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# The socioeconomic performance of small and medium-sized industrial towns: Slovenian perspectives

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## Abstract

*The socioeconomic performance of industrial small and medium-sized towns (SMSTs) in comparison to that of non-industrial SMSTs, is subject to evaluation in this paper, to see if the presence of industry has adverse effects on socioeconomic factors. We studied 32 variables accounting for dimensions of socioeconomic performance in Slovenian SMSTs and conducted various statistical tests. We found only minor differences between the two groups, pertaining mainly to some elements of economic structure and demography, and some mixed relations of industrial employment and socioeconomic performance. The results demonstrate that industrial SMSTs should not be labelled automatically as 'disadvantaged'. We discuss why our results differ from general research expectations in the literature: in the local context, we outline the "egalitarian syndrome" and policies of polycentric spatial development; in the global context, we discuss the "failed tertiarisation effect" and the differences between post-socialist and "Western" countries. We conclude by proposing that research should be re-oriented towards the more place-sensitive issues of industrial towns across Europe.*

*Keywords: small and medium-sized towns, industry, socioeconomic development, post-socialism, tertiarisation effect, Slovenia*

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## 1. Introduction

Small and medium-sized industrial towns (SMSTs) are rarely perceived as an independent object of research, and little is known about their socioeconomic performance. Such towns are seen as having a dual problem. Firstly, small towns in general are "losers" in relative terms because they cannot compete with the agglomeration economies of larger metropolitan regions, which have more productive firms (Combes et al., 2012) or attract more knowledge workers and knowledge-intensive companies (Van Winden, 2010).

Secondly, those smaller towns with an economic base in traditional mining and industrial activities, such as steel and textiles, are more prone to urban decline because they are unable to find a niche in the international economic environment (Fol and Cunningham-Sabot, 2010; Martinez-Fernandez et al., 2012). They could easily fit into the category of (perceived) "places that don't matter", described by Rodríguez-Pose (2018) as lagging and declining areas with little economic potential. Traditional industrial SMSTs are thus characterised as having old productive economies, in contrast to the "new" productive economies supported by creative and knowledge-based activities (Hamdouch et al., 2017), indicating that industrial towns are inherently vulnerable and are more likely to experience the painful processes of restructuring in the near future.

On the other hand, researchers and policy makers largely ignore the socioeconomic performance of SMSTs (Meili and Mayer, 2017) in general, let alone those with an industrial economic base. The dominant research theme suggests that the presence of industry in towns is associated with pending deindustrialisation and consequently inferior socioeconomic performance, especially in the context of urban shrinkage, where older industrial urban areas are "economically disadvantaged" and prone to demographic shrinkage (Wolff and Wiechmann, 2018) or have unsustainable development trajectories (Vaishar et al., 2016). Despite all the research on (post)industrial urban development, however, few have empirically tested how the presence of a traditional industrial sector impacts the socioeconomic performance of SMSTs (Meili and Mayer, 2017), or it is limited only to a few employment and demographic variables (Hamdouch et al., 2017). Additionally, there is no research comparing industrial

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versus non-industrial towns to establish the effects of sectoral structure on the socioeconomic performance of SMSTs.

This paper attempts to bridge this research gap and empirically test the socioeconomic performance of industrial SMSTs in comparison to non-industrial SMSTs, and to see if the presence of industry has adverse effects on the socioeconomic aspects of SMSTs. Given the recent discussions on (re)industrialisation or the so-called Industry 4.0 (Davies, 2015), this paper first contributes to a renewed understanding of the role and the effects of the industrial sector on people living and working in SMSTs. This renewed understanding encompasses a wider array of socioeconomic variables, pertaining not only to economic performance and demographics but also to previously neglected aspects of the living environment and voting behaviours. Second, by understanding how industry in SMSTs affects their socioeconomic performance, we can add to the discussion on tailored (post)industrial policies, which do not favour only large, service-oriented and liberal urban environments but also consider the specifics of smaller industrial towns.

This research project is guided by two main research questions:

- Is there a difference in socioeconomic performance between industrial SMSTs and their non-industrial counterparts that have shifted towards consumption or service oriented economic activities?; and

- What is the association between industry and socioeconomic performance in SMSTs?

We define industrial SMSTs as second- and third-tier towns with populations between 5,000 and 60,000, with a predominant industrial economic base. We explore this research problem in the case of Slovenia, which is interesting from several perspectives: Slovenia has one of the most polycentric urban structures in Europe (Meijers, 2008), similar to Switzerland, Germany or the Netherlands; and it has a specific urban system with a large share of SMSTs with an industrial profile. This makes Slovenia a good "test" case for conducting such research, in contrast with more de-industrialised countries where industrial SMSTs are scarce. Slovenia is also relatively unknown to the wider international research community but has an intermediate position in East Central Europe, often exhibiting mixed characteristics from the capitalist West and post-socialist East.

The paper is structured as follows: after the literature review, we describe the context of the Slovenian urban system, especially polycentrism, socialist industrialisation and egalitarianism, since they are important for understanding the results. In the methodological section, we present the selection of indicators and the two main methods used in the research. Afterwards, we present the results and later discuss them in relation to local specificities and link them with overarching global processes. The last section draws conclusions with special emphasis on future policies in industrial SMSTs.

## 2. Theoretical background

To understand why industrial SMSTs are repeatedly linked with urban decline and poorer socioeconomic performance, it is helpful to highlight the literature that influenced generations of urban researchers. The roots of the bleak view on the future of industrial towns can be traced back to Bell's (1973) influential work on post-industrial society, where he predicted the transformation to more highly developed societies in which employment in manufacturing would decline while professional, technical and other service occupations would increase. Post-industrial urban paradigms, such as the informational city (Castells, 1989), the global city (Sassen, 1991), the cultural city (Scott, 1997), and the creative city (Landry, 2000; Florida, 2003), to name just a few, have painted a rather gloomy picture of traditional industrial activities, celebrating service-based economic activities in cities in one form or the other. Those paradigms were widely used to "prove" that culture-led development (Bailey et al., 2004) or the development of specialised services, amenities and knowledge-based institutions (Clark et al., 2002), can encourage economic and demographic growth in urban environments. Some research went further and tried to prove that post-industrial, service-based structures are associated with people being "happier", having a better quality of life and greater personal well-being (Mellander et al., 2012).

