) a federal structure where the local, subnational and the national levels have institutionalized capacities to shape policies, such as economic development, and 2) areas with a dense and fragmented settlement, where large functional economic areas do not correspond with institutional municipal borders (Sager et al. 2017). This high interdependence contrasts with more centralised that delegate the responsibility for economic development to a single national institution and with areas that have large metropolitan centres and peripheries.

The role of local autonomy in economic development is particularly interesting for municipalities that have considerable economic relevance but lack metropolitan core functions. Small municipalities often only have a small local economy in terms of employment and firms, and many inhabitants commute to larger municipalities. Accordingly, these municipalities have a small base on which to focus their economic policy. On the other side of the spectrum, cities are the largest form of municipalities, and they usually have a large economy in terms of employment and firms. Cities function as centres of agglomerations, and they have a great deal of economic activity to focus on. This thesis focuses on the municipalities in-between small and large municipalities: small and medium-sized towns (SMSTs). SMSTs have recently received more attention from urban studies and economic geography from both a normative and an empiric point of view (Bell and Jayne 2009). They are located between the extremes of the glamour and social burning glass of large cities and the tranquillity of, often structurally weak, small municipalities or villages. In their plea for a stronger focus on smaller cities, Bell and Jayne (2009, p. 691) argue that SMSTs act as 'important nodes in the networks between places of different scales, and they are seen to mediate between the rural and the urban, as well as between the local and the global'. An empirical study on economic development in EU15 countries shows that SMSTs have experienced economic performance and population growth that is similar to large cities (Dijkstra et al. 2013). Focusing on the economic development of SMSTs therefore enables us to shed light on these types of urban areas that connect metropolitan and rural regions. In Switzerland, 152 municipalities fall under the Federal Statistical Office's (FSO) definition of a SMST. Furthermore, there are nine small and medium-sized cities and one large city (see Table 1).

Category	Inhabitants[1]	No. in Switzerland % of Pop. (in 2016)

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[1] The definition of SMSTs is not limited to the number of inhabitants; it also includes indicators for density, overnight stays and the amount of jobs. Hence, not all municipalities with 5'000 inhabitants are defined as SMSTs.

Towns			
Small and medium-sized towns	5'000-50'000	152	
(SMSTs)		30%	
Cities			
Small and medium-sized cities	50'000-250'000	9	
(SMSCs)		12%	
Large cities	250'000-5'000'000	1	
		5%	
Global cities	> 5'000'000	0	

Source: Adapted from Dijkstra and Poelman (2012) and Servillo et al. (2013).
Data from the Federal Statistical Office.

The spatial context of SMSTs influences their economic development and horizontal interdependencies (Krugman 1997). As mentioned above, horizontal interdependence is more evident in areas where municipalities are actually located proximate to each other. This proximity increases the mobility of people, knowledge and technology (Kloosterman and Musterd 2001). So-called polycentric urban regions (PURs) connect several cores of similar sizes, in contrast to areas with large single city centres (Kloosterman and Musterd 2001; Meijers and Burger 2017). These multiple connections make PURs particularly interesting for examining regional development, as they have a large potential for spill-over effects. Switzerland's high institutional fragmentation and dense settlement structure that consists of many regional centres makes it a highly polycentric region (see e.g., Meijers 2008; ESPON Policy Brief 2016). Preserving this regional polycentric structure is a crucial goal of the Swiss spatial concept (see Schweizerischer Bundesrat, KdK, BPUK, SSV, SGV 2012) and in line with European regional development strategies (ESPON Policy Brief 2016). As Alonso (1973) and Meijers and Burger (2017) have shown, smaller towns in polycentric regions can 'borrow size' from each other. This means that they can experience better economic performance and more metropolitan functions (such as cultural amenities) through spill-over effects compared to isolated towns. Proximity to larger cities is, however, not always positive and may also lead to 'agglomeration

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shadows' that can manifest themselves through greater competition or through a SMST bearing the costs of large cities (Meijers and Burger 2017; Krugman 1997).

The interdependency of SMSTs and cities is at the centre of the concept of PURs. This thesis therefore seeks to uncover how the interdependency of SMSTs in PURs influences traditionally strong local autonomy in the decentralised Swiss context. Examining the economic development of SMSTs in polycentric regions leads to the question: How is this economic development driven? Economic development directly affects the local level, however, we still do not know the role of autonomy and leeway: Can the local level also shape its economic development alone or does it rely on the spatial environment?

Approach of the thesis

The thesis employs an interdisciplinary analysis. On the one hand, questions of local autonomy and municipal revenue that take place within a multi-level institutional setting stem from public administration and political science. On the other hand, questions regarding spatial structure and its impact on local autonomy and economic development stem from economic geography. This interdisciplinary approach aims to show that the spatial structure is another important factor that influences local autonomy, in addition to the classical dimensions of federalism and decentralisation (see e.g. Keman 2000).

Critical urban theory has focused on the link between local autonomy and economic development for many years (see e.g. Harvey 1989; Brenner 1999; Swyngedouw 2009; Peterson 1981). A crucial argument of this theory is that the interdependent globalised economy is not rooted in local entities. Harvey (1989), for example, argues that 'to the degree that inter-urban competition becomes more potent, it will almost certainly operate as an "external coercive power" over individual cities to bring them closer into line with the discipline and logic of capitalist development' (p. 12). This has implications for the local level in two different ways: First, it claims that because economic development is interdependent, important action takes place at

regional or national levels while the local level itself is unable to shape economic development on its own (see e.g. Brenner 1999). I call this perspective 'regional determinism' (based on Servillo et al. 2017). Second, even if there are situations in which the local level can influence economic development, local entities' inclination to grow economically in a competitive environment tends to lead to a local post-political condition of 'managerial consensual governing' (Swyngedouw 2009; Peterson 1981). This condition indicates that there is a consensus by local political parties on an entrepreneurial stance to local economic development, i.e., to compete for resources (Harvey 1989, pp. 4-5).

This thesis adapts these assumptions of regional determinism and 'managerial consensual governing' to the case of SMSTs in Switzerland and argues that both may emerge even stronger in the case of SMSTs. SMSTs are smaller than cities, and they lack the 'centrality of cities for public contestation' (Beveridge and Koch 2016, p. 41). Even though SMSTs are often regional centres of economic relevance, they have fewer cultural or educational amenities to offer their inhabitants than larger cities, and they have less options for designing local policy in various ways. Moreover, the spatial barriers between SMSTs are lower than between cities because there are more SMSTs than cities, and they are located near to each other. Consequently, they directly contend with municipalities that are more similar and, as a result, it is possible to assume that competition for 'development capital' (Harvey 1989, p. 11) is even more intense.

This thesis builds on the assumption that economic development in the form of increasing local development is important for all SMSTs in Switzerland. SMSTs are by definition different from smaller municipalities, not only by population size, but also by the amount of local employment. Additionally, a survey of elected local politicians shows that local economic development is a crucial issue in local politics (Geser et al. 2011). It is important to note, the political importance of economic development does not mean that it is beneficial for SMSTs or for all

inhabitants of an SMST. However, this thesis does not aim to address the question of the purpose of economic growth; instead, it seeks to examine whether and how it can be shaped at the local level.

Research questions of the three papers

To examine whether the local level can actively shape economic development, the thesis addresses the question in three ways through three self-contained papers (see Table 2 for an overview of the papers). Paper 1 has been published in *Regional Studies* in 2019, Paper 2 has a Revise&Resubmit from the *Urban Affairs Review* (revisions due in January 2021) and Paper 3 has been accepted for publication in *Territory, Politics, Governance* on October 2020. The first two papers examine whether the local level has a grip on local economic development or whether it is mainly driven by regional development, i.e., how neighbouring SMSTs develop. The papers focus on two different aspects:

In the first paper, in cooperation with David Kaufmann, I take a broad look at the economic development of 152 SMSTs over 18 years and examine which local factors (such as population size or political factors) and regional factors (such as proximity to metropolitan centres or the economic development of neighbouring SMSTs or cities) explain local economic development in the export-oriented sector (which is juxtaposed with the residential economy). This paper thus follows an explorative approach that focuses on local and regional factors that explain the dependent variable of the local development of employment.

Papers	Authorship	Publishing state	Focus	Methods	Sample
Paper 1: *Business Center or Bedroom Community? The development of employment in small and medium-sized towns*	Co-authored with David Kaufmann (equal contribution)	Published in *Regional Studies* (5 year IF[2]: 4.174) in 2019	Regional determinism vs. local autonomy in local economic development	Bayesian multi-level regressions	152 Swiss SMSTs in 1995 and 2013
Paper 2: *How strong is local politics' grip on local economic development? The case of Swiss small and medium-sized towns*	Single author	Revise & Resubmit from *Urban Affairs Review* (5 year IF: 2.551) received 24 July 2020, revisions due on 24 January 2021	Impact of local political development on different economic sectors	Hybrid panel models	152 Swiss SMSTs in 2001, 2005, 2008, 2011, 2012, 2013
Paper 3: *Voluntary regional cooperation in Swiss polycentric regions*	Single author	Accepted for publication in *Territory, Politics, Governance* (5 year IF: 2.477) on 13 October 2020	Examining voluntary polycentric cooperation in economic development and its causes	Logistic regressions	152 Swiss SMSTs from 2011 to 2019

Table 1: Overview of the three Papers

In the second paper, I take a closer look at the role of local factors in economic development. By analysing panel data from 2001 to 2013, I examine how prior party-political developments

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[2] 5 Year Impact Factors from Clarivate Analytics (on 24 October 2020).

in the local executive are able to affect subsequent local economic development. By focusing on the explanatory potential of local political conditions, I argue that the impact of local factors on the development of employment depends on the characteristics of the economic sector of the employment. The more a sector depends on resources and demands that the SMST cannot provide autonomously, the lower the impact of local political development and vice versa.

The third paper examines a different but related aspect of local autonomy in local economic development. While the first two papers examine which factors at the local and the regional levels explain economic development, the third paper asks what steps SMSTs actually take to benefit from regional development: Do SMSTs actively try to benefit from regional development by cooperating with other SMSTs, hence engaging in institutional collective action? If so, which factors can explain whether SMSTs engage in cooperation or not? I use the Institutional Collective Action (ICA) framework, developed by Feiock (2013), to derive hypotheses on voluntary polycentric cooperation of SMSTs. The paper adds a different dimension to the other two papers in being able to track whether stronger SMSTs (in terms of population, economy, wealth) rely less on cooperation because they are strong enough alone or whether some SMSTs voluntarily act as 'leaves in the wind' (Kaufmann and Meili 2019). It goes beyond a morphological view of networks based on spatial proximity by including the functional dimension of voluntary horizontal cooperation in economic development (Meijers 2008).

The questions this thesis addresses are of theoretical and practical relevance. From a theoretical point of view, the thesis contributes to the literature on local autonomy in a competitive urban environment, on the spill-over effects of economic development and on horizontal collective action and regional governance. From a practical point of view, the thesis addresses questions that are relevant for the strategic planning on the local, regional, cantonal and federal levels in the policy area of local and regional economic development that is more driven by competition

than for example transport policy (Sager 2005). Insights into the local and regional determinants of economic development and on the determinants of voluntary cooperation can help to provide an understanding of which level political interventions, regulations or subsidies are most promising and who should be the relevant institutional actors.

Data and empirical approach

All three papers rely on a comprehensive dataset of all SMSTs and cities in Switzerland from 1995 to 2013 (for the years 1995, 2001, 2005, 2008, 2011, 2012 and 2013). Data on population, voting behaviour in national parliamentary elections and income tax rates were available from the FSO. Information on employment in different economic sectors stems from Rahel Meili (see e.g., Meili and Mayer 2018) and the FSO, which I adapted to full-time equivalence measures. The spatial component in the papers is based on a self-coded connectivity matrix that codes whether SMSTs are located close to each other and can therefore be counted as neighbours. I then use the matrix to consider embeddedness and regional economic development. In order to take a closer look at local political factors, I expanded a dataset from the FSO for the party-political composition of local executives for SMSTs where information was lacking. To measure horizontal cooperation, I collected new data on membership in voluntary regional economic development organisations and on the characteristics of these organisations.[3] The thesis thus provides and analyses data that has so far not been studied comparatively and systematically. Next to contributions to theoretical debates, the three papers also provide an explorative approach towards the autonomy of SMSTs in questions of local economic development.

The three papers follow three different methodological approaches that I chose depending on each paper's different research question and data structure. In the first paper, David Kaufmann

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[3] A detailed description of the data and the data collection strategies is provided in the three papers.

and I conducted a hierarchical Bayesian analysis and combined the findings with qualitative vignettes of two case studies (Nüssli & Schmid 2016; Kaufmann and Meili 2019). The qualitative vignettes allow us to benefit from the three advantages provided by case study research as an additional analysis that improved regression-based inferences (see Seawright 2016): (1) evaluating the plausibility of hypothesised paths, (2) testing measurement quality and (3) searching for omitted variables. In the second paper, I use the panel structure of the data and a hybrid panel model to examine the temporal effects of local political development. The third paper analyses logistic regression models with clustered standard errors to examine which factors increase the odds of a SMST voluntarily engaging in cooperation with other SMSTs. It also combines this analysis with qualitative vignettes.

Summary of the findings of the thesis

In the *first paper* on the influence of local and regional factors on the development of employment from 1995 to 2013, we find that an increase in export-oriented full-time-equivalent jobs in neighbouring SMSTs and cities increases the number of full-time-equivalent jobs in the observed SMSTs. Except for this regional effect, and taking cantonal variance and the network density into account, local factors such as higher education institutions, prior employment, population and political factors did not affect the development of employment from 1995 to 2013.

Proximity to a metropolitan centre does not have a positive effect, hence SMSTs that are close to the centres of metropolitan regions did not develop differently than SMSTs in other locations. SMSTs in a dense and dynamic network of other SMSTs and cities, which may also include SMSTs in metropolitan regions, grew substantially stronger. The results therefore support the argument that SMSTs that are closer to large cities are more likely to suffer from agglomeration shadows, which may counteract the potential beneficial effects of proximity (Meijers et al. 2016). Additionally, SMSTs that are close to metropolitan centres may also

focus more on the residential economy and aim for the benefits of having wealthy residents (Segessemann & Crevoisier 2016).

With the help of case studies by Nüssli & Schmid (2016) and Kaufmann & Meili (2019), we shed more light on the network effect and on potentially omitted variables that are crucial for explaining the development of employment. The case studies show that embeddedness in a dense network of cities and SMSTs and the rapid growth of the whole regions, i.e. positive spill-over effects, are crucial for explaining the rapid economic development in the knowledge-intensive, export-oriented economy. This hence supports the main findings of our regression analysis. Additionally, the case studies suggest that land-use planning is important for explaining the development of employment in SMSTs.

While the first paper focuses on the export-oriented economy and juxtaposes it to residential jobs, the finding that SMSTs with a higher share of jobs in the knowledge-intensive business sector (KIBS) have experienced stronger employment growth indicates that it is fruitful to distinguish between economic sectors. In *paper 2*, I distinguish between four economic sectors that differ in their dependence on local space-bound factors and classical export-oriented sectors that rely on specialised knowledge that can be found in a broader region. While the first paper shows that local factors do not play a role in the development of all export-oriented economies, the second paper postulates that local factors, and particularly local party-political developments, may influence the residential and the low-tech economy.

The paper reveals that it is crucial to differentiate between economic sectors to obtain a more nuanced view of local and regional factors that affect economic growth and because the results between the sectors vary considerably. While the composition of local government only plays a role in the development of the residential economy, regional developments (measured as the development of employment in neighbouring SMSTs and the proximity to a metropolitan centre) have the greatest impact on the development of the heavily export-oriented KIBS. This

means that SMSTs surrounded by other SMSTs that experienced job growth and that are closer to metropolitan centres experienced job growth in the KIBS. This effect is not visible for the low- and high-tech sectors that are also export-oriented. Consequently, KIBS benefit most from network knowledge, information exchange and pecuniary and technological spill-overs. From a regional perspective, it is interesting to note that developments in neighbouring SMSTs and proximity to the metropolitan centre have the strongest effect on KIBS but no effect for the low- and high-tech sectors.

Regional economic development also influences the residential economy. Residential economies that have prosperous neighbourhoods with growing export-oriented economies increase the demand for residential goods, such as restaurants and department stores. This finding indicates that the regional environment is also crucial for the residential economy. Additionally, only in the residential economy did I find evidence of an effect of local party-political development. The composition of the local executive over time and between SMSTs only subsequently affects the development of the residential economy. A higher share of left parties in local governments leads to growth in the residential economy, especially in more remote SMSTs.

The paper does not find any evidence of an impact of local political development in the other economic sectors. The paper gives two possible explanations for these findings: First, SMSTs do not have much leeway when implementing local strategies that aim to promote low-/high-tech sectors or KIBS. This could be because they are mainly driven by local path-dependent development, in the case of the low- /high-tech sector, or by regional or cantonal developments, in the case of KIBS. Second, SMSTs can implement local strategies, however, the decision to promote these sectors does not depend on the party-political composition of the government because of a cross-party consensus. Given that a different political composition in SMSTs with a similar regional context (i.e., *ceteris paribus*) does not lead to different outcomes, even

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though governments can decide how proactively they want to try to benefit from regional spill-overs, e.g., by engaging in regional or agglomeration institutions or by pursuing more competitive strategies than their neighbours, the results postulate a state of post-political 'managerial consensual governing' (Swyngedouw 2009, p. 605).

The first two papers show how employment development in SMSTs depends on regional development. Both papers employ a morphological perspective (Meijers 2008) on networks that examines whether SMSTs are located close to other SMSTs or cities. Based on these findings, the *third paper* asks how and why SMSTs actively try to make use of regional development. It focuses on the horizontal cooperation of SMSTs and applies a functional perspective (Meijers 2008) on networks.

In a first bivariate descriptive overview of horizontal economic development organisations, I compare organisations that have a polycentric structure, that is, that consist of multiple SMSTs with organizations that have a monocentric structure, meaning cities with just one SMST. I show that polycentric organisations have more cross-border cooperation, stronger agency and more hybrid governance than monocentric regions. Additionally, polycentric cooperation is less likely to take place in cantons where municipalities are grouped into subcantonal economic development regions. Although membership in these regions remains voluntary and the perimeters of the regions are negotiable, the participation behind the cooperation process is less bottom-up.

The analyses then find support for hypotheses derived from the Institutional Collective Action (ICA) framework. SMSTs with high income per inhabitant and high out-commuting patterns are less likely to cooperate with other SMSTs. This indicates that they do not see enough benefits in a potential cooperation. However, if neighbouring SMSTs cooperate, the pressure for a SMST to cooperate is higher. The descriptive discussion on economic development regions reveals that cooperation mainly takes place inside the institutionalised borders of cantons.

These factors support the assumptions of the ICA framework, which weighs the potential gains and costs of cooperation. However, other factors postulated by the ICA framework, such as the role of political parties, political majorities and regional political homophily do not seem to play a role. The decisions to cooperate are thus not driven by ideological differences but rather by structural pressures.

Additionally, the study shows that SMSTs that have a large share of employment in export-oriented sectors are more likely to cooperate with other SMSTs, despite being able to establish themselves as single regional centres. In contrast to the residential economy in bedroom communities, jobs in export-oriented sectors rely heavily on mobile resources such as knowledge and skills. Hence, SMSTs with a higher share of export-oriented employment and a larger population benefit more from cluster effects and may be more likely to see more benefits of cooperation. Additionally, as these SMSTs are economically strong, they can also proportionally spare higher costs than weaker SMSTs, and they have a stronger starting position in negotiations. On the other hand, SMSTs with a lower share of jobs in the export-oriented sector rely more on development in the local residential economy and their inhabitants and thus have a weaker position in negotiations. An illustrative view of three different areas in Switzerland empirically demonstrates the findings of the quantitative analysis. For example, the 'gold coast' in the canton of Zurich illustrates how SMSTs inhabited by a comparatively very high share of wealthy residents and that are located close to a large economic centre benefit from their spatial context by free-riding. As a result, they do not need to actively promote the region as they directly benefit from their proximity to Zurich. However, another case of two areas that are equally close to Zurich illustrates how proximity can also produce agglomeration shadows. Both areas consist of multiple SMSTs that have an average or slightly above average income per inhabitant but similar distances to Zurich and similar out-commuting rates as the 'gold

coast'. There are numerous benefits to cooperatively promoting their region as a distinct (but still dependent) region of Zurich as a strategy for overcoming agglomeration shadows.

In an additional paper that is not part of the thesis, I also examine voluntary collective action in economic development at the cantonal level with two co-authors (Wittwer, Sager & Huegli 2020). We find that voluntary horizontal cooperation in economic development at the cantonal level is highly unlikely without top-down steering from the federal level. While the third paper of the thesis highlights how the benefits of collective action can lead to cooperation, this additional paper shows that voluntary cooperation is much more difficult for the even more institutionalised subnational cantonal level.

Contribution of the thesis

The findings of the three papers can be summarised as follows: When looking solely at export-oriented economies, there is not very much leeway for SMSTs to foster their own economic development, and regional determinism in PURs is very strong. When we look closer at four economic sectors and on development over time, we see that the residential sector also depends on local factors and that the KIBS is most dependent on regional development. In order to benefit from regional development, SMSTs often voluntarily choose to engage with other SMSTs or cities instead of acting as a single regional centre, especially if they see the benefits of cooperation.

The thesis contributes to the literature by applying different theoretical approaches to a comparative study of a full sample of Swiss SMSTs. The finding that networks of SMSTs and cities with a increasing amount of jobs strongly impact on the development of employment in single SMSTs, whereas proximity to a large center alone does not have an effect contributes to the literature on borrowing-size and agglomeration economies (Meijers and Burger 2017). In terms of critical urban theory and the question of local 'post-political consensual governing'

(Swyngedouw et al. 2009), the findings show that an economic sector's degree of export-orientation influences how local factors are able to shape economic development. It contributes to the literature on PURs by applying the ICA framework to the polycentric network of Swiss SMSTs, thereby revealing which factors are crucial for understanding why some SMSTs decide to cooperate and integrate with other SMSTs while others do not (Kloosterman and Musterd 2002; Meijers et al. 2019). Additionally, this thesis is the first to test the assumptions of the ICA framework on Swiss SMSTs and one of the few studies that the ICA framework in Europe (Feiock and Tavares 2017; Lee et al. 2020) thereby contributing to this literature by demonstrating how the ICA is adaptable to the highly federalist and polycentric Swiss context. Lastly, it contributes to the literature on multi-level governance by including spatial factors to address questions of local autonomy in a federalist and decentralized setting (Kübler & Rochat 2018; Sager 2005). Despite the thesis' focus on Switzerland, its relevance goes beyond the Swiss case. It directly provides a direct contribution to the international literature and addresses recent questions about local autonomy in federalist settings by showing the importance of the spatial structure as an indicator for local leeway in local policy-making.

From a practical perspective, the findings are relevant for local and regional economic development strategy- and policy-making. While the fact that the regional level is central for a sustainable economic development is well researched (see e.g. Toedtling & Trippl 2005), this thesis focuses on municipalities and their role in economic development. It shows how the local level of SMSTs still has the ability to shape its economic development and how this development depends on the economic sectors that prevail in each SMST. While SMSTs still possess autonomy in economic sectors that rely on local demand, local governments may even actually gain local autonomy if they engage in economic policy-making at the regional level. Additionally, from a top-down planning perspective, it is crucial to understand the relevance of regional development and of factors enabling regional cooperation. The findings regarding

the governance of PURs are important given the importance of polycentric development as a spatial development goal at the European and at the Swiss national level (see Schweizerischer Bundesrat, KdK, BPUK, SSV, SGV 2012; ESPON Policy Brief 2016). The question of regional cooperation also points to the necessity of democratic legitimacy of regional cooperation. Regional determinism and engagement in regional organizations can undermine local democratic entities, which is a problem if local politics seeks to have a democratically legitimized grip on local economic development in a federalist setting. Matching democratic structures and economic functional regions would require consolidated regions that possess a regional institutionalized political entity or a regional activity democratically legitimized by local direct democratic procedures.

Despite its comprehensive scope, this thesis has limitations. It captures local development using the development of employment, although there are also other, equally important aspects that are relevant for local development, such as the satisfaction of the population or population growth. It would be interesting to see whether local autonomy and interdependences are similar when considering these aspects. Second, the analysis always remains on the macro-level and does not systematically include the perceptions or assessments of local, regional and cantonal actors. An interesting future analysis would therefore examine the impact of economic development on SMSTs' other development goals. Additional questions for future research may include examining the impact of horizontal cooperation on economic development. Does it pay off, and does it pay off in a similar manner for all cooperating SMSTs? It is possible that smaller and economically weaker SMSTs would benefit differently than stronger and larger SMSTs. Additionally, further research should deepen the research on concrete local strategies that promote the residential economy and thereby address another limitation of this thesis. What is the role of local spatial planning and how can local citizens' initiatives shape local development? This could be achieved by collecting data on different local economic development policies

and by interviewing actors on different institutional levels on how and why they design local economic development policy in their area.

The empirical approach used in the three papers of this dissertation however shed light on the role of the local autonomy and interdependencies of Swiss SMSTs in a polycentric environment in the case of economic development. Local autonomy will remain crucial to SMSTs in the federalist context of Switzerland. However, regional cooperation can help to preserve influence on highly interdependent regional processes. The following three papers show where regional determinism and where local autonomy is strong and shows ways how Swiss SMSTs can make use of autonomy and interdependencies both by either cooperating with other SMSTs or by focusing on local development strategies.

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Paper 1

Business centre or bedroom community? The development of employment in small and medium-sized towns

Business centre or bedroom community? The development of employment in small and medium-sized towns

ABSTRACT

This study scrutinizes the development of employment towards business centres or bedroom communities in Swiss small and medium-sized towns (SMSTs). We analyse an original data set of all 152 SMSTs in Switzerland. Bayesian multi-level and spatial regression techniques examine regional and local explanatory factors affecting the development of employment. We find evidence for employment growth if an SMST is embedded in a dynamic network, meaning that employment growth in neighbouring cities and towns creates spillover effects for SMSTs. Thus, if local administrations want to influence their employment structure, they are well advised to engage in regional economic policy-making.

INTRODUCTION

The rapidly changing patterns of economic restructuring constantly challenge the economies of cities and towns. Smaller cities and towns are perceived to be especially exposed to the turmoil of economic globalization. Whereas the effects of economic restructuring on cities of global importance, and their policy responses, have been studied intensely (e.g. Brenner, 1999; Savitch and Kantor, 2002; Kaufmann, 2018), the ways in which small and medium-sized towns (SMSTs) are affected by changing economic patterns have not received the same amount of scholarly attention. SMSTs, defined as dense settlements with between 5,000 and 50,000 residents (Servillo et al., 2013), are often described as regional towns, rural towns, one-industry towns or economic lightweights (Bell and Jayne, 2006; Servillo et al., 2017), without an analysis of their capabilities to perform in the globalized economy.

Comparative studies of European cities demonstrate that population size is not a linear predictor for economic performance. In fact, SMSTs are catching up with large cities in terms of economic (and also population) growth (Dijkstra et al., 2013). They are central units in the European urban system given that Europe has been composed of networks of towns and small, medium and large cities for many decades (Hohenberg and Lees, 1995). Around 27 per cent of the European population currently lives in SMSTs (Servillo et al., 2017, 366).

However, SMSTs have largely been neglected by urban and regional research (Servillo et al., 2017; Meili and Mayer, 2017). It is necessary to examine small settlement structures in order to understand how they are able to develop competitive advantages in globalized interurban competition. Towns and small cities are 'much more than fillers, not (yet) cities or would-be cities – they are important nodes in the networks between places of different scales, and they are seen to mediate between the rural and the urban, as well as between the local and the global' (Bell and Jayne, 2006, 7). While Dijkstra et al. (2013) demonstrate the considerable growth dynamics that are taking place in European SMSTs, they have neither investigated

explanations for this positive economic and demographic performance nor have they analysed employment in SMSTs.

This paper further scrutinizes the economic development of SMSTs by analysing factors that may explain the development of employment and, as a consequence, the economic specializations exhibited in SMSTs. Illustratively speaking, we seek to discover why some SMSTs have developed into (or have remained) business centres with employment in export-oriented sectors, while other SMSTs have become (or have remained) bedroom communities with residential economies. Theoretically speaking, the business centre profile matches the economic base theory that emphasizes the importance of export-oriented jobs for economic development (Massey, 1995; Storper and Scott, 2009). Economic base theory views industrial activities and high added value services as a prerequisite for economic development. Therefore, we include knowledge intensive business/financial services, high and low tech industries and tourism to the business centre profile. Conversely, the bedroom community profile exemplifies the revisited economic base theory that emphasizes the importance of residents for the economic development of a locality (Markusen and Schrock, 2009; Segessemann and Crevoisier, 2016). We include jobs that produce goods and services for the residents to the bedroom community category. In a next analytical step, we investigate local and regional determinants of employment development and thereby add to the debate between the importance of 'regional determinism vs. territorial autonomy' for the economic performance of cities and towns (e.g. Servillo et al., 2017; Tödtling and Trippl, 2005).

