BRIGHT FUTURE, RQ3

National analysis of Slovenian small and medium-sized industrial towns

David Bole, Jani Kozina, Jernej Tiran
Anton Melik Geographical Institute, Research centre of the Slovenian academy of sciences and arts

Contents:

Authors:
David Bole, Jani Kozina, Jernej Tiran

ZRC SAZU Research Centre of the Slovenian Academy of Sciences and Arts

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1. Introduction

This report is the Slovenian national analysis of small and medium sized industrial towns (SMITs). It is a descriptive quantitative analysis, where we tried to answer on basic research questions from the BRIGHT FUTURE management plan. The analysis is based on the collection of 34 variables explaining employment, economic performance, demographic trajectories, living environment, and voting behaviour for 212 LAU 2 units (*občine* or municipalities). Because of Slovenia's small size, the analysis is conducted solely on LAU 2 units. The 12 existing NUTS3 units do not represent a sufficient size to carry out complex regional analysis. Besides, NUTS3 units in Slovenia are merely statistical entities and do not correspond to functional regions. In the report we answered the following questions:

1. What are the historic processes of (de)industrialisation and the present state of industry in Slovenia?

We tried and answer with a short overview of the Slovenian historic trajectories of industrialisation and subsequent deindustrialisation (Chapter 2) to understand its present structure. We briefly present the types and the roles of industry in a national context. We present the distribution of various industrial sectors and highlight its importance in certain industrial regions.

2. What are the units of analysis / What and where are SMITs in Slovenia?

In Chapter 3 we define the small and medium sized town in Slovenia, not just present, but also past (former), which are marked as de-industrialised.

3. What is the general relation between industrial employment and other indicators on a nation-wide town level? How are industrial small and medium-sized towns different from non-industrial ones?

In Chapter 4 we present a regression and a correlation analysis of how is industrial employment connected with other indicators. The second part of the chapter is devoted to exploring the statistical differences in industrial and non-industrial SMTs according to the set of five types of indicators.

4. What is the typology of SMITs in Slovenia according to a) economic performance and employment what are their b) demographic, c) living environment, and d) voting behaviour characteristics?

In Chapter 5 we present a typology of SMITs in Slovenia according to their economic performance and based on cluster analysis. Than we compare basic statistics on the four types of indicators to draw comparisons/differences among SMITs and also former deindustrialised SMITs.

In the end (Chapter 6) we tried to make a short synthesis of statistical results, relating back to Research question 3 in the BRIGHT FUTURE management plan.

1.1 Dataset description

All data statistically analysed and discussed in this document are retrieved from Statistical Office of the Republic of Slovenia or other public records. Altogether 34 indicators at the LAU 2 local level were available and taken into consideration. There are 212 municipalities in Slovenia, so the dataset has almost no missing values. The indicators are divided into five groups: **employment**, **economic performance**, **demographic trajectories**, **living environment** and **voting behaviour** as the only group of indicators available for determining the political structure. For the typology of SMITs based on economic performance, we have combined indicators from the "economic performance" group with "employment" group. Unfortunately, only one indicator is directly related to industry, i.e. share of employment in the secondary sector, which is defined as those employed in B (mining), C (manufacturing) and F (construction) sectors according to NACE classification. We excluded D (energy supply) and E (water and sewage supply) sectors, since this would significantly differ from the past

research done in Slovenia and would not allow for historical comparability. But in any case, D and E sectors represent only 2.2% of the total employment or 6.5% of industrial employment (considering sectors from B to F), so results should be comparable.

Table 1: Indicators used in statistical analysis.

Group of indicators	Indicator	Year	N	Mean	Standard deviation	Minimum	Maximum
Employment	Commuting ratio	2015	212	68.04	15.38	16.10	90.50
	Average salary (gross)	2015	212	1364.64	149.12	1021.51	2348.26
	Added value per employee (net)	2015	212	33962.34	8057.85	3682.75	61992.77
	Share of employment in the secondary sector	2015	212	34.68	15.84	5.60	84.10
	Share of unemployed	2015	212	11.84	3.94	4.60	24.90
	Share of long-term unemployed	2015	212	6.04	2.57	1.60	15.10
	Share of foreign workforce	2015	212	5.36	3.73	0.00	18.85
	Share of medium-tech companies	2015	212	0.92	0.73	0.00	4.02
Economic performance	Share of high-tech companies	2015	212	0.16	0.28	0.00	1.67
	Share of medium and high-tech companies	2015	212	1.08	0.82	0.00	4.60
	Share of employed in medium and high-tech companies	2016	212	3.61	6.81	0.00	38.31
	Share of medium and big companies[1]	2015	212	0.93	0.60	0.00	2.75
	Share of employed in medium and big companies	2016	212	31.80	23.43	0.00	81.02
	Investment index per capita[2]	2015	212	1.61	1.54	0.03	9.81
	Share of high-growing companies[3]	2015	212	0.29	0.32	0.00	1.41
	Number of patents 1991–2016 per 1000 inhabitants	1991–2016	212	0.00	0.00	0.00	0.01
	Population in 2016	2016	212	9736.74	22259.60	372.00	288307.00
Demography	Population growth 1991–2016	1991–2016	212	0.05	0.18	-0.33	1.07
	Population growth 1991–2000	1991–2000	212	0.01	0.06	-0.22	0.26
	Population growth 2000–2010	2000–2010	212	0.03	0.10	-0.19	0.70
	Population growth 2010–2016	2010–2016	212	0.00	0.04	-0.16	0.23
	Aging index[4]	2016	212	128.90	32.99	62.70	274.40
	Average net usable area (m^2) per dweller	2015	212	28.75	2.33	22.50	36.60
Living environment	Finished dwellings 2007–2016 per 1000 inhabitants	2007–2016	210	14.65	9.13	1.80	64.60
	Share of dwellings without appropriate basic infrastructure[5]	2015	212	6.58	4.37	1.30	30.90
	Share of dwellings built before 1946	2015	212	23.98	8.86	4.84	57.24
	Share of degraded urban areas	2011	212	0.00	0.00	0.00	0.01
	Days of sick leave per employee[6]	2016	211	14.45	2.80	8.44	29.35
	Mortality index	2016	211	1048.68	232.64	577.27	2211.45
	Convicted adults and minors 2006–2015 per 1000 inhabitants	2006–2015	211	3.20	1.65	0.00	10.87
Voting behaviour[7]	Voter turnout on parliamentary elections	2014	212	49.25	5	32	64
	Share of vote for left-wing parties on parliamentary elections	2014	212	12.78	4.91	4.62	41.78
	Share of vote for centrist parties on parliamentary elections	2014	212	45.01	7.96	23.02	61.49
	Share of vote for right-wing parties on parliamentary elections	2014	212	38.91	10.60	13.10	67.81

[1] More than 50 employees.
[2] In € / inhabitant; data for the municipalities Destrnik in Sv. Andraž v Sl. Goricah is from 2014.
[3] Companies that have above 10 % employee growth rate.
[4] The ratio between 65+ year-olds and 0–15 year-olds, multiplied by 100.
[5] Basic infrastructure elements: internal toilet, bathroom, water, and electricity.
[6] Average number of calendar days of incapacity for work per worker. The days taken by the selected personal doctors on the certificate of a physically justified absence from work are taken into account.
[7] Votes for political parties were summed up in three groups (left, centrist, right) according to parties' position on the left-right scale, defined with public opinion surveys and parties' membership in European political parties. Only parties with more than 2 % votes were taken into consideration.