The literature originating from this realm discusses how towns can transform, revitalise or gain functions, which is often biased towards the creative economy (Lorentzen and Heur, 2012). Industrial SMSTs are rarely presented outside of the context of shrinkage and are almost never represented by a wider and more comprehensive array of socioeconomic indicators. Nonetheless, industrial SMSTs are an important part of urban systems. One in five people in Europe lives in an industrial SMST (Koceva et al., 2016). It is estimated that 27% of the EU population lives in SMSTs (Servillo et al., 2017), and according to an SMST-employment study in six European countries, industrial employment remains an important component of the local economy since it is "overrepresented" in SMSTs compared to the national averages (Servillo et al., 2014).

Research linking the size of cities with economic success is also important in understanding why industrial SMSTs are perceived as inherently austere. Urban economists consider that increased city size is correlated with more dynamic productivity rates and stronger economic growth (Duranton, 2015). Frick and Rodríguez-Pose (2018) confirmed that in high-income countries, city size promotes better economic growth, while in developing countries the causality is reversed. The reasons for linking city size with better economic performance in high-income countries can be found in studies of economic diversity and knowledge flows, where larger cities have advantages. Larger cities "exhibit large concentrations and diversity of high human capital and skills and as such act as the 'magnets' towards which both international and interregional flows of capital and labour gravitate" (Dijkstra et al., 2013, p. 336). There is, however, evidence that smaller towns can also generate diversity despite lower concentrations of people and firms, by relying on other factors stemming from the closer social structure of smaller towns (Meili and Shearmur, 2019).

Considering the more economic aspects of urban growth, we should mention the debates about the relationships between industrial specialisation and the economic performance of cities. Storper (2013) argues that the driving force behind the economic growth of cities is specialisation, and that the recent inter-urban divergence is because some cities became specialised into knowledge intensive sectors. Other cities (mostly industrial ones, specialising in labour-intensive manufacturing) lack resilience and are lagging behind (Kemeny and Storper, 2015). There is also research

on UK cities, however, that contradicts these notions. For example, Martin et al. (2016) found that employment growth is only marginally linked with sectoral specialisation, and they call for a better explanation of "city-specific" effects. A study of Czech micro-regions showed that manufacturing correlates with higher economic performance but also with higher regional vulnerability, and that in industrial areas, specialisation is still important for better economic performance (Ženka et al., 2015).

According to Fol and Cunningham-Sabot (2010), poorer socioeconomic performance in industrial towns is assumed. They write that "these cities [small cities], with few resources in the areas of research, education and qualified employment, and sometimes underserved by transport infrastructures, are unable to keep pace with competition from the large cities", particularly exposing those small cities with a "reliance on a single industry … or even one large company" (2010, p. 13). The ESPON project, focusing on SMSTs in Europe (population between 5,000 and 50,000), has shown that traditional industrial towns face a problematic future, as a higher proportion of employment in industrial activities is associated with poorer job growth (Servillo et al., 2014). The results from this study also show that industrial SMSTs have larger unemployment rates compared to SMSTs with jobs in the service sector. According to Hamdouch et al. (2017), the majority of industrial SMSTs have had lower employment growth rates since 2000.

Recently, some alternative responses have emerged with a more positive stance towards industry in towns and cities. Some authors have focused on de-industrialised cities and towns and the negative effects of their tertiarisation on socioeconomic polarisation (Beatty and Fothergill, 2017; Gornig and Goebel, 2018). There is also limited evidence that older industrial cities were more resilient to the recent economic crisis (Plöger and Kohlhaas-Weber, 2014; Ženka, et. al., 2019), contesting prior research that traditional industrial cities are less resilient (Kemeny and Storper, 2015). Such research is important because it shows that tertiarisation and the demise of industry in cities and regions in parts of Europe only made matters worse. National urban policies are arguably tailor-made for larger urban conurbations with service-oriented economies, rather than for smaller towns with a pronounced industrial profile. Therefore, it is important to know if industrial SMSTs are truly in a disadvantaged position, and in what ways it might be expressed through their socioeconomic indicators.

The above-mentioned research literature concerns only partial aspects of the socioeconomic performance of SMSTs in Europe – but available studies of the socioeconomic performance of concrete national urban systems are even rarer. A typology of small towns in the Czech Republic demonstrated how towns with an industrial economic profile performed according to basic sustainable development indicators (Vaishar et al., 2016). The results indicated that industrial towns have higher unemployment rates and face population decline. This research is limited, however, since towns are compared using only three indicators: population growth, tertiary educational attainment and unemployment. Other similar research was conducted in Switzerland, where types of SMSTs were evaluated by socioeconomic indicators (Meili and Mayer, 2017). Two industrial types – high-tech and low-tech towns – typically exhibit lower population growth rates in contrast to service-economy or residential towns, but some show better economic performance. Other research involving industry in SMSTs

is oriented towards their role within the urban system (Cox and Longlands, 2016), such as the borrowed size concept (Meijers et al., 2016), and do not try to find relationships between industry and socioeconomic performance.

In sum, these studies show that we have a rather limited (and possibly) biased knowledge of the socioeconomic performance of industrial SMSTs, and that we do not know how specific aspects such as economy, employment, demography, living environment and voting behaviours, are expressed within them.

## 3. Key features of industrial small and medium-sized towns in Slovenia

Industrial SMSTs are a hallmark of the Slovenian urban system and are shaped by two distinct processes: (i) the long-standing policies of polycentric spatial development, and (ii) socialist industrialisation. Both are connected with egalitarianism as a dominant socio-cultural concept. To understand the context of this research and its results, brief overviews of egalitarianism, polycentrism and socialist industrialisation are necessary.