We choose to study Swiss SMSTs because they are embedded in growing metropolitan regions, their economic specializations vary considerably (Meili and Mayer, 2017; Kaufmann and Meili, 2019) and Swiss local governments enjoy comparatively very high autonomy

(Sellers and Lidström, 2007). Accordingly, Swiss SMSTs operate in a highly dynamic economic context and their high local autonomy may provide them with the policy instruments necessary to influence their employment structure.

This interdisciplinary paper integrates theories from regional studies, economic geography and political science in order to derive five potential explanatory factors for the development of employment in SMSTs. The quantitative analysis uses Bayesian multi-level and spatial regression techniques and examines an original data set of employment data in all 152 Swiss SMSTs between 1995 and 2013. In the discussion of the results, we confront the quantitative findings with qualitative insights about Swiss SMSTs in order to test and enhance the reliability of the quantitative findings. Thus, we simulate a multi-method research design (Seawright, 2016). This paper finds employment growth in SMSTs that are integrated in a dynamic network of other SMSTs and cities. This suggests that spillover effects are the main influencer of employment in SMSTs and that development of employment is largely exogenous to local policy-making.

SMALLER CITIES AND TOWNS IN A GLOBALIZED ECONOMY

Economic globalization has pushed cities of various sizes into a rapidly changing and global economic playing field (Kaufmann and Arnold, 2018; Kaufmann, 2018). Along with greater exposure to global economic pressures, the position of cities has been strengthened as they have become the places where crucial production factors are concentrated (Brenner, 1999). In this globalized economic competition, cities and towns with small populations are perceived as victims of the centripetal forces of economic globalization (Kaufmann and Arnold, 2018).

It is argued that smaller cities lack the critical mass needed to participate in interurban competition, that they lack research and development functions, and that they are unable to benefit from agglomeration economies in the way that larger cities can (Turok, 2004; Polèse, 2005). In addition, smaller cities may especially suffer because their path-dependent industrial specializations may have led to an undiversified economy or even to their conversion into one-industry towns (Hamdouch et al., 2017).

This type of globalization literature all too often reduces smaller cities to their functions as peripheral or regional capitals, or as marginalized parts of metropolitan regions (Bell and Jayne, 2006; Robinson, 2002). Similarly, Meijers and Burger (2017, 5) argue that 'smaller cities that surround larger cities are merely considered part of the urban hinterland from which larger cities draw support for urban functions'. As a consequence, smaller cities and towns have mostly been studied in light of rural economic development (Courtney and Moseley, 2008). Recent research on the economic performance of smaller European cities does not confirm these pessimistic assumptions. For example, Dijkstra et al. (2013) examine the growth dynamics of different urban types in EU15 nations and show that, since 2001, SMSTs have registered similar economic and demographic growth rates than their larger counterparts. While there is only a thin body of research that studies the economic development of smaller cities, there is even less research on the economic development of SMSTs.

Economic globalization may be either a threat or a chance for SMSTs. On the one hand, a SMST may develop into a business centre. Such an SMST may occupy an economic niche, or it can position itself as an alternative that is potentially more affordable or less congested for doing business. On the other hand, SMSTs may develop into bedroom communities or residential towns. The economy of residential towns serves the needs of their residents while neglecting export-oriented economic sectors (Hamdouch et al., 2017; Segessemann and Cre-

voisier, 2016). Becoming a bedroom community is not necessarily negative for SMSTs because their residential economy can also generate local business activity and employment (Markusen and Schrock, 2009; Segessemann and Crevoisier, 2016). Such SMSTs may be attractive for wealthy residents. Taxing these residents allows towns to increase their personal income tax base. The socio-economic development of residential towns may be even more stable than business centres, since they are not directly exposed to the competitive economic restructuring caused by globalization (Davezies, 2009).

EXPLANATORY FACTORS FOR EMPLOYMENT DEVELOPMENT IN SMALL AND MEDIUM-SIZED TOWNS

Most of the economic geography literature that examines the socio-economic development of SMSTs is located on a continuum that stresses the importance of regional or local factors. This continuum can be described as 'regional determinism vs. territorial autonomy' (Servillo et al., 2017; Tödtling and Trippl, 2005). For example, Giffinger and Suitner (2015, 1172) claim that '(...) cities need to be attractive not as single nodes, but as part of an urban region'. It is argued that SMSTs are therefore dependent on regional, or even international, economic and political developments and thus, 'the localness of the interests and identities driving the politics forward can be almost totally obscured' (Cox, 1998, 19). However, high local autonomy may enable SMSTs to counter or manage regional and international pressures to a certain degree. 'Territorial autonomy' emphasizes the importance of local agency and local policies in the socio-economic development of SMSTs (e.g. Knox and Mayer, 2009; Lorentzen and van Heur, 2012).

Against this backdrop, we derive three regional explanatory factors and two local explanatory factors for the development of employment, and we formulate hypotheses for each of these explanatory factors. The three regional explanatory factors represent a functional explanation (network density), a spatial explanation (distance to a metropolitan centre), and a knowledge-generation explanation (Higher Education Institutions). The two local explanatory factors capture the role of politics (local politics) and policy (taxes) on the development of employment. The variance in formal territorial autonomy is limited in this study, given that we analyze SMSTs that are embedded in the same national institutional setting.

Regional explanatory factors

Network density: There is an explicit regional dimension to spillover effects (Segarra-Blasco et al., 2018). SMSTs may benefit from employment growth in neighbouring towns and cities. Due to spillover effects, an increase in employment in neighbouring towns and cities may induce employment growth in an SMST's own locality. SMSTs' may compensate their relative lack of size or mass by being very well embedded in networks of cities' (Meijers et al., 2016, 183). In this regard, the concept of borrowing size is fruitful because it suggests that SMSTs may 'borrow' some benefits (e.g. well-qualified human resources), as well as some functions (e.g. cultural amenities), from their neighbouring towns and cities (Alonso, 1973; Meijers et al., 2016; Meijers and Burger, 2017). The concept of borrowing size requires a network perspective for studying cities within a metropolitan region (Meijers et al., 2016). SMSTs may also 'borrow size' from each other even without a neighbouring big city (Meijers and Burger, 2017).

> *Hypothesis $_{1.1}$: The denser the network in which an SMST is located and the more dynamic the network, the higher is the development of export-oriented employment.*

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Distance to a metropolitan centre: SMSTs that are well-connected to the centre of a metropolitan region may benefit from metropolitan functions, such as financial and business services, creative industries and global transportation (Hall and Pain, 2006; Meijers et al., 2016). SMSTs that are closer to the core city of a metropolitan region are likely to be more specialized than towns farther away from the urban core (Polèse and Shearmur, 2006). SMSTs close to the centre of a metropolitan region may experience employment growth, especially in knowledge-intensive services (Polèse and Shearmur, 2006; Servillo et al., 2017). In Switzerland, SMSTs that are close to the centre of a metropolitan region and that have well-established transport connections are able to attract knowledge-intensive firms (Glanzmann et al., 2006; Meili and Mayer, 2017). All in all, the distance to the centre of a metropolitan region is assumed to be important because agglomeration benefits attenuate with distance to the metropolitan core (Viladecans-Marsal, 2004).

> *Hypothesis $_{1.2}$: The closer an SMST is to a metropolitan centre, the higher is the development of export-oriented employment.*

Higher Education Institutions (HEIs): HEIs have emerged as central actors in today's knowledge-intensive economy. HEIs are referred to as 'knowledge creators', 'knowledge circulators' or 'catalyst' for knowledge production (e.g. Bramwell and Wolfe, 2008; Benneworth and Nieth, 2018). HEIs include universities, technical universities or universities of applied sciences (Benneworth and Nieth, 2018). These HEIs can contribute to economic development and employment growth in various ways, such as by producing (commercializable) innovation (Benneworth and Nieth, 2018), by conducting basic research that provides specialized expertise and facilities for on-going, firm-based R&D activities (Bramwell and Wolfe, 2008), by enabling firms to access knowledge from 'global pipelines' of international academic research networks (Bathelt et al., 2004; Bramwell and Wolfe, 2008) and by attracting and educating talent (Bramwell and Wolfe, 2008; Mayer, 2007). Thus, HEIs are an important underlying

component of, what Tödtling and Trippl (2005) describe as, regional knowledge generation subsystems (Mayer, 2007). Especially in more peripheral regions, HEIs are important to contribute to the regional knowledge generation subsystem (Benneworth and Nieth, 2018). Hence:

> *Hypothesis $_{1.3}$: To the more HEIs an SMST is closely located, the higher is the development of their export-oriented employment.*

Local explanatory factors

Local politics: Local politics may influence local economic development trajectories. For example, Devecchi (2016) finds different local governance types in local planning processes in Swiss municipalities and links them, among others, to the political orientation of the electorate and the leadership of a municipality. In general, the classic left-right axis maps an economic conflict between state interventions and market solutions (Kriesi et al., 2008) and indicates that rightist parties prioritize economic growth as a development strategy. Given the high autonomy of Swiss municipalities, local political leaders are able to formulate a wide range of local economic development policies (Kaufmann and Arnold, 2018). We assume that in municipalities with a more rightist electorate, leaders formulate local economic development policies that aim to stimulate export-oriented industries.

> *Hypothesis $_{2.1}$: The more an SMST has a rightist electorate, the higher is the development of export-oriented employment.*

Taxes: Research on tax policy follows the tradition of Tiebout (1956), who argues that local governments compete for mobile capital. The economic literature on local taxes can be summarized as that a decrease in taxes increases employment *ceteris paribus* (Wolman, 2012). Switzerland offers a highly interesting case in which to examine tax competition because of

its high local tax autonomy (Brühlhart et al., 2015; Sellers and Lidström, 2007). Switzerland is the only country in Europe where sub-national jurisdictions, i.e. the cantons and municipalities, have considerable power to tax individual and corporate incomes. Furthermore, Swiss local governments can determine their own tax rates. As a consequence, the differences in (effective) tax rates across Swiss cantons are much more marked than those in any other European country (Feld and Reulier, 2009, 93). We therefore assume that:

> *Hypothesis $_{2.2}$: The lower the taxes of an SMST, the higher is the development of export-oriented employment.*

Local control variables: We include two controls in our analysis that account for local factors, namely population size and economic specialization. We treat these local factors as controls because we are interested in how local policy makers can influence the development of employment. These two controls are path-dependent local factors and therefore they are hard to influence by local policy-making. We include population size because larger towns, within the range of the SMST definition, are often considered to have a competitive advantage in interurban competition over smaller cities. More populated SMSTs may offer a denser concentration of economic activities and are therefore less dependent on neighbouring towns or cities. Furthermore, the economic specialization of SMSTs may have an influence on the development of employment. We therefore control for the stock of export-oriented firms and the strength of different economic sectors in 1995. Meili and Mayer (2017) find that Swiss SMSTs with a high share of employment in the service industry tend to be more economically dynamic.[1]

RESEARCH DESIGN

Case selection: Swiss SMSTs

We are interested in the smallest, arguably most vulnerable, type of urban settlement. On the European level, Servillo et al. (2013) propose a classification of towns and Dijkstra and Poelman (2012) do the same for cities (see Table D in the appendix). The classification of urban settlements by the Swiss Federal Statistical Office integrates European definitions of both towns and cities. Urban settlements are defined as dense settlement forms that have a minimum of 5,000 residents living within their administrative boundaries (see Goebel and Kohler, 2014).

Europe may be at the forefront of the research on polycentric networks of smaller cities and SMSTs due to the large presence of these settlement types across Southern England, the Benelux countries, Western Germany, Switzerland and Northern Italy. We choose to study SMSTs in Switzerland because they are embedded in a growing and polycentric urban system, they are a very common settlement type in Switzerland, their economic specializations vary (Meili and Mayer, 2017) and they enjoy a comparatively very high autonomy (Sellers and Lidström, 2007). Given that we explicitly search for local explanatory factors, the high local autonomy makes Swiss SMSTs most-likely cases, meaning that there is a higher likelihood of finding local policies that influence the development of employment in Swiss SMSTs than in SMSTs in other Western European countries.
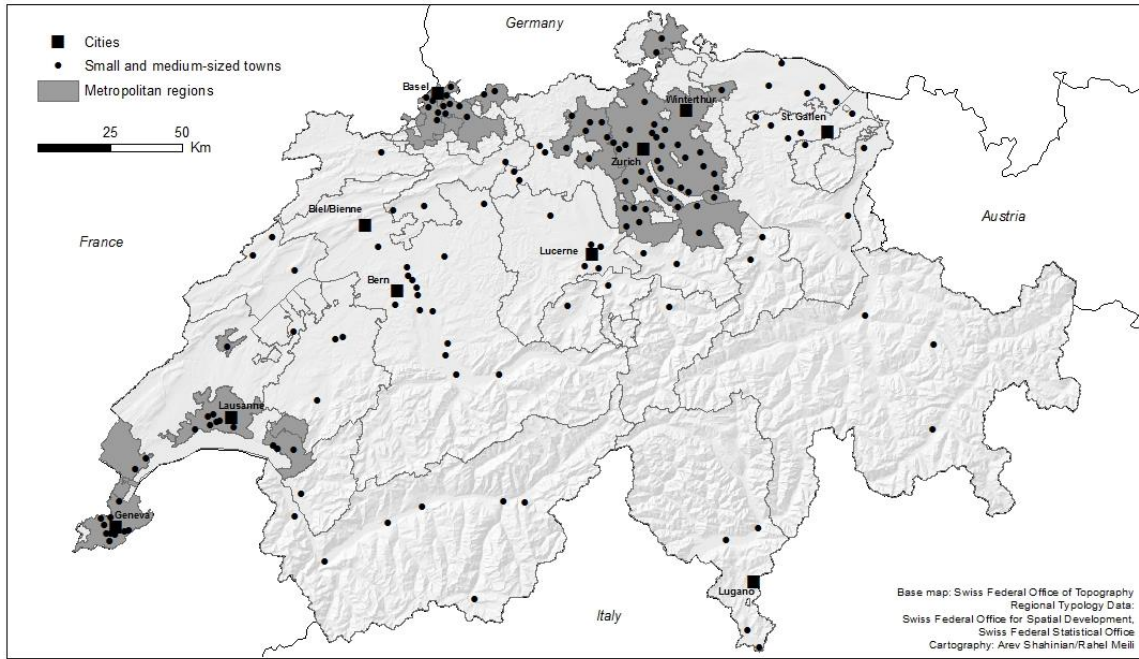
Notes: Lugano and the four SMSTs around it belong to the metropolitan region of Milano, Italy, which is not shown in the map. This map was created by Arev Shahinian and Rahel Meili (University of Bern) and is published with the permission of the copyright holders.

Operationalization and model

Our sample includes a full census of all of the 152 Swiss SMSTs. Descriptive statistics of the dependent and independent variables and a correlation table is provided in the appendix (Tables A and B). We conduct a quantitative analysis of the development of employment in these 152 SMSTs by examining the theoretically derived regional and local explanatory factors. We use the logarithmized development of full-time equivalent jobs in export-oriented economic sectors from 1995 to 2013 as the dependent variable. The number in the dependent variable equals all jobs in all economic sectors minus jobs in the residential economy.[2] An increase in the dependent variable implies the SMST's development towards a business centre while a decrease or stagnation in the variable indicates that it either remains or becomes a bedroom

community. We use regional and local explanatory factors as independent variables from both a dynamic (i.e. development from 1995 to 2013) and a static (i.e. average value) perspective.

To measure network density, we devise a new dataset that incorporates the location of SMSTs. Based on the literature on spatial interdependence and spatial regression modeling (Neumayer and Pluemper, 2016; Ward and Gleditsch, 2008), we define a binary matrix C that specifies connectivities between SMSTs with an entry for SMST i and SMST j with $c_{ij} = 1$ if a connection exists and $c_{ij} = 0$ if there is no connection (Ward and Gleditsch, 2008, 14). In line with the literature, distance is calculated by a measurement of the transportation network via trains and not by physical distance. If a town is located within a driving distance of less than 20 minutes from the centre of a metropolitan region[3], it is considered to have spatial proximity and is therefore coded as 1.[4] The result of this process is a connectivity matrix that shows which and to how many other SMSTs and cities each SMST is connected.

The spatial lag of network density is measured by examining the amount of full-time equivalent jobs in the export-oriented economic sector of the neighbouring SMSTs of the SMST under observation. If SMST A is connected to SMST B and SMST C, where B has a value of 350 in full-time equivalency and C has a value of 500, the spatial lag of SMST A is 850. It can be assumed that the higher the value of the spatial lag, the denser SMST A is embedded in a city-network that has high job growth. In addition to the absolute value of jobs in neighbouring towns and cities, we also take into account the development of employment in the regional network by measuring how many full-time equivalent jobs in the export-oriented economic sector neighbouring towns and cities won or lost during the time period in question. The spatial lag variables also consider whether or not SMSTs are located close to large cities[5], where the city-network is supposed to be denser than in peripheral networks of towns.

Neumayer and Pluemper (2016) argue that, even though the variables that measure distance by spatial proximity are not subject to being endogenous (see also LeSage and Pace, 2011;

Kelejian and Prucha, 2010), they are only valid if they are theoretically grounded or highly correlated with the true interactions and relations between the observations, which constitute the actual causal mechanism. Because this paper focuses on locational aspects, spatial proximity is of fundamental interest and acts as an important explanatory variable for the development of employment. Therefore, measuring network density by geographical proximity acts as a proxy for city-network characteristics.

To assess the distance from SMSTs to the centre of their respective metropolitan regions[6], we measure the distance in train minutes for each SMST to its nearest metropolitan centre. HEIs are measured by accounting for all universities, technical universities and universities of applied science in Switzerland. We thereby take advantage of the connectivity matrix described above, to measure whether an SMST hosts HEIs or has neighbours that do. Additionally, our model includes a political variable measuring the average election results for non-leftist parties in the Swiss federal election for the National Council and the average local income tax rate and the change of the tax rate from 1995 to 2013 (see the operationalization table A in the appendix for further information).

Subnational entities in Switzerland, i.e. the cantons, are the most powerful political entities with respect to policy making (Sager et al., 2017). We assume that the error terms are clustered at the cantonal level and we therefore run a Bayesian multi-level model (Gelman and Hill, 2007; Steenbergen and Jones, 2002; Stegmueller, 2013).[7] We allow the intercept to vary across SMSTs in their respective cantons.[8] In order to assess the weight of the three regional explanatory factors, we first run a model that only contains the variables that measure regional factors. In the second model, we add the local control variables before adding the variables measuring local political factors. Models 4-6 include controls for the strength in three distinct economic sectors in 1995.

RESULTS AND DISCUSSION

Table 1 presents the results of the regression analysis.[9] In all of the models, the only hypothesized variable with a coefficient that is significantly different from 0 is the dynamic of the network that an SMST is embedded in. Thus, only hypothesis 1.1 can be supported. The effect remains robust independent of the inclusion of additional variables. In all of the other variables, the effect is around 0, i.e. negligible. As the Deviance Information Criterion (DIC) is lowest in the first model with the fewest variables,[10] we can argue that a 10 per cent increase in export-oriented full-time equivalent jobs in neighbouring SMSTs and cities increases the number of full-time equivalent jobs in the observed SMSTs by 1.7 per cent. It is interesting to note that, when taking cantonal variance and the network density into account, HEIs, prior employment, population and political factors do not help to explain the development of employment.

The only control that shows a significant effect on the development of employment is the share of KIBS jobs of SMSTs in 1995. This is as a path-dependent effect, meaning that SMSTs who already had a higher share of KIBS jobs were in a better position to gain new export-oriented jobs because the Swiss economy was mainly growing in knowledge-intensive and service-intensive industries.

The inclusion of the distance to the centre of metropolitan regions highlights that network density does not simply imply proximity to the metropolitan centre. The data shows that SMSTs close to the centres of metropolitan regions did not develop differently than SMSTs in other locations. Meanwhile, employment grew substantially stronger in SMSTs in a dense and dynamic network of other SMSTs and cities. This supports the argument that SMSTs that are closer to large cities can, and are more likely to, suffer from agglomeration shadows, which

may counteract the potential beneficial effects of proximity (Meijers et al., 2016). SMSTs that are close to the centres of metropolitan regions may also specialize in residential economies and they may deliberately choose to reap the benefits of having wealthy residents (Segessemann and Crevoisier, 2016).

The multi-level approach in the analysis allows for the control of the mechanisms that take place at the cantonal level, due to its role as the most important political entity in the Swiss political system (Sager et al., 2017). As Figure B in the appendix shows, cantonal variance is considerable in the dependent variable. However, including the independent variables that measure regional determinism in Model 1 decreases the remaining unexplained variance between the cantons.[11]

We also conduct additional analyses in which we control for whether or not the political factors, namely the political orientation of the electorate and local tax rates, have an impact depending on their degree of embeddedness in a network of SMSTs and cities.[12] We find no indication that political factors only matter when SMSTs are located in isolated areas or when they are strongly integrated in a network. Considering the high local autonomy of Swiss local governments, it is interesting that local political factors had no systematic influence on SMSTs' development towards business centres or bedroom communities. Other research on local economic policy making in Switzerland seems to support this finding. With regard to the political orientation of the local electorate, Berli (2018) shows that structurally similar municipalities in Switzerland behave similarly in regard to local land-use planning despite different political attitudes. This points to a more functionalist behavior of local leaders: They are first and foremost concerned with tackling challenges at the local level and partisan preferences are only of secondary interest. With regard to tax rates, Segessemann and Crevoisier (2016) observe that wealthy residents tend to cluster in municipalities that possess a developed

residential economy. This means that a residential economy and low tax rates can go hand in hand.

Since our sample contains all Swiss SMSTs, we can say that, between 1995 and 2013, SMSTs in Switzerland benefited from being embedded in a dynamic environment. Additionally, the share of KIBS jobs of SMST in 1995 is positively correlated with the development of export-oriented employment.

The short distance to a centre of a metropolitan region, the presence of HEIs, the prior stock of export-oriented jobs, the prior stock of residential jobs, the population size, the political orientation of the electorate and local tax rates show no clear effect on the development of employment.

Table 1: Results of Bayesian multi-level estimates.

	(1) Δempl[a]	(2) Δempl[a]	(3) Δempl[a]	(4) Δempl[a]	(5) Δempl[a]	(6) Δempl[a]
Regional explanatory factors						
Netw. density[a]	-0.002	0.002	0.003	0.003	0.003	0.004
(in 1995)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Netw. density[a]	0.169**	0.160**	0.153**	0.152**	0.169**	0.152**
(Δ 1995-2013)	(0.048)	(0.050)	(0.051)	(0.050)	(0.053)	(0.051)
Distance	0.000	0.000	0.001	0.001	0.001	0.001
to metro centre	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Higher education	-0.032	-0.036	-0.034	-0.035	-0.036	-0.034
institutions	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Local explanatory factors						
Politics			-0.005	-0.005	-0.005	-0.005
(share non-left parties)			(0.003)	(0.003)	(0.003)	(0.003)
Tax rate			-0.021	-0.018	-0.021	-0.021
(mean 1995-2013)			(0.020)	(0.019)	(0.019)	(0.018)
Tax rate			-0.001	0.005	0.000	0.000
(Δ 1995-2013)			(0.022)	(0.022)	(0.022)	(0.022)
Control variables						
Population		0.000	0.000	0.000	0.000	0.000
(Δ 1995-2013)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population[a]		-0.038	-0.043	-0.068	-0.051	-0.050
(mean 1995-2013)		(0.057)	(0.060)	(0.057)	(0.057)	(0.056)
Residential econ		0.000	0.000	0.000	0.000	0.000
(Δ 1995-2013)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Employment[a,c]		-0.009	-0.010			
(in 1995)		(0.035)	(0.035)			
Employment[a,c]		-0.009	-0.010			
(in 1995)		(0.035)	(0.035)			
KIBS in 1995[a]				0.062*		
				(0.029)		
Low tech					0.023	
(in 1995)					(0.029)	
High tech						-0.006

(in 1995)						(0.015)
Intercept	6.873	7.272	7.876	8.196	7.787	7.854
	(0.446)	(0.664)	(0.802)	(0.797)	(0.794)	(0.790)
N	152	152	152	152	152	152
DIC	-25.2	-21.4	-18.9	-24.7	-19.9	-18.9

Notes: Standard deviation in parentheses. One-sided Bayesian p-values reported: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

[a] Coefficients have been logarithmized.

[C] Time lag of the dependent variable in 1995.

QUALITATIVE INSIGHTS

The results of the different regression models indicate that there is still a considerable amount of variance in the dependent variable that we cannot explain with our theoretically derived variables.[13] By making use of the multi-method research strategy (Seawright, 2016), we discuss case study research of Swiss SMSTs as qualitative vignettes in order to briefly examine whether the unexplained variance is due to idiosyncratic effects or to a misspecification of the quantitative model. We focus on the three advantages of case study research as an additional analysis that improves regression-based inferences, as outlined by Seawright (2016), namely: 1) evaluating the plausibility of hypothesized paths, 2) testing measurement quality 3) and searching for omitted variables.

First, we find some evidence of the importance of network density for employment growth in case studies about SMSTs in Zurich North, which is located between the city of Zurich and the airport of Zurich. This region has developed rapidly since the 1950s when land reserves in the Northern parts of the city of Zurich were exhausted. Zurich North is now a polycentric and well-connected region, which mainly features a headquarter and knowledge-intensive economy (Nüssli and Schmid, 2016). Kaufmann and Meili (2019) interviewed local decision

makers in Zurich North and find that the economic development of these towns can only be understood within the context of the rapid growth of the entire region. Thus, Zurich North has specialized into a fast-growing knowledge-intensive economy due to spillover effects, without much influence of local political action. This supports the main effect found in our regression analysis.

Second, a case study on the town of Wädenswil (Kaufmann and Meili, 2019) highlights a measurement issue found in our dependent variable. Wädenswil hosts a campus of the Zurich University of Applied Science. The Swiss Federal Statistical Officce (SFSO) categorizes University of Applied Sciences' jobs as residential economy jobs. However, these jobs are as much research jobs as they are teaching jobs, especially when compared to jobs in the same SFSO category of primary and secondary education. The number of these jobs is marginal and thus this classification flaw does not distort our model.

Third, case study research identifies cantonal and local land-use planning as relevant explanatory factors that we did not incorporate into our regression analysis. Cantonal land-use planning strategies often designate growth areas within their territories. The cantons, and sometimes also the Swiss Confederation, finance the public transport system in these growth areas. Yet, most SMSTs have no parts designated as growth areas. Our multilevel model is able to control for inter-cantonal variation but not for intra-cantonal variation. However, since cantonal growth areas are only designated as such in places where established dynamic networks of SMSTs exist, including them as a variable would result in problems of reverse causality. Kaufmann and Meili (2019) identify local land-use planning as the only relevant local policy instrument to impact the economic development of Swiss SMSTs. Devecchi (2016) reveals, in nine case studies of Swiss SMSTs, that SMSTs differ in their ability to impact local land-use planning. Given this importance of local land-use planning and the complexity to assess

its influence on the development of employment, it would be best to capture this potential omitted variable with qualitative in-depth interviews or through survey research.

In general, case study research supports the effect of network density and the importance of 'regional determinism' in explaining employment growth in Swiss SMSTs. Additionally, qualitative studies point to land-use planning as important in explaining the development of employment in SMSTs. Furthermore, the small size of our unit of analysis makes local employment numbers vulnerable to distortions caused by idiosyncratic events, such as a successful attraction of a big firm or a closure of a big local firm. Systematic patterns are thus difficult to find when analysing and comparing SMSTs.

CONCLUSION

The goal of this paper is to find explanatory factors for the development of employment in Swiss SMSTs in order to scrutinize why some SMSTs have developed into bedroom communities while others have transformed into business centres. It is highly relevant to examine local economic processes of SMSTs in more detail, given the outcome of recent studies that highlight the good economic performance of SMSTs as well as the recent discussions about the agency of SMSTs in today's globalized economy (Dijkstra et al., 2013; Servillo et al., 2017). We derive five potential explanatory factors from an interdisciplinary set of theories stemming from regional studies, economic geography and political science. We locate the determinants of economic development between regional determinism, i.e. regional explanatory factors, and territorial autonomy, i.e local explanatory factors (Servillo et al., 2017; Tödtling and Trippl, 2005).

We choose to study SMSTs in Switzerland because they are embedded in a growing and polycentric urban system, they are a frequent settlement type in Switzerland, their economic specializations vary and they have comparably high local autonomy. This high local autonomy allows us to examine whether or not local governments can influence the development of employment in SMSTs. We conduct a quantitative analysis that draws on a full census of all 152 Swiss SMSTs from 1995 to 2013. The multilevel analysis controls for cantonal variation, and it employs spatial regression techniques to measure network effects.