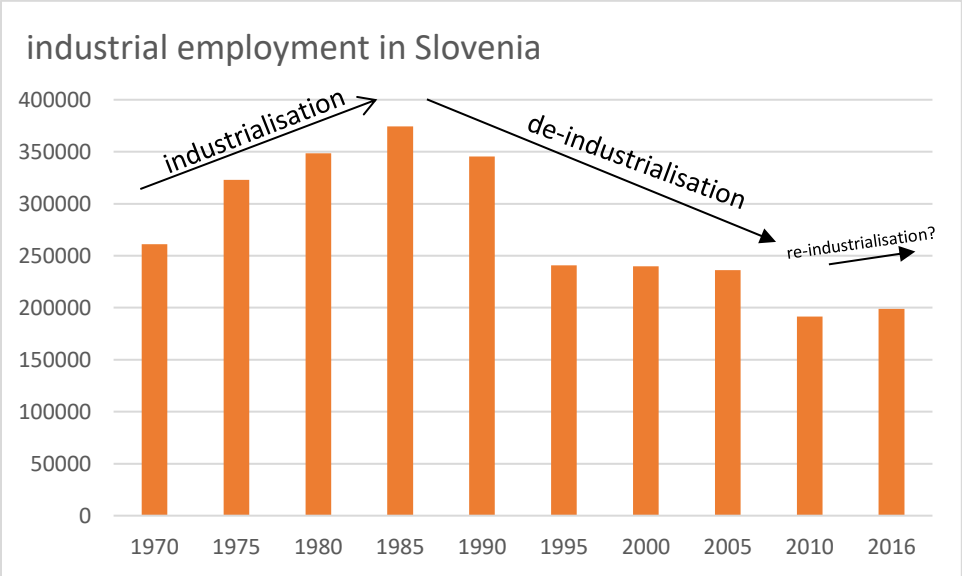
2. Short description of historical (de)industrialisation processes and present state of industry in Slovenia

2.1 Historical perspective

Present day structure and location of industry was more or less determined at the "third" and the most influential industrial revolution, which began after WW2. After 1945, the new or renovated factories were at first still primarily concentrated in the "industrial crescent" that had formed before World War II. Because the "socialist political goal" was to spread industrialism and the proletariat across the country, all the regional centres were industrialized. The second wave of industrialisation began in the 1970s when the authorities concluded that the industry is too concentrated in larger towns and they feared disproportionate development and social issues. In line with the principles of polycentric development, smaller towns as well as completely rural areas began industrializing with factories, which is still characteristic of industrialization today. Regional centres and older industrial towns experienced stagnation, while a completely new industry began developing in smaller rural towns. This was also the height of industrialization, as almost 50% of people were employed in industry in the late 1970s.

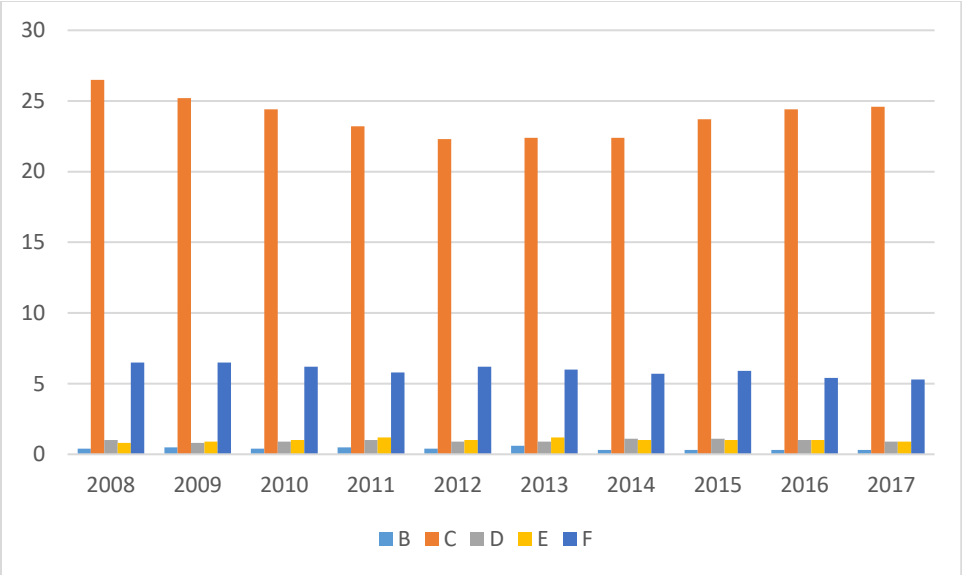
With the independence of Slovenia in 1991 and the introduction of a market economy, the majority of industrial companies found themselves in a difficult position due to the loss of a major part of their extensive market in the former Yugoslavia, the restructuring of production, the lack of investment funds, and privatization. But many companies gradually managed to overcome these problems. Some went bankrupt, many were sold off plant by plant, and others were partly or entirely bought by foreign entrepreneurs, or simply ceased operation. Some Slovene companies outsourced production to the Balkans or Eastern European countries or transformed themselves into successful export-oriented companies. Fig. 1. is showing employment in mining (B sector) and manufacturing (C sector) through time. The largest number of people employed in Slovene industry was in 1986, when factories employed 392,237 people (50% of the workforce) and the extent of the industrial production was at its peak. In the decade's final few years, industrial employment stabilised at around 200,000 workers, which represents about 26% of the entire workforce, but the number has been slightly rising from 2010 onwards.

Figure 1: Number of workers in industry and mining in Slovenia.



In Fig. 2 we can clearly see the effects of the global economic crisis, which resulted in the downfall of industrial employment in general. But it seems that the industrial sector managed to overcame this crisis, since the employment rates in 2017 almost reached those from 2008, with one notable exception – the construction sector (B) – where employment growth is more precarious.

Figure 2: Share of employment in industrial sectors from B to F[8] in Slovenia from 2008 onwards.