### 3.1 Egalitarianism

The "egalitarian syndrome" is a preference for an equal distribution of earnings without taking into account one's position in the social division of labour (Županov, 1970). The effect of the egalitarian syndrome is especially significant for smaller communities (Gavrilets, 2012), which is why it is particularly useful for understanding the structural (im) balances between SMSTs. Egalitarianism as a dominant social value today, prevails not only among the majority of the Slovenian population but also among the ex-Yugoslav population (Burić and Štulhofer, 2016). Županov (1970) argued that the germ of the egalitarian syndrome in Yugoslavia should be sought in agrarian societies, characterised by scarcity and low levels of economic development. Hafner-Fink (2006), on the other hand, mentions at least two important sources of egalitarianism in Slovenia: the Communist ideology and the Christian religion (more precisely, the Roman Catholic tradition). Despite the opposite trends in some post-socialist contexts in Central and Eastern Europe that have introduced the neoliberal agenda more openly (Sýkora and Bouzarovski, 2012), egalitarian values in Slovenia have been growing since the beginning of the 1990s (Vehovar and Tiran, 2017). This explains to a large extent the high ranking of Slovenia among the most equal European countries, according to the income and wealth gap, together with Nordic and some Central and Eastern European countries, such as the Czech Republic and Slovakia (OECD, 2017a).

Egalitarianism as a dominant socio-cultural concept possibly influenced the long-standing policy focus on ensuring balanced regional development and suggesting the presence of multiple growth poles in Slovenia (Banerjee and Jesenko, 2014). Egalitarianism on a spatial level was reflected by polycentric policies in times of socialism to create conditions for the more uniform economic and social development of all parts of Slovenia, as well as to provide a uniform allocation of working places and social infrastructure. Even though political, economic and social transitions after the collapse of the Eastern Bloc brought a new planning orientation, the polycentric arrangement in Slovenia still remained understood as the reestablishment of approximately the same access to services and social infrastructure, the

opportunity to enable autonomy of decision making, and the management of certain administrative units and the development of local identity (Drozg, 2012). This is especially true for smaller and closed industrial communities with low mobility, which is characteristic of Slovenia.

### 3.2 Polycentric spatial development and socialist industrialisation

The primary trait of the Slovenian urban system is the dominance of smaller towns (Sýkora and Mulíček, 2017), due to the traditionally dispersed settlement system and polycentric policies during the socialist and post-socialist eras because of the "egalitarian syndrome". The introduction of a communal system in the 1960s strongly favoured the development of smaller towns, which were seen as an extension of state power and were developed with jobs, public services and financial subsidies (Nared, 2018). This was seen as a step towards better social and territorial justice and had strong ideological connotations. Around 13–15 regional centres were somewhat neglected, especially after the 1990s when a new local self-government reform was adopted. This policy recognised only two spatial levels of government: the local (municipal) and state levels, whereas the regional level of government was only administrative. This exacerbated the unevenness of the Slovenian urban system, which is reflected in the lack of regional capitals or medium-sized towns with populations above 60,000, and a strong presence of small towns below 20,000 inhabitants that typically display an "oversupply" of public services and functions in comparison to medium-sized towns (Nared et al., 2017). There are only two large towns with 100,000 inhabitants or more (Ljubljana and Maribor). Contemporary polycentrism policies continue to pursue the principle of balanced spatial development, which might explain why Slovenia is one of the most polycentric European countries (Meijers, 2008). Moreover, some recent spatial studies advocate lesser agglomerative tendencies in Slovenia (Kozina and Bole, 2018), compared to other countries in Central and Eastern Europe (Egedy and Kovács, 2009; Slach et al., 2013) and metropolitan areas in Western Europe (Boix et al., 2015).

Small towns that became municipal centres in the 1970s were further developed with new economic functions – for instance, every town was "equipped" with at least one industrial plant, accompanying apartment buildings built for industrial workers, and basic social infrastructure (Drozg, 2012). Before that, industry was concentrated in medium-sized and large towns. This industrialisation of smaller towns and even rural areas (Zavodnik Lamovšek et al., 2008) became the second trait of the Slovenian urban system. After the transition from a socialist to a market economy, some SMSTs as well as large towns became deindustrialised, but the majority of towns kept their industrial profile (Bole, 2012). SMSTs have 36% industrial workplaces (Bole et al., 2017), which is 7% higher than the national average and 14% higher than the EU-28 average (Eurostat, 2017).

## 4. Methodology

### 4.1 Definition of industrial small and medium-sized towns in Slovenia

Although we acknowledge the criticism of population-based definitions because of the arbitrariness of any population threshold (Brenner and Schmid, 2014),

delimitations of SMSTs in Slovenia are quite constant in representing towns between 5,000–60,000 inhabitants. Our classification is based on previous research (Bole, 2012; Bole et al., 2015), in which we have used the same population thresholds. This population criterion is also close to the one used in other research, for instance, in the ESPON town study or the Swiss study, where the population criterion for an SMST was from 5,000 to 50,000 inhabitants (Meili and Mayer, 2017; Servillo et al., 2017). The spatial units of analysis are 212 municipalities, which correspond to local administrative units (LAU level 2), according to the Nomenclature of Territorial Units for Statistics (NUTS) of EUROSTAT. With this criterion, we identified 84 small and 16 medium-sized towns with 1,352,000 people, representing 66% of the national population.

If population size is a straightforward criterion that is consistently used in other studies, delimiting industrial towns from non-industrial ones is more difficult, as thresholds are always arbitrary. To select industrial and non-industrial SMSTs, we decided to use the standard deviation grouping technique on the proportion of industrial workplaces. This is a common method and is particularly useful when the purpose is to show deviations from the mean of a data array (Nelson, 1955; Ricketts and Sawhill, 1988), which allows us to make a distinction between "the most" and "the least" industrialised towns. We used 0.5 standard deviations above and below the mean measure, which cuts off SMSTs with more than 42.8% of industrial workplaces and SMSTs with less than 29.8% of industrial workplaces. Our definition of industry includes B (mining and quarrying), C (manufacturing) and F (construction) sectors based on the NACE classification.