The results indicate that SMSTs that are located in a dynamic regional network, i.e. located close to towns and cities that exhibit employment growth, experience an increase in full-time equivalent jobs in the export-oriented sector. Additionally, the share of KIBS jobs of SMSTs in 1995 is positively correlated with the development of export-oriented employment. Other regional and the local political explanatory factors show no significant effect in the time period in question. This means that the embeddedness in a dynamic network can explain the positive development of employment in Swiss SMSTs while the other examined explanatory factors can equally result in lower growth rates, stagnation or loss of jobs in export-oriented sectors. A discussion of qualitative studies reveals that the results of the quantitative analysis appear to be robust and plausible.

We are aware that the findings generated from analyses of Swiss SMSTs should be generalized with caution given the specific Swiss context and the small sample size that makes local economies vulnerable to distortions caused by idiosyncratic events. We analyze the development of employment in a full census of all 152 Swiss SMSTs. This entails that we analyze overall effects and, potentially, also opposite effects, meaning that we can not do justice to the economic development of every individual SMST. Yet, the findings in this paper are in line with Camagni et al. (2016) conclusion regarding the importance of network effects for European cities. They find that other factors, such as urban size, do not explain urban growth but

that 'the upgrading over time of the quality of the entire metropolitan/regional system (...) has been identified as another important driver of the growth of the single cities belonging to that system' (p. 155). Given the scarcity of research about SMSTs, it would be interesting to expand future research to other countries with high local autonomy, such as Germany, or to countries that have a similar urban system, such as The Netherlands. We assume that a similar study in Germany or The Netherlands would also reveal that local explanatory factors do not influence the development of employment given that SMSTs in these countries possess a lower degree of local autonomy than in Switzerland, which constitutes a most-likely case to find an effect of local explanatory factors.

SMSTs are dependent on their regional networks and they lack substantial local agency to influence their economic development. Theoretically speaking, 'regional determinism' trumps 'territorial autonomy'. If local administrations want to generate jobs beyond the residential economy, this study advises them to coordinate their economic development policies on a regional level with other local governments. This is supported by Beer et al. (2019), who recommends that key individuals and agencies should reach out to others, either within their existing networks or through the formation of new connections. The strengthening of regional coordination structures, such as metropolitan council of government organizations, is thus in the interest of local governments. This is relevant in the case of Switzerland, where local governments are often reluctant to cooperate in regional coordination structures because of their fear of losing local autonomy (Kaufmann et al., 2016). Yet, this study suggests that local governments may gain local autonomy if they engage in economic policy-making at the regional level.

NOTES

1. We use the categorization of economic sectors provided by Meili and Mayer (2017), which are based on the Nomenclature generale des activites economiques (NOGA) (Eurostat, 2016)

2. See Figure A in the appendix for its distribution.

3. Using the online timetable of www.sbb.ch and GoogleMaps. Twenty minutes is considered to be a good proxy for a commuting distance that indicates closeness (Kloosterman and Musterd, 2001), given that reaching distances within Swiss cities also easily require more than 20 minutes driving time.

4. On average, Swiss SMSTs have 3.5 neighbors. The distribution of the number of neighbors is visible in Figure D in the appendix.

5. Cities with more than 50,000 inhabitants, such as Zurich or Geneva.

6. The centres of metropolitan regions are Zurich, Lausanne, Geneva, Basel, and Milano (Raumkonzept Schweiz, 2012)

7. We used di use priors $\rho(\beta_k) \sim 1$ for the parameters and inverse Wishart priors $\rho(1/\sigma^2_{\mu 0}) \sim$ *Gamma*(0.01, 0.01) for the variance component. All models are estimated using the Markov Chain Monte Carlo (MCMC) estimation in Stata15. We let the models run for 209 999 iterations (resp. 50,000 for Models 4-6), with a respective burn-in of 10,000 (resp. 5,000 for Models 4-6) and a thinning of 2 (resp. 1 for Models 4-6). Extensive diagnostics based on the graphical inspection of the trajectories and the Raftery-Lewis and Brooks-Draper diagnostics lead to the conclusion that the chains have mixed well and converged.

8. See Figure B in the appendix for cantonal means of the dependent variable.

9. The models and variables have been tested for multicollinearity, heteroscedasticity, nonlinearity and influential outliers, see appendix. Variables with outliers have been logarithmized. Convergence diagnostics are included in the appendix.

10. The lower the DIC, the better the model fits the data (see Gelman and Hill, 2007, 525-526). Since only one variable is significant, and the DIC penalizes for additional parameters, the first model, unsurprisingly, fits best.

11. The coefficients regarding the political variables were also allowed to vary across cantons in order to control for the fact that SMSTs in cantons that are very active in promoting their SMSTs may only have a small political impact. The results, however, show that the cantonal variance of the coefficient is negligibly low, which is why the random-slope is not presented here.

12. See Table C and further explanations in the appendix.

13. This can be seen when comparing the predicted and observed values in the dependent variable.

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Paper 2

How strong is local politics' grip on local economic development? The case of Swiss small and medium-sized towns

How strong is local politics' grip on local economic development?

The case of Swiss small and medium-sized towns

Abstract

Economic development directly manifests itself in the form of employment at the local level. This paper examines the ability of local politics to shape this development in a competitive federalist environment by examining how local party-political developments affect local economic development in Swiss Small and medium-sized towns (SMSTs). Local economic development in the form of employment is a central local policy domain in federal and polycentric Switzerland. This paper argues that party-political influence is conditional on the characteristics of four distinguished economic sectors that differ in their dependence on the regional context. By analysing panel data with spatial lags from a full sample, the paper finds that local party-political developments only impact the development of the residential economy, while regional processes determine the more export-oriented economies. The grip of local politics on the development of export-oriented economies therefore is not guided by party-political development and more influential at regional levels. (150 words)

Key words: small and medium-sized towns, local politics, local economic development, regionalism, fiscal federalism

Introduction

While regional development and multi-level governance often dominate the discourse on economic development (Ansell 2002; Tödtling and Trippl 2005), this economic development directly manifests itself at the local level in the form of jobs and local economic development, thereby remaining crucial for local politics. This paper analyses the ability of local politics to shape this development in a competitive federalist and polycentric environment by examining how party-political developments in the local executive can affect local economic development.

The focus of this paper lies on a single functional category of municipalities: small and medium-sized towns (SMSTs). SMSTs have traditionally been neglected by urban and rural research because they fall between the fields of regional/peripheral development literature, classical urban studies and research on agglomerations. However, as Bell and Jayne (2009, p. 691) argue in their plea for a greater focus on smaller cities, SMSTs act as 'important nodes in the networks between places of different scales, and they are seen to mediate between the rural and the urban, as well as between the local and the global'. Additionally, as Dijkstra et al. (2013) show in a comparative study of EU15 countries, SMSTs are catching up with large cities in terms of population growth and economic performance. A better understanding of SMSTs is therefore not only of theoretical relevance, it also follows recent empirical trends.

The vast literature on regional and multi-level governance discusses the importance of coordination and steering in upper-level institutions (Pierre and Peters 2000; Savitch and Kantor 2002; Kantor 2006). With the increasing mobility of goods, people and identities, local developments have an impact on and are impacted by developments beyond their territorial boundaries (Brenner 1999). The role of autonomous local municipalities in shaping *local* development somehow got out of sight. However, local autonomy remains a crucial feature of federalist

and decentralized states where participatory processes (such as local elections) remain fragmented among local institutions (Kübler 2015) and local politics often respond to very local questions. Switzerland provides an ideal case for studying the impact of local politics given its high fragmentation and local autonomy (Sellers and Lidström 2007). This paper views local politics as the political power constituted in the party composition of the local government in Swiss SMSTs. Different party compositions can lead the local government to take different concrete strategic and operational actions in local economic development.

Local economic development is an especially important policy field in Switzerland's fragmented, polycentric urban structure that rests on autonomous municipalities. Municipalities have their own budget, bear many costs, spend money at their discretion and guarantee the provision of local public goods for their inhabitants. This financial autonomy rests on the acquisition of raising sufficient income through taxation (Linder & Mueller 2017). Consequently, SMSTs compete with many other municipalities for jobs and capital. As a result, understanding the grip of local politics is also crucial for the field of economic development policy, which often takes a regional perspective. SMSTs, as units of analysis of regional economic and political importance, thereby offer an optimal case for studying the impact of development in local party politics. No evidence of the impact of development in local party politics on local economic development in SMSTs would make it likely that there is also no impact in smaller municipalities of less regional importance.

One crucial aspect of local economic development is local employment. Job growth leads to greater corporate tax income and can help to boost the importance of SMSTs in a larger region. However, SMSTs can have different types of economic specializations and develop differently. The absolute number of people employed could potentially conceal different mechanisms that underlie employment development. This paper therefore acknowledges the role of the characteristics of specific economic sectors by distinguishing between four sectors whose demand

differs on their dependence on factors beyond their municipal border and, consequently, on the regional context.

This paper argues that the impact of local party-political developments is conditional on the characteristics of the employment specialization. The more dependent the economic sector is on external demand, the more important spatial context characteristics are, such as proximity to a metropolitan centre or to prospering clusters. The more the economic sector relies on the demand of its inhabitants, the more important local characteristics are, such as political conditions, population size or local economic conditions. The ability of party-political development to explain different local economic development therefore depends on the degree of interdependence of economic sector development.

Analysing panel data, the paper shows that a differentiated view of economic development helps to understand the potential of local party-politics to shape it. Only the development of the residential economy is related to local party-political differences between SMSTs and differences over time, while regional processes mainly determine the export-oriented knowledge-intensive business sector. This indicates that different party compositions in the local executive can lead to different local economic policy strategies that aim to support the residential economy. While the paper does not measure different local economic development strategies and how they are related to political parties, we discuss how party-politics in the residential economy can manifest itself in Swiss SMSTs and how politics' local grip on the development of export-oriented economies (1) is not guided by party-political development and (2) is more influential by activity at the regional level.

The structure of the paper is as follows. The next section discusses the role of local politics in local economic development and derives the hypotheses. Then, there is a description of the data, the data-gathering process and the methodology of spatial lags and the hybrid within-

between random effects model. Afterwards follows the presentation of the results of the analyses on four different economic sectors and a discussion on the role of local party-political strategies on economic development. In the conclusion, we sum up the paper and discuss its implications, contributions and further steps of research.

Local politics and local economic development

The phenomenon to be explained

Research on decentralized countries shows that local parties can matter for local revenue policies such as local income and property taxes and local public spending (Egerod and Larsen 2020; Kübler and Rochat 2018; Einstein and Kogan 2015). This is also true in Switzerland where tax rates and the economic freedom of local enterprises are two of elected local officials' main self-reported issues (Geser et al. 2011; Geser and Meuli 2011). Economic development policy, however, is not a classical local policy field because much is negotiated on higher regional levels (Ansell 2002). Nonetheless, empirical studies on SMSTs and smaller municipalities in Switzerland show that they not only use their discretion in designing local tax policy (Brülhart et al. 2012) and land-use policy (Kaufmann and Meili 2019; Devecchi 2016; Berli 2018) but also that these policies have the potential to shape local economic development (see also Kaufmann and Arnold 2018). Additionally, regional governance and vertical exchange with cantonal entities enable local politicians to advocate for their municipality. As regional development organizations generally operate through cooperation agreements that are based on contracts that do not include directly elected representatives and formal democratic procedures at the regional level, the public can only express their demands through local elections and votes. While the paper does not contest the relevance of regional governance and inter-municipal cooperation for local and regional development, the extent of the role of local autonomy remains a crucial question, particularly in times of decreasing public interest in local politics (see Kübler 2015, p. 14).

Local elections often are considered as being elections of personalities and experience and not particularly of parties and ideologies (Marien et al. 2015; Jennings and Niemi 1966). For members of local executives in Swiss SMSTs, independent of the size of the municipality, reputation is the most important (self-reported) requirement for getting elected. Party affiliation has been important for only 31.75% of elected officials while factors such as orderly family relationships and high professional qualifications were similarly important requirements for getting elected (Geser et al. 2011, p. 90; Geser and Meuli 2011).

While a crucial goal for the elected officials surveyed irrespective of their party (range 80-90%) is attracting wealthy residents to increase the tax base and demand in the local economy, the strategy of lowering tax rates to attract wealthy tax payers is substantially more disputed at the local level (range 34-88%) (Geser et al. 2011, p. 65). Lowering tax rates is therefore not the only instrument for attracting wealthy residents. Geser and Meuli (2011, p. 10) also show that fostering economic growth is mainly a crucial goal for right and middle parties (for 52-58%) but also for 41% of local officials of left parties.

These numbers indicate that parties are not the only crucial factor in the local elections of SMSTs: they are one of many factors. Once elected, however, party affiliation becomes important: local officials from left parties state different aims and focal points for economic development strategies than those of more economic liberal middle and right parties. Literature on the political preferences of voters indicates that their preferences are very stable and governed by long-term values that do not often change in volatile economic circumstances (see e.g. O'Grady 2019; Sears and Funk 1999). Additionally, research from the UK and Sweden shows that local economic conditions and tax rates do not impact local voting decisions (James and John 2006; Elinder 2010). A change in the political composition of the executive is therefore not often due to party-political competition regarding local employment development, but

it is instead influenced by external developments such as withdrawals and new popular candidates from different parties in elections.[4]

A differentiated approach on local autonomy in local economic development

Although party membership is not central to elections, it shapes preferences for the design of local policies and therefore can result in different policy outcomes. Local politicians who favour economic growth are more likely to advocate for policies that foster growth and to advocate for the economic interests of their municipalities in upper-level institutions or cooperation arrangements (Feiock 2007; Feiock et al. 2009; Bel and Sebő 2019). However, the more a sector that is important to the local level depends on resources and demands that the SMST cannot provide autonomously, the more restricted party-political aims will be.

This paper examines whether local party politics explain local economic development or whether upper-level, regional or national developments determine it. While the former process would highlight the ongoing importance of local politics and fragmented authority, the latter would indicate processes of regional determinism or 'managerial consensual governing' (Swyngedouw 2009, p. 605), where party politics has a low impact. Regional determinism means that political parties with different economic development goals are not able to shape local economic policy because regional and national developments are stronger and decisive. The post-political condition of 'managerial consensual governing' indicates that there is a local political party consensus on an entrepreneurial stance to local economic development, which means that all parties want to engage in inter-municipal competition in the same way in order to compete for resources (Harvey 1989, pp. 4–5; Peterson 1981; Jensen & Malesky 2018; Filion et al. 2019). As Peterson (1981) argues, local politics matter only for allocative policies

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[4] Table A5 in the online Appendix also tests this assumption empirically by regressing party-political development on prior economic development in the different economic sectors and finds no signs of endogeneity. In other words, the regressions show that political change does not depend on prior economic development in Swiss SMSTs.

because these policies have no impact on the economic position of the city. In development and redistributive policies there should be a consensus between parties.

These processes of regional determinism or 'managerial consensual governing' may emerge even stronger in the case of SMSTs that lack the 'centrality of cities for public contestation' (Beveridge and Koch 2016, p. 41). While some SMSTs are regional centres of economic relevance, they have fewer amenities (cultural, sports, universities and so on) to offer to their inhabitants than larger cities, and they have less options for designing local policy in various ways. Additionally, spatial barriers between SMSTs are lower than between cities (because there are more SMSTs than cities), and they directly contend with municipalities that are more similar. As a result, it is possible to assume that competition for 'development capital' (Harvey 1989, p. 11) is even more intense. A recent study by Kübler and Rochat (2018) on intergovernmental cooperation and revenue sharing in local social policy supports this assumption and finds that local party politics only impacts social expenditures in metropolitan core cities, not in metropolitan municipalities.

However, the focus here does not lie on the impact of local party politics on expenditures, but on the ways to *acquire* money through economic development: Can local party-political development explain local economic development? We argue that local politics can still affect economic development but that this influence depends on the characteristics of different economic sectors (Alt et al. 1999; Meili & Mayer 2017). Additionally, the location of an SMST supposedly impacts local politics: It is likely that local politics in SMSTs that are close to metropolitan centres in agglomerations follow external developments (Meijers and Burger 2017) while more remote SMSTs are more autonomous when designing their economic policy.

The basic argument is that local party-political developments can impact economic development but that economic development requires a more differentiated approach. Although many assume that Switzerland's polycentric context makes SMSTs interdependent (Meijers and

Burger 2017), a differentiated view on economic sectors can address different extents of dependence. Consequently, the impact of local party-political developments relies on the characteristic of the employment specialization (Box 1 summarizes the hypotheses).

As Figure 1 illustrates, economic sectors that are more to the right of the line are more dependent on local place-specific assets while sectors more to the left are more dependent on developments in the broader region. The figure includes the tourism sector as an example of a sector that is heavily dependent on place-specific assets (such as the landscape), however, it does not figure in the paper.

Figure 1: Relation of economic sectors to spatial context (own illustration). KIBS: Knowledge-intensive business services

The residential economy and low-tech industries are more immobile and place-bound factors are important to them, and they are not so dependent on regional developments. The residential economic sector offers goods and services for the local demand. This sector exists in every SMST to some degree (i.e. hairdressers, wholesales, bakeries). The low-tech industry relies on large, immobile manufacturing infrastructure and often exploits natural resources that are place-bound and are therefore also less mobile. The local autonomy for shaping these sectors is larger and local party-political development should have a visible effect on them. As the residential economy is not primarily export-oriented, the effect of local place-specific assets is likely more substantial than in the low-tech industry.

High-tech industries and knowledge-intensive business services (KIBS) are classical export-oriented economies that rely on specialized knowledge that can be found in a broader region. Similar to low-tech industries, high-tech industries can rely on immobile manufacturing infrastructure, but they are less dependent on place-bound resources – they are more mobile than low-tech industries but less mobile than KIBS. KIBS primarily rely on knowledge and talent and do not require immobile infrastructure. As a result, local development is less important than what takes place in the SMST's region. However, given that high-tech industries rely more on infrastructure and are less flexible in changing location, they rely more on local assets than KIBS.

Box 1

H1: For the development of the residential economy, local characteristics are more important than regional characteristics.

H2: For the development of the low-tech sector, local characteristics are more important than regional characteristics, although they also play a role.

H3: For the development of the high-tech sector, regional characteristics are more important than local characteristics, although they also play a role.

H4: For the development of knowledge-intensive business services, regional characteristics are more important than local characteristics.

Research design

Data[5]

The paper focuses on SMSTs in Switzerland. The Swiss Federal Statistical Office (FSO) defines SMSTs based on European Definitions (Dijkstra and Poelman 2012). It defines an SMST as a minimum of 14'000 inhabitants, workers or overnight stays and as having a dense core with at least 2500 inhabitants, workers or overnight stays per square km (see Goebel and Kohler 2014, p. 15).

Data on the dependent variable, the *development of employment in different economic sectors* in SMSTs in Switzerland, includes people working in a specific sector as full time employment equivalence in each SMST for the years 2005, 2008, 2011, 2012 and 2013 (in addition to 1995 and 2001 for time lagged variables). The sample consists of five periods. The four sectors are (1) knowledge-intensive business services ((*KIBS)* that are reliant on high professional knowledge, such as scientific research, computer programming, consulting, legal activities), (2) high-tech industries ((*HT)* such as the pharmaceutical industry, electronic devices), (3) low-tech industries ((*LT)* (manufacturing of paper, textile, cement) and (4) residential economies ((*RES*) such as reparations, wholesalers, hairdressers, construction) (see Meili and Mayer 2017).

Based on the classification by Eurostat (2008), Meili and Mayer (2017) assign each firm in a SMST to one type of economic structure and measure the amount of full-time equivalency in each sector of each SMST.[6] A one point increase in full-time equivalency thus equals one more full-time employment position in a SMST in the respective economic sector.

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[5] We are happy to share data and code if requested.
[6] As Meili and Mayer (2017) state, the measure of the economic sectors changed in 2008. However, since the correlation over time and for different measures in the same year remain very high (>0.9), and we can control for year fixed effects, we also include data prior to 2008.

Table 1 displays some descriptive information on of Swiss SMSTs (see Appendix for a full operationalization table). SMSTs are on average more conservative than cities (around 70% non-left parties (SMSTs) vs. 42% non-left parties (cities) in the local executive) and consist of around 35% of the Swiss population. Meanwhile, the ten larger cities consist of around 17% of the Swiss population (FSO, see Appendix for a full operationalization table).

Table 2: Descriptive data on Swiss SMSTs (averaged over years and units)

	Mean	*SD*	*min*	*max*
Full employment	7'671	4'860	1'356	26'138
Residential	*5'602*	*3'820*	*1'306*	*19'313*
KIBS	*528*	*679*	*9*	*5'795*
Low-tech	*708*	*541*	*14*	*3717*
High-tech	*833*	*1063*	*0*	*7'287*
Share of non-left parties in executive	72%	17%	27%	100%
Population	14'894	6'879	5'268	41'157

A self-extended dataset from the FSO identifies the composition of the local government of SMSTs, including the left/right dimension of parties in local governments. While there is comparative research on local politics in Switzerland that relies on the readily available data of local vote shares in national parliamentary elections (Kaufmann and Wittwer 2019; Berli 2018; Kübler and Rochat 2018) or on a sample of survey respondents (Geser et al. 2011), this study is, to the best of the authors' knowledge, is the first that incorporates data on the local executive level for all SMSTs over time. Local vote shares in national parliamentary elections are good proxies for measuring local political preferences because they capture the political preferences of the local population (those allowed to vote). However, it does not provide much information on local political action and power structures. The election of the local executive (they have

three to ten seats) does not exactly represent the local political preferences elections.[7] When focusing on local party-political power structures to examine the impact of local politics, it is more accurate to measure the composition of the local executive.

Since the number of towns in the previous FSO definition steadily increased, data on earlier years do not include all SMSTs of interest. To ensure the analysis of the full sample of all Swiss SMSTs, we collected data on the composition of the local governments with the help of a comprehensive media analysis. For each SMST not included in the FSO's sample, we analysed official municipal online documentation, and, in the common case of no online documentation, newspaper articles following local elections[8] in order to find information on local election results. Similarly, we collected information on independent local officials to situate them along a left/non-left dichotomy. We code these officials as zero if they position themselves to the left or if they were supported by left parties (SPS, GPS, AL, CSP and other local left parties) and as 1 otherwise.

To take into account the spatial environment of SMSTs, we use a self-coded dataset that incorporates the spatial context of SMSTs. A binary matrix (*C)* specifies 'connectivities' between all SMSTs and assigns a 1 to the connectivity (c_{ij}) of SMST *i* and *j* if a connection exists and a 0 if there is no connection (Ward and Gleditsch 2008, p. 14; Neumayer and Pluemper 2016). If an SMST has a connection with another SMST or a city within a driving distance of less than 20 minutes[9], we measure it as spatially proximate and we consider the two SMSTs (or a SMST and a city) to be neighbours. The binary matrix (*C)* then shows which SMSTs are connected and the amount of other SMSTs and cities each SMST is connected to. It also calculates the spatial lag of regional economic development.

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[7] See Figure A2 in the online Appendix for an illustration of the difference.
[8] We used the newspaper online archives of swissdox and Factiva by searching for '[*name of SMST*] AND wahl*', '[*name of SMST*] AND élect*' and '[*name of SMST*] AND elez*'.
[9] Twenty minutes is a good proxy for a commuting distance indicating closeness (Kloosterman and Musterd 2001). Within Swiss cities, reaching distances within cities also easily requires more than 20 minutes of driving time.

We measure the spatial lag of the economic development of neighbouring towns by examining the amount of full-time equivalent jobs of its neighbours. By measuring the amount of full-time equivalent jobs of a SMST's neighbours at *t*-1 and adding them up, we can assess the impact of the economic development of SMSTs close to the SMST under observation. We can therefore measure whether the increase or decrease of full-time equivalent jobs of neighbouring SMSTs in previous years (at *t-1*) impacts the development of a specific economic sector of the SMST under observation, and we are then able to quantify the impact of regional development.

To measure how close a SMST is to large centres, we assess the distance in train minutes for each SMST to its nearest metropolitan centre (Zurich, Geneva, Lausanne, Basel, Bern, Milan (Italy)). Data on population are taken from the Swiss FSO (see operationalization table in the Appendix).

Methods

This paper uses a hybrid panel data approach that combines fixed and random effects 'that yields the advantages of fixed effects while identifying the parameters of time-invariant regressors' (Halaby 2004, p. 530). This means that we mix the properties of fixed effects for the time-varying explanatory variables with random effects estimators for stable explanatory variables (see also Mundlak 1978; Bell and Jones 2015). In this so-called 'hybrid model' (Halaby 2004) or 'within-between Random Effects' (Bell and Jones 2015), we estimate within effects in a random effects model by decomposing time-varying variables into a between ($\bar{x}_i$) and a within ($x_{it}-\bar{x}_i$) component. The within component, which only measures the change over time (e.g., change in the political composition of the executive), is a pure fixed effects estimator that avoids unit heterogeneity bias. The time-invariant between component and the other time-invariant variables (e.g., the average share of non-left parties in the executive over the years or

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cantonal membership) are random effect estimators interested in the variation between the observations and can therefore can still be subject to heterogeneity bias if important variables are missing (Halaby 2004, p. 531).

We measure the independent variables at time *t-1* to track how past developments impact the current outcome of interest (e.g. the impact of party-political development at time *t-1* on jobs in a specific sector at time *t*). The lag of the dependent variable is measured at *t-2*.[10] We use panel-robust standard errors to control for serial correlation and heteroscedasticity (Halaby 2004, p. 524).

The next section presents the results of the hybrid panel models for the four economic sectors. We report two models for each economic sector. The first is a model that includes the party-political development of all SMSTs in the sample. The second is a model that only examines the party-political development of more remote SMSTs.

Results

Table 2 displays the results of the hybrid panel models for the four economic sectors. The 'within' variables account for the fixed-effects estimates, i.e., the development over time for each SMST. The 'between' variables account for the comparison of the values between the SMSTs. The results discuss each economic sector separately before comparing them in the discussion section.

Residential economy (Models 1.1-1.2)

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[10] The lagged dependent variable ensures that the models consider whether prior development in a specific economic sector (growth or shrinkage) impacts development two time periods later, instrumenting *t-1*. Excluding the lagged dependent variable does not substantially alter the results of the other variables (see Table A4 in the online Appendix). The effect of prior development therefore varies considerably between SMSTs and is on average, if at all, only weakly positive. This indicates that the dataset is not very dynamic and that including the lag does not lead to a bias in the results due to autocorrelation.

The models that examine the development of the residential economy reveal the influence of local development, and particularly that of local politics. An increase in the share of non-leftist parties in the composition of the local government led to a decrease in jobs in the residential sector. A 20% decrease (i.e., a one-seat change in a five person executive) resulted in an average 1.7% decrease in the number of full-time-equivalent jobs in the residential economy, all else remaining equal. This indicates that a turn to more leftist parties in SMST's local governments results in a greater focus on promoting the residential economy.

Because SMSTs that are closer to metropolitan centres are expected to genuinely benefit more from spill-over effects and agglomeration economics, Models 3 and 4 interact the party-political development variables with the threshold of being remote from large metropolitan centres where it is likely that autonomy is higher because these remote SMSTs are less affected by metropolitan dynamics (more than 20 minutes away, which is the case for 60% of the SMSTs). The interaction reveals that, while the within-estimate of party-political development remains similarly negative (though weaker – a 20% decrease leads to a 1.3% decrease), the absolute share of non-left parties also has a negative effect on the development of the residential economy in remote SMSTs. Remote SMSTs, which have 20% less non-left seats in the executive (i.e., one seat less in a five person executive) on average have 5.2% less full-time-equivalent jobs in the residential economy. If neighbouring SMSTs grew into more of an export-oriented economy, the residential economy in the respective SMST grew too. Additionally, previous development in the residential sector, larger and growing SMSTs and SMSTs closer to a metropolitan centre experienced more job growth in the residential economy. The results corroborate the first hypothesis, which postulates that local factors play a central role in determining local economic development.

Table 2. Results of within-between random effects models.