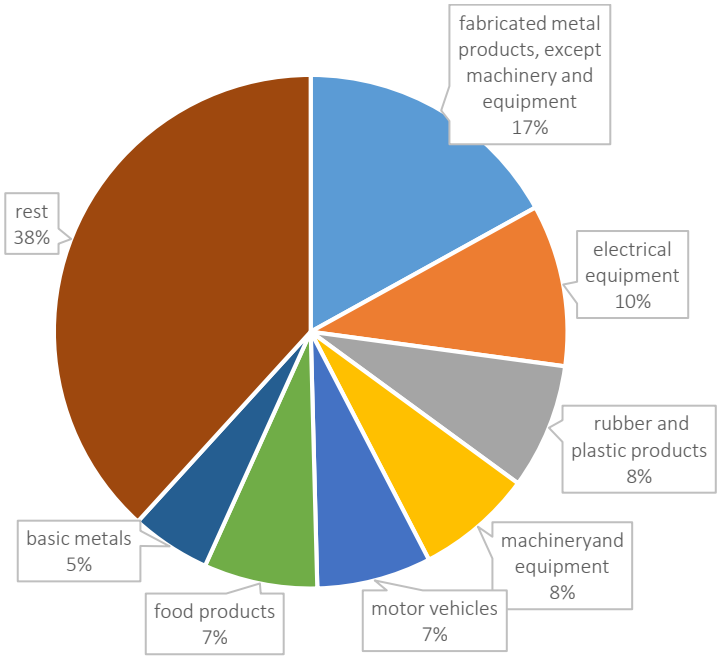


2.2 Present state and location of industry

Industry (B+C+F economic sectors according to NACE classification) currently employs 243,000 people, which is about 30% of the entire national workforce. The majority (23%) works in manufacturing, 6% in construction and less than 1% in mining. Fig. 3 is showing the most important manufacturing sectors regarding employment. Metal industry, small electric appliances manufacturing and plastic manufacturing account for a third of the total industrial workforce.

[8] B= mining; C= manufacturing, D= energy, E= water & sewage, F= construction

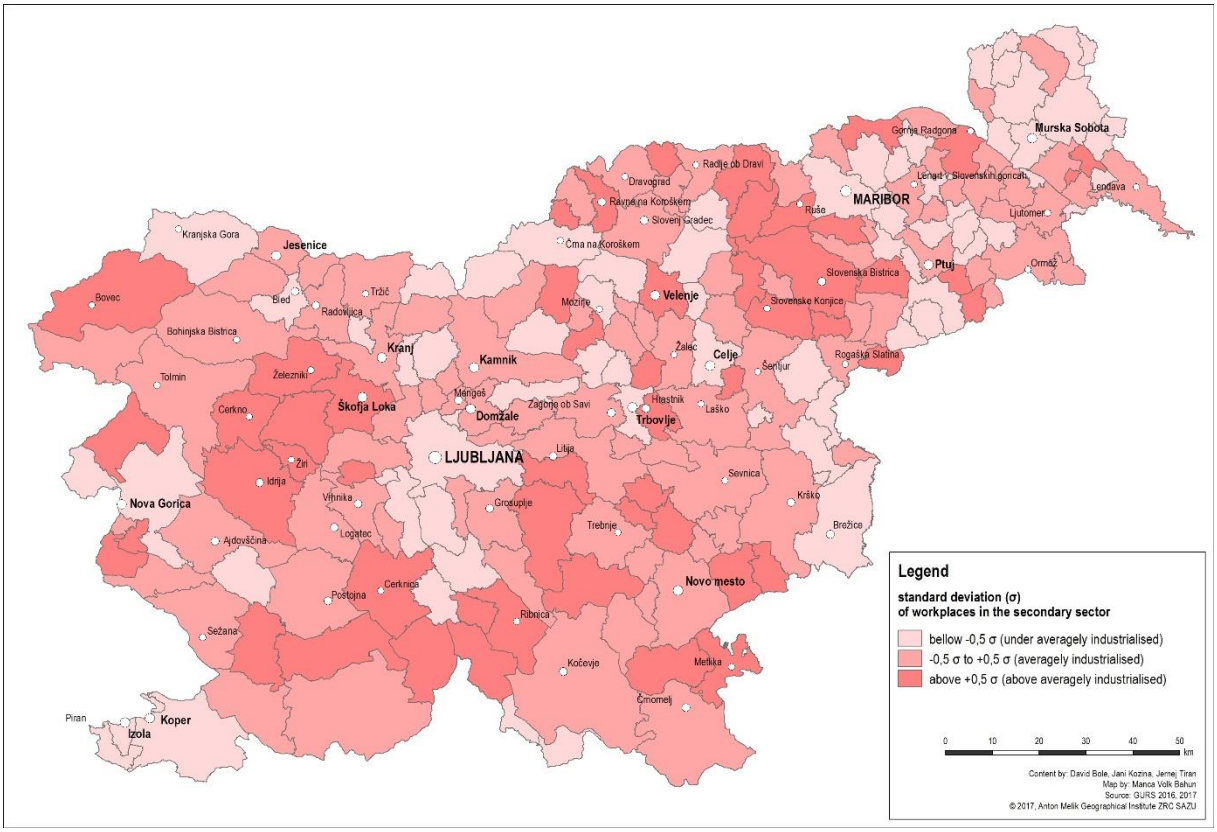
Figure 3: Workplaces in the manufacturing sector (C) in Slovenia in 2016.



Industry is generally more represented at the "fringes" and not in the central urban parts of the country. This is partly the consequence of socialist policies of industrial dispersion to rural areas in the later stages, and partly due to deindustrialisation trends in large and medium-sized towns in the country in the 1990-ies. Present day industry is located in smaller towns and rural municipalities that managed to transform former socialist style factories into successful ventures. Rarely, new industrial development spurred due to foreign industrial investments, which is characteristic for other post-socialist central European countries such as Slovakia, Hungary or Czechia (Pavlinek 2004). Many of SMITs are interestingly in more remote, hilly areas, not connected with highways or railways and mostly depend on large manufacturing companies that expanded during the socialist period. There are also (rare) towns that were industrialised after the 1990-ies with new and smaller companies, such as in Ivančna Gorica (motor vehicle equipment factory).

We have made the typology based on the share of workplaces in the industrial sector (B, C and F) of 212 LAU2 units (municipalities). Municipalities having the share between – 0.5 and + 0.5 standard deviation of industrial employment are listed as "average" industrialised, those that have the industrial sector above + 0.5 of the standard deviation are "above average industrialised", and those bellow -0.5 standard deviation of industrial employment are "under average industrialised". Translating standard deviations into absolute numbers means that – 0.5 st. dev translates to 26.67% and + 0.5 st. dev into 42.6% of industrial employment. This means that 70 LAU2 units are under-industrialised, 89 are averagely and 53 over-industrialised (Fig. 4).

Figure 4: Share of workplaces in the secondary economic sector (B+C+F) in Slovene municipalities in 2016.