To sum up, the two criteria used to define industrial and non-industrial SMSTs are:

1. Population criterion: SMST (population from 5,000 to 60,000); and
2. Industrial criterion: a) industrial SMST (above $M + 0.5$ SD (42.8%) of industrial workplaces); and b) non-industrial SMST (below $M - 0.5$ SD (29.8%) of industrial workplaces).

According to these criteria, 23 municipalities represent industrial SMSTs (21 small and two medium-sized towns), 30 municipalities represent non-industrial SMSTs (25 small and five medium-sized towns), while 47 municipalities fall into the "middle category" (38 small and nine medium-sized towns; see Fig. 1). The territorial distribution of industrial SMSTs is not uniform and is scattered across the country, with minor concentration tendencies around two larger towns (Figure 1). There appears to be no general rule for their distribution, however. Industrial SMSTs around Ljubljana are typically peripheral and located in hilly areas, with a strong manufacturing or mining tradition. Those closer to Maribor to the east have better transportation access and industrial activities tied closely to the recent socialist industrialisation.

### 4.2 Selection of indicators

We selected two types of indicators for the analysis: the structural and the socioeconomic indicators. The first type of indicator represents general economic structure and measures selected characteristics of the economic base, with a focus on its competitiveness – such as technology intensity, investment, and growth. They are added for contextual purposes to better understand and describe the conditions in SMSTs. The second type of indicators are
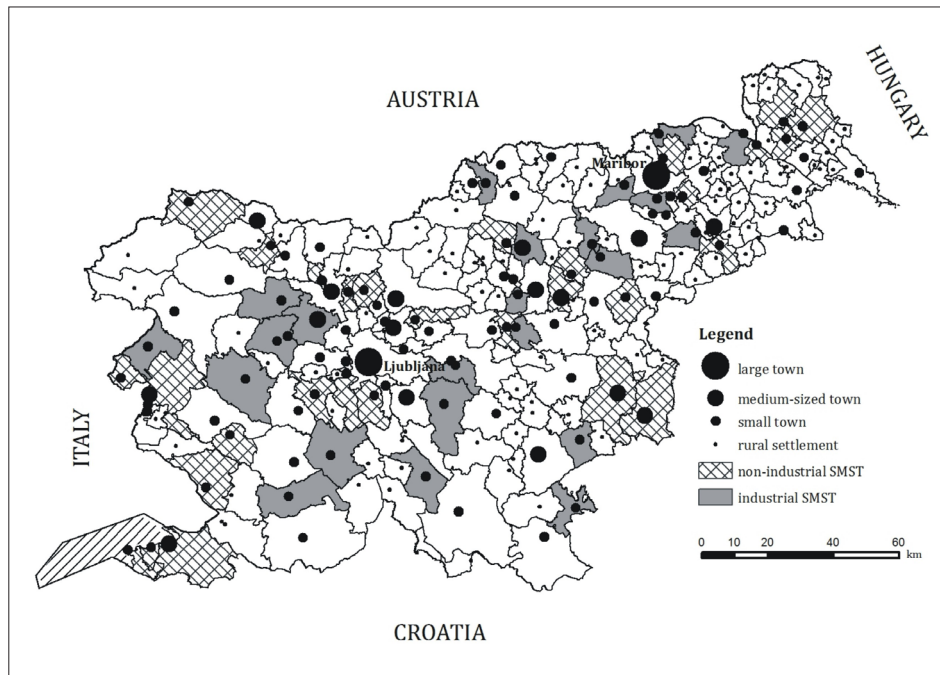
*Fig. 1: Map of industrial and non-industrial SMSTs in Slovenia*
*Source: authors' elaboration*

socioeconomic indicators and are central to this research, since they are needed to compare the performance of industrial and non-industrial SMSTs. They are further divided into four dimensions: employment, demography, living environment and voting behaviour. Employment and demographic characteristics are the most straightforward and frequently measured dimensions of socioeconomic performance in the area of research (Wirth et al., 2016; Vaishar et al., 2016; Meili and Mayer, 2017). We tried to include a wider array of both types of indicators, but we were limited by the availability of data collected at town level. Employment indicators are comparable to the above-mentioned research (average income, unemployment, share of commuters and foreign workforce), with an additional indicator of the share of long-term unemployment, which can lead to a culture of unemployment and urban poverty (Engbersen et al., 2006). Demographic indicators are also standard: total population, ageing index and population growth in several time periods after 1991 (independence of Slovenia), to better indicate periods of population growth or decline.

In contrast to other studies, which limited socioeconomic indicators to demographic and economic variables, we included two additional dimensions. Living environment, encompassing the relevant housing, spatial and social conditions of the municipality, was added, as it is an important aspect of a town's success or attractiveness (Buch et al., 2014; Hospers, 2014) and parallels the emergence of policy approaches for small towns, which go beyond economic growth and include or even focus on quality of life and the environment (Knox and Mayer, 2013; Pink and Servon, 2013; Wirth et al., 2016). We also hypothesised a political dimension as relevant from our research perspective, as an indirect indicator of socioeconomic performance. Some scholars have argued that political orientation of a certain place is strongly linked or even driven by their vulnerability and relative economic performance (Rodríguez-Pose, 2018), while there is plenty of evidence that economic deprivation, insecurity, grievance

and decline of a place can lead to decreasing voter turnout (Blais, 2006), and the emergence of and support for new populist and radical parties and movements (Inglehart and Norris, 2016; Rooduijn et al., 2017; Dijkstra et al., 2019). Therefore, we included voting behaviour indicators in the analysis, using voter turnout and support for radical political parties in the 2018 parliamentary election. Radical left and radical right parties were defined based on previous studies (Burgoon et al., 2019) and expert surveys of party programmes (Polk et al., 2017): the radical left party is The Left; radical right parties are the Slovenian Democratic Party and the Slovenian National Party.