	(1.1) Res	(1.2) Res	(2.1) LT	(2.2) LT	(3.1) HT	(3.2) HT	(4.1) KIBS	(4.2) KIBS
Prior development in the sector (t-2)	0.135*** (0.0372)	0.140*** (0.0386)	0.121** (0.0575)	0.114** (0.0569)	0.0495 (0.0870)	0.0497 (0.0870)	0.0928 (0.0598)	0.0942 (0.0601)
Party composition (*between*)	-0.101 (0.342)		-0.157 (0.630)		-0.941 (1.146)		-0.568 (0.639)	
Party composition (*within*)	-0.0798** (0.0364)		-0.291 (0.179)		0.184 (0.272)		-0.0742 (0.191)	
In remote SMSTs (*between*)		-0.253** (0.126)		0.110 (0.238)		0.00184 (0.460)		-0.470 (0.300)
In remote SMSTs (*within*)		-0.0640* (0.0380)		-0.328 (0.261)		0.280 (0.302)		-0.160 (0.153)
Economic dev. Neighbours (*within*)	0.114** (0.0422)	0.120*** (0.0435)	-0.0224 (0.115)	0.00574 (0.119)	0.0613 (0.242)	0.0505 (0.245)	0.400** (0.193)	0.404** (0.195)
Distance to metropolitan centre (*between*)	-0.0698** (0.0236)	-0.0494** (0.0230)	0.00308 (0.0360)	-0.00681 (0.0372)	0.00988 (0.0829)	0.00581 (0.0867)	-0.213*** (0.0390)	-0.177*** (0.0382)
Population (*between*)	0.971*** (0.0905)	0.966*** (0.0825)	0.697*** (0.150)	0.726*** (0.149)	0.630** (0.308)	0.749** (0.309)	1.078*** (0.173)	1.117*** (0.153)
Population (*within*)	0.351*** (0.0874)	0.345*** (0.0883)	0.234 (0.221)	0.228 (0.222)	0.854* (0.479)	0.846* (0.476)	0.535** (0.268)	0.538** (0.273)
Cantonal and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	8.060*** (0.319)	8.017*** (0.102)	5.760*** (0.209)	5.760*** (0.209)	6.484*** (0.975)	5.663*** (0.333)	6.285*** (0.594)	5.872*** (0.226)
N (SMSTs/years)	740 (148/5)	740 (148/5)	740 (148/5)	740 (148/5)	740 (148/5)	740 (148/5)	740 (148/5)	740 (148/5)
R^2 within	0.77	0.77	0.07	0.06	0.02	0.02	0.24	0.24
R^2 between	0.58	0.58	0.35	0.34	0.27	0.26	0.42	0.42

Panel-robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$. Res: Residential economy; LT: Low-tech sector; HT: High-tech sector; KIBS: Knowledge-intensive business sector.

Low-tech industry (Models 2.1-2.2)

The results are different for the low-tech sectors. The R^2 is much lower, which indicates that the variables in the model only weakly explain SMSTs' variance in economic development. Only a higher population on average and prior development lead to an increase in development in this sector. Developments in the medium and low-tech industry were therefore neither guided by specific party constellations nor by the developments of neighbouring SMSTs or the

metropolitan centre. Idiosyncratic factors mainly drove development. Idiosyncratic factors can include the path dependent growth of manufacturing firms that a SMST establishes long before the period examined by the data. As the manufacturing industry relies more on infrastructure (large buildings for processing goods, such as wood), it is expected to be less flexible than residential economies and KIBS. Consequently, the results corroborate hypothesis 2 given that only local characteristics play a role in job development in the low-tech industry.

High-tech industry (Models 3.1-3.2)

The development of the high-tech sector is even more difficult to compare. Prior development in the sector has had no visible effect. Only a larger population on average and over time contribute to the explanation of job growth. Local political factors and regional development have no effect. Once again, development in this sector is mainly driven by idiosyncratic factors. Even though the high-tech sector is more dependent on mobile knowledge than the low-tech sector, local infrastructure remains crucial, and we therefore reject hypothesis 3.

Knowledge-intensive business services (Models 4.1-4.2)

As for the residential economy, the model fits better to describe the development for KIBS than low-/high-tech sectors. As postulated, party political factors do not play a role over time compared to other SMSTs nor for remote SMSTs. Regional factors, however, seem to play an important role: The economic development of neighbouring SMSTs has a strong positive effect on local economic development while prior development in the SMST of observation does not. If employment in the export-oriented sector in a neighbouring SMSTs rises by 10%, the number of full-time-equivalent jobs in KIBS grew by an average of 4%. Additionally, being remote from a metropolitan centre is also strongly negative, which indicates that SMSTs further than 20 minutes away from a metropolitan city have an average of 16-20% less full-time-equivalent jobs in KIBS.

However, the results show that the development of KIBS also depends on local-specific developments because the size and trend of the local population have a strong positive effect. The results corroborate hypothesis 4 because regional characteristics prove crucial for development. However, the influence of the size of the local population also indicates that local characteristics are also important.

Comparison of economic sectors

The results support the assumptions that a differentiated view on economic development contributes to a better understanding of the potential for local politics to shape it. This section compares the results of different economic sectors on development before discussing local politics' grip on economic development. Figure 2 compares the results using two coefficient plots that display the estimates of the variables of the second and fourth models and their confidence intervals at the 90% level.[11] For each variable, the figure compares the coefficients of all four economic sectors and the coefficient of a model that added all economic sectors (i.e. total employment, see Table A3 in the online Appendix), as well as measuring the effect of the variables on full employment.

The comparison shows that it is crucial to differentiate between economic sectors to obtain a more nuanced view on local and regional factors that enable or impede economic growth. The results between the sectors vary considerably and the coefficients of the model with the full employment conceal these differentiated effects.

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[11] If the lines that display the confidence intervals do not cross the vertical line of 0, they are statistically significant at the 90% level.
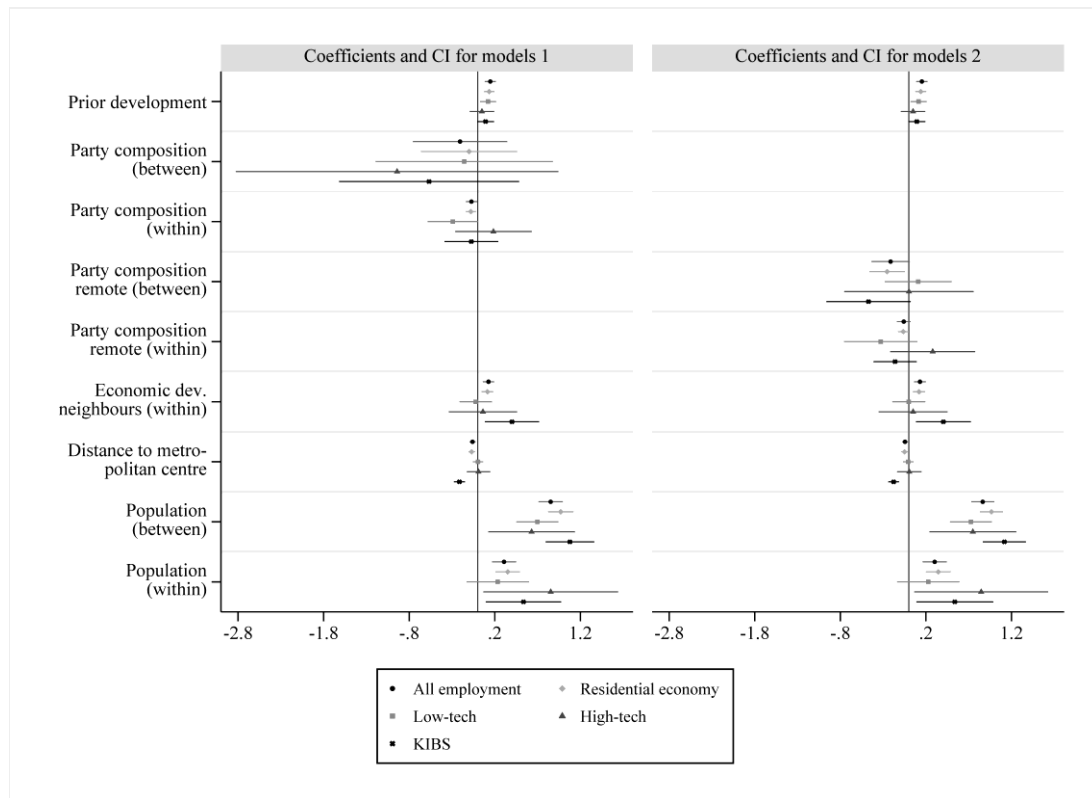
Figure 2: Coefficient plots for model comparison

In line with the assumptions, while local government composition only plays a role in the development of the residential economy, regional developments (measured as the development of employment in neighbouring SMSTs and the proximity to a metropolitan centre) have the greatest impact on the development of KIBS. SMSTs surrounded by other SMSTs that have experienced job growth and are closer to metropolitan centres experienced job growth in KIBS. From a regional perspective, it is interesting to see that development in neighbouring SMSTs and proximity to the metropolitan centre has the strongest effect on KIBS but no effect for the MLT and MHT. These findings support the assumption that KIBS benefit most from network knowledge, information exchange and pecuniary and technological spill-overs. Additionally, prior development has no impact on the more export-oriented sectors of KIBS and MHT. This finding supports the assumption that the development of KIBS is mainly driven by regional development. However, the case for the high-tech sector is less clear and manifold causes could

drive development in the sector. Future research should examine this using a more inductive, case-based approach.

These regional effects also hold true for the residential economy. For residential economies, prosperous neighbourhoods with a growing export-oriented economy increase the demand for residential goods, such as restaurants and department stores as people might otherwise commute to neighbouring SMSTs. The residential economy is therefore not only driven by local place-specific assets but also by its regional environment. Party politics only effects the residential economy.

Box 2	Findings
H1: For the development of the residential economy, local characteristics are more important than regional characteristics.	*Yes, but also regional characteristics*
H2: For the development of the low-tech sector, local characteristics are more important than regional characteristics, although they also play a role.	*Yes, only local characteristics*
H3: For the development of the high-tech sector, regional characteristics are more important than local characteristics, although they also play a role.	*No, only local characteristics*
H4: For the development of knowledge-intensive business services, regional characteristics are more important than local characteristics.	*Yes, but also local population*

Discussion: Local politics and local economic development

These findings shed light on the question of whether the different party-political compositions of local executives impact local economic development. While surveys with members of local governments show that party-political differences exist when assessing economic growth as a crucial policy goal (Geser et al. 2011), this paper finds that a different composition in the local executive over time and between remote SMSTs only impacts the development of the residential economy and that the effect is rather low compared with other factors. Local governments composed of a higher share of left parties are more successful in or focused on promoting the residential economy, especially in more remote SMSTs. While the paper does not measure actual policies, the results indicate that left parties successfully promote strategies that aim to guarantee a residential economy-friendly environment, e.g., by traffic calming, or by actively promoting the SMST in the region to benefit from spill-overs. Residential economies generally depend heavily on local demand, which local land-use policy can possibly better shape, while the other three sectors are export-oriented and other kinds of incentives attract them, such as low corporate income taxes and agglomeration economies (see e.g., Brülhart et al. 2012). As Kaufmann and Wittwer (2019) and Kaufmann and Meili (2019) show, land-use policy is an area where the local level still has the potential to shape economic development. The findings on the residential economy indicate that the party-political composition of the local executive can lead to different land-use planning strategies or generally more progressive policies promoting the residential economy by 'lessen[ing] the extent that resources and capital flow out of the local economy' (Filion et al. 2019, 17; Imbroscio 1995), e.g. with buy-local campaigns (called 'self-reliance strategies'; Imbroscio 1995). Hence, on the one hand, left parties may focus on increasing local demand by supporting self-reliance strategies or enlarging the population and gathering places. Berli (2018), for example, shows that in the metropolitan area of Zurich, decisions on growth control depend on the vote share of environmentalist parties (in

national parliamentary elections). On the other hand, promoting industrial zones that focus on export-oriented industries is not guided by different party-political compositions.

For the other three economic sectors, different party-political compositions do not impact local economic development. There are two possible explanations for these findings: First, SMSTs do not have much leeway when implementing local strategies that aim to promote low-/high-tech sectors or KIBS. This could be because they are mainly driven by local path-dependent development in the case of the low- /high-tech industry or by regional or cantonal developments in the case of KIBS. The second explanation could be that SMSTs are able to implement local strategies, however, the decision to promote these sectors does not depend on the party-political composition of the government because of a cross-party consensus. For KIBS, the substantial impact of the spatial environment manifested by the SMST's proximity to the metropolitan centre and development in neighbouring SMSTs indicates that regional developments are also crucial drivers of local economic development. The results show that in SMSTs with a similar regional context, different political compositions do not lead to different outcomes even though governments can decide on how proactively they want to try to benefit from regional spill-overs, e.g., by engaging in regional or agglomeration institutions (see e.g. Feiock et al. 2009; Bel and Sebő 2019) or by pursuing a tax strategy that is more competitive than their neighbours (see e.g. Brülhart et al. 2012; Jensen et al. 2015). Hence, it is possible to argue that a cross-party consensus exists, and therefore also a state of post-political 'managerial consensual governing' (Swyngedouw 2009, p. 605).

Conclusion

This paper examines the relation of local party-political development and economic development in Swiss small and medium-sized towns (SMSTs). Based on recent literature on the role of locational policies for local development and surveys with elected local government offi-

cials, we argue that even though parties do not play a crucial role in the election of local government officials, local politicians still emphasise different local economic development measures based on their party background. Additionally, even though local economic development is a policy field where higher-level entities, such as cantons and regions, play an important role, local politicians in SMSTs can still shape locational policies, and they can decide on how intensely they promote their SMST in these higher-level entities. This is especially true given that regional engagement mostly only occurs through contractual or even informal agreements that guarantee the discretion of SMST engagement. We argue that the characteristics of four different economic sectors (residential economy, low-tech industry, high-tech industry and knowledge-intensive industry) influence how local politics affect economic development. The more specialized the sector is and the less it is based on locally specific assets, the more regional development and regional spill overs or agglomeration effects influence it. Conversely, the more important place-specific assets are, such as local demand, the more impact local party-political developments have.

This paper analyses a full sample of SMSTs, i.e., a specific category of municipalities that have sufficient economic and political power to consider local economic development as a crucial policy goal. It does so by examining panel data including local party-political developments in the composition of the local government as well as spatial lags to examine how neighbouring SMSTs and larger cities influence local development.

Hybrid panel models consisting of within- and between-estimates support the assumptions that a differentiated view of economic development helps to understand the potential of local politics to shape it. The findings show that party-politics only has the potential to shape the residential economy, and that there is a negative effect on local economic development for a government with a lower share of left parties. While the models do not explain much in terms of

the development of low-/ high-tech industries who are supposed to develop idiosyncratic, KIBS are mainly driven by regional developments.

Governments with a higher share of left parties more successfully provide an attractive environment for the residential sector, which is highly dependent on local demand. In contrast, the low-/high-tech industries and KIBS are export-oriented and interesting environments and attractive economic conditions, such as low corporate tax rates (Brülhart et al. 2012), interest them more. The results indicate that different party compositions in the local executive lead to different local economic policy strategies that aim to support the residential economy. However, whether non-effects in KIBS stem from the considerable impact of regional so that local party-political differences in local economic strategies do not matter or from the fact that all parties agree on the same strategies should be subject to further research.

By analyzing a full sample of SMSTs, this paper offers a broad view of the relevance of local autonomy and party politics on local economic development. Since SMSTs are by definition municipalities of economic and political importance, the findings can possibly also be generalized to smaller municipalities: when local party-politics does not affect the development of low-/high-tech sectors and KIBS, it is likely that the effect holds true for smaller, more vulnerable municipalities with lower populations and fewer jobs.

The findings are also relevant beyond the Swiss context. This polycentric structure in a highly federalist setting provides the local level with very high autonomy and makes Switzerland a most likely case for local party-political influence on local economic development. If different political perspectives of how to shape the local economic structure only manifest themselves in the residential economic development, and weakly at that, it is likely that local party-politics also has a low impact in other countries that have less local autonomy. On the one hand, the high impact of regional developments indicates that regional cooperation in different policy

areas, such as economic development, land use- or transport policy, is crucial for local economic development in a highly federalist setting with high local autonomy and a highly competitive inter-municipal relationship (see also Sager 2005; Koch 2013; Feiock et al. 2009). On the other hand, the low impact of local party-political differences on the growth of employment indicates a post-political consensus on the need for economic growth, which classical critical urban theory criticizes (Harvey 1989).

A differentiated understanding of co-determination in economic development on different administrative levels can also contribute to regional institutionalism arguments and the 'dilemma of scale' in democratic theory (Swanstrom 2006; Kantor 2006). This paper shows how local autonomy in economic development is limited by regional development, depends on the economic sector and therefore raises the question of how to deal with this regional influence from a local democratic perspective. Highlighting interdependencies can 'represent opportunities for subnational authorities to develop new forms of democratic participation as well as new forms of organization' (Loughlin et al. 2011, p. 10). If local politics seeks to have a democratically legitimized grip on local economic development in a federalist setting, it is worth noting that regional determinism and engagement in regional organizations can undermine local democratic entities. Matching democratic structures and economic functional regions would require consolidated regions that possess a regional institutionalized political entity or a regional activity democratically legitimized by local direct democratic procedures.

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Appendix

Table A1. Operationalization table.

	Source	N	Mean	sd	Min.	Max.
Full employment (log)[12]	BFS	740	7671	4860	1356	26'138
Res (log)	BFS	740	5602	3820	1306	19'313
KIBS (log)	BFS	740	528	679	9	5795
LT (log)	BFS	740	708	541	14	3717
HT (log)	BFS	740	833	1063	0	7287
Party composition (between)	BFS and media analysis (swissdox.ch)	740	.72	.17	.267	1
Party composition (within)	See above	740	-0.007	.08	-.390	.33
Economic dev. Neighbours (log, within)	BFS and connectivity matrix	740	0.020	.10	-.290	.50
Distance to metropolitan centre (min.)[13]	Sbb.ch	740	34.3	26.7	3	137
Population (log) (between)	BFS	740	14'894	6879	5268	41'157
Population (log) (within)	BFS	740	0.038	0.075	-0.62	0.52

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[12] The operationalization table lists absolute values.

[13] Divided by 10 so that the models ease the comparability of the coefficients.

Paper 3

Voluntary regional cooperation in Swiss polycentric regions

Voluntary regional cooperation in Swiss polycentric regions

Abstract

This paper extends the recent research on the increasing economic and political importance of Small and Medium-sized Towns (SMSTs) in Polycentric Urban Regions (PURs). It does so by examining the kind of governance mechanisms Swiss SMSTs in PURs voluntarily engage in to partake in regional economic development and analyses macro-level data for all Swiss SMSTs and smaller cities to determine which political, economic and spatial factors explain polycentric cooperation. Combining concepts from political science, public administration and economic geography and taking the bottom-up perspective of SMSTs sheds light on the question of how and why some SMSTs in PURs decide to cooperate while others do not. While recent research shows how SMSTs benefit from their proximity to each other, research on how and why they make use of this proximity is scarce. The paper offers new insights into the determinants of voluntary cooperation in regional economic development that are relevant for the appropriate planning of cooperation in fragmented PURs beyond the Swiss context. The findings support the theoretical arguments that the assessment of potential gains and division and information costs of a cooperation helps to explain voluntary cooperation with other SMSTs (words: 191).

Introduction

Cities and towns in Polycentric Urban Regions (PURs) constitute the lowest administrative state level. While extensive research exists on whether the location in a PUR and PURs in general promote economic performance and spatially balanced territorial development, this paper asks how and why cities and towns at the bottom of the institutional state hierarchy actively try to overcome their fragmented polycentric spatial contexts by engaging in functional integration. Therefore, we examine the governance mechanisms of regional economic development cooperation and aim to answer two questions: 1) what characterises polycentric cooperation in regional economic development and 2) which political, economic and spatial factors explain whether cities and towns cooperate with each other in the highly polycentric and federalist case of Switzerland. Top-down spatial development planning is difficult in the context of fragmented arrangements in decentralized states (Sager 2005; Kaufmann and Sager 2019). For this reason, this paper argues for a bottom-up view of why towns decide to cooperate beyond their institutionalized borders in order to bolster the economic development of their broader region. Kaufmann and Wittwer (2019) show that Swiss towns and cities experience positive employment development if they are embedded in a dynamic network of towns and cities.[14] This paper aims to deepen the understanding of this finding by focusing on functional integration in PURs (see Meijers 2008) and seeks to uncover how SMSTs actively try to take advantage of spill-over effects by cooperating with each other to promote the regional economy.

The focus lies on a specific functional category of municipalities: small and medium-sized towns and small cities (SMSTs). Several publications emphasise the relevance of SMSTs argue for a research perspective beyond large metropolitan centres (Servillo et al. 2017; Bell and

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[14] They apply a strictly morphological perspective on PURs by focusing on travel minutes between SMSTs and cities.

Jayne 2009; Dijkstra et al. 2013). SMSTs can act as centres on a regional scale and contribute to a country's gross domestic product (GDP) in a way that is similar to large cities. Although SMSTs are at a smaller scale than prominently studied areas like the Ruhr Area or the Randstad, they also possess city characteristics, such as dense structures, centre functions and economic relevance (see Bell and Jayne 2009). They also provide a higher variety of cases to analyse and compare in a specific institutional setting. The fact that SMSTs themselves can act as regional centres highlights the aspect of voluntary cooperation. For some SMSTs, the decision to cooperate shows a willingness to actively engage in collective action. For other municipalities, cooperation is more of a necessity that allows them to take advantage of the developments that occur in SMSTs and larger cities.

Switzerland's strongly institutionalised decentralised structure comprised of powerful subnational cantons and municipalities with comparatively high local autonomy has its roots within the history of the federal state (Sager et al. 2017). Consequently, Switzerland is a highly polycentric region (see e.g. Meijers 2008; ESPON Policy Brief 2016) consisting of many large and small regional centres and a high concentration of SMSTs. Preserving this regional polycentric structure is a crucial goal of the Swiss spatial concept (see Schweizerischer Bundesrat, KdK, BPUK, SSV, SGV 2012). In line with European regional development strategies (ESPON Policy Brief 2016), polycentric regional economic development that extends beyond the largest cities is a specific and widely supported spatial development goal in Switzerland.[15] While Schmitt (2013, p. 409) claims that the issue of the top-down promotion of polycentric cooperation 'is perhaps even greater within nation states with a federal structure, since a metropolitan area can be of the same socioeconomic (and thus even political) weight as a federal state (e.g. a Bundesland in Germany and Austria)', the case of Switzerland shows that while federalism and decentralisation can impede top-down planning, it is still possible to politically promote a

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[15] A concrete measure is the so-called 'New Regional Policy', which fosters economically sustainable, potentially innovative projects at the local and regional levels outside of large cities and their agglomerations.

polycentric structure. However, it is more a question of horizontal governance. This paper's findings can therefore be of interest to other countries that have a decentralised planning structure – but also to less federal states that lack the national commitment to foster spatially balanced territorial development (see e.g. Martin 2015 for a discussion on the United Kingdom). While the bottom-up view is interesting as top-down planning often is difficult for federal states or states with traditional decentralized planning structures, countries with a more top-down planning culture also rely on compliance at the bottom level of the municipalities. Additionally, regional cooperation is relevant also beyond the nation state. In a study on the interlinkage between regional cooperation and international integration in the European Union, Mueller and Hechter (2019) show that countries that delegate authority from the local and higher levels to regions are more likely to partake in economic (and legal) European multilevel governance.

Horizontal regional cooperation between SMSTs take many forms. This is true even without 'adding another layer of administration to the existing system' (Kloosterman and Musterd 2001, p. 627). Beyond the highly institutionalised borders of the subnational cantons, cooperation occurs on a voluntary basis. The paper responds to its first question by analysing the different governance mechanisms that address the regional economic development of Swiss SMSTs in PURs are being analysed.

To answer the second question, the paper analyses data on political, economic and spatial factors. Analysing these factors help to explain why SMSTs choose to cooperate with other SMSTs in a polycentric region or position themselves as a regional centre that only cooperates with small municipalities or not at all.

The theoretical argument stems from the literature on the institutional collective action framework (Feiock 2007, 3013), which claims that the incentives for participating in polycentric cooperation are greater when there is higher structural pressure on SMSTs and when the region is more homogenous.

The paper seeks to uncover the reasons behind SMSTs' decisions to cooperate or not (i.e., causes of cooperation, not the consequences). Switzerland's polycentric urban structure and high local autonomy provide an excellent case for examining cooperation in a setting that is less influenced by top-down planning than other European countries (see e.g. Nelles et al. 2018). A multi-disciplinary approach combines theories of political science, public administration and economic geography in order to contribute to the discussion on how PURs in fragmented settings organise their cooperation and which factors constrain and foster polycentric regional development. It thereby aims to offer helpful insights into the appropriate planning and governance of PURs beyond the Swiss context.

The paper adopts the following structure. The first section discusses horizontal cooperation in regional economic development from a theoretical perspective. The second section derives assumptions about the factors that may explain why SMSTs cooperate with each other. The third and fourth sections present the data and methods. Section five presents and discusses the results, and the sixth section provides a conclusion.

Horizontal cooperation in regional economic development in a multi-level context

This paper focuses on horizontal cooperation in regional development policy, where SMSTs as co-operators aim to bolster their region economically by making use of several instruments. They establish a regional brand, advertise their region to firms, support knowledge transfer for firms, assist them in finding network partners and help them to settle in the region. Polycentric cooperation occurs in a region that consists of more than one SMST. In contrast, an SMST in a monocentric setting only cooperates with smaller municipalities, if at all, and is the only centre.

The organisation of regional economic development heavily depends on the institutional context. In a centralised state, central planning agencies can set regions' perimeters based on their functional characteristics and can delegate authority to them (Schmitt 2013).[16] However, in decentralized states such as Switzerland, the consolidation approach is more difficult: the municipal level is highly autonomous and cannot be forced into consolidated regions as territorial logics are too institutionalised (Sager 2002, 2005). In such cases, the decision to cooperate lies with municipalities. Choosing *local* economic development may lead to municipal competition, as postulated by public choice theory. Embracing *regional* economic development may encourage the building of horizontal and vertical networks with different actors, as postulated by the new regionalism approach (see e.g. Savitch and Vogel 2009). The question of whether or not SMSTs promote regional cooperation is particularly interesting in the case of SMSTs in PURs. First, economic development is crucial for SMSTs' economic and political relevance. Second, a polycentric environment can enable an SMST to borrow size and benefit from spillover effects. However, these benefits do not guarantee that all SMSTs are ready to pay the transaction costs required for cooperation. Two reasons may explain SMSTs' reluctance to cooperate: They try to free-ride on their neighbours' spill-over effects or they are so powerful that the costs of cooperation would be higher than its potential benefits.

In order to examine whether or not SMSTs decide to cooperate with each other, we first need to clarify the relevance of regional economic development and regional functional integration. With this in mind, three questions drive the next section: 1) why is local economic development important for a municipality *per se*, 2) why is economic development *in a region* important for a municipality and 3) why can *active integration* into a region through horizontal polycentric cooperation be important for a municipality.

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[16] For example, as is the case with 'communautés urbaines' in France (see Kübler 2012).

Why is *local* economic development important for SMSTs?

Switzerland's local level possesses a highly fragmented authority, and it's local autonomy is among the highest worldwide (Ladner et al. 2016; Sellers and Lidström 2007). Municipalities compete for tax payers, whether it be income or corporate taxes, given that the municipal level raises between 20-30% of all taxes (Linder and Mueller 2017, p. 167). Additionally, high autonomy means that the money is spent at the municipalities' discretion. Sufficient income through taxation is necessary to guarantee the provision of public goods for the municipality's inhabitants. Local economic development is therefore a substantial municipal goal. A survey of executive politicians at the local level shows that crucial local policies include taxation policy and policies that provide a favourable environment for firms (Geser et al. 2011). Economic development is inherent in the definition of SMSTs as this designation implies a certain number of jobs and a certain regional economic relevance. The question lies in whether local economic development benefits more from fragmented municipalities or cooperation. SMSTs in particular must question if they should position themselves as single regional centres or whether polycentric cooperation is better.

Why is *regional* economic development important for SMSTs?

Spill-over effects and economies of scale speak for fostering regional development over solely municipal economic development (Kloosterman and Musterd 2001, p. 627; Krugman 1997). PURs provide a particularly interesting setting through which to examine regional development, as they have a large potential for spill-over effects. Smaller towns in polycentric regions can 'borrow size' from each other, which can lead to better economic performance and to more metropolitan functions (such as cultural amenities) through spill-over effects when compared with isolated towns (Alonso 1973; Meijers and Burger 2017). However, proximity to larger

cities may also lead to 'agglomeration shadows' that may lead to greater competition or to an SMST bearing the costs of large cities, such as the presence of low income residents that work in the nearby city but cannot afford to live there (Meijers and Burger 2017; Krugman 1997).

There is evidence of positive economic spill-overs in Swiss regions that have a higher density of SMSTs (Kaufmann and Wittwer 2019). However, it remains unclear whether proximity (morphological perspective) itself produces the positive spill-over effects or if interaction and integration (functional perspective) are crucial (e.g. Ansell and Gash 2007; Ahrend et al. 2016; Meijers et al. 2018). Meijers et al. (2018) and Meijers and Burger (2017) show that in European PURs, institutional integration has a positive effect on the spill-overs of metropolitan functions and that agglomeration shadows are lower in regions with more functional integration. The ESPON Policy Brief (2016) also argues for an integrative perspective: 'Polycentric develop-ment is not about cities making massive investments in order to grow bigger. Instead it is about building linkages and joining forces with neighbouring cities and towns' (p. 2). The fact that SMSTs voluntarily engage in regional economic development cooperation supports the as-sumption that interaction and integration are crucial factors for regional economic develop-ment.