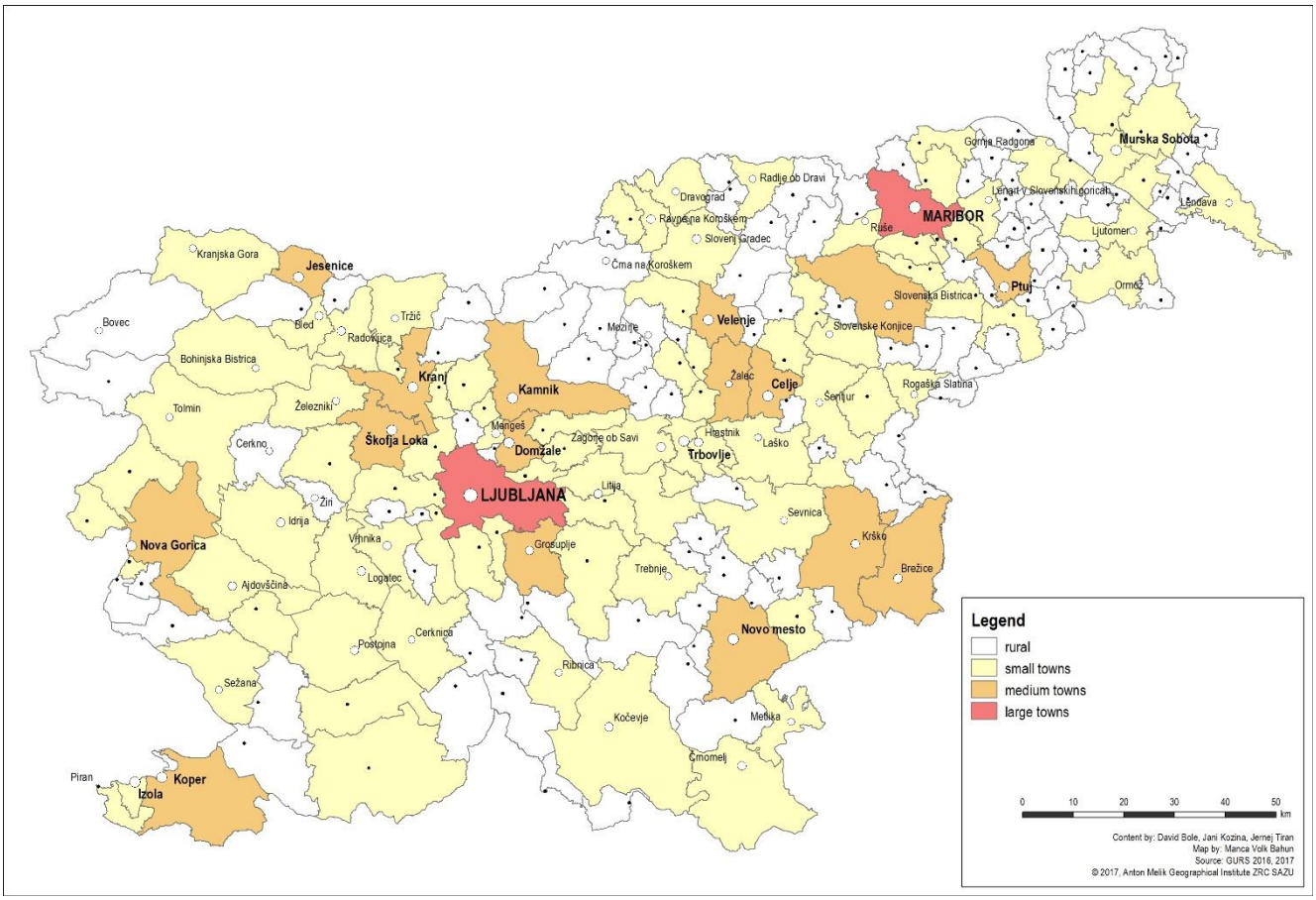
3. Units of analysis

3.1 Small and medium-sized towns

As mention earlier, our units of analysis are LAU 2 units or *občine* (municipalities). According to the OECD methodology, Slovenia is the third most rural country in Europe, since 57.6% of the total population lives in low-density and smaller settlements (OECD 2017). Despite their smaller size, small towns are important elements of the urban system and are very important for ensuring spatial cohesion in Slovenia, as they perform service, economic, and social functions for the outskirts (Nared et al. 2017). This unevenness of the urban system is further strengthened by the governmental structure of Slovenia since there are only two levels of governance: the national and the local (municipalities or LAU 2 unites). This is also reflected in the lack of regional capitals or medium sized towns with populations around 50,000 inhabitants. Smaller towns are also very strong in economic indicators and match or sometimes outperform medium-sized cities of regional importance especially in export orientated production.

Towns are defined based on previous research (Bole, Nared & Zorn 2016; Bole 2012; Rebernik 2007) and consider the specificities of the Slovenian urban system. Rural towns have a total population bellow 5000, small towns between 5000 and 20,000, medium-sized towns between 20,000 and 100,000, large towns above 100,000 and are shown on Fig. 5.

Figure 5: Identification of small, medium-sized and large towns in Slovenia on municipal (LAU 2) level according to population size.



Slovenian urban system is dominated by small towns (Table 2), as the majority of analysed municipalities in Slovenia (84 of 102) have the population less than 20,000, representing more than two fifths of total population (40.97%). Small and medium-sized towns have more than one third of workplaces in industry, much more than large towns (16.85%). This distribution of population matches with abovementioned characteristics of the settlement structure. Municipalities with less than 5,000 inhabitants were classified as rural and were excluded from further analyses.

Table 2: Distribution of population and industry across different sizes of towns.

	Population	% of total population	N	Mean	Standard deviation	Minimum	Maximum	% industrial workplaces
Small towns	845,678	40.97	84	10067.60	4285.92	5007	19047	36.44
Medium-sized towns	505,755	24.50	16	31609.69	11416.11	20059	56115	35.81
Large towns	400,139	19.38	2	200069.50	124786.67	111832	288307	16.85
Total	1,751,572	84.86	102	17172.27	30430.75	5007	288307	87.10

3.2 Industrial small and medium-sized towns

According to the current employment structure:

As noted above, we have taken a general delimitation of small and medium-sized towns adapted to the Slovenian context. We applied a further criterion of above-/below- average industrialisation to shell out SMITs in Slovenia. We decided to use a quantitative measure of a very pragmatic nature: to define above average towns according to standard deviation. We use 0.5 Standard deviation measure, which cuts off about 30% of "extreme" (bellow- and under-average) towns. The criteria are:

1) Population:
   a) Small town: 5.000–20.000 inhabitants
   b) Medium-sized town: 20.000–100.000 inhabitants
   c) Large town: > 100.000 inhabitants
2) Employment in the secondary sector (%):
   a) Under average industry: < Mean – 0.5 Standard deviation (34.68 – 15.84/2 = 26.76)
   b) Average industry: Mean ± 0.5 Standard deviation (26.76–42.60)
   c) Above average industry: > Mean + 0.5 Standard deviation (34.68 + 15.84/2 = 42.60)

According to the above criteria, there are 24 SMITs (21 small and 3 medium-sized industrial towns) in Slovenia (see Tables 3 and 4). They have 265,000 inhabitants or about 13% of the country population.

Table 3: Distribution of population across different sizes of towns and their level of industrialisation.