The selected indicators (see Tab. 1) represent each respective dimension, complement each other (within and across dimensions), and can also partly be found in other similar studies in this research area of analysing the socioeconomic performance of spatial structures (Andreoni and Galmarini, 2016; Vaishar et al., 2016; Meili and Mayer, 2017). All the data were retrieved from the Statistical Office of the Republic of Slovenia, and public records such as the National Institute of Public Health, the Slovenian Intellectual Property Office and the State Election Commission, and are valid for 2015, 2016 or 2018 or refer to a selected period (e.g. 1991–2016): these are the 'Sources' for the data presented in Table 1.

### 4.3 Methods

To assess differences in socioeconomic factors between industrial and non-industrial SMSTs, we studied 22 variables representing the four dimensions of socioeconomic structure and an additional 11 variables describing the general economic structure (Tab. 1). We conducted Mann-Whitney tests for the first research objective to find differences in socioeconomic aspects between industrial and non-industrial SMSTs. This test is the nonparametric equivalent to the independent samples t-test, which determines whether there is a statistically significant difference between the means in two unrelated groups – in our case between industrial and non-industrial towns.

| | | Industrial SMSTs (N = 23) | | | | Non-industrial SMSTs (N = 30) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | SD | Min. | Max. | Mean | SD | Min. | Max. |
| **Structural indicators** | Share of employment in the industrial sector | 53.81 | 8.98 | 43.00 | 77.90 | 21.84 | 5.81 | 5.70 | 29.40 |
| | Share of medium-tech companies | 1.26 | 0.46 | 0.42 | 2.40 | 0.71 | 0.29 | 0.00 | 1.23 |
| | Share of high-tech companies | 0.18 | 0.22 | 0.00 | 0.89 | 0.16 | 0.22 | 0.00 | 0.89 |
| | Share of medium- and high-tech companies | 1.44 | 0.57 | 0.42 | 2.61 | 0.87 | 0.43 | 0.00 | 1.96 |
| | Share of people employed in medium- and high-tech companies | 9.51 | 10.69 | 0.00 | 37.37 | 2.45 | 2.44 | 0.00 | 7.99 |
| | Share of medium-sized and big companies | 1.47 | 0.53 | 0.64 | 2.75 | 0.91 | 0.45 | 0.22 | 2.26 |
| | Share of people employed in medium-sized and big companies | 55.33 | 11.12 | 37.63 | 81.02 | 35.10 | 18.56 | 0.00 | 57.87 |
| | Investment index per capita | 2.37 | 1.50 | 0.52 | 6.13 | 1.97 | 1.79 | 0.40 | 9.81 |
| | Share of high-growth companies | 0.27 | 0.23 | 0.00 | 0.85 | 0.26 | 0.24 | 0.00 | 0.97 |
| | Number vof patents 1991–2016 per 1000 inhabitants | 0.0023 | 0.0021 | 0.0050 | 0.0096 | 0.0015 | 0.0010 | 0.0000 | 0.0053 |
| | Value added per employee (net) | 37,630 | 7,185 | 26,398 | 52,212 | 37,715 | 7,542 | 25,856 | 52,924 |
| **Socioeconomic indicators** — Employment | Average income (gross) | 1,420 | 127 | 1,180 | 1,695 | 1,450 | 210 | 1,157 | 2,348 |
| | Share of unemployed | 11.26 | 3.36 | 5.20 | 17.60 | 12.04 | 4.03 | 5.90 | 20.70 |
| | Share of long-term unemployed | 5.78 | 2.07 | 2.10 | 10.30 | 6.18 | 2.56 | 2.50 | 11.80 |
| | Share of commuters | 56.77 | 13.78 | 26.90 | 78.00 | 64.23 | 15.79 | 31.50 | 86.30 |
| | Share of foreign workforce | 5.91 | 3.39 | 1.10 | 16.53 | 6.66 | 3.74 | 1.00 | 15.24 |
| Demography | Population | 10,409 | 6,394 | 5,007 | 32,747 | 13,872 | 12,018 | 5,138 | 51,045 |
| | Population growth 1991–2016 | 0.04 | 0.12 | -0.18 | 0.34 | 0.09 | 0.18 | -0.16 | 0.59 |
| | Population growth 1991–2000 | 0.01 | 0.04 | -0.05 | 0.09 | 0.03 | 0.07 | -0.06 | 0.23 |
| | Population growth 2000–2010 | 0.02 | 0.06 | -0.10 | 0.15 | 0.05 | 0.08 | -0.06 | 0.27 |
| | Population growth 2010–2016 | 0.00 | 0.03 | -0.08 | 0.06 | 0.00 | 0.037 | -0.07 | 0.11 |
| | Ageing index | 120.51 | 26.09 | 67.50 | 171.70 | 134.64 | 33.17 | 77.90 | 215.80 |
| Living environment | Average useful floor space (m²) per dweller | 28.08 | 1.74 | 25.20 | 31.00 | 29.36 | 2.58 | 25.50 | 36.60 |
| | Finished dwellings 2007–2016 per 1000 inhabitants | 15.35 | 6.74 | 4.60 | 27.30 | 13.15 | 4.68 | 3.70 | 23.70 |
| | Share of dwellings without appropriate basic infrastructure | 4.87 | 2.52 | 1.30 | 13.00 | 5.22 | 3.42 | 1.90 | 15.20 |
| | Share of dwellings built before 1946 | 21.69 | 10.64 | 4.84 | 57.24 | 22.96 | 7.66 | 7.27 | 43.22 |
| | Share of brownfields | 0.0007 | 0.0011 | 0.0000 | 0.0041 | 0.0006 | 0.0010 | 0.0000 | 0.0047 |
| | Days of sick leave per employee | 14.55 | 2.35 | 9.18 | 18.59 | 13.55 | 2.52 | 9.59 | 19.28 |
| | Mortality rate | 1,033.63 | 186.42 | 753.05 | 1,378.01 | 1,023.68 | 185.60 | 711.88 | 1,352.50 |
| | Convicted adults and minors 2006–2015 per 1000 inhabitants | 3.37 | 1.51 | 1.15 | 6.09 | 3.43 | 1.67 | 1.13 | 8.33 |
| Voting behaviour | Voter turnout on parliamentary election | 0.53 | 0.04 | 0.47 | 0.61 | 0.52 | 0.05 | 0.42 | 0.61 |
| | Share of vote for radical right parties | 0.34 | 0.07 | 0.16 | 0.45 | 0.30 | 0.08 | 0.17 | 0.47 |
| | Share of vote for radical left parties | 0.07 | 0.02 | 0.04 | 0.13 | 0.08 | 0.03 | 0.03 | 0.16 |