Why is *horizontal cooperation* in regional economic development important for SMSTs?

A rational-choice assumption claims that horizontal cooperation is a means of engaging in economic development, thereby leading to more gains than an individual SMST strategy could provide (Feiock 2007). From a political perspective, horizontal cooperation can strengthen the economic and the political importance of a region at higher government levels. Cantons are the most important players in imperative policy fields such as large-scale land-use planning (Sager et al. 2017). Cantonal administration designate some SMSTs, or specific areas in SMSTs, as 'growth areas' (Kaufmann and Meili 2019). These 'growth areas' are areas that have been determined to have a large growth potential and hence a vibrant economic environment. As a

result, they are central for cantonal, and sometimes also federal, investments in land-use planning. Horizontal cooperation can compensate for the lack of such top-down interventions in SMSTs. Additionally, cantons are also responsible for implementing federal regional policy, which aims to support regions through the start-up funding of innovative regional projects. Higher-tier governments are very active in the policy field of regional economic development. Their active participation is also visible in the promotion of very large-scale economic development organisations that transcend multiple cantonal borders (such as the Greater Zurich Area with 9 cantons, the Greater Geneva Bern Area for western Switzerland or the Switzerland Global Enterprise for all of Switzerland). Even though these organisations are important players, not all regions and SMSTs benefit from being included in their perimeter. With this in mind, the horizontal cooperation of municipalities can be a reaction to the fact that a region does not receive sufficient support from higher-level agencies and therefore relies on itself or a means of becoming more visible in order to benefit from the support of higher-tier governments.

In the case of SMSTs, some towns may already be large enough so that they do not have to rely on cooperation with others because they either already benefit from higher-tier governmental support or because they do not need to rely on it. The question of why SMSTs decide to cooperate with each other must therefore evaluate the potential costs and benefits of cooperation.

Sources of transaction costs in cooperation

The governance of functional economic regions that usually exceed institutionalised (local, subnational, national) borders faces well known and studied challenges of cooperation, defection and free-riding (Feiock 2007; Feiock and Scholz 2010; Feiock 2013; Ostrom 1990). To understand the motivation for cooperating from a bottom-up perspective, the Institutional Col-

lective Action Framework (Feiock 2013) weighs the costs of different mechanisms of cooperative governance with potential benefits and risks.[17] Economic development is a promising field for examining cooperation. Feiock et al. (2009) argue that '… the potential benefits from cooperation in economic development can be large', but 'the transaction costs tend to be correspondingly high, making economic development one of the toughest cases for institutional collective action' (p. 256). Opportunistic motivations provide compelling incentives to free-ride and to defect. In studies that explain joint ventures in the economic development of cities in the US, Feiock et al. (2009), Hawkins (2010) and Gerber et al. (2013) describe four factors that are crucial for cooperation in economic development policy: *joint gains, the division of joint gains, agency costs and information costs*. The next section will discuss and adapt these factors to the Swiss case.

Transaction costs in the polycentric cooperation of SMSTs

Why do some SMSTs cooperate with others, while others decide to only cooperate with small municipalities and act as a regional centre or not cooperate at all? Economic development regions in Switzerland serve to economically bolster their region and to conduct economic development strategies to support firms already settled or aiming at settling in the region. They for example establish and promote a regional brand or advertise opportunities for firms in their region and to help them settle in.

Regional activity therefore inherently operates on the assumption of positive spill-overs as members accept that firms may also settle in neighbouring municipalities. However, the perception of these spill-over may vary. As the focus of this study lies in a bottom-up view of why SMSTs choose to cooperate with each other, this section derives its assumptions based on the

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[17] The ICA framework can be compared to approaches that aim to capture processes leading to intergovernmental cooperation in European Union integration theory. It mainly applies a *post-functionalist* approach that argues that structural factors, pressure as well as identity-related factors are important for explaining member state integration (Schakel et al. 2015; see also Mueller and Hechter 2019).

theoretical arguments of the institutional collective action framework. It does so by comparing the costs and benefits of cooperation for SMSTs in Switzerland (Box 1 sums up the hypotheses).

Joint gains: What do SMSTs gain if they cooperate, and, consequently, does the local level evaluate regional economic development? The larger the benefits of cooperation, the more likely they are to outweigh the costs of cooperation that are necessary to achieve them. Hence, the greater the need for economic development, the more to be gained from successful cooperation.

When do the potential benefits of a cooperation outweigh its costs (Feiock et al. 2009)? The more an SMST depends on surrounding SMSTs, the higher its incentive to jointly organise regional development. Commuting patterns can measure an SMST's dependence on surrounding SMSTs. The more inhabitants that out-commute for work, the more the SMST relies on the economic development of its neighbours.

However, economically stronger SMSTs may be less inclined to cooperate with other SMSTs. These SMSTs do not rely on spill-overs as much, they are more essential for top-down cantonal spatial planning policies (as 'growth areas'), and they can often position themselves as regional centres. SMSTs with higher employment rates in the export-oriented sector (in relation to the population) are therefore assumed to be less likely to cooperate with other SMSTs. SMSTs suffering economic stress and having low employment rates on the other hand are more dependent on regional development and hence are more willing to cooperate out of necessity (Feiock et al. 2009, p. 261).

A high income per inhabitant can be a sign that SMSTs see themselves as 'bedroom communities' that focus on offering good living conditions for wealthy residents that work in nearby

centres (Segessemann and Crevoisier 2016). These SMSTs are arguably less interested in regional economic development as they already benefit from their proximity to large centres, even though they have large out-commuting patterns. They therefore also have fewer incentives to cooperate with other SMSTs. Last, the political composition can weigh the gains of regional cooperation economic development differently.

Another crucial factor is the behaviour of an SMST's neighbours: If an SMST has neighbours and these neighbouring SMSTs are themselves in a region, there are greater incentives to cooperate as well, be it with this neighbour or with others, in order to avoid giving them a competitive advantage.[18]

Division of joint gains: How are the joint gains of cooperation distributed? Is the SMST satisfied with the contractual conditions of the cooperation? The allocation of joint gains depends on the negotiation outcome. More homogeneous regions are expected to distribute gains more equally because no one actor possesses substantially more negotiation power.

If potential cooperation partners have different bargaining power, the potential for conflict is higher. It is possible to operationalise this heterogeneity by measuring the absolute number of jobs, the development of jobs over time and the population *in relation* to neighbouring SMSTs. The greater the differences, the more difficult it is to reach a consensus and the more likely it is that a fear of bad compromises will arise. Additionally, consensus is less likely if there are differences between the political composition (measured by share of non-left parties) of SMSTs' administrations that negotiate the cooperation.

Agency costs: How homogeneous are the interests inside an SMST? Constituents have to legitimise cooperation agreements because these agreements require resources from the municipal budget. Local opposition in a heterogeneous political environment can hinder cooperation

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[18] See Note A.4 in the Appendix for a methodological discussion on the interdependence between the observations and the argumentation for the approach.

while unstable political majorities make local opposition more likely. However, this is only the case if the SMST is in a condition where there are incentives for cooperation. In a very remote SMST for example, where polycentric cooperation is already difficult, political majorities could also have a political consensus against cooperation. Consequently, we assume that agency costs in a heterogeneous setting only play a role for SMSTs incentives for cooperation already exist.

Therefore, in SMSTs that have a neighbouring SMST that already cooperates with others, left or centre and right parties that possess a stable majority in the local government (more than 3/4 of seats in the executive) face less opposition to their decisions for cooperation than a government composed of more or less similar amounts of left and middle/right parties. This measurement does not account for the government's political ideology, only its relative strength.

Information costs: How well is an SMST already connected to a potential partner? The public administration literature contains vast information on the informal factors that increase the likelihood for cooperation, such as trust and repeated interactions, which occur at the individual and institutional level (see e.g. Ansell and Gash 2007; Gilardi and Wasserfallen 2016 for Switzerland). For cooperation to work, the cost of gathering information on potential partners must be low.

Information costs are higher for SMSTs that only have infrequent experience exchanging information with others. There is a greater likelihood of having experience in this area if SMSTs belong to the same canton and are close to each other. There is a greater likelihood of having experience in this area if SMSTs belong to the same canton and are close to each other. Additionally, SMSTs that are closer to a metropolitan centre are also automatically located in denser settlement structures.

SMSTs that neighbour each other are more likely to cooperate in policy fields other than economic development (such as intergovernmental service agreements), and it is likely that they have more regular exchanges. On a broader scale, the same holds true for SMSTs in the same canton.

However, an SMST's location in a denser settlement structure also increases its incentive to free-ride. To grasp the free-riding potential, we interacted the number of an SMST's neighbours with local variables. These variables include political majorities and economic characteristics that examine whether SMSTs are more likely to free-ride if they have many neighbours and a prosperous economy or a large share of non-left parties in local government.

Box 3: Hypotheses

Joint gains:

H1: The stronger a town is economically, the lower the odds that it will cooperate with other SMSTs

H2: The higher an SMST's focus on being a bedroom community, the lower the odds of cooperation

H3: If an SMST has a neighbouring SMST that cooperates in a region, the likelihood for the SMST to cooperate is higher

Division of joint gains:

H4: The stronger a town is economically and the larger its population *in relation* to neighbouring towns, the more unbalanced the bargaining power and hence lower the odds of cooperation

H5: The greater the difference in the political composition of the local government, the lower the odds of cooperation

Agency costs:

H6: The more homogeneous a town is politically, the easier it is to find a majority in favour of cooperation and hence the higher the odds of cooperation

Information costs:

H7: The more experience an SMST has cooperating with other SMSTs, the higher the odds of cooperation in regional economic development

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Table 1: Operationalisation table

Variable	Operationalisation	Scale	Source	Mean (SD)	Range
Polycentric cooperation (DV)	Cooperation with other SMSTs (e.g. polycentric) or not?	Binary	Web search, self-conducted	0.72 (0.45)	0-1
No. of neighbours	Number of SMSTs in a <20minutes commuting distance.	Interval	Self-conducted	3.70 (2.30)	0-10
Neighbours cooperating	Are neighbouring SMSTs cooperating in an economic development region?[19]	Binary	Self-conducted	0.87 (0.34)	0-1
Distance to metropolitan centre	Distance of SMST to a metropolitan centre (Zurich, Basel, Geneva, Lausanne, Milano and Bern) in train minutes.	Interval	Self-conducted, sbb.ch	38.50 (27.20)	4-137
Population	Population of the SMST, mean of 2011-2013.	Interval	Federal Statistical Office (FSO)	11'344 (13'621)	379.75-86'896.8
Difference Population	Absolute difference of population in the respective SMST and the mean of the population in all neighbouring SMSTs.	Interval	FSO	19'305 (11'260)	0-61'837
Income per inhabitant	Income per inhabitant in 2013 in Swiss Francs (divided by 100).	Interval	FSO	358.90 (103.90)	224.9-890
Party composition	Share of non-left parties in the local government (executive), mean of 2011-2013.	Interval	FSO and self-conducted	71.50 (16.80)	25-100
Difference party composition	Absolute difference of share of non-left parties in local government in the respective SMST and the mean of the share of non-left parties in all neighbouring SMSTs.	Interval	FSO and self-conducted	12.60 (11.50)	0-69
Political majority	More than 75% either left or non-left parties in the local government for SMSTs with a neighbouring SMST cooperating in an economic development region.	Binary	FSO and self-conducted	0.43 (0.50)	0-1
Employment per inhabitant	Number of jobs in the export-oriented economy (all but residential jobs) per inhabitant, mean of 2011-2013.	Interval	FSO	0.14 (0.09))	0.015-0.51
Difference employment	Difference of employment in the respective SMST and the mean of the employment in all neighbouring SMSTs.	Interval	FSO and self-conducted	-56.30 (2521)	-6'619-10'114
Out-commuting per Inhabitant	Share of out-commuters of the total population in 2013.	Interval	FSO	32.00 (8.12)	5.87-46.64

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[19] The data fall into all four possible categories: 1) 'SMSTs has neighbours in PURs and is in PUR as well' (n=89), 2) 'SMST has neighbours in PURs but itself is not' (n=21), 'SMST has no neighbours in PURs but itself is' (n=3) and 'SMST has no neighbours in PURs and itself is not either' (n=14).

Data and methodology

Data

The paper's analytical approach systematically compares the macro-level characteristics of Swiss SMSTs. The sample includes a full census of all Swiss SMSTs and smaller cities (representing 34% of the Swiss population. The Appendix includes a list of all the municipalities examined).[20] The classification of these urban settlements comes from the Swiss Federal Statistical Office (SFSO). It integrates European definitions of towns and cities (see Servillo et al. 2013; Dijkstra and Poelman 2012) into its own definition that includes dense settlements that have a minimum of 5'000 residents and a minimum sum of 14'000 people that either live, work or lodge within their administrative boundaries (Goebel and Kohler 2014).

In order to describe and analyse the *dependent variable* of cooperation in regional economic development, data on the regional economic strategies of SMSTs was collected by searching SMSTs' websites for references to their membership in economic development regions. Given that economic development regions seek to actively promote their region, the visibility of the cooperation is inherent and the websites of cooperating SMSTs prominently promote it. The websites of the respective regions also include documents that provide additional information on economic development regions. A variable was constructed to operationalise the dependent variable that examines how transaction costs can explain polycentric cooperation. The variable assigns a value of 1 for SMSTs that cooperate with other SMSTs and 0 for SMSTs that act as a single centre.[21]

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[20] See table A.5. Excluded here is the 12.2% of the population that lives in the large cities of Zurich, Geneva, Lausanne and Basel, as well as Bern which only recently merged with the SMSTs of Glarus Nord, Glarus and the isolated touristic SMSTs of Zermatt and St. Moritz.

[21] The study treats being in a monocentric region (i.e. the only SMST in a region together with smaller municipalities) or in no region at all as one category due to the study's focus on explaining cooperation between similar entities. Hence, these two realities indicate that the SMST acts as a regional centre.

The study relies on a self-coded connectivity matrix based on proximity for measuring the spatial context of each SMST. In line with the literature, it calculates distance by measuring the transportation network by train distance and not by physical distance. If a town is located within a train journey distance of less than 20 min from the centre of a metropolitan region, it is considered to be a neighbour.[22] An SMST's neighbours are taken into account in order to assess their economic, demographic and political characteristics in relation to other SMSTs and cities in their spatial context. The characteristics of interest are considered in relation of the mean values of its neighbours. Regional political homophily, for example, is measured by calculating the absolute difference of the share of non-left parties in local government in the respective SMST and the mean of the share of non-left parties in the neighbouring SMSTs.[23] A detailed list of the operationalisation of the variables appears in Table 2.

Data on economic and demographic characteristics are taken from the FSO, and the division of the economic sectors into export-oriented and residential economies adheres to that of Meili and Mayer (2017) and Kaufmann and Wittwer (2019). The political composition of the local government also partly stems from the FSO. However, some SMSTs are not included in the FSO's data as it only incorporates municipalities that fall under an older definition.[24] In these cases, data on the composition of the local governments was collected using a web and media analysis that examined the online documentation of local election results.[25] SMSTs are coded as 0 if local government officials position themselves as left or as being supported by left parties (SPS, GPS, AL, CSP and other local left parties) and as 1 otherwise. The distance in train

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[22] See Figure in A.1 displaying the distribution of number of neighbors. Time calculated using the www.sbb.ch time table and GoogleMaps. Scholars consider twenty minutes to be a good proxy for a commuting distance that indicates closeness (Kloosterman and Musterd 2001) given that reaching distances within Swiss cities can also easily require more than 20 min of transport time.

[23] Large cities as neighbours are strong outliers for their values of population size and economic power. Their values are therefore excluded when calculating the spatial context for population size and economic power.

[24] The older definition simply required having more than 10'000 inhabitants.

[25] This data was source from the online news archive of swissdox.ch and a search of local administrative websites.

minutes for each SMST is measured to assess the distance from an SMST to its closest metropolitan centre[26].

Methods

A first analytical step compares the descriptive characteristics of SMSTs that cooperate with other SMSTs and SMSTs that are part of a monocentric network or no network at all.

In order to allow for an empirical assessment of the factors that explain polycentric cooperation in regional economic development, the likelihood of forming part of a polycentric cooperation is regressed on the above mentioned explanatory factors. As the dependent variable is binary, logistic regressions with cluster robust standard errors (Williams 2000) are estimated in order to control for heteroscedasticity at the subnational cantonal level (i.e. controlling for unobserved effects of cantonal factors on the observed SMSTs).

Descriptive patterns of economic development regions in Switzerland

This section illustrates the characteristics of cooperation in regional economic development in Switzerland in order to provide an initial descriptive overview. The economic development regions are characterised based on the following attributes:

1. Are the regions polycentric or monocentric?
2. Does cooperation cross cantonal borders?
3. How strong is the agency of the region? Does the region have an office and staff?
4. Are private actors involved in cooperation?
5. Top-down vs. bottom-up: Is there a cantonal initiative that encourages municipalities to build regions or are regions established through bottom-up initiatives led by the municipalities?

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[26] Metropolitan centres include Zurich, Geneva, Lausanne, Basel, Bern and Milano.

The descriptive patterns reveal an important finding regarding the institutional setting of the different economic development regions. Cantonal agencies in three regions within the cantons of Basel-City/Basel-Country, Schwyz and Geneva pro-mote regional economic development that automatically includes every municipality as part of the development region, whether it be a small village or a city. This is a classic top-down approach to planning polycentric govern-ance. As a result, the next section's theoretically bottom-up approach excludes SMSTs in these four cantons. However, they remain in the sample as part of the descriptive overview.

	Coopera-tion in re-gion	*Of which:*	Polycen-tric regions	Crossing can-tonal bor-ders?	Strong Agency	Hybrid coopera-tion	Mainly hori-zontal
Share of total	90%		78%	10%	84%	43%	49%

Table 4: Descriptive characteristics of Swiss economic development regions

Supporting the relevance for regional economic development, almost 90% (139 of 153) of Swiss SMSTs are part of a regional cooperation of which 78% cooperate with other SMSTs in a polycentric region. Interestingly, only 10% of SMSTs cooperate with SMSTs from other cantons. This finding supports the assumption on the effects of information costs. This assump-tion posits that cooperation across cantonal borders is more difficult due to SMSTs' limited experience exchanging information across borders when compared to exchanges with SMSTs in the same canton.
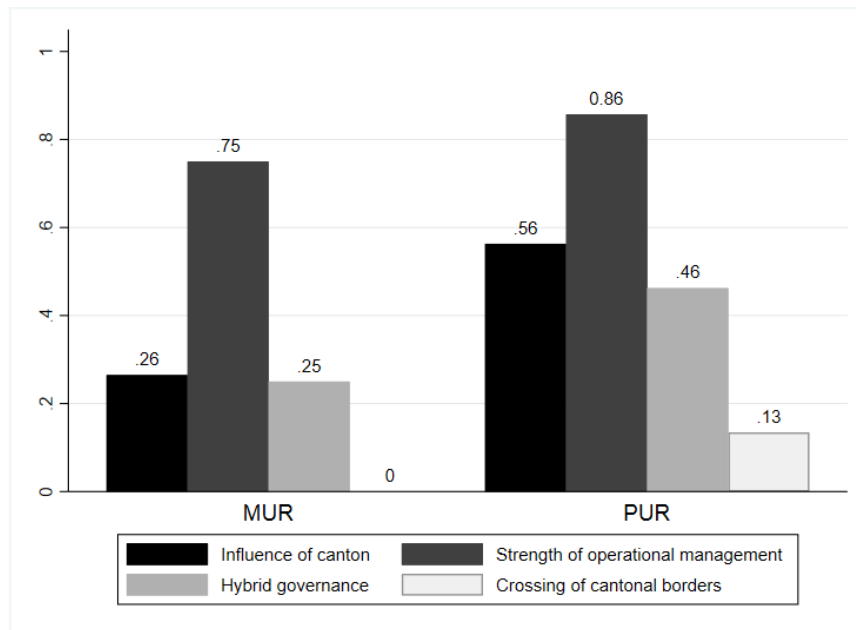
Figure 3: Characteristics of polycentric (PUR) and monocentric (MUR) regions

The plots in Figure 1 show the differences in cooperation characteristics between polycentric and monocentric regions. PURs have more cross-border cooperation, stronger agency and more hybrid governance than monocentric regions. Cooperation is less likely to take place in cantons where the municipalities of a canton are grouped in subcantonal economic development regions.[27] Although membership in these regions remains voluntary and the perimeters of the regions are negotiable, the process is less bottom-up. While less than half of SMSTs cooperate with private actors, this share is higher in PURs. This can help to explain why PURs have stronger agency, i.e. more people who are directly responsible for the operative tasks of the regions. Consequently, regions that count on the greater involvement of higher-tier organisations have less agency power and hybrid governance. If regions are constructed as part of a more horizontal bottom-up process, they often involve more private actors, greater crossing of cantonal borders and, they possibly have more personal resources in the operative management of the region in order to deal with higher negotiation costs in the cooperation.

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[27] In the regression models, cluster robust standard-errors control for cantonal influence.

Polycentric cooperation from an institutional collective action perspective

This section further examines the polycentric cooperation of SMSTs by analysing potential explanatory factors using multivariate logistic regressions that take cantonally clustered error terms into account. The first four models include local and relational variables while models 5-6 also examine potential interaction effects. Since the total number of neighbours and the distance to a metropolitan centre are factors that are of substantial interest but highly correlated, they are analysed in separate regressions. Additionally, as the variable measuring the population is highly correlated with other variables and leads to high multicollinearity values, it has been excluded in the models. However, population is indirectly captured by putting it in perspective with neighbouring population size ("difference population") and the out-commuting variable. Additionally, as the income variable is highly correlated with the distance to a metropolitan centre and the party composition, it had to be excluded in model 3 (correlation table in the Appendix A.6).

Table 5: Logistic regressions with cluster-robust standard errors

	(1)	(2)	(3)	(4)	(5)	(6)
		Local and relational variables			*Including interaction effects*	
Neighbours cooperating	14.32** (14.18)	10.76** (12.97)	11.50** (8.888)	8.134** (8.280)	15.95** (15.75)	14.10** (14.04)
Number of Neighbours	0.984 (0.125)	1.001 (0.143)			0.970 (0.145)	0.991 (0.130)
Distance to metropolitan centre			0.995 (0.0142)	0.984 (0.015)		
Income per inhabitant	0.994* (0.00318)	0.993* (0.0033)		0.992** (0.00354)	0.994* (0.00346)	0.994** (0.00294)
Party composition	0.990 (0.0134)		0.988 (0.0153)		0.995 (0.0165)	0.987 (0.0146)
Employment per inhabitant	1.059* (0.0327)	1.061* (0.0344)	1.052* (0.0303)	1.064** (0.0347)	1.052 (0.0385)	1.067 (0.0425)
Difference population	0.9999** (0.0000278)	0.9999** (0.0000292)	0.9999 (0.0000341)	0.9999 (0.000033)	0.9999** (0.0000279)	0.9997* (0.0000298)
Difference party composition	0.0286 (0.0757)	0.0606 (0.118)	0.0194 (0.0524)	0.0428 (0.0961)	0.0266 (0.0750)	0.0247 (0.0670)
Difference employment	0.9997** (0.000151)	0.9997* (0.000170)	0.9997** (0.000144)	0.9997* (0.000158)	0.9997* (0.000169)	0.9997** (0.000162)
Out-commuting per inhabitant	1.001*** (0.000172)	1.001*** (0.000176)	1.000** (0.000179)	1.001** (0.000167)	1.001** (0.000182)	1.001*** (0.000171)
Political majority (dummy)		1.379 (0.871)		1.601 (1.143)		
Number of neighboursXpolitics					1.008 (0.00990)	
Number of neighboursXjobs						2.427 (3.331)
N	127	127	127	127	127	127
pseudo R^2	0.307	0.320	0.277	0.331	0.317	0.310
Wald Chi^2	(9) 23.45	(9) 41.89	(8) 22.09	(9) 82.33	(10) 42.21	(10) 23.95
Prob > Chi^2	0.005**	0.000***	0.005**	0.000***	0.000***	0.007**

Notes: Odds Ratios (values above 1 indicate a positive relationship, below 1 a negative relationship); Cluster-robust standard errors are in parentheses. Intercepts are not reported.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$

The results in Table 3[28] support the assumptions that a consideration of the potential benefits of cooperation is fruitful. First, SMSTs that have a neighbouring SMST that cooperates as part of a region have substantial and significantly higher odds of also cooperating. However, after controlling for this aspect, other factors still seem to have a significant impact on polycentric cooperation. SMSTs that have a higher income per inhabitant are less likely to engage in co-operation with other SMSTs.

Out-commuting has a positive effect on cooperation: the more people that commute out of an SMST, the more likely an SMST will be to cooperate with others. Additionally, SMSTs with a high share of local employment in export-oriented sectors are more likely to cooperate. The relational variable of the difference in employment shows an interesting pattern: SMSTs that have a higher level of employment than their neighbours are less likely to cooperate. While the share of employment in an SMST has a positive effect on cooperation, a higher difference between the level of employment of an SMST's neighbours curbs this effect. In addition to the neighbouring employment, larger differences regarding the population in a region also have a decrease the odds for cooperation. Interestingly, neither the number of neighbours nor the distance to a metropolitan centre have an effect on cooperation. This finding indicates that SMSTs that have many neighbours and are close to metropolitan centres do not cooperate.

The results partly support the hypotheses derived from the Institutional Collective Action framework. SMSTs with a high income per inhabitant and high out-commuting patterns are less likely to cooperate with other SMSTs. This finding indicates that they do not see enough benefits in a potential cooperation. However, if neighbouring SMSTs cooperate, the pressure for an SMST to cooperate is higher. The descriptive discussion on economic development regions reveals that cooperation mainly takes place inside the institutionalised borders of cantons.

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[28] The models and variables were tested for multicollinearity (variance inflation factor VIF below 10 for all variables), non-linearity and influential outliers (see Appendix A.2 for more model diagnostics). Variables with extreme outliers were logarithmised.

These factors support the assumptions of weighing the potential gains and costs of cooperation. However, the factors of political parties, political majorities and regional political homophily do not seem to play a role. Decisions for cooperation hence are not driven by ideological differences but rather by structural factors.

Additionally, SMSTs that have a large share of employment in export-oriented sectors are more likely to cooperate with other SMSTs, despite being able to establish themselves as single regional centres. In contrast to the residential economy in bedroom communities, jobs in the export-oriented sectors rely heavily on mobile resources such as knowledge and skills. Hence, SMSTs with a higher share of export-oriented employment and a higher population benefit more from cluster effects and may be more likely to see more benefits in cooperation. Additionally, being economically strong, they proportionally also can spare higher costs than weaker SMSTs and have a privileged starting position in negotiations. SMSTs with a lower share of jobs in the export-oriented sector on the other hand rely more on development in the local residential economy and have a weaker position in negotiations. However, the finding show that a difference in the size of an SMST's export-oriented economy and the population in relation to its neighbouring SMSTs' export-oriented economy decreases the odds for cooperation. This argues for the potential division of costs given that reaching a consensus between SMSTs of uneven economic power is more difficult than in a more homogeneous setting.[29]

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[29] Additional models that take the share of specific economic sectors in SMSTs into account have no significant effects and do not substantially affect the other coefficients. The analyses can be found in the Appendix A.3.

Joint gains:	*Hypothesis supported?*
H1: The stronger a town is economically, the lower the odds that it will cooperate with other SMSTs	*Partly*
H2: The higher an SMST's focus on being a bedroom community, the lower the odds of cooperation	*Partly*
H3: If an SMST has a neighbouring SMST that cooperates in a region, the likelihood for the SMST to cooperate is higher	*Yes*
Division of joint gains:	
H4: The stronger a town is economically and the larger its population in relation to neighbouring towns, the more unbalanced the bargaining power and hence lower the odds of cooperation	*Yes*
H5: The greater the difference in the political composition of the local government, the lower the odds of cooperation	*No*
Agency costs:	
H6: The more homogeneous a town is politically, the easier it is to find a majority in favour of cooperation and hence the higher the odds of cooperation	*No*
Information costs:	
H7: The more experience an SMST has cooperating with other SMSTs, the higher the odds of cooperation in regional economic development	*Partly*

Empirical illustrations of the results

The case of the so-called 'gold coast' in the canton of Zurich helps to vividly illustrate some of the findings summarised above and those derived from the regressions. It is called the 'gold coast' because five SMSTs and smaller municipalities are located on the sunny side of the coastline of the lake of Zurich, and they are inhabited by a comparatively very high share of wealthy residents. SMSTs in this region do not cooperate with each other to externally promote the region or jointly offer services to regional firms. While three of these SMSTs have neighbours that are themselves in a region, their income per inhabitant is clearly above average and their share of commuters is also above average, albeit only slightly. This indicates that they

benefit from their spatial context by free-riding and do not need to actively bolster the regional economy. They directly benefit from their close proximity to Zurich (and also to the larger regional centre Rapperswil-Jona).