	Small towns		Medium-sized towns		Large towns	
	N	%	N	%	N	%
Under average industrialised towns	190,284	22.50	156,174	30.88	400,139	100.00
Average industrialised towns	471,656	55.77	268,494	58.11	0,00	0.00
Above average industrialised towns	183,738	21.73	81,087	11.01	0,00	0.00
Total	845,678	100.00	505,755	100.00	400,139	100.00

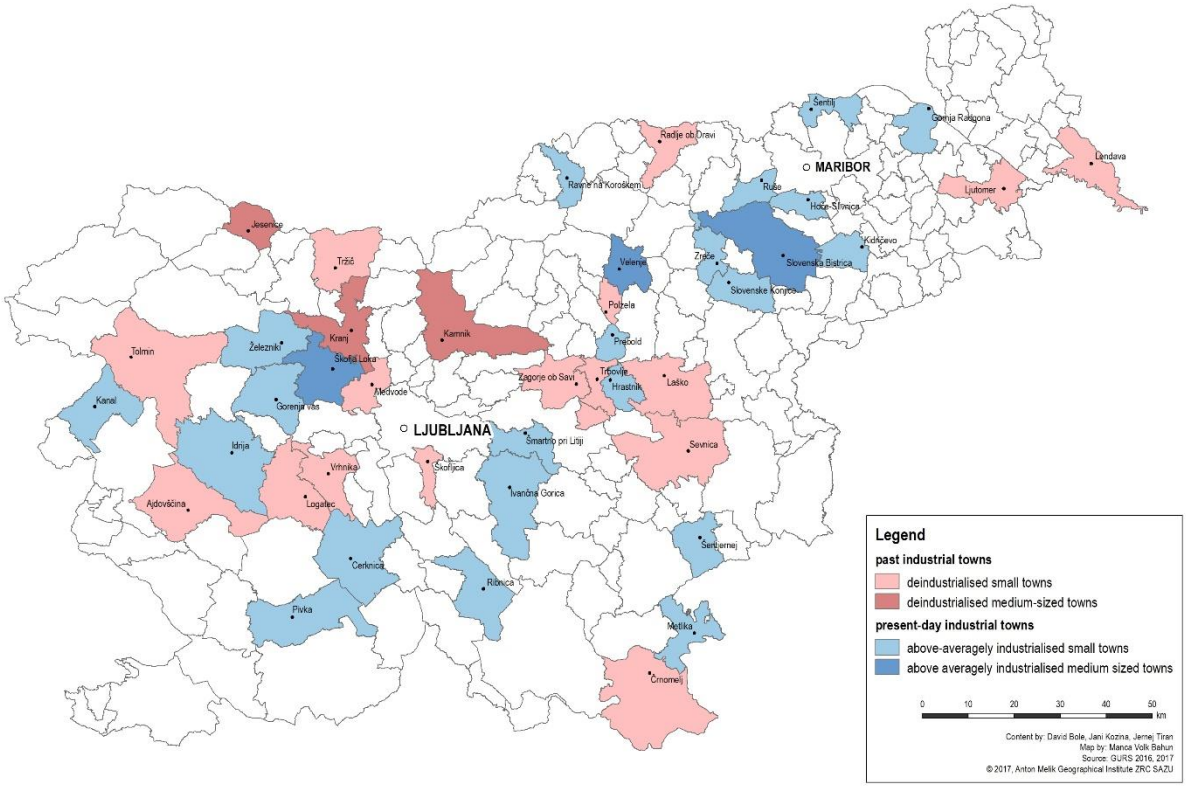
Table 4: Distribution of towns across different sizes and their level of industrialisation.

	Small towns		Medium-sized towns		Large towns	
	N	%	N	%	N	%
Under average industrialised towns	21	25.00	4	25.00	2	100.00
Average industrialised towns	42	50.00	9	56.25	0	0.00
Above average industrialised towns	21	25.00	3	18.75	0	0.00
Total	84	100.00	16	100.00	2	100.00

Identifying former industrial SMITs (de-industrialised SMITs):

Because the above-mentioned classification has its limits and can only highlight present-day towns with above or below average industrial function, it disregards past industrial towns. Those exhibit average or below-average industrial employment, but have social, cultural, spatial, and identity ties and can be considered as a “derelict” type of industrial towns. To identify de-industrialised towns we compared the same data on industrial employment in 1991 and 2002. Those towns that were above average in industry in 1991 and 2002 according to the 0.5 standard deviation rule, but are now only average or even below-average, were marked as deindustrialized (Fig. 6).

Figure 6: Present SMITs and former SMITs in Slovenia.



4. General relationships between industry and other indicators on the town level in Slovenia

Correlation analysis:

In order to analyse correlation between industry and development indicators, correlation analysis by employing Pearson's coefficient was performed. Indicators share of high-tech companies, share of employed in medium and high-tech companies, and share of degraded urban areas were excluded from the initial analysis due to violation of assumption of normal distribution. However, for these three indicators Spearman's coefficient was calculated as a non-parametric counterpart of Pearson's coefficient.

Looking at the correlations matrix (Annex 1), we can see that industry is positively related with a majority of indicators measuring economic performance. The structure of industry in SMTs consists of more medium-tech, and medium-sized and big companies with more employees. The reason for that could probably be assigned as a heritage of socialist period with favoured big industrial companies. Despite the economic base of nowadays industrial structure is mostly medium-tech, it is still quite innovative (positive correlation with number of patents).

Industry is negatively related with commuting ratio, aging index, and average net usable area (m^2) per dweller. As expected, industrial SMTs present strong local employment centres. Because more of the housing stock originates from the socialist era, when construction of multi-storey blocks with smaller flats was a popular domain, industrial SMTs face a lower degree of dwelling surface per capita today. Surprisingly, industry is also negatively related with aging index. Probably, we could associate this finding with a lower spatial mobility rate of Slovenian population and a higher fertility rate of industrial vs. post-industrial society.

Regression analysis:

In order to model the impact of industry on development indicators in SMTs in Slovenia, stepwise OLS regression analysis was performed[9]. Share of employment in the secondary sector was used as a dependent variable. The results show that share of employment in the secondary sector is positively associated with share of employed in medium and big companies and share of medium-tech companies. In contrary, it is negatively associated with aging index, average salary (gross), and population growth 1991–2016. In conclusion, the average SMIT will have large medium tech companies, and will also have a better young/old ratio (aging index) but a slight decrease of population, and lower average salaries (gross). By indicated regression model below it is possible to explain 61% of a variance of the dependent variable.

Table 5: Regression coefficients for share of employment in the secondary sector (N = 100).

	B (SE B)	β
(Constant)	8.327 (11.584)	
Share of employed in medium and big companies_x*x	.005 (.001)	.517 **
Share of medium-tech companies	10.952 (1.998)	.370 **
Aging index	-.220 (.043)	-.501 **
Average salary (gross)_1/x	-50,869.424 (13,260.185)	-.268 **
Population growth 1991-2016_log10(x+1)	-51.789 (19.220)	-.275 *

R^2 = .605; * Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed)

4.1 Comparisons of SMITs versus non-SMITs (industrial SMTs and non-industrial SMTs)

Economic performance: The breakdown of economic performance (Annex 2) shows that SMITs have higher shares of medium- and high-tech companies, which is reasonable, since the definition of those companies mainly includes manufacturing sectors[10]. Medium and large companies are also more present in SMITs, which is probably due to the fact that manufacturing companies are bigger on average to those in the service sector. SMITs show promising economic development statistics with higher average investment index per capita, more patents per capita and a higher share of fast-growing companies.

Employment: The employment statistics (Annex 3) shows that SMITs on average have 53.35% workplaces in the industrial sector, which is significantly higher compared to other small and medium-sized towns (30.96%). They also have lower commuting ratios, higher wages, lower unemployment and interestingly – lower shares of foreign (non-Slovene) workforce. In contrast to western European countries industry traditionally depends on local workers, which explains low commuting ratios and low share of foreign workers.