*Tab. 1: Descriptive statistics of the variables used. Source: authors' calculations based on the data from Statistical Office of the Republic of Slovenia, National Institute of Public Health, the Slovenian Intellectual Property Office and the State Election Commission*

To answer the second research objective on the association between industry and socioeconomic performance, we conducted a correlation analysis, using Pearson's coefficient ($r$). Some variables were not normally distributed according to the Kolmogorov-Smirnov test and the Q-Q plot. We transformed the data by applying square, square root, reciprocal, or log functions. For the variables share of high-tech companies, share of people employed in medium and high-tech companies, and share of degraded urban areas, the transformations were not successful and were excluded from the initial analysis. For these indicators, a Spearman's rho coefficient was calculated as a non-parametric counterpart to Pearson's $r$.

## 5. Results

### 5.1 Significant differences between industrial and non-industrial SMSTs

As seen from the descriptive statistics in Table 1, differences in the means of indicators are quite subtle. To test if the differences between industrial and non-industrial SMSTs in Slovenia are statistically significant we conducted Mann-Whitney tests. The results are statistically significant ($p < 0.05$) only for the following indicators:

- Share of employment in the industrial sector ($U = 0.00$, $z = -6.19$, $p = 0.000$, $r = -0.85$);
- Share of medium-tech companies ($U = 98.00$, $z = -4.43$, $p = 0.000$, $r = -0.61$);
- Share of medium- and high-tech companies ($U = 136.50$, $z = -3.74$, $p = 0.000$, $r = -0.51$);
- Share of medium-sized and big companies ($U = 133.00$, $z = -3.81$, $p = 0.000$, $r = -0.52$);
- Share of people employed in medium-sized and big companies ($U = 113.00$, $z = -4.17$, $p = 0.000$, $r = -0.57$);
- Share of commuters ($U = 229.50$, $z = -2.07$, $p = 0.038$, $r = -0.28$).

The statistical tests reveal that differences between industrial and non-industrial SMSTs are in most cases not significant. Statistically significant differences relate mainly to the structural indicators. For instance, it is obvious that industrial SMSTs have a greater share of larger and medium-tech companies since Slovenian industrial enterprises are based on large, export-orientated companies formed in the socialist era and later transformed in the post-socialist era. The differences in structural indicators explain the average picture of Slovenian industry: industrial towns have larger medium to high-tech companies, while the opposite is true for non-industrial towns, with companies mainly in the service sector.

The only significantly different socio-economic indicator is the share of commuters ($r = -0.28$), i.e. in industrial towns the share of commuters is lower. This confirms an initial finding that industry depends on local workers and reflects a more "closed" labour market, which was also found in the Swiss case, where it was established that these types of towns are more isolated from larger neighbouring centres and might be too far away from them to be able to "borrow size" (Kaufman and Meili, 2019; Meili and Mayer, 2017). In Slovenian case, this "closed" labour market of industrial towns is probably also due to their geographic location in peripheral areas. We might speculate that, in Slovenia, a more peripheral location enabled those towns to continue with industrial development, since there was no option for workers to commute daily to larger services-oriented

towns. In a way, peripheral location was responsible for those industrial towns to be able to better adapt to various restructuring events and shocks. For instance, the case of Jutland – an industrial, successful and peripheral region in Denmark – showcased how entrepreneurs were required to be more technologically advanced, innovative and internally organised to compete with the economies of metropolitan areas (Hansen, 1991).

No other socioeconomic indicator was statistically significantly different, leading to the conclusion that there are no major differences in socioeconomic performance between industrial and non-industrial SMSTs in Slovenia. These findings contradict some other studies, which state that industrial towns face poorer socioeconomic development with regard to unemployment (Hamdouch et al., 2017), population decline and educational structure (Vaishar et al., 2016), or demographic and economic decline (Fol and Cunningham-Sabot, 2010).

### 5.2 Relationship between industry and the socioeconomic indicators of SMSTs

Since the socioeconomic differences between industrial and non-industrial SMSTs are subtle, we tried to establish if there is any correlation between industry and other dimensions of socioeconomic performance in all SMSTs in Slovenia. This is especially important because the presence of industry in previous research is associated with poorer job growth (Servillo et al., 2014), demographic shrinkage (Wolff and Wiechmann, 2018), unsustainable development (Vaishar et al., 2016) and unemployment (Hamdouch et al., 2017).

The correlation between industry and general economic structure indicators (Tab. 2) show that a greater presence of industrial activity is positively related to larger and medium-tech companies. This is a legacy of the socialist industrialisation, which favoured large labour-intensive industrial plants. Despite the fact that the current economic base is mostly medium-tech (automotive, electrical appliance, pharmaceutical and metal products industries), it shows some significant innovative potential due to a higher concentration of patents, which indicates positive transformative capacities (Kozina and Bole, 2018).

The correlation analysis between industrial employment and socioeconomic performance returned similar results to the Mann-Whitney tests. Industry is negatively associated with the commuting ratio, which reaffirms the notion of industrial areas representing more closed and vulnerable societies that may additionally increase intolerance. This notion is also reflected in the positive correlation between industrial employment and support for radical right parties. This could relate to increasing levels of economic insecurity or even fear in the context of post-industrialisation and (hyper)globalisation, which contributed to the decline of many industrial areas in Western societies, making the electorate susceptible to campaigns of populist and radical parties (Rydgren, 2012; Inglehart and Norris, 2016; Obschonka et al., 2018). In Slovenia there is another possible explanation connected with this association: industrial SMSTs have smaller populations, and right wing parties in Slovenia have historically performed better in smaller towns (Tiran, 2015).