However, the fact that the SMSTs' proximity to metropolitan centres does not show a significant effect in the regressions suggests that proximity can also produce agglomeration shadows. In SMSTs experiencing these shadows, regional economic development cooperation can be a crucial strategy for obtaining economic weight by actively positioning the region as an attractive location for business and residents. This is vividly manifested in the Limmatstadt AG and the Flughafenregion. These two polycentric regions close to Zurich consist of multiple SMSTs with average or slightly above average income per inhabitant. They also have similar proximities to Zurich and similar out-commuting rates as the 'gold coast'. There are numerous benefits to bolstering their region as a distinct (but still dependent) region of Zurich as a strategy for overcoming agglomeration shadows.[30]

Outside of the Zurich region, the relationship between income per inhabitant and out-commuting patterns also reveals interesting patterns. SMSTs that have an above average income per inhabitant but low out-commuting patterns prefer to foster their own economic base and thereby seek to cooperate with other SMSTs in order to gain or sustain their relevance. One such example is the city of Zug and the surrounding SMSTs that have a vibrant economy. Another factor that supports the impact of income is that the SMSTs with low income but no polycentric cooperations are the ones that are located in areas with no or only one neighbour and hence few options.

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[30] While the two metropolitan centres of Basel and Geneva are in very small city cantons (city states) where economic development is only handled by cantonal agencies, Bern and Lausanne themselves take part in regional economic development cooperation. Hence, the case of Zurich provides the most interesting case for analysing the role of metropolitan centres.

The impact of high division costs can be illustrated by the case of Lugano (in the south of the country, close to the Italian border) that deviates from its neighbours regarding population and strength of the export-oriented sectors above average. It can be seen as a typical case of a strong regional centre with an economic focus beyond its region. The economic relevance complemented with a university and the Swiss National Supercomputing Centre of Lugano has been a major reason for the inclusion of the canton of Ticino in to the large intercantonal Greater Zurich Area in 2019.[31] As indicated in the theoretical section, Lugano hence can be seen as a case where the costs of negotiating conditions of regional cooperation with its neighbours are too high as benefits are supposedly higher when focusing on larger scale regional cooperation.

Conclusion: Implications for planning and coordinating in polycentric regions

This study aims to shed light on bottom-up cooperation for regional economic development within a polycentric and federal setting. It does so using an interdisciplinary approach to examine polycentric cooperation and its drivers for all Swiss SMSTs and small cities. This approach relies on recent trends in regional studies that examine polycentric regions and municipalities that are located outside the bright lights of large cities in combination with the Institutional Collective Action (ICA) framework mainly used in political science for the study of local governments. A bottom-up view of cooperation provides perspective on the challenges of planning and governing PURs. It goes beyond top-down planning strategies by considering the factors that actually enable or impede the successful implementation of strategies that aim to create spatially balanced territorial development in a polycentric context.

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[31] https://www.greaterzuricharea.com/de/news/beitritt-tessin (access on 2 March 2020, no English version).

Regions that have multiple SMSTs have different characteristics than regions that have one single centre since they are more hybrid and have more agency power. This supports the assumption that polycentric cooperation is taken seriously as a means for bolstering a region. Future research should consider how the different characteristics of cooperation can influence the success and sustainability of regional economic development. The question of integration into a region is only one part, the other is how the region is organised and equipped. Stronger agency can increase the visibility of a region on a larger scale, but it also requires more resources. Some regions therefore decide to include private actors into the regions. This strategy invites investments but also results in higher cooperation costs that require resources.

The second part of the paper focuses on a rational-choice based bottom-up explanation of voluntary polycentric cooperation in regional economic development that tries to weigh the potential costs and benefits of cooperation. The analysis of a mix of newly-gathered data and the official data of the FSO reveals that an institutional collective action perspective on polycentric cooperation is fruitful. The behaviour of neighbouring SMSTs is the most substantial explanatory factor in the data: if at least one neighbour participates in an economic development region, the pressure for an SMST to cooperate rises. However, after controlling for this aspect and for the total number of neighbours and embeddedness in the agglomeration of a metropolitan centre, other factors also prove to be influential. While political variables do not play a direct role, a macro-perspective on the potential division costs and benefits of cooperation indicates that they can help to understand whether or not SMSTs engage in polycentric cooperation. SMSTs that act as bedroom communities, possess high out-commuting patterns and host wealthy residents are especially less likely to cooperate as they benefit from spill-over effects without network integration. On the other hand, SMSTs with a large share of export-oriented industry rely more on the economic development of their region, as this industry heavily depends on mobile resources such as knowledge and skills. This finding expands the results of

the study by Kaufmann and Wittwer (2019), which reveals that SMSTs located close to SMSTs with growing export-oriented sectors also experienced growth. Additionally, it emphasises that these SMSTs actively engage in the bolstering of their region by cooperating in regional economic development, especially if they have similar economic potentials and population to that of their neighbours. The assumptions postulated by the ICA framework (see Feiock et al. 2009; Gerber et al. 2013) of the importance of political homophily for cooperation and the inclination of economically powerful municipalities to pursue purely self-serving non-cooperation strategies however cannot be supported in the case of Switzerland.

This paper's bottom-up view on polycentric cooperation in economic development can be applied to regions outside of Switzerland, especially in regions where top-down intervention is difficult such as federal states or countries with a decentralized planning tradition. A systematic consideration of potential costs and benefits for each town or city that cooperates is crucial in order to make obstacles visible. This systemization hence is also crucial from a more top-down planning view: the motivation to comply with and engage in polycentric cooperation that is planned from top-down is greater if potential obstacles such as high division costs are already addressed in the planning phase prior to implementation. The findings of this paper are comparable to findings from similar empirical approaches in the comparably decentralized USA, which show that the (sub)national context is crucial. For example, in California, a higher difference in the share of Latinos in the local population compared to the share of Latinos in the population of potential cooperation partners (cities) has a negative effect on cooperation (Gerber et al. 2013). Additionally, general agency variables account for differences in the institutional organisation of a municipality, e.g. if city residents and not the district elect the council seats the accountability of the politician in charge is higher (Feiock et al. 2009). Understanding the potential benefits and costs for each town or city requires taking the institutional and cultural context into account.

A bottom-up view that assesses the costs and benefits of cooperation for a town or city based on its specific characteristics and spatial context can contribute to understanding how cooperation in PURs works in fragmented settings. This view helps to explain the factors that foster polycentric regional development and how to overcome constraints in a fragmented setting.

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Appendix

A. Additional Figures and Tables

Figure A1: Histogram dependent variable
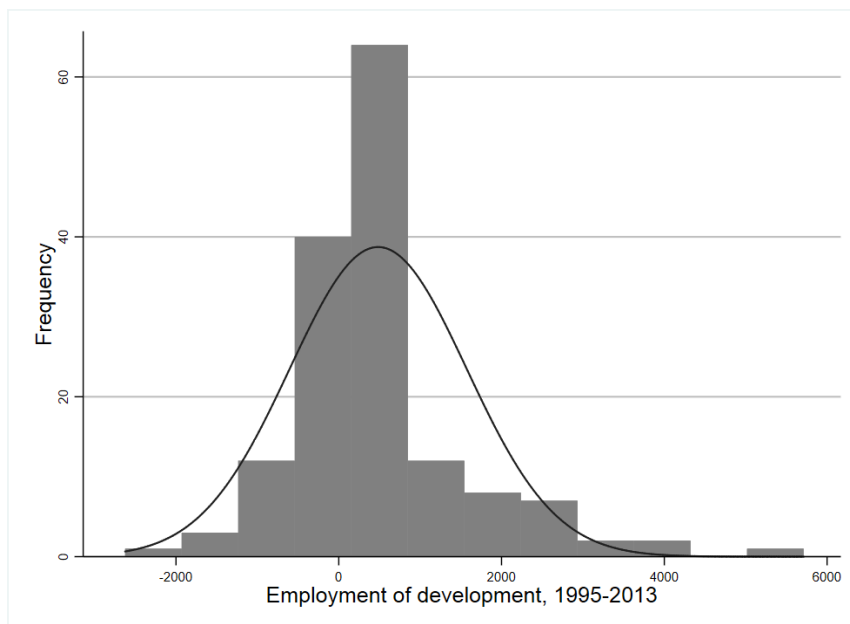
Figure A2: Cantonal means in dependent variable
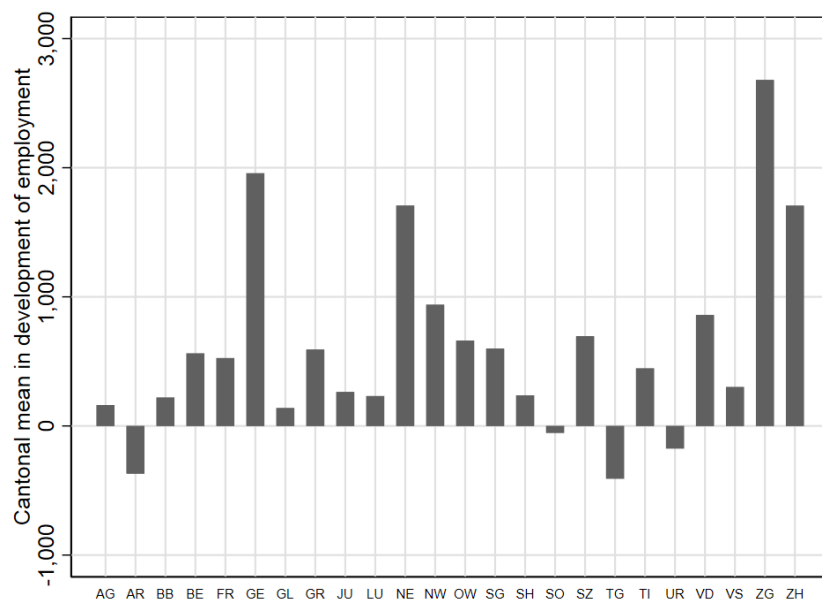
Figure A3: Residual plot using raw residuals
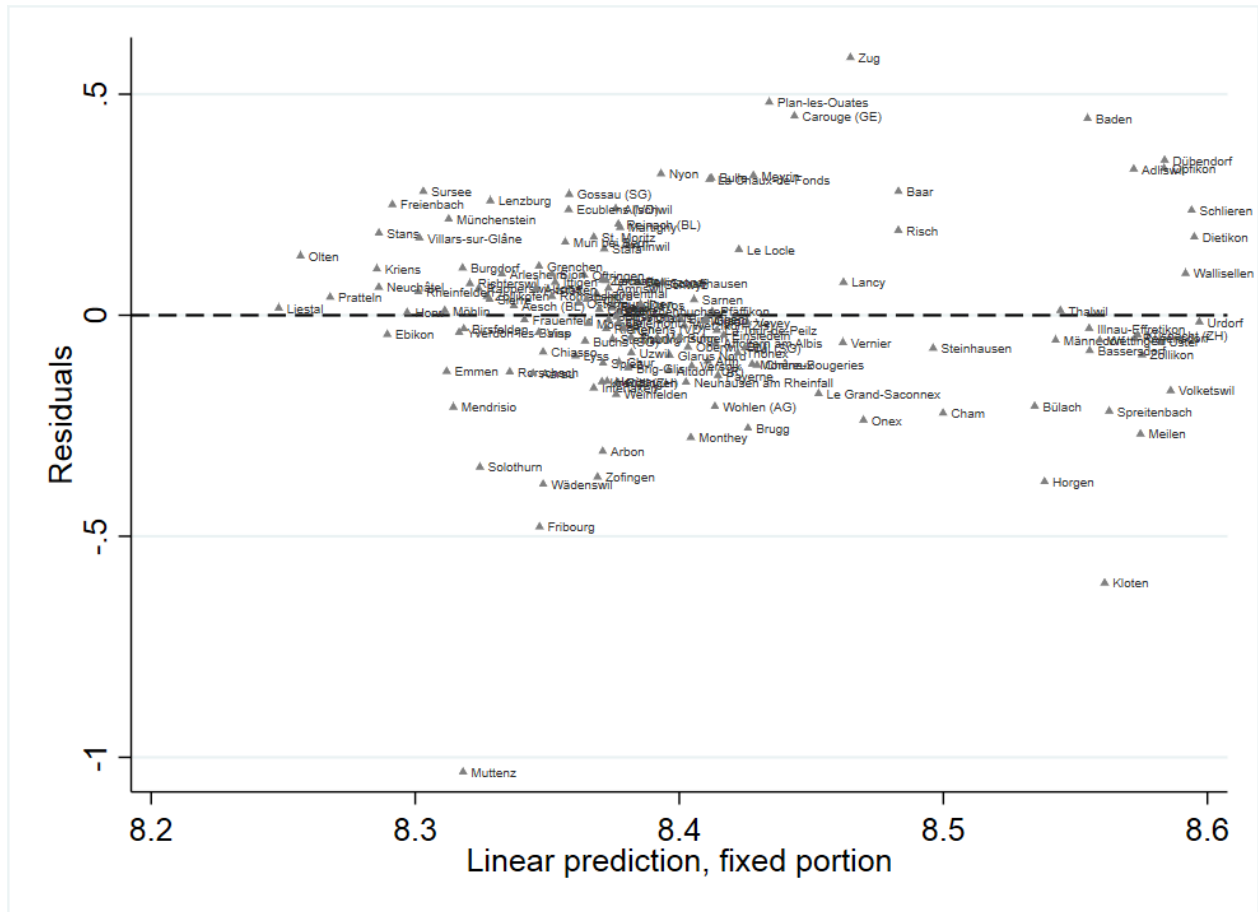
Note on Figure A3: Due to simplicity, we calculated this figure using the results of a Maximum Likelihood regression of Model 1 from the paper instead of a Bayesian regression. The results for the regression are very similar (fundamentally the same). The figure shows that there is no pattern of outliers (i.e. no outliers from a similar region or of similar size) and that the t of the SMSTs does not depend on their manifestation in the dependent variable. If we exclude the three strongest outliers Kloten, Muttenz and Zug (individually and together), the results of the regression do not change notably.

Notes on the spatial lag variables: Row-standardization does not seem suitable for our research question given that our focus lies in the absolute number of neighbours and their values in the variables of interest. Neumayer and Pluemper (2016) criticize the common approach of row-standardizing connectivity matrices (see e.g. Ward and Gleditsch 2008, 18). Row-standardization is guided by the assumption that each connection between an observation is weighted for each observation (or recipient) *i* the sum of connectivities to all neighbours (or sources) *k* equals 1 (Neumayer and Pluemper 2016). Consequently, absolute values are concealed and 'if one subject has fewer ties to other subjects, then each tie is assumed to be more important, which again may run counter

to theoretical predictions' (Neumayer and Pluemper 2016, 176). Thus, our spatial lag conceptualizes that an SMST with neighbours that experience high employment growth, exhibits a higher value in the spatial lag than a SMST that has neighbours with lower employment growth or an SMST in an isolated location.

Figure A4: Amount of neighbors of Swiss SMSTs
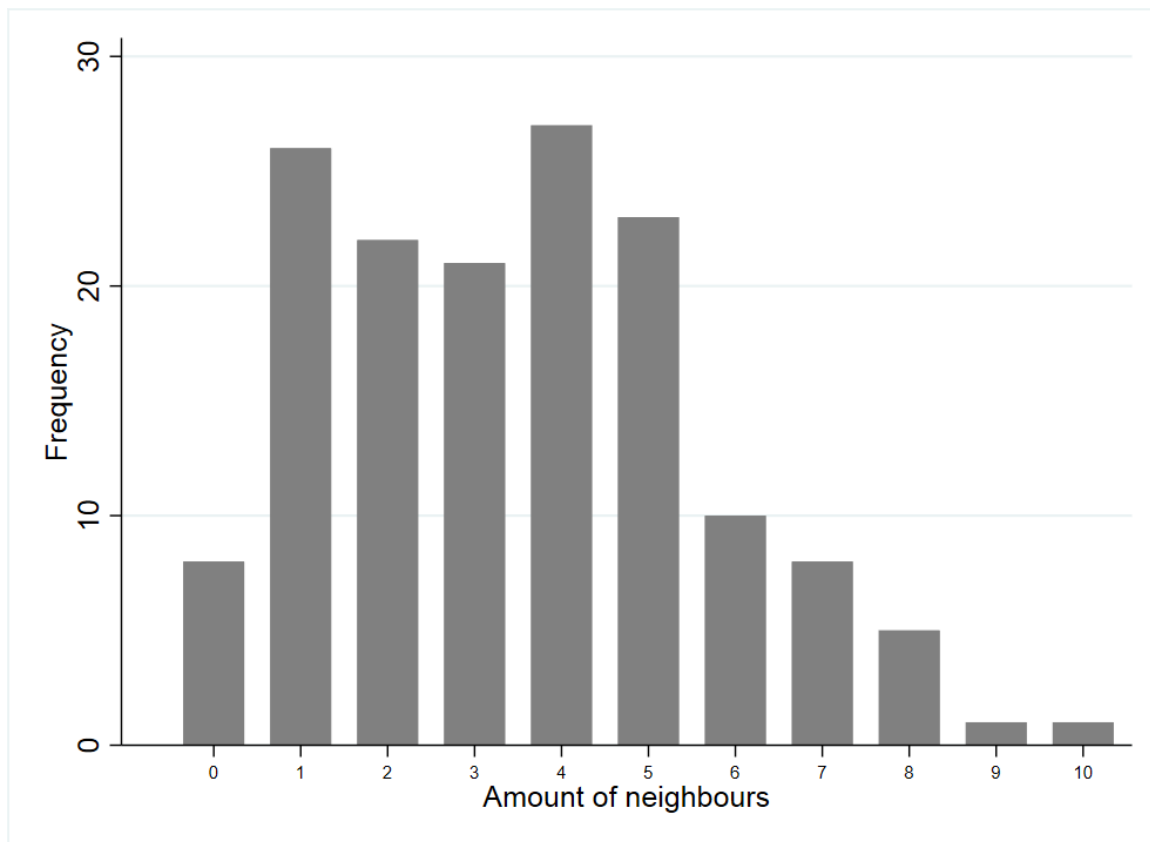
Table A1: Operationalization Table

Variable	Operationalization	Source	N	Mean	SD	Min	Max
Dep. Variable							
empl	Employment in full-time equivalence (FTE), minus residential jobs. Change over time 1995-2013 (logged)	Federal Statistical Office (FSO)	152	484.5	1087.7	-2624.9	5711.1
Network variables							
Network density	FTE of neighbors: absolute and development over time	Sbb.ch (Swiss Federal Railways), google-maps, FSO	152				
	1. 1995 (logged)			37'490	42004	0	157'409
	2. 1995-2013			8938	15310	-2582	49325
Connectivity to metro	Distance to nearest metropolitan center in train minutes	Sbb.ch	152	42.3	33.2	3	186
Higher education institutions	Universities and universities of applied sciences: Number of universities in SMSTs and neighbours, ordinal	Swissuniversities.ch	152	1.89	1.45	0	5
Political variables							
Politics	Percentage of votes for non-leftist parties in national election 2011.	FSO	152	67.3	9.9	41.77	89.84
Tax rate	Personal tax rate difference. Average over years and development over time	FSO	152				
	1. Average 1995-2013			10.2	1.95	4.66	14.6
	2. Development 1995-2013			2.53	1.41	0.12	6.11
Control variables							

Economic structure of	β-convergence: Number of FTE in 1995 (log)	FSO	152	2774	1960	156	14138
SMST	As controls: Number of jobs 1995 (log) in % in						
	Knowledge-intensive business services,			4.5	3.7	0.6	38
	High tech sectors and			11	10	0.02	58
	Low tech sectors			13	7	0.5	34
Residential Economy	Development of residential economies 1995-2012	FSO	152	1465.6	1412	-303.74	6379.7
Population	Population size of town divided by 100 (mea over the four periods).	FSO	152				
	1. Average 1994-2012 (log)			14945	6887	5127	41347
	2. Development 1994-2012			2141.6	1810.6	-1151	9882

Table A2: Correlation table

	Δempl	Network density (mean)	Network density (Δ)	Distance to metro centre	HEIs generation subsystem	Residential econ (mean)	Population (Δ)	Population (mean)	Residential econ (Δ)	Politics	Tax rate (mean)	Tax rate (Δ)	KIBS (1995)	Low tech (1995)	High tech (1995)
Δempl	1														
Net. dens	0.0177	1													
Net. Dens Δ	0.218**	0.504***	1												
Distance to metro	-0.0727	-0.596***	-0.447***	1											
HEIs	0.0179	0.631***	0.578***	-0.484***	1										
Res. econ	-0.00334	-0.0421	-0.0456	0.0930	-0.0129	1									
Population Δ	0.235**	0.0105	0.247**	-0.265***	0.0530	0.195*	1								
Population	0.0705	0.129	0.113	-0.211**	0.110	0.498***	0.378***	1							
Res. Econ Δ	0.209**	0.121	0.152	-0.233**	0.230**	0.489***	0.532***	0.508***	1						
Politics	-0.0707	-0.153	0.0889	0.326***	-0.179*	-0.0428	0.0739	-0.276***	-0.160*	1					
Tax rate	-0.133	-0.0686	-0.380***	0.232**	-0.00710	-0.0197	-0.283***	0.0804	-0.131	-0.553***	1				
Tax rate Δ	0.0639	0.0296	-0.217**	0.0407	-0.0294	-0.0869	0.0428	0.0317	0.141	-0.0829	0.0162	1			
KIBS (1995)	0.309**	0.0914	0.170*	-0.0664	0.190*	0.494***	0.304***	0.458***	0.399***	-0.0752	-0.0846	-0.0892	1		
Low tech (1995)	-0.182*	0.0211	-0.212**	0.0508	-0.162*	-0.0698	-0.155*	-0.208**	-0.240**	0.128	-0.0133	-0.0662	-0.218**	1	
High tech (1995)	-0.0947	0.251**	0.0246	-0.171*	0.0736	0.222**	-0.0666	-0.0125	-0.0610	-0.0248	-0.0244	0.0130	-0.0810	0.371***	1

$^{*}p < 0.05,\ ^{**}p < 0.01,\ ^{***}p < 0.001$

Table A3: Additional models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Δempl[a]	Δempl[a]	Δempl[a]	Δempl[a]	Δempl[a]	Δempl[a]	Δempl[a]
Netw. density[a]	0.010	0.003	0.003	0.004	0.002	0.003	0.004
(in 1995)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Netw. density[a]		0.186*	0.140*	0.143	0.130*	0.149**	0.157**
(Δ 1995-2013)		(0.090)	(0.067)	(0.077)	(0.059)	(0.059)	(0.058)
Distance	0.001	0.001	0.001	0.001	0.001	0.001	0.001
to metro centre	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Higher education	-0.005	-0.035	-0.034	-0.034	-0.035	-0.034	-0.034
institutions	(0.018)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Residential econ	-0.023	-0.011	-0.011	-0.010	-0.010	-0.010	-0.010
(Δ 1995-2013)	(0.036)	(0.035)	(0.035)	(0.036)	(0.036)	(0.036)	(0.036)
Population	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(Δ 1995-2013)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population[a]	-0.021	-0.046	-0.042	-0.043	-0.040	-0.042	-0.044
(mean 1995-2013)	(0.061)	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)	(0.061)
Residential econ	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(Δ 1995-2013)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Politics	-0.005	-0.005	-0.004	-0.005	-0.005	-0.005	-0.005
(share non-left parties)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Tax rate	-0.033	-0.023	-0.021	-0.019	-0.020	-0.021	-0.021
(mean 1995-2013)	(0.018)	(0.019)	(0.018)	(0.022)	(0.018)	(0.019)	(0.019)
Tax rate	-0.009	0.000	-0.001	-0.002	0.000	0.001	-0.003
(Δ 1995-2013)	(0.022)	(0.023)	(0.022)	(0.022)	(0.022)	(0.027)	(0.025)
pol*low density		0.001					
		(0.002)					
pol*low density2			-0.000				
			(0.001)				
tax*low density				-0.002			
				(0.011)			

| tax*low density2 | -0.004 |
| | (0.005) |

taxdi *low density						-0.004	
						(0.023)	
taxdi *low density2							-0.003
							(0.021)
cons	9.254***	7.629***	8.007***	7.97***	8.094***	7.903***	7.850***
	(0.682)	(1.004)	(0.900)	(0.938)	(0.851)	(0.820)	(0.825)
N	152	152	152	152	152	152	152

Standard deviation in parentheses.

Bayesian p-values reported. *p $< 0:05$, **p $< 0:01$, ***p $< 0:001$

$^{\bullet}$ Coefficients have been logarithmized. ^{c} Time lag of the dependent variable in 1995.

The models and the variables have been tested for convergence, multicollinearity, heteroscedasticity, non-linearity and influential outliers. Variables with outliers have been logarithmized.

Note on model 1: In the first model, we check how the model changes when we exclude the only variable with an effect significantly different from 0, the network density dynamic. The result shows that the other variables remain robust indicating that they do not correlate with the network density variable.

Note on the interaction effects, models 2-7: We used two measures to operationalize low density by using the mean (low density, 18938.5) and the median (low density2, 11697.2) of the network density variable as a threshold to construct a dummy variable. SMSTs with a network density below the mean or median are coded as 1, indicating that they are located in an area with comparatively low network density. By multiplying the dummies with the three respective political variables (politics, tax rate and tax rate difference) leading to six different models, we are able to measure the effects isolated for SMSTs with low network density to test whether political variables only matter if regional processes are weak. The results however show no significant effects different from 0 and the inclusion of the interaction effects do not affect the other variables considerably. We hence can say that the degree of network density does not affect the influence of political factors.

Table A4: Categorization of Swiss towns and cities

Category	Inhabitants	No. in Switzerland % of Pop. (in 2008)
Towns		
Small and medium-sized towns	5'000-50'000	152
(SMSTs)		34.8%
Cities		
Small and medium-sized cities	50'000-250'000	9
(SMSCs)		12.3%
Large cities	250'000-5'000'000	1
		4.72%
Global cities	> 5'000'000	0

Source: Adapted from Dijkstra and Poelman (2012) and Servillo et al. (2013).

Data from the Federal Statistical Office.

B. Model diagnostics
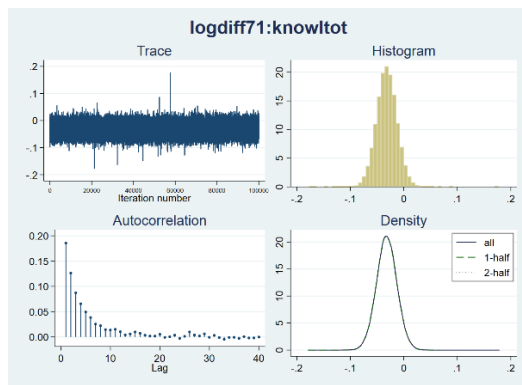
MCMC, Convergence diagnostics for each coefficient in the models of Table 2.