Demography: the average SMIT has about 11,000 inhabitants, while other non-industrial towns are bigger (14,300 inhabitants), which is characteristic of the Slovene urban system (Annex 4). Population

[9] Each step significantly improved on the previous one (*Sig F Change* < .05). Anova tests showed that the model is a significant fit of the data overall (p < .05). Errors in regression are independent (Durbin–Watson = 1.249). VIF values < 3, tolerance values > 0.4.

[10] High-technology: Manufacture of basic pharmaceutical products and pharmaceutical preparations (21); Manufacture of computer, electronic and optical products (26); Manufacture of air and spacecraft and related machinery (30.3).

Medium/high-technology: Manufacture of chemicals and chemical products (20); Manufacture of weapons and ammunition (25.4); Manufacture of electrical equipment (27); Manufacture of machineryand equipment n.e.c. (28); Manufacture of motor vehicles, trailers and semi-trailers (29); Manufacture of other transport equipment (30) excluding Building of ships and boats (30.1) and excluding Manufacture of air and spacecraft and related machinery (30.3); Manufacture of medical and dental instruments and supplies (32.5)

growth in SMITs has been slower in all time periods, but interestingly enough the aging index is somewhat better in SMITs in comparison to non-industrial small and medium-sized towns (120:126), meaning that industrial towns have a more favourable proportion of younger versus older population.

Living environment: the differences among industrial and non-industrial towns are small (Annex 5) We can notice that SMITs have an older building stock (built before WW2) and smaller dwellings, which is expected since industrial workers apartments in the past were built under different circumstances and building criteria. It is not surprising that workers in SMITs have more sick-leave and have a bigger mortality index, probably due to the effect of industrial pollution or overall environmental effects.

Voting behaviour: SMITs and non-SMITs do not differ in voting behaviour characteristics (Annex 6). Non-SMITs have a slightly higher share of votes for right-wing parties and slightly lower share of votes for left-wing parties, but the differences were smaller than we might expect as left-wing parties were traditionally stronger in industrial centres. Voter turnout is also very similar in both types (around 50%).

In order to see if there are statistically significant differences between industrial and non-industrial SMTs in Slovenia, we conducted the independent *t*-test. The Levene's test for equality of variances turned to be non-significant in all cases ($p > .05$), except for population growth 2000-2010_1/(x+1) and share of vote for centrist parties. For variables share of high-tech companies, share of employed in medium and high-tech companies, and share of degraded urban areas we conducted the Mann-Whitney test as a non-parametric counterpart of independent *t*-test due to violation of assumption of normal distribution (Annex 8).

The *t*-test turned to be non-significant in all cases ($p > .05$), except for:

- Share of employment in the secondary sector,
- Share of medium-tech companies,
- Share of medium and high-tech companies_log10(x+1),
- Share of medium and big companies,
- Share of employed in medium and big companies_x*x,
- Population growth 2000-2010_1/(x+1).

The results (see Annex 7) show that industrial SMTs differ from non-industrial SMTs when it comes to the structure and size of companies (industrial SMTs have more medium-tech companies, and more medium and big companies with more employees), and population growth (lower growth in industrial SMTs in the previous decade).

5. Typology of SMITs based on economic performance and their general characteristics

5. 1 Classification of present SMITs based on economic performance

In order to derive a typology of SMITs based on their economic performance, multivariate statistics by using principal component analysis (PCA)[11] and cluster analysis (CA) was applied. We used 15

[11] We conducted a PCA on the 13 standardised indicators with orthogonal rotation (varimax). Two indicators were omitted from the analysis due to high correlation with other indicators (r > .90), i.e. share of long-term unemployed and share of medium-tech companies. Three indicators were previously transformed (share of high-tech companies, share of employed in medium and high-tech companies, number of patents 1991–2016 per 1000 inhabitants) due to violation of assumption of normal distribution (see Tabachnick and Fidell, 2007; Howell, 2010). The Kaiser–Meyer–Olkin measure verified the sampling adequacy for the analysis, KMO = .50

indicators measuring economic performance (Table 5) and applied it to 24 present SMITs. Deindustrialised SMITs were omitted from the classification, but were added later for making comparisons.

Table 5: Descriptive statistics of SMITs' economic performance.

	Year	N	Minimum	Maximum	Mean	SD
Commuting ratio	2015	24	26.90	78.00	56.59	13.50
Average salary (gross)	2015	24	1180.78	1695.78	1421.89	124.88
Added value per employee (net)	2015	24	26398.17	52212.10	37709.13	7038.67
Share of unemployed	2015	24	5.20	17.60	11.32	3.29
Share of long-term unemployed	2015	24	2.10	10.30	5.82	2.04
Share of foreign workforce	2015	24	1.10	16.53	5.87	3.32
Share of medium-tech companies	2015	24	.42	2.40	1.24	.46
Share of high-tech companies	2015	24	.00	.89	.18	.21
Share of medium and high-tech companies	2015	24	.42	2.61	1.42	.57
Share of employed in medium and high-tech companies	2016	24	.00	37.37	9.19	10.56
Share of medium and big companies	2015	24	.64	2.75	1.45	.53
Share of employed in medium and big companies	2016	24	35.75	81.02	54.51	11.58
Investment index per capita	2015	24	.52	6.13	2.34	1.48
Share of high-growing companies	2015	24	.00	.85	.27	.22
Number of patents 1991–2016 per 1000 inhabitants	1991–2016	24	.0005	.0096	.0023	.0020

Annex 9 shows the component loadings after rotation. The indicators that cluster on the same components suggest that:

- Component 1 represents the transformed socialist industry inherited from the past with a large share of medium and big companies. They are still well supported with investments and have a positive impact on emergence of high-growing companies.
- Component 2 represents the highly profitable industry. Employees in medium and high-tech companies bring high added value and are highly paid.
- Component 3 represents the promising and growing industry characterised with small and high-growing companies. The workforce comes from non-local areas. Innovation potential is not yet fully operationalised by high number of patents.
- Component 4 represents the high-tech industry.
- Component 5 represents the less successful industry, the only clear negative component characterised by large share of unemployment and foreign workforce and low share of high-growing companies.

In order to derive clusters based on principal component scores, we decided for a combination approach using a hierarchical CA[12] followed by a non-hierarchical CA[13]. This allows to select the most

('mediocre' according to Field, 2009), and majority KMO values for individual items were above the acceptable limit of .50 (Field, 2009). Bartlett's test of sphericity χ^2 (78) = 105.74, $p < .05$, indicated that correlations between indicators were sufficiently large for PCA. Five components had eigenvalues over Kaiser's criterion of 1 and in combination explained 74.50% of the variance.