Industry is also negatively associated with the average useful floor space per dweller. Because a significant share of their housing stock originates from the (pre)socialist era, when the construction of working colonies (earlier) and multi-storey blocks with smaller flats (later), was popular,

| Indicator | Share of employment in industry |
|---|---|
| **Structural indicators** | |
| Share of medium-tech companies | 0.456** |
| Share of medium- and high-tech companies | 0.401** |
| Share of medium-sized and big companies | 0.502** |
| Share of people employed in medium-sized and big companies | 0.588** |
| Number of patents 1991–2016 per 1000 inhabitants | 0.239* |
| **Socioeconomic indicators** | |
| Employment: Share of commuters | − 0.208* |
| Demography: Ageing index | − 0.221* |
| Living environment: Average useful floor space (m$^2$) per dweller | − 0.286** |
| Voting behaviour: Share of vote for radical right parties on parliamentary election | 0.220* |

*Tab. 2: Correlations between industrial employment and socioeconomic indicators in Slovenian SMSTs (significance < 0.05 and 0.01 only). Notes: N = 100; \*p < 0.05 (2-tailed); \*\*p < 0.01 (2-tailed)*
*Source: authors' calculation*

industrial towns have a lower housing standard from this perspective today. The dwellings still have a smaller surface area, which is expected since traditional workers' apartments were built under different circumstances and building criteria. Approximately 20% of these apartments were built before the Second World War.

Unexpectedly, industry is negatively related to the ageing index, implying that a better age structure of industrial SMSTs, in comparison to non-industrial SMSTs, means that industrial towns have a somewhat better demographic outlook. This triggers interesting research questions and policy implications.

This correlation analysis reconfirms that industrial SMSTs are not necessarily disadvantaged concerning their socioeconomic performance. Moreover, the presence of industry in Slovenian SMSTs is not associated with poor overall performance, as was the case in other research presented in the earlier theoretical background.

## 6. Discussion

The main principles appearing from our results are twofold. First, there are very few statistically significant differences in socioeconomic structure between industrial and non-industrial towns in Slovenia. Of 22 socioeconomic variables, only one (share of commuters) differs significantly. Second, the association between industry and other socioeconomic variables is very subtle with few significant and generally weak correlation coefficients. Our results demonstrate several opposing views with respect to previous research. Below, we discuss the potential reasons for this apparent mismatch. We start with locally-specific explanations and discuss them with respect to the distinctive socioeconomic trajectories of Slovenia. We follow up with discussing the post-industrial transformation in Slovenia, which might have influenced the results. We finish with discussing this study in comparison with other studies and by assessing some of the limitations of this analysis.

### 6.1 The specific economic trajectory of Slovenia

It has to be stressed that Slovenia has had some very specific economic policies, which might contribute to the lack of significant differences between industrial and non-industrial SMSTs. In contrast to other Central and Eastern European countries, where new industrial development was spurred by foreign industrial investments (Pavlinek, 2004; Novotná and Novotný, 2019), the present-day industrial development in Slovenia is mostly based on endogenous development of companies that managed to transform from former 'socialist-style' factories into global ventures (Bole et al., 2019). The economy of Slovenia is considered to be very export-orientated (41% of GDP in 2014), one of the highest in the OECD (OECD, 2017b). It is interesting to note that according to research on the recent economic recession, Slovenian towns with an export-oriented economic base were more resilient (Lapuh, 2018). Industrial SMSTs generally belong to this category and many of them were either unaffected by the recession or recovered more rapidly, which might also explain why industrial SMSTs do not underperform compared to non-industrial ones. If Slovenian industrial towns were less export-oriented, they would perhaps exhibit poorer socioeconomic indicators due to lower levels of adaptation and resilience dynamics.

The small town of Idrija is an example of such an export-oriented town, because it was transformed from a former mercury mining town to a major and globally important supplier in the automotive industry (Urbanc et al., 2012). Many other successful Slovenian industrial towns specialised into niche manufacturing sectors, such as electrical components manufacturing, the chemical industry … and are labelled as "single-industry towns" or "post-socialist champions" (Bole et. al., 2019, p. 77). But it would be premature to say that industrial specialisation leads to better performance, as is the case in Czech microregions (Ženka et al., 2015), especially since successful single-industrial towns in Slovenia are actively developing new paths from older industrial traditions.

There are some interesting research findings, which indicate the positive influence of industrial culture in smaller and older industrial cities through neo-industrialisation strategies of flexible specialisation, the knowledge economy and the fostering of the "pioneering spirit" (Görmar and Harfst, 2019; Harfst et al., 2018; Pipan, 2018). Industrial towns proved very resilient to recent economic shocks because they were able to adapt in what Pike at al. (2010, p. 62) call the "renewal of a pre-conceived and previously successful development path". They are using old industrial paths to create new ones: either directly in a process called

"layering" as found in Czech microregions, where an original industrial specialisation adds new layers through an implantation of export-oriented industry (Ženka et al., 2019); or indirectly through industry-related activities (industrial heritage tourism, education based on industrial knowledge and skills, etc.).

### 6.2 Specific post-industrial transformation in Slovenia

One process that could influence our results is the absence of the so-called "failed tertiarisation" effect in Slovenia. Some authors suggest that urban shrinkage and poor socioeconomic performance is a problem of failed post-industrial transformations or tertiarisation and not of industry as such (Bartholomae et al., 2017). Gornig and Goebel (2018) explain how tertiarisation left deep scars on cities by forsaking certain achievements from the industrial age, such as collective wage setting and the welfare state. The shift to the service sector also brought increasing social polarisation linked to policies deregulating the labour market. Beatty and Fothergill (2017, p. 177) describe how deindustrialised regions in the UK have been hit by social problems, and even call for "a rebalancing of the UK economy in favour of industry". Although there are deindustrialised towns in Slovenia, we must not forget that the embedded egalitarianism of the society managed to maintain its welfare state. Consequently, Slovenia has one of the lowest wage and wealth gaps in Europe (OECD, 2017a). Perhaps this is the reason that failed tertiarisation effect was not felt to the same extent as some other countries, which can explain weak socioeconomic differences between industrial and non-industrial SMSTs.