Model 1

209'999 iterations, burn-in 10'000, Thinning 2. Default priors. Computed with Stata 15.
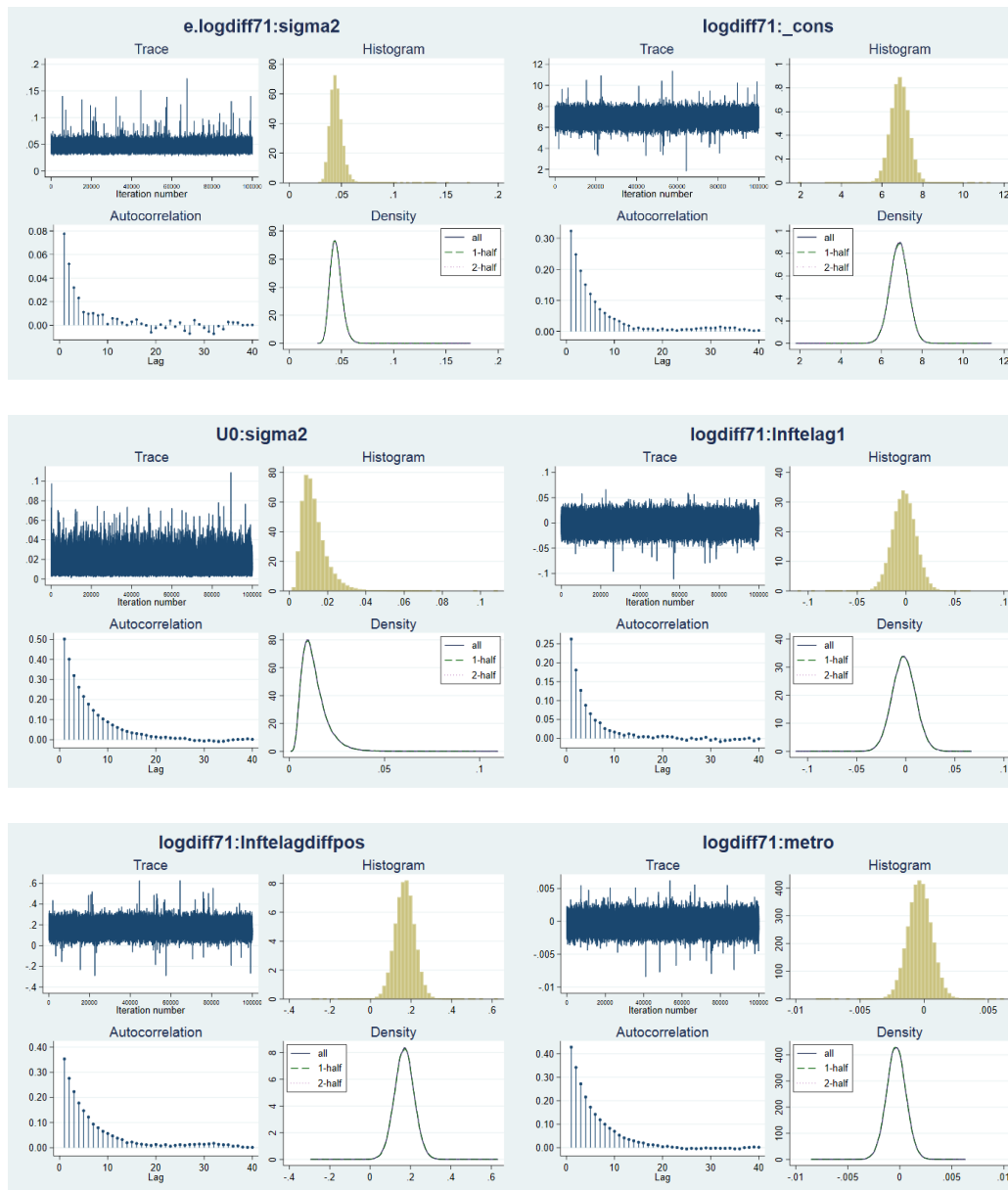
Model 2

209'999 iterations, burn-in 10'000, Thinning 2. Default priors. Computed with Stata 15.

Model 3

209'999 iterations, burn-in 10'000, Thinning 2. Default priors. Computed with Stata 15.
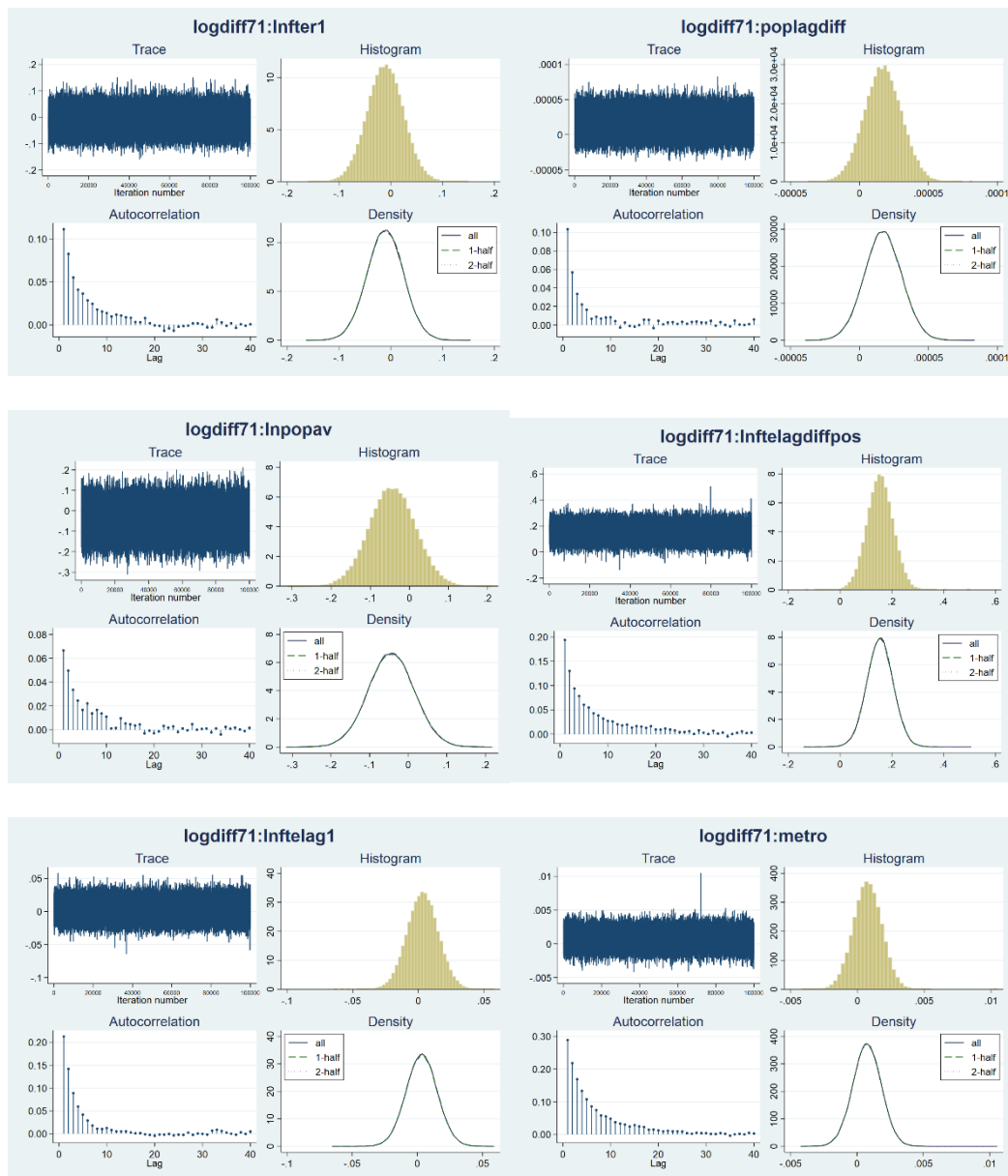
Model 4[32]

50'000 iterations, burn-in 5'000, Thinning 1. Default priors. Computed with Stata 15.

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[32] The other regression coefficients to not differ from the first models regarding their convergence. Their model diagnostics are not presented in Models 4, 5 and 6 due to lack of space. They can be optained upon request.
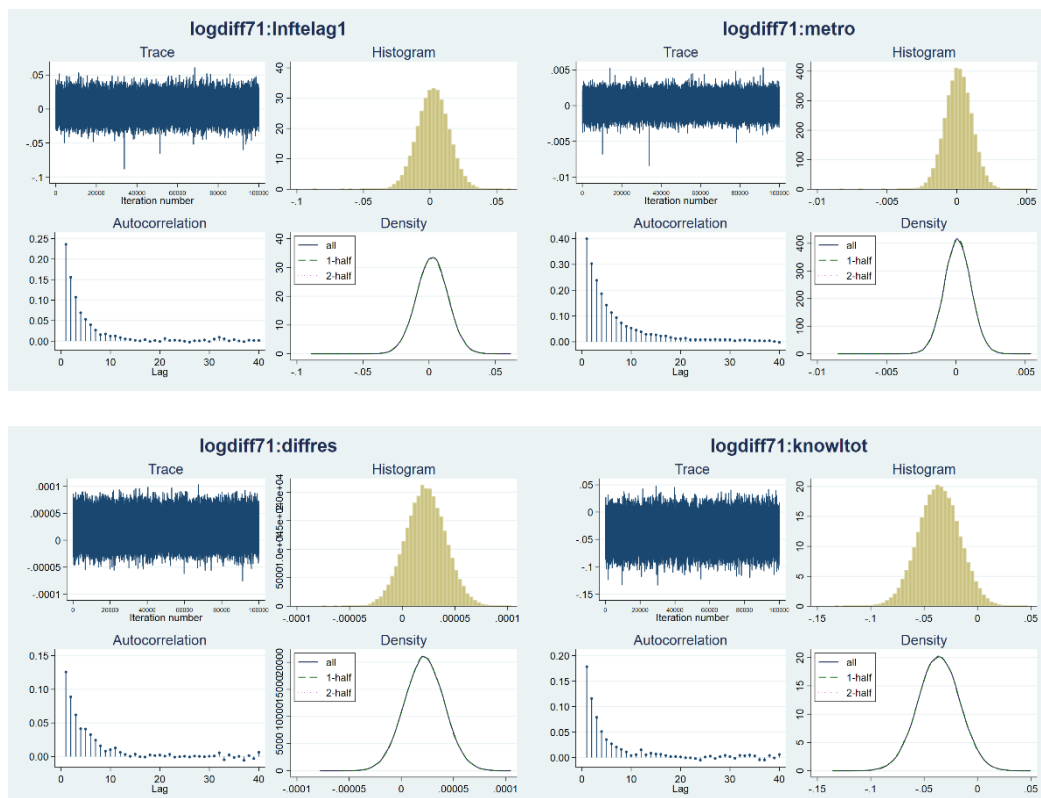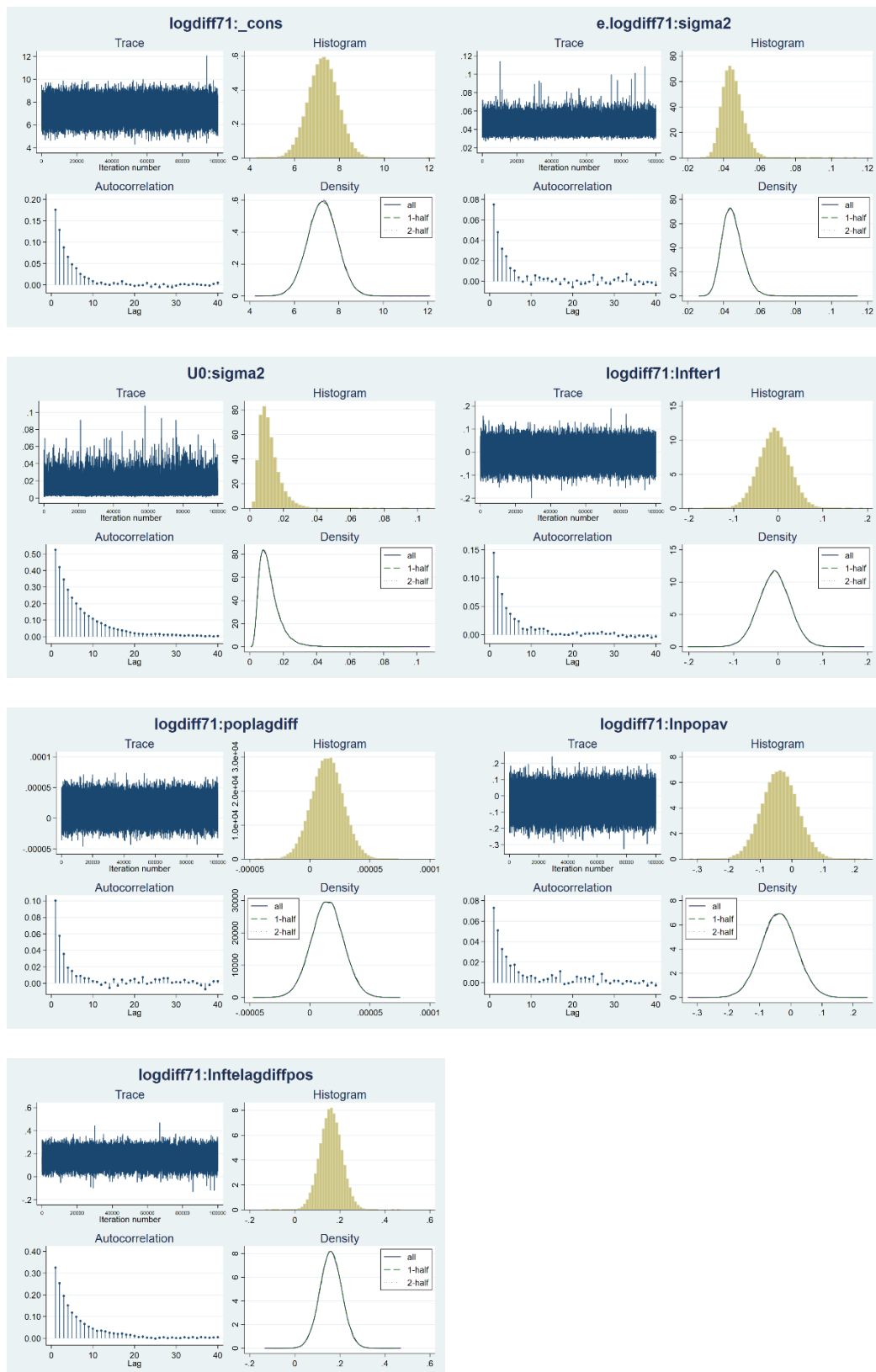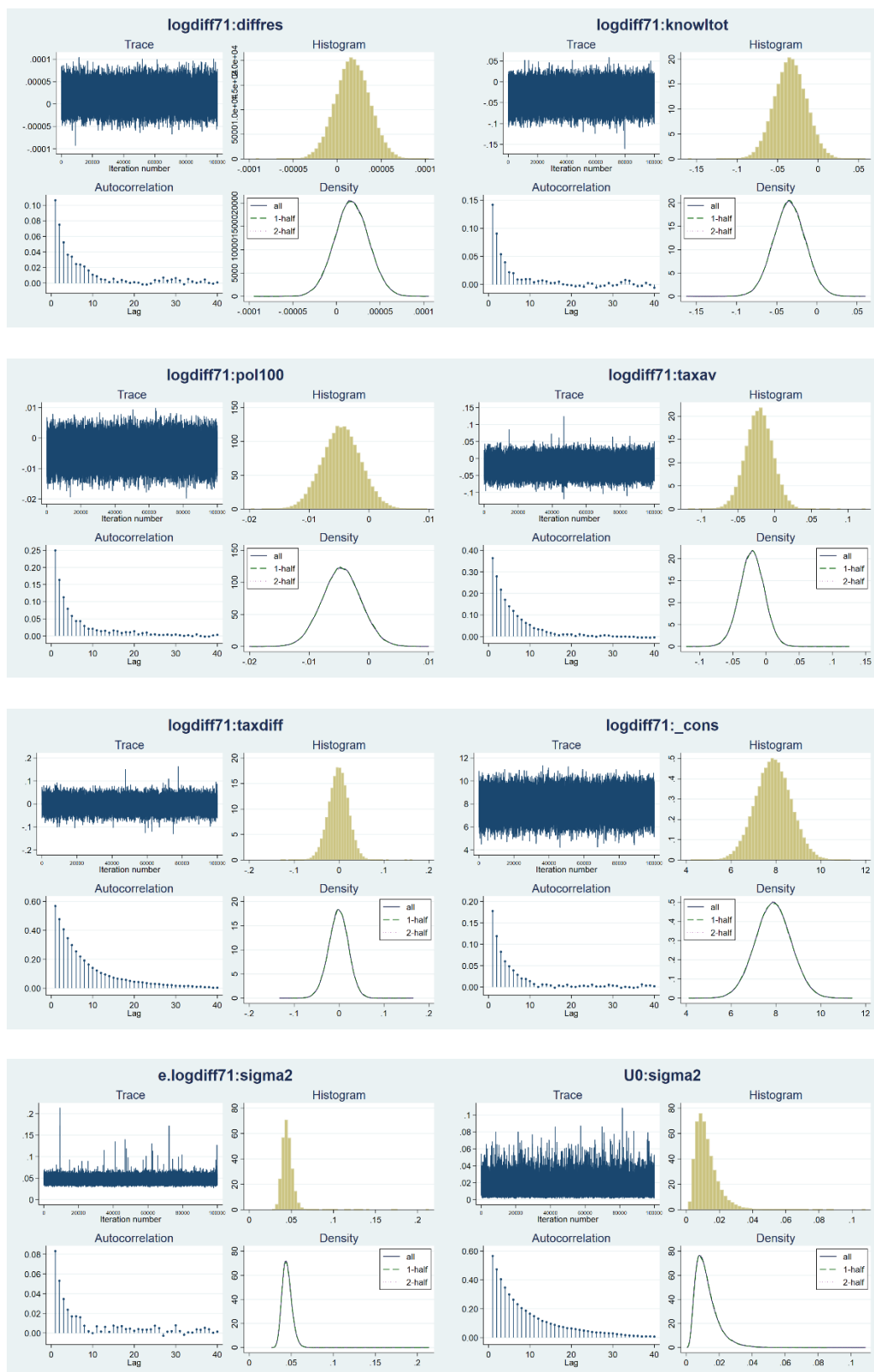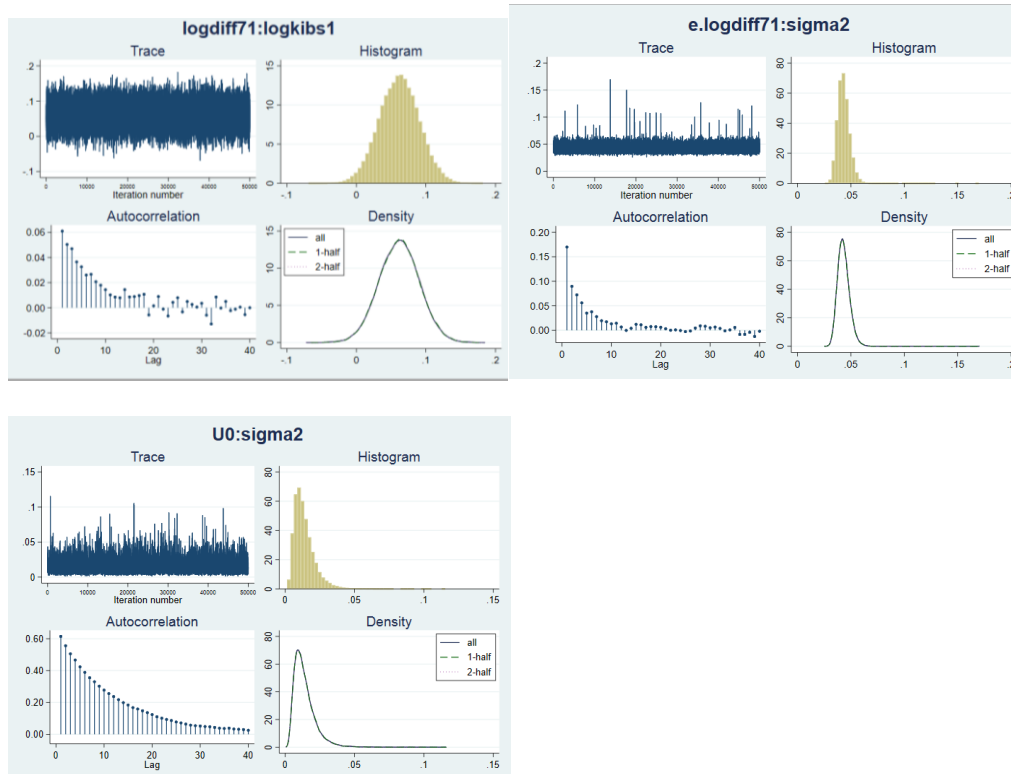
Model 5

50'000 iterations, burn-in 5'000, Thinning 1. Default priors. Computed with Stata 15.
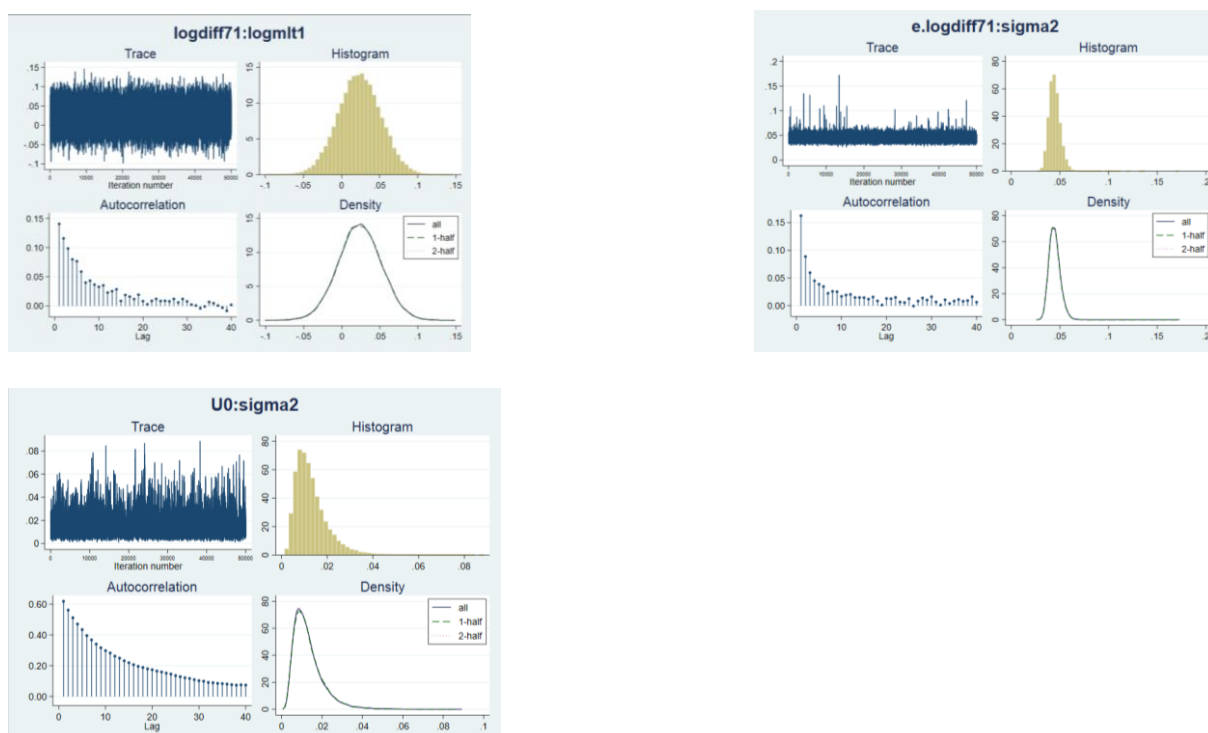
Model 6

50'000 iterations, burn-in 5'000, Thinning 1. Default priors. Computed with Stata 15.
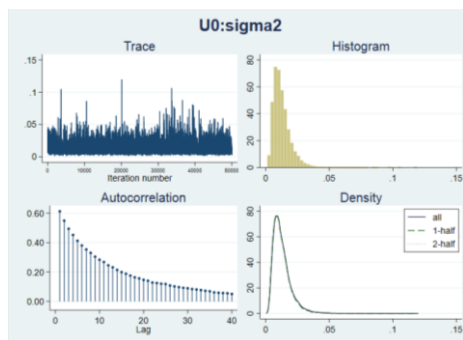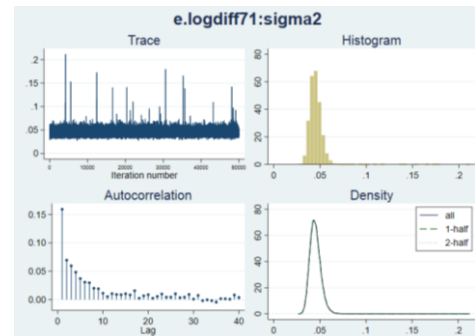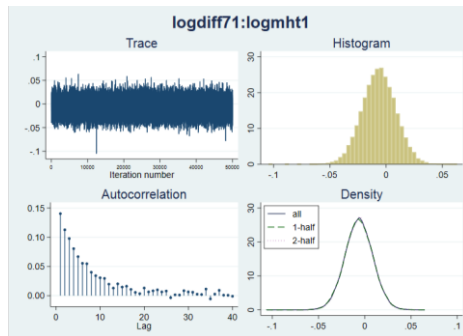
C. References in appendix

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Appendix Paper 2

Municipality	Canton
Affoltern am Albis	ZH
Bassersdorf	ZH
Bülach	ZH
Kloten	ZH
Opfikon	ZH
Wallisellen	ZH
Regensdorf	ZH
Hinwil	ZH
Rüti (ZH)	ZH
Wetzikon (ZH)	ZH
Adliswil	ZH
Horgen	ZH
Richterswil	ZH
Thalwil	ZH
Wädenswil	ZH
Küsnacht (ZH)	ZH
Männedorf	ZH
Meilen	ZH
Stäfa	ZH
Zollikon	ZH
Illnau-Effretikon	ZH
Pfäffikon	ZH
Dübendorf	ZH
Uster	ZH
Volketswil	ZH
Dietikon	ZH
Schlieren	ZH
Urdorf	ZH
Lyss	BE
Langenthal	BE
Köniz	BE
Muri bei Bern	BE
Zollikofen	BE
Ittigen	BE
Ostermundigen	BE
Burgdorf	BE
Münchenbuchsee	BE
Interlaken	BE
Münsingen	BE
Spiez	BE
Belp	BE
Steffisburg	BE
Thun	BE
Emmen	LU
Ebikon	LU
Horw	LU
Kriens	LU
Sursee	LU
Altdorf (UR)	UR
Einsiedeln	SZ
Freienbach	SZ
Arth	SZ
Schwyz	SZ
Sarnen	OW
Stans	NW
Baar	ZG
Cham	ZG
Risch	ZG
Steinhausen	ZG
Zug	ZG
Bulle	FR
Fribourg	FR
Villars-sur-Glâne	FR
Grenchen	SO
Olten	SO
Solothurn	SO
Riehen	BB
Aesch (BL)	BB
Allschwil	BB
Arlesheim	BB
Binningen	BB
Birsfelden	BB
Münchenstein	BB
Muttenz	BB
Oberwil (BL)	BB
Reinach (BL)	BB
Liestal	BB
Pratteln	BB
Neuhausen am Rheinfall	SH
Schaffhausen	SH
Herisau	SG
Rorschach	SG
Altstätten	SG
Buchs (SG)	SG
Rapperswil-Jona	SG
Flawil	SG
Uzwil	SG
Wil (SG)	SG
Gossau (SG)	SG
Davos	GR
Chur	GR
Aarau	AG
Suhr	AG
Baden	AG
Spreitenbach	AG
Wettingen	AG
Wohlen (AG)	AG
Brugg	AG
Lenzburg	AG
Möhlin	AG
Rheinfelden	AG
Oftringen	AG
Zofingen	AG
Arbon	TG
Romanshorn	TG
Amriswil	TG
Frauenfeld	TG
Kreuzlingen	TG
Weinfelden	TG
Bellinzona	TI
Locarno	TI
Chiasso	TI
Mendrisio	TI
Aigle	VD
Crissier	VD
Prilly	VD
Pully	VD
Renens (VD)	VD
Bussigny	VD
Ecublens (VD)	VD
Morges	VD
Gland	VD
Nyon	VD
Payerne	VD
Montreux	VD
La Tour-de-Peilz	VD
Vevey	VD
Yverdon-les-Bains	VD
Brig-Glis	VS
Martigny	VS
Monthey	VS
Sierre	VS
Sion	VS
Visp	VS
La Chaux-de-Fonds	NE
Le Locle	NE
Neuchâtel	NE
Carouge (GE)	GE
Chêne-Bougeries	GE
Le Grand-Saconnex	GE
Lancy	GE
Meyrin	GE
Onex	GE
Plan-les-Ouates	GE
Thônex	GE
Vernier	GE
Versoix	GE
Delémont	JU

Figure A4: Distribution of number of neighbours

Table A3 for regressions with full employment (all sectors) as dependent variable.