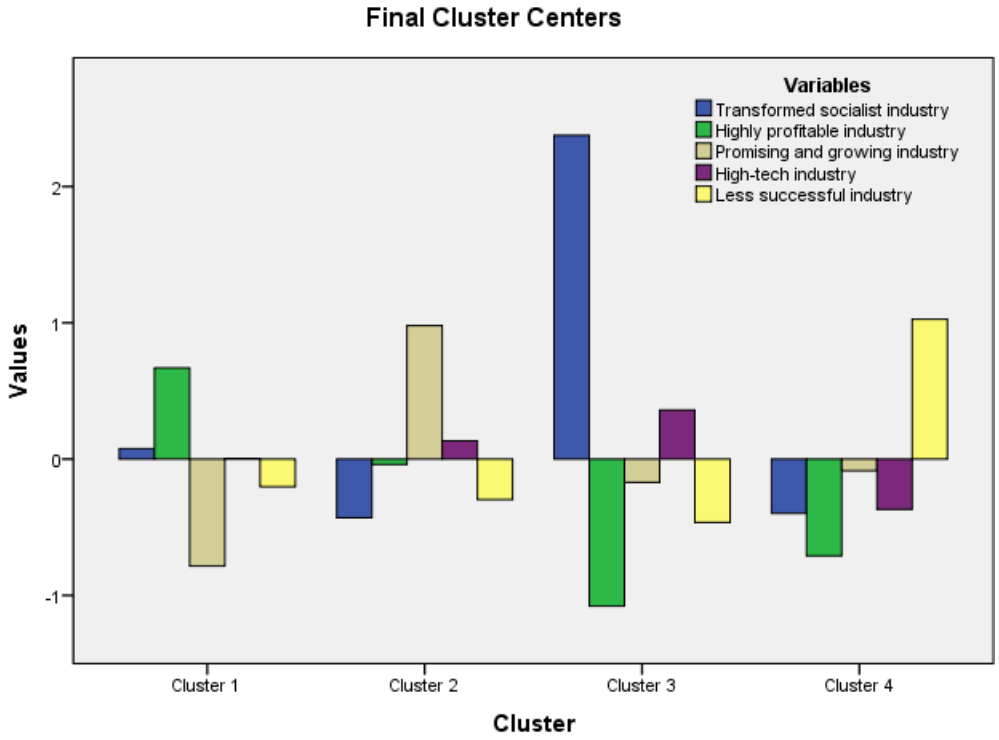
[12] Hierarchical technique by using Ward's method and Squared Euclidean distance was performed to select the number of clusters. The dendrogram indicated 3-6 clusters and the agglomeration schedule suggested a 6-cluster solution as the most appropriate one. However, 6 and 5-cluster solutions each extracted one cluster containing only one unit. So we decided the optimal version to be a 4-cluster solution.

[13] Non-hierarchical k-means clustering by using an Iterate and classify method was applied. In this way, the advantages of hierarchical method were complemented by the ability of the non-hierarchical method to refine the results by allowing the switching of cluster membership.

appropriate solution in terms of the number of clusters, and then ensure the best possible allocation of cases to clusters (Fredline 2012, 215).

Based on the k-means CA cluster 1 represents **highly profitable industry**, cluster 2 indicates **promising and growing industry,** cluster 3 is a combination of **transformed socialist and high-tech industry**, while cluster 4 reflects loadings on **less successful industry** (Fig. 7). The ANOVA test indicated that the first three components contributed more to the implemented cluster solution.

Figure 7: Identified clusters and corresponding component scores.



Four SMITs were classified as unsuccessful towns, nine as those with highly profitable companies, two as transformed socialist and high-tech industry towns and eight as promising and growing industrial towns (Table 6).

Table 6: Cluster membership and the Euclidean distance to the cluster centre.

Name of SMITs	Cluster	Distance	Name of SMITs	Cluster	Distance
Slovenske Konjice	Less successful SMITs	1.123	Kidričevo	transformed socialist and high-tech SMITs	1.479
Ribnica	Less successful SMITs	1.727	Gornja Radgona	transformed socialist and high-tech SMITs	1.479
Metlika	Less successful SMITs	1.818	Slovenska Bistrica	promising and growing SMITs	.947
Šentilj	Less successful SMITs	1.953	Hoče - Slivnica	promising and growing SMITs	1.096
Hrastnik	Less successful SMITs	2.157	Kanal	promising and growing SMITs	1.160
Idrija	highly profitable SMITs	1.374	Ivančna Gorica	promising and growing SMITs	1.196
Zreče	highly profitable SMITs	1.503	Šmartno pri Litiji	promising and growing SMITs	1.791
Škofja Loka	highly profitable SMITs	1.507	Prebold	promising and growing SMITs	1.938
Ravne na Koroškem	highly profitable SMITs	1.561	Gorenja vas - Poljane	promising and growing SMITs	1.980
Cerknica	highly profitable SMITs	1.659	Pivka	promising and growing	2.069

				SMITs	
Velenje	highly profitable SMITs	1.903			
Ruše	highly profitable SMITs	2.102			
Železniki	highly profitable SMITs	2.194			
Šentjernej	highly profitable SMITs	2.540			

5.2 Characteristics of present and past SMITs in Slovenia

Economic performance and employment: Annex 10 shows a breakdown of economic performance of SMITs in Slovenia. The results of a Kruskal-Wallis test[14] (Annex 11) indicate statistically significant differences between clusters of SMITs in six indicators. Average salary (gross), added value per employee (net), investment index per capita, share of high-growing companies, and number of patents 1991–2016 per 1000 inhabitants are higher in the clusters of highly profitable SMITs and transformed socialist & high-tech SMITs. Those two clusters of SMITs indeed have the best economic performance and less successful SMITs of-course have the worst.

Comparison between SMITs and deindustrialised towns revealed statistical differences only in three indicators (Annex 12): as expected, SMITs have a higher share of employment in the secondary sector, a higher share of medium and big companies, and a higher share of employed in medium and big companies. No other economic performance indicators are statistically different, which indicates that deindustrialised towns are economically not better nor worse than their industrial counterparts.

Demographic trajectories: Annex 13 shows a breakdown of demographic statistics of SMITs in Slovenia. The results of a Kruskal-Wallis test in Annex 14 indicate no statistically significant differences between the variables except for the population growth 2010-2016. That was positive only in cluster 4 (promising and growing SMITs) but negative in other clusters.

Comparison between SMITs and deindustrialised towns revealed statistical differences only in population in 2016 (Annex 15). Deindustrialised towns are on average a bit bigger than SMITs, which leads to a conclusion of vertical disintegration where large towns deindustrialised and diversified their economic base before small and medium-sized ones.

Living environment: Annex 16 shows a breakdown of living environment of SMITs in Slovenia. The results of a Kruskal-Wallis test in Annex 17 indicate no statistically significant differences between the variables. Moreover, there are no statistical differences in indicators measuring the living environment even when comparing SMITs and deindustrialised towns (Annex 18). Despite non-significant results we can notice that the cluster of older transformed socialist SMITs has less new dwellings (built after 2007) and the highest share of dwellings with inappropriate infrastructure.

Voting behaviour: Annex 19 shows breakdown of voting behaviour of SMITs in Slovenia. The results of a Kruskal-Wallis test in Annex 20 indicate no statistically significant differences between the variables, as Slovenian party arena is, rather on economy, divided on urban-rural axis. As expected, voter turnout is slightly higher in towns with better economic performance (with promising and growing industry). Those towns have a slightly more right political orientation as most of them are located in traditionally right political environments with above average share of rural population.