Perhaps we should also consider the proposition that there are macroregional differences in Europe and that towns in Central and Eastern Europe develop differently to those in the West. This could also explain our results. Krzysztofik et al. (2016) stipulated that post-industrialism, understood as industrial change, is accompanied by deindustrialisation and urban shrinkage, but simultaneously, at least in Central Europe, re-industrialisation is taking place. Re-industrialisation in certain regions of the Czech Republic, Slovakia and Poland (Krzysztofik et al., 2019), as well as in Croatia (Lončar and Braičić, 2016), is not only a consequence of newly-established plants from abroad but also due to the expansion and modernisation of traditional industry in towns (Industry 4.0). A modern post-industrial region can simultaneously experience processes of re-industrialisation, industrial stabilisation or deindustrialisation. Analogically, towns can experience urban growth and better socioeconomic performance (re-industrialisation) or urban shrinkage (deindustrialisation). We cannot claim that the case of Slovenia represents a standard situation across the whole of Europe, or even East Central Europe. The above-mentioned examples, however, could potentially lead to a conclusion that there are some common patterns of adaptation dynamics, such as re-industrialisation, at least in certain regions of Central and Eastern Europe, and that this is the reason why the socioeconomic situation in Slovenian industrial towns cannot be compared to Switzerland or other countries with a longer capitalist tradition. Post-socialist countries have reintegrated differently to the global economic and spatial structures, and present different current and future development trajectories (Novotný et al., 2016).

### 6.3 Limitations and future research orientations

As well, there are other possibilities why the results of this study differ significantly from previous research. When we investigated whether there are statistically significant differences between the most and the least industrial towns, deindustrialised towns were generally not included in the analysis, since they did not meet the required 0.5 SD threshold of the share of industrial workplaces. Deindustrialised towns have below average industrial employment and were thus not a part of the industrial towns group, although cognitively they are considered as "industrial". This engenders more research for those shrinking deindustrialised towns faced with the failed tertiarisation effect, and for research demonstrating the heterogeneity and variety of industrial towns. We agree with those authors emphasising the evolutionary perspective on reindustrialisation in Europe, showing the importance of adaptive capabilities according to context- and place-specific structures (Wink et al., 2015).

Additionally, we used statistical analysis to detect differences between two types of smaller towns and a correlational analysis to detect patterns of association in any statistical relationship, whether causal or not, between industrial employment and other socioeconomic indicators. We offered a descriptive snapshot of socioeconomic analysis, but not causality – from our results we know that industrial employment interacts with certain variables, such as the share of votes for radical right parties, but it would be premature to say that industry "causes" populist and radical movements. To delve further into causalities, directionality and other processes (for instance industrial specialisation versus diversification in socioeconomic performance), we would need better sets of data combined with more complex statistical methods, such as multi-level models.

Another potential reason for the different results of this study compared to others could be in differences in data and methodologies. Although we have established that similar research on a national level is extremely limited, we should also acknowledge their methodological heterogeneity. For example, the Czech example (Vaishar et al., 2016) considers towns with population thresholds from 3,000 to 15,000 people, while the Swiss (Meili and Mayer, 2017) and the European study (Servillo et al., 2017) have thresholds similar to ours. In the European study (Servillo et. al. 2014), the selection of towns was predetermined and based on 31 case study towns across Europe, while other studies included SMSTs in the entire national urban system. Methodologically, there are important differences as well, from data collection to analytical procedures. We believe it is important to conduct more unbiased, cross-national and methodologically comparative research on the socioeconomic performance of industrial towns to understand them, and avoid the residents' fear of being left behind and of having no future (Rodríguez-Pose, 2018), which might lead to proneness to populism and political radicalisation (Dijkstra et al., 2019).

## 7. Conclusions

This paper attempted to test the socioeconomic performance of industrial SMSTs in comparison to their non-industrial counterparts, and to see if the presence of industry has adverse effects on employment, demography, the living environment and voting behaviours. The results, based on multiple and diverse indicators, do not confirm the adverse effect of industry on socioeconomic performance. In fact, only minor differences between industrial and non-industrial SMSTs exist, pertaining mainly to employment and the living environment (slightly better in non-industrial SMSTs). This finding does not reflect mainstream literature on post-industrial discourse, which clearly favours the

development of a service-based economy, often as the only way forward for industrial towns and regions. Our theoretical suggestion is that industrial SMSTs should not be viewed too simplistically as some sort of remnant of the industrial past. The sheer fact that SMSTs in Europe exhibit above-average industrial employment compared to national averages, should render them an independent subject of further research and strategic policy-making. No European country, however, has an exclusive policy directed specifically to SMST development (Atkinson, 2017), let alone to that of industrial SMSTs. Local policies in SMSTs are found to have a limited impact on the local economy since they lack expertise and seem to be too small-scale to influence economic development – but they do have more control over land-use planning and the general attractiveness of towns (Kaufman and Meili, 2019).

Ferm and Jones (2017) have argued that cities need to plan for new industry if they are to be economically and socially resilient, sustainable and vibrant. If industrial activities are not planned, there is always a danger that unforeseen or ad hoc industrial development might bring further environmental concerns and have adverse consequences on the socioeconomic well-being of SMSTs. This is important for Slovenian industrial SMSTs because they exhibit slightly worse housing standards. These less favourable living environment conditions indicate that policies on industrial SMSTs should focus on enabling a better quality of life, strengthening (industrial) town identity with local sports and cultural activities – all those factors are important elements of retaining people and fostering diversity (Meili and Shearmur, 2019) that could also attract a younger population and the (higher income) high-tech sector.

We can only agree with Rodríguez-Pose (2018), who is proposing a shift towards more place-sensitive development policies in "places that don't matter", instead of uncritically embracing the idealistic culture-led discourse with no support from the local communities. Instead, we propose the re-orientation of the research and policy fields towards addressing the real socioeconomic issues of industrial SMSTs, such as a lower quality of the living environment and rise of radicalism. It would be best to focus policy making on the advantages and untapped potential of industrial SMSTs – over larger and more service-oriented urban environments.

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