	(1) Employment	(2) Employment	(3) Employment	(4) Employment
Lagged DV	0.166***	0.147***	0.173***	0.153***
	(0.0412)	(0.0392)	(0.0426)	(0.0403)
Party composition (*between*)	-0.210	-0.206		
	(0.336)	(0.335)		
Party composition (*within*)	-0.0795*	-0.0731*		
	(0.0414)	(0.0398)		
Party rural (*between*)			-0.213	-0.212
			(0.136)	(0.136)
Party rural (*within*)			-0.0638	-0.0589
			(0.0539)	(0.0496)
Economic dev. Neighbors (*within*)		0.126***		0.131***
		(0.0406)		(0.0419)
Distance to metro-politan centre (*between*)	-0.0606***	-0.0603***	-0.0441**	-0.0438**
	(0.0215)	(0.0216)	(0.0205)	(0.0206)
Population (*between*)	0.852***	0.853***	0.864***	0.864***
	(0.0864)	(0.0865)	(0.0819)	(0.0820)
Population (*within*)	0.317***	0.308***	0.311***	0.303***
	(0.0910)	(0.0860)	(0.0912)	(0.0862)
Cantonal and year fixed effects	Yes	Yes	Yes	Yes
Intercept	8.542***	8.545***	8.396***	8.403***
	(0.308)	(0.308)	(0.112)	(0.112)
N	740	740	740	740
R^2 *within*	0.68	0.69	0.70	0.70
R^2 *between*	0.56	0.56	0.55	0.55

Cluster-robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A4: Results for models without lagged dependent variable

	(1) Res	(2) Res	(3) MLT	(4) MLT	(5) MHT	(6) MHT	(7) KIBS	(8) KIBS
Lagged DV (*t-2*)	No	No	No	No	No	No	No	No
Party composition (*between*)	-0.102 (0.341)		-0.159 (0.629)		-0.945 (1.145)		-0.567 (0.638)	
Party composition (*within*)	-0.0882** (0.0393)		-0.258 (0.187)		0.196 (0.280)		-0.0702 (0.199)	
Party rural (*between*)		-0.254** (0.126)		0.110 (0.238)		0.00117 (0.459)		-0.470 (0.299)
Party rural (*within*)		**-0.0590 (0.0408)**		-0.317 (0.284)		0.293 (0.316)		-0.124 (0.163)
Economic dev. Neighbors (*within*)	0.150*** (0.0458)	0.158*** (0.0471)	-0.0276 (0.115)	-0.00797 (0.117)	0.0477 (0.250)	0.0360 (0.254)	0.457** (0.208)	0.463** (0.213)
Distance to metro-politan centre (*between*)	-0.070*** (0.0236)	-0.0492** (0.0229)	0.00303 (0.0360)	-0.00682 (0.0371)	0.00992 (0.0828)	0.00589 (0.0866)	-0.213*** (0.0390)	-0.177*** (0.0382)
Population (*between*)	0.971*** (0.0904)	0.967*** (0.0824)	0.697*** (0.149)	0.726*** (0.149)	0.631** (0.308)	0.750** (0.308)	1.078*** (0.173)	1.117*** (0.153)
Population (*within*)	0.431*** (0.0824)	0.427*** (0.0835)	0.242 (0.219)	0.237 (0.219)	0.915** (0.459)	0.908** (0.456)	0.550* (0.282)	0.552* (0.287)
Year and cantonal fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	740	740	740	740	740	740	740	740
R² within	0.76	0.76	0.04	0.04	0.02	0.02	0.23	0.23
R² between	0.58	0.58	0.34	0.34	0.26	0.26	0.41	0.42

Cluster-robust standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note to table A4: The results of the models without the lagged dependent variable measuring previous development in the respective sectors show, that the inclusion of the lagged dependent variable does not change the models significantly (not regarding significance and number of the coefficients and also not regarding R^2). The only coefficient, where the standard errors are substantially larger and the coefficient loses significance is the variable (here bold) measuring the development of the party composition in remote SMSTs (significant in the full model in Table 2 at the 90%-level). This indicates, that a change in the share of non-left party in the local executive in remote SMSTs is only significant when controlling for previous development in the residential economy. While this interpretation is unproblematic, makes sense from a

theoretical point of view and speaks for an inclusion of the lagged dependent variable, it can become problematic when assuming potential second-order correlation. Then, the effect of this particular variable needs to be treated with caution. However, seeing that the lagged DV generally does not alter the other results in all other models and the change in the variable of concern here is also rather weak (it is only weakly significant in the full model in Table 2), we keep the lagged dependent variable at t-2 in the models. The basic interpretation of the results that a lower share of non-left parties in local governments has a negative effect on the development of the residential economy remains correct when looking at the development of the local executive for all SMSTs and the share between SMSTs for remote SMSTs.

Table A5: Fixed-effects models estimating the effect of prior economic development on local political development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Political composition (Effect of Res)		Political composition (Effect of MHT)		Political composition (Effect of KIBS)		Political composition (Effect of MLT)	
Lagged DV (t-1)		0.353*** (0.0631)		0.362*** (0.0626)		0.360*** (0.0633)		0.358*** (0.0639)
Prior development of Res	-0.0814 (0.0587)	-0.0933 (0.0584)						
Prior development of MLT			-0.00404 (0.0255)	-0.00079 (0.0313)				
Prior development of MHT					0.0170 (0.0109)	0.0114 (0.0102)		
Prior development of KIBS							-0.0206 (0.0125)	-0.0198 (0.0135)
Population	-0.00042 (0.00091)	0.00036 (0.0009)	-0.0008 (0.00085)	0.00001 (0.0008)	-0.00092 (0.00085)	-0.00009 (0.0008)	-0.00072 (0.00084)	0.000056 (0.0008)
Year and cantonal Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	888	740	888	740	888	740	888	740

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Table A5 addresses potential endogeneity in the variable measuring political change. Does political change depend on prior economic development? The models in table 7 are in line with recent research arguing that political preferences are not affected by volatile economic circumstances (O'Grady 2019) or local economic conditions and tax rates (James and John 2006; Elinder 2010)[33] and hence show that the measure of the local party composition is not endogenous to economic development. The respective first models include the available years of 2001 to 2013 while the respective second models include a lagged dependent variable controlling for prior political change at the local level. The results do not alter the variables of interest.

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[33] See main document for references.
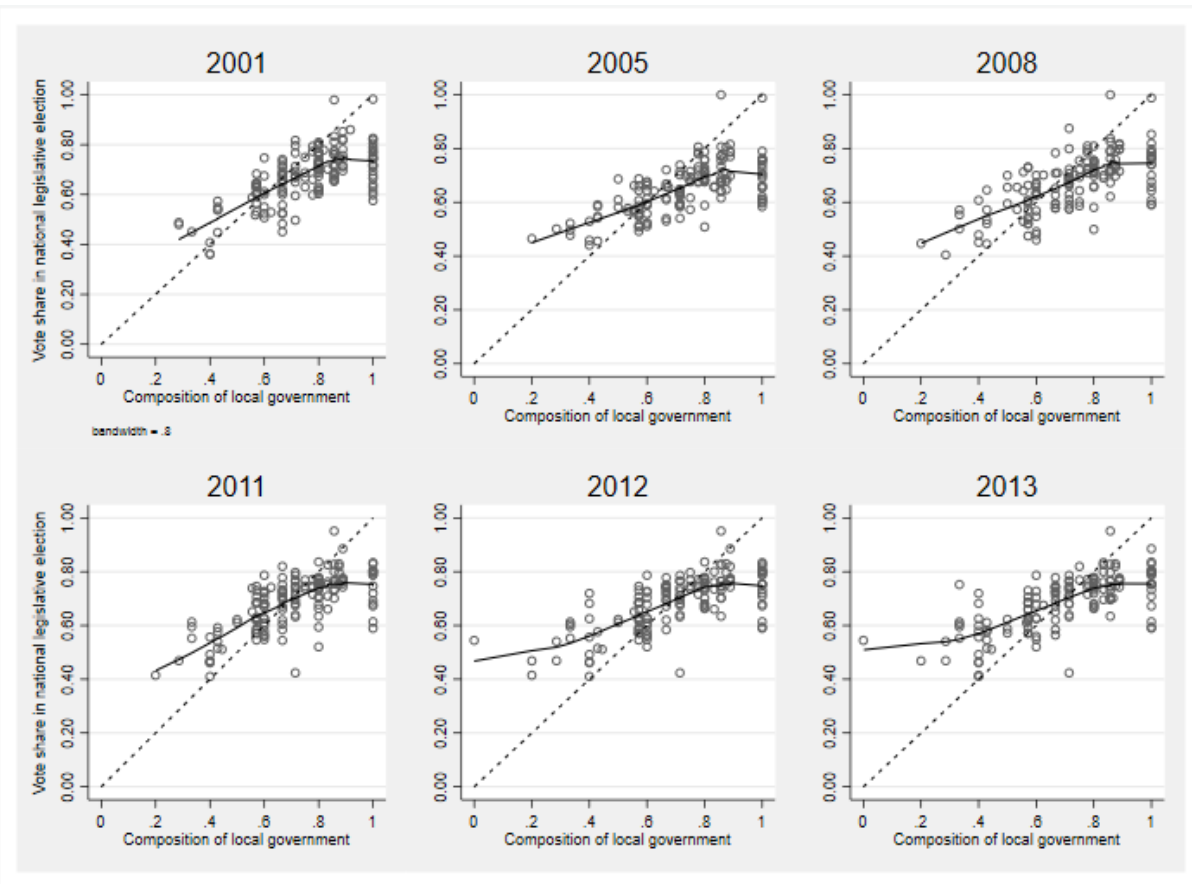
FigureA2: Relationship of local vote share in national parliamentary elections and the composition of the local government. The solid line indicates locally weighted scatterplot smoothing (LOWESS), the dashed line indicates same values for both measures.

Appendix Paper 3

A. Additional information on data and methodology (A.1-A.6)

1. Distribution of number of neighbours
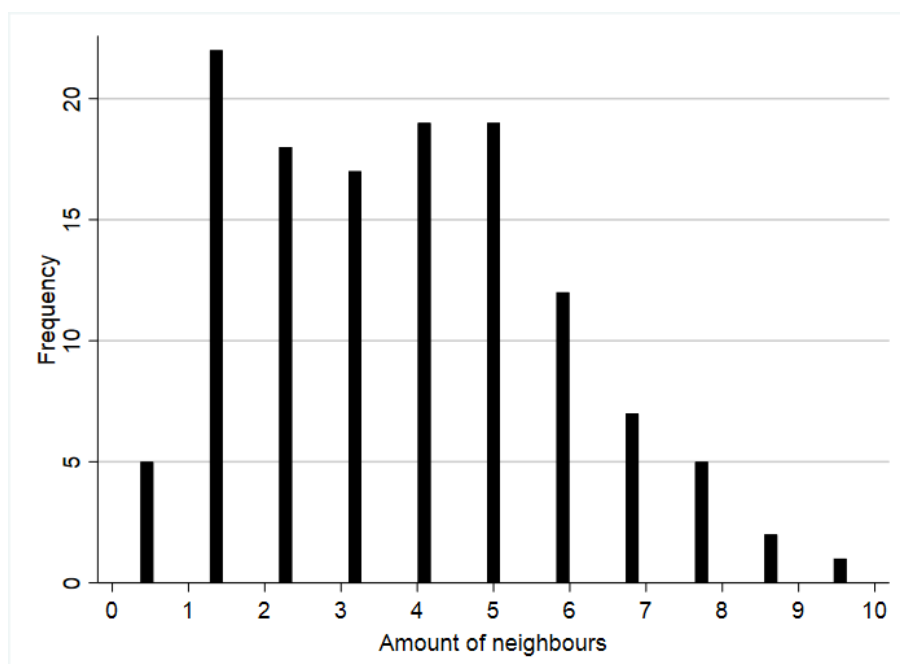
2. Model diagnostics, robustness checks

As mentioned in footnote 15, all logistic regression models have been tested for multicollinearity by looking at the variance inflation criterion (VIF). The variables used in the models fall under the VIF threshold of 10. Additionally, variables with extreme outliers were logarithmised.
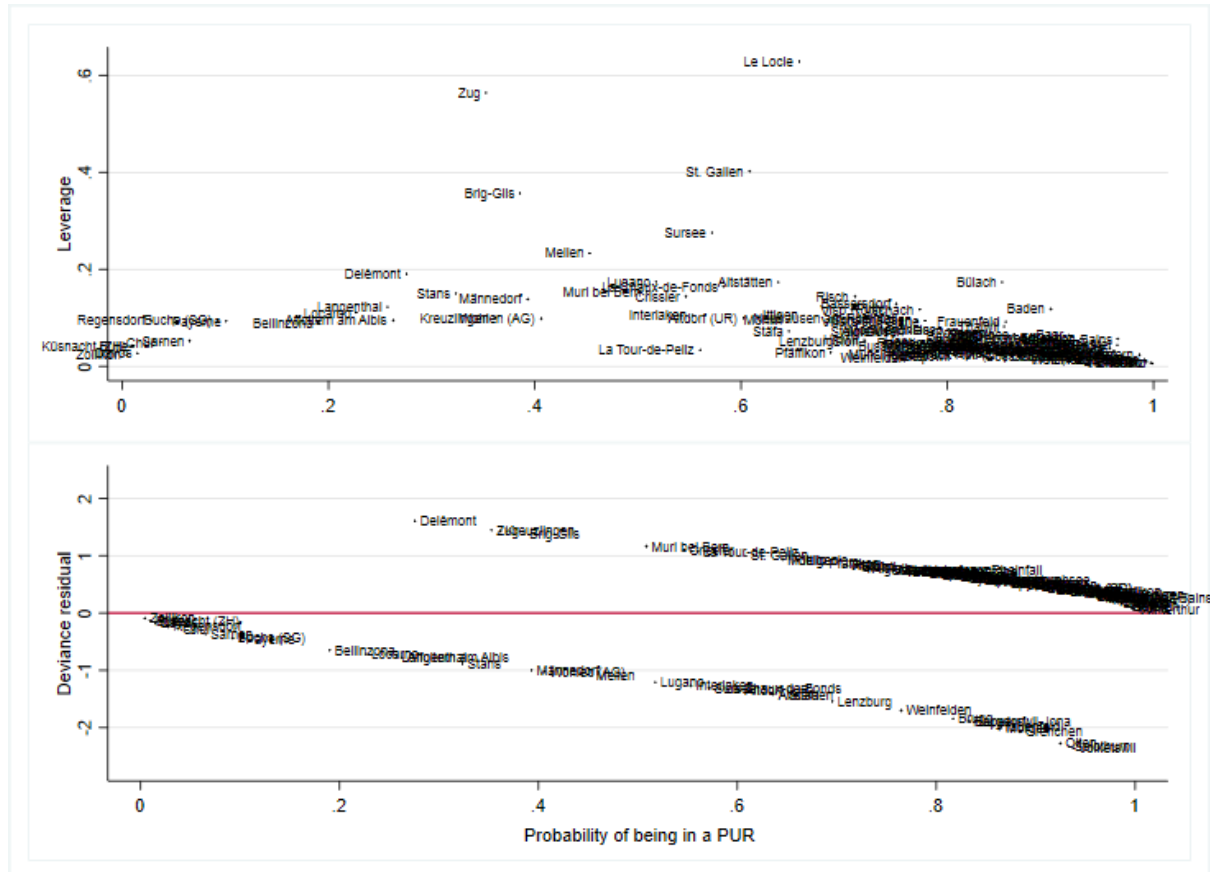
Figure 5: Leverage and deviance residual plots

Influential outlier cases and potential patterns were diagnosed by looking at the leverage of observations and their deviance of residuals. The x-axis in Figure 2 (calculated with the results of Model 1[34]) shows the predicted probability of being in a PUR. In the first plot, leverage indicates that not including observations with high leverage would impact the results of the model. The deviance residual shows if the predicted probability is far from the observed outcome (i.e., the calculated probability of being in a PUR vs. whether the observation is actually in a PUR or not). There are no clear patterns in either plot that indicate that a crucial variable

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[34] The diagnostics here only deal with the results of Model 1 but it was conducted for all models and the diagnostics do not vary considerably.

(such as specific regions, language regions, or other not included alternative explanatory factors) has been omitted or that clusters in the data are present other than the controlled cantons.

Regarding leverage, the SMSTs of Le Locle, Zug and St. Gallen are the most influential observations in the models. Since we rely on a full sample, simply excluding them is not an option. However, a closer look at the observations can provide insights into how they might influence the estimations in the model. Le Locle is a particularly interesting case since its only neighbour is not in a PUR while Le Locle itself is. Additionally, both SMSTs strongly deviate from the mean in their difference in population and employment when compared with their neighbours and in their employment per inhabitant in the export-oriented sector. Zug also deviates in income per inhabitant. Le Locle only has one neighbour (La Chaux-de-Fonds), which is itself not in an economic development region and which leans left politically. Instead, Le Locle cooperates with two other SMSTs located farther away. La Chaux-de-Fonds is an SMST with a large population and a very important watch-making industry, making Le Locle a small neighbour in comparison (even though the watch-industry is also important in Le Locle). Le Locle is therefore located in a highly specialised watch-making region with a strong neighbour, making it deviant from other Swiss SMSTs. Zug, on the other hand, is an industrial hub that is very attractive due to its tax conditions. Being larger than its surrounding five neighbours, Zug attracts a lot of firms and similarly also offers good living conditions. Zug is therefore a very special SMST in Switzerland due to its position at the centre of a very enterprise- and wealth-friendly region. St. Gallen as the third municipality belongs to the category of a small city. It deviates from other SMSTs mainly due to a larger population and stronger economy as its neighbours. However, excluding it from the model does not change the coefficients substantially.

Regarding the deviance of residuals, the model predicts that Delémont and Zug do not cooperate with other SMSTs while Volketswil (bottom-right) does. However, the opposite is the case for all three observations. There is no clear pattern that explains the deviance of these three cases and only Zug has a high deviance and also high leverage. Volketswil is embedded in an area with many SMSTs in the canton of Zurich. It has nine neighbouring SMSTs but is economically weaker (in the export-oriented sector) than its neighbours. According to the hypotheses of the division of joint gains, its position might make it difficult for it to reach a consensus with its neighbouring SMSTs in pursuit of joint regional economic development. Délemont, on the other hand, is itself in a PUR but its only neighbour is not. Délemont cooperates with

SMSTs from other cantons from the French-speaking part of Switzerland, while its neighbour is from the German-speaking part.

3. Analyses including economic sectors

The models in Table 4 take a closer look at the economic sectors in SMSTs by looking at employment in four different categories and their share of the total employment. Knowledge-intensive business services (KIBS) that are reliant on high professional knowledge, such as scientific research, computer programming, consulting, advertising, legal activities, high-tech industries, such as the pharmaceutical industry, the manufacturing devices, low-tech industries like the manufacturing of paper, textile and cement and residential economies such as repairs wholesale enterprises, hairdressers, construction (see Meili and Mayer 2017, based on categorisations by the NACE). Reliance on specific economic sectors could help to explain whether an SMST actively seeks to cooperate with others. However, there are no clear directions hypothesised despite for the residential economy: A strong residential economy can go in hand with an SMST's desire to be a bedroom community that possesses a high rate of out-commuters and wealthy residents that invest in the residential economy. However, this development is already accounted for by income and commuting patterns.

The results however reveal no further insights in addition to the models in Table 1.[35] The coefficients of the other variables remain robust while no variable measuring the share of a specific economic sector is significant. Only a higher share in the residential economy leads decreases the odds for cooperation – a finding that is in line with the assumption of lower incentives for bedroom communities such as in the illustrated case of the "gold-coast".

Table 6: Logistic regressions including the share of different economic sectors

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
	Residential economy		Knowledge-intensive services		High-tech industry		Low-tech industry	
Neighbours cooperating	0.984 (0.125)		0.979 (0.126)		0.979 (0.126)		0.984 (0.121)	
Number of neighbours	13.95** (14.44)	8.247** (7.856)	15.14** (14.86)	8.642** (7.992)	14.32** (13.98)	8.419** (7.867)	15.79** (16.14)	9.368** (9.120)
Distance to metropolitan centre		0.982 (0.0151)		0.982 (0.0150)		0.982 (0.0150)		0.984 (0.0154)
Difference	0.9999	0.9999	0.9999**	0.9999	0.9999*	0.9999	0.9999*	0.9999

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[35] This is also true when using the political majority variable instead of party composition.

population	(0.00004)	(0.00004)	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00003)
Income per inhabitant	0.994*	0.992*	0.994**	0.992**	0.994*	0.992*	0.992**	0.991**
	(0.00330)	(0.00397)	(0.00310)	(0.00382)	(0.00318)	(0.00384)	(0.00338)	(0.00349)
Party composition	0.990		0.988		0.988		0.992	
	(0.0137)		(0.0143)		(0.0142)		(0.0150)	
Difference party composition	0.0295	0.0182	0.0305	0.0193	0.0332	0.0159	0.0195	0.0138
	(0.0794)	(0.0522)	(0.0789)	(0.0545)	(0.0936)	(0.0467)	(0.0540)	(0.0391)
Employment per inhabitant	1.058*	1.065**	1.060*	1.066**	1.066	1.059	1.079**	1.087**
	(0.0353)	(0.0336)	(0.0345)	(0.0337)	(0.0445)	(0.0436)	(0.0378)	(0.0375)
Difference employment	0.9997	0.9997	0.9997*	0.9997*	0.9997**	0.9997**	0.9997*	0.9997*
	(0.00024)	(0.00020)	(0.0002)	(0.00017)	(0.00014)	(0.00014)	(0.00014)	(0.00013)
Out-commuting per inhabitant	1.001***	1.001**	1.001***	1.001**	1.001***	1.001**	1.001***	1.001**
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Share residential economy	1.000	1.000						
	(0.00009)	(0.00009)						
Share knowledge-intensive services			1.000	1.000				
			(0.0004)	(0.0004)				
Share high-tech industry					1.000	1.000		
					(0.0003)	(0.0003)		
Share low-tech industry							0.999*	0.999*
							(0.00046)	(0.00048)
N	127	127	127	127	127	127	127	127
pseudo R^2	0.308	0.321	0.310	0.322	0.308	0.321	0.322	0.336

Notes: Odds Ratios; Cluster-robust standard errors are in parentheses. Intercepts are not reported. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$

4. *Methodological discussion of interdependence in cooperation*

One crucial condition of the statistical analysis is that the observations are independent of each other, or in other words, observations do not influence the outcomes of other observations (Gross and Jansa 2016). In the case of cooperation, it can be assumed that SMST A's decision to cooperate with another SMST influences the behaviour of neighbouring SMST B. Hence, this interdependency needs to somehow be integrated into the statistical model. While approaches in international relations (in e.g. measuring the likelihood of war or trade deals) mainly use dyads and not single observations, the question of the interdependence of dyads as units of observations remains unaddressed (Gross and Jansa 2016). Network analysts developed a way of modelling interdependencies that include exponential random graph models (ERGM) and the quadratic assignment procedure. (Cranmer et al. 2017). The convincing feature of these models is that they allow for the modelling of higher-order networks effects (such as 'the friend of my friend is also my friend'). However, our data only consists of closed networks, where all cooperation structures are mutual (given its measurement of formal membership in a regional organisation). For this reason, higher-order network dependencies cannot be modelled and an ERGM would not provide additional insights. As Cranmer et al. (2017, p. 244) note, simple endogenous network effects can also be included as covariates in a simple logistic regression.

This paper therefore follows the approach by Feiock et al. (2009) and Hawkins (2010), which measures the dependent variable as a binary variable that indicates whether a municipality is in a (polycentric) cooperation or not and expands it by including a variable that measures the behaviour of neighbouring SMSTs: Does the fact that the SMST under observation has neighbours in a PUR impact the question, whether the SMST under observation itself is in a PUR? Since the nature of interdependence in our data is supposedly highly driven by spatial factors (an SMST's decision may be mainly driven by the decisions of nearby SMSTs), we argue that this measurement is a valid way to model potential interdependencies. Additionally, the potential effects of belonging to the same subnationally institutionalised cantons can be controlled by using cantonal clustered standard errors (Williams 2000).

References for Appendix 4:

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- Gross, Justin H.; Jansa, Joshua M. (2016): Relational Concepts, Measurement, and Data Collection. In Jennifer Nicoll Victor, Alexander H. Montgomery, Mark Lubell, Justin H. Gross, Joshua M. Jansa (Eds.)*: The Oxford Handbook of Political Networks*: Oxford University Press (1), pp. 175-201.

- Feiock, Richard C.; Steinacker, Annette; Park, Hyung Jun (2009): Institutional collective action and economic development joint ventures. *Public Administration Review* 69 (2), pp. 256–270.

- Williams, R. L. (2000): A note on robust variance estimation for cluster-correlated data. In *Biometrics* 56 (2), pp. 645–646. DOI: 10.1111/j.0006-341X.2000.00645.x

5. Sample of municipalities

SMSTs	Canton							
Affoltern am Albis	ZH	Münchenbuchsee	BE	Oberwil (BL)	BB	Mendrisio	TI
Bassersdorf	ZH	Interlaken	BE	Reinach (BL)	BB	Aigle	VD
Bülach	ZH	Münsingen	BE	Liestal	BB	Crissier	VD
Kloten	ZH	Spiez	BE	Pratteln	BB	Prilly	VD
Opfikon	ZH	Belp	BE	Neuhausen am Rheinfall	SH	Pully	VD
Wallisellen	ZH	Steffisburg	BE	Schaffhausen	SH	Renens (VD)	VD
Regensdorf	ZH	Thun	BE	Herisau	SG	Bussigny	VD
Hinwil	ZH	Emmen	LU	Rorschach	SG	Ecublens (VD)	VD
Rüti (ZH)	ZH	Ebikon	LU	Altstätten	SG	Morges	VD
Wetzikon (ZH)	ZH	Horw	LU	Buchs (SG)	SG	Gland	VD
Adliswil	ZH	Kriens	LU	Rapperswil-Jona	SG	Nyon	VD
Horgen	ZH	Sursee	LU	Flawil	SG	Payerne	VD
Richterswil	ZH	Altdorf (UR)	UR	Uzwil	SG	Montreux	VD
Thalwil	ZH	Einsiedeln	SZ	Wil (SG)	SG	La Tour-de-Peilz	VD
Wädenswil	ZH	Freienbach	SZ	Gossau (SG)	SG	Vevey	VD
Küsnacht (ZH)	ZH	Arth	SZ	Davos	GR	Yverdon-les-Bains	VD
Männedorf	ZH	Schwyz	SZ	Chur	GR	Brig-Glis	VS
Meilen	ZH	Sarnen	OW	Aarau	AG	Martigny	VS
Stäfa	ZH	Stans	NW	Suhr	AG	Monthey	VS
Zollikon	ZH	Baar	ZG	Baden	AG	Sierre	VS
Illnau-Effretikon	ZH	Cham	ZG	Spreitenbach	AG	Sion	VS
Pfäffikon	ZH	Risch	ZG	Wettingen	AG	Visp	VS
Dübendorf	ZH	Steinhausen	ZG	Wohlen (AG)	AG	La Chaux-de-Fonds	NE
Uster	ZH	Zug	ZG	Brugg	AG	Le Locle	NE
Volketswil	ZH	Bulle	FR	Lenzburg	AG	Neuchâtel	NE
Dietikon	ZH	Fribourg	FR	Möhlin	AG	Carouge (GE)	GE
Schlieren	ZH	Villars-sur-Glâne	FR	Rheinfelden	AG	Chêne-Bougeries	GE
Urdorf	ZH	Grenchen	SO	Oftringen	AG	Le Grand-Saconnex	GE
Lyss	BE	Olten	SO	Zofingen	AG	Lancy	GE
Langenthal	BE	Solothurn	SO	Arbon	TG	Meyrin	GE
Köniz	BE	Riehen	BB	Romanshorn	TG	Onex	GE
Muri bei Bern	BE	Aesch (BL)	BB	Amriswil	TG	Plan-les-Ouates	GE
Zollikofen	BE	Allschwil	BB	Frauenfeld	TG	Thônex	GE
Ittigen	BE	Arlesheim	BB	Kreuzlingen	TG	Vernier	GE
Ostermundigen	BE	Binningen	BB	Weinfelden	TG	Versoix	GE
Burgdorf	BE	Birsfelden	BB	Bellinzona	TI	Delémont	JU
		Münchenstein	BB	Locarno	TI		
		Muttenz	BB	Chiasso	TI		

Small cities

Winterthur	ZH
Luzern	LU
St. Gallen	SG
Lugano	TI

Biel   BE

6. Correlation table

Table 7: Correlation table

	DV: PUR?	Neigh. total	Distance to metro.	Neigh. in PUR?	Diff. population	Population	Income p.p.	Party composition	Majority	Diff. parties	Employment
DV: PUR?	1										
Neigh. total	0.290***	1									
Distance to metro.	-0.272**	-0.557***	1								
Neigh. in PUR?	0.482***	0.468***	-0.314***	1							
Diff. population	0.00975	-0.106	0.157	0.0536	1						
Population	0.105	0.0566	-0.0425	0.0771	0.558***	1					
Income p.p.	-0.144	0.211*	-0.323***	-0.0668	-0.123	0.0183	1				
Party composition	-0.127	0.0473	0.183*	-0.0395	-0.170	-0.302***	0.155	1			
Majority	0.160	0.0955	0.0985	0.338***	-0.0405	-0.156	-0.0393	0.636***	1		
Diff. parties	-0.141	-0.0132	-0.123	-0.125	0.124	0.111	0.0190	-0.00294	-0.0548	1	
Employment	0.0473	0.0431	0.127	0.0719	0.0757	-0.128	-0.0712	0.0152	0.0508	0.0408	1
Diff. employment	-0.0382	0.0430	-0.0338	-0.0102	0.345***	0.590***	0.0848	-0.142	-0.161	0.0532	0.247**
Out-commuting	0.266**	0.549***	-0.627***	0.337***	-0.300***	-0.309***	0.279**	0.193*	-0.132	-0.00039	-0.0539
NeighXParties	0.171	0.0776	-0.128	0.0695	0.00691	0.0439	-0.0286	-0.111	0.0268	0.000765	0.165
NeighXEmployment	0.0153	0.0609	-0.106	-0.0192	-0.143	0.0588	0.0532	0.167	-0.0387	-0.0451	-0.0455

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$