Description of types of SMITs:

In general we can say that economically the most successful types of SMITs are represented by two clusters: highly profitable towns and transformed socialist & hi-tech towns. This is a mix of older and newer industrial towns that grew considerably in the socialist era and managed not just to transform their "socialist-type" of manufacturing, but also grow new types of production. Their performance is based on one or two large companies. Their location is generally more remote and not close to highways (with some exceptions). But statistically they do not differ so much to other types of SMITs. It is true they have much better economic and employment statistics, but show very mixed results

[14] A non-parametric counterpart of the one-way independent ANOVA.

regarding population growth / decline: for instance, transformed socialist & high-tech towns have a negative population growth.

More favourable demographic and living environment statistics are attributed to promising and growing towns, which are located in suburban and even rural areas in Slovenia. Although they were industrialised in the socialist era, it seems that their growth is based on new high-tech production with smaller companies. Economically they do not preform best, but have the lowest unemployment rates and highest population growth. In contrast to the first two SMITs types, these towns are located near transportation nodes and closer to major cities. In terms of descriptive statistics they have the best living environment statistics and are more orientated towards voting for right-wing parties. This is perhaps due to the fact that because of their more recent economic success they do not have practices of labour unions and traditional left-wing workers movements.

Less successful towns generally have poorer demographic and living environment statistics (higher mortality index, more sick leave, etc.), but yet again those differences are statistically not significant. All of them are older industrial towns with major production plants. Those towns had a similar starting point as the "transformed socialist & high tech" towns, but after the 1990-ies they didn't transform their traditional production to a more high-tech direction. Those towns still have a high industrial employment, but in less innovative sectors such as the paper industry (Šentilj), textile industry (Metlika) or mining (Hrastnik). Worse living conditions can be observed on the basis of descriptive statistics, but interestingly voting behaviour does not differ from other towns.

Deindustrialised towns are a heterogeneous group. The biggest towns (medium-sized Kranj, Kamnik and Jesenice) lost their industries already in the first decade after independence, but the majority of other towns, which are typically smaller, were deindustrialised only in the last 15 years. Many of those towns already transformed either into the service sector economy or simultaneously became "satellite" or "suburban" towns with high share of daily commuters. Such towns are not considered to be problematic or shrinking – in fact some of them are fast growing, especially those closer to Ljubljana (Vrhnika, Logatec, Kamnik, Škofljica). Some towns are still experiencing shrinkage since they did not transform, nor became satellite towns. Those are older former industrial and mining centres (Trbovlje) that were affected by the last economic crisis, where many work-intensive factories were closed (Polzela, Ajdovščina). Because this groups is a mix of both shrinking and growing towns, their statistics is not significant – although we can distinguish among fully transformed and growing (post)industrial towns and transitional towns facing shrinkage.

6. Synthesis

We can answer RQ 3 systematically from the analysis made in this document. RQ3 is: *What are the characteristics of S/MITs in the national context and how do they compare to the national level*?

Firstly, we can summarise that the industry, despite deindustrialisation after the 1990-ies, is still very important in Slovenia. On the national level it provides 30% of total employment, in all small and medium-sized cities it is above average (small: 36.4%, medium-sized: 35.8%), while in the two larger cities it is below average. The 24 SMITs present a quarter of all small and medium-sized towns in Slovenia where 13 % of the country population reside. SMITs are located mainly at the fringes, mostly in hilly and less densely populated areas. They are a mix of old industrial centres that underwent a successful transformation of former socialist manufacturing, such as old mining and manufacturing towns; and some newer industrial centres, which gained importance in the post-socialist period, coming either with foreign investments (rarely) or through local innovations (more common). The fact that industry is present in smaller towns and even in rural areas in reinforced by the fact that only three medium-sized towns are above averagely industrialised. All other larger towns have been deindustrialised and became more service orientated (Kranj, Jesenice, Trbovlje …), although they still have some industrial employment.

Dominance of industry in smaller towns, even those below the threshold of 5,000 inhabitants, can be explained through historical context of Slovenia: industrialisation of the countryside in the socialist era, state-run polycentric development favouring local centres (LAU2) and neglecting the development of larger and medium-sized cities, under-urbanisation and rural character of the country, … Those are the factors that probably influenced spatial patterns of present industrialisation.

Regarding the characteristics of present-day SMITs we can conclude that they have favourable economic characteristics (number of patents, medium/high tech companies …). Legacy of the "socialist" style of industrial production is that they are orientated towards medium-high tech manufacturing companies, with larger numbers of employees, while high-tech companies are not exclusive to SMITs. In practice this means that many SMIT have only one or two industrial companies, which provide a large number of industrial workforce not only for the town, but also for the surrounding rural areas that commute to it. SMITs have generally favourable economic indicators due to the "completed" cycle of industrial transformation of low-tech industries relying on manual labour (textile industry or mining). Those industries either went bankrupt or moved their production to third countries. This had twofold effect: creation of problematic de-industrialised towns such as former mining towns with high unemployment and shrinkage (former mining town of Trbovlje currently has only 26% industrial workplaces and is not considered industrial in this analysis); or transformation from the industrial towards the "service" orientated towns (Kranj, Jesenice …).

This is probably also the reason why we cannot mark SMITs in Slovenia as shrinking towns. On average they grew less than non-industrial towns, but have a better aging index. Again, this is probably due to the fact that post-socialist transformation of industry has almost finished – only ten years ago this picture was probably very different. But there are challenges for SMITs in Slovenia. Regression analysis indicates that industry is connected with lower wages, while correlation analysis is showing weak associations (statistically non-significant) with lower quality of life indicators such as smaller and older dwellings, insufficient infrastructure, more sick-leave, higher mortality. We can presume that this is the result of lower environmental quality in SMITs, which were industrialised primarily in the socialist era or even before that. Even in the smallest industrial towns new socialist-style apartment building were built to house the new industrial workers. The standards of those dwellings are worse and cannot compare to present-day dwellings in larger (sub)urban towns.

Classification of SMITS regarding their economic performance excerpts five less successful towns, two distinctly best clusters with 11 towns (older transformed socialist SMITs with high-tech industry and the cluster with distinctly profitable industry) and eight towns, which perform average, but have good potential (promising and growing SMITs). There is no distinct spatial pattern to those clusters and very

few significant non-economic differences among them. Perhaps the biggest differences are in population growth since the cluster of promising and growing SMITs also exhibits population growth in the last decade. Deindustrialised towns are on average bigger to present SMITs, some have become growing “satellite towns” with commuting to bigger cities, some have successfully transformed their economies to non-industrial sectors, some are facing shrinkage (Trbovlje). But on average they are nor better nor worse in economic performance to present SMITs.

If we make a connection of this findings with WP3 and WP4 we can summarize that SMITs are an integral part of the Slovene settlement system. They are characterised by large manufacturing plants transformed from the socialist to the free-market era. There are indices in the statistical analysis that despite their successful transformation they have issues that need to be further explored and dealt with, such as the quality of living environment. But on the other hand an important finding is that despite the negative connotations of industrialism in Europe, Slovenian SMITs are not plagued by shrinkage, unemployment, lack of innovations or investments. It would be interesting to further explore if this strong industrial character and traditions translate into other social, cultural and political phenomena, for example strong identity, solidarity, pride, innovativeness or perhaps negative phenomena in less successful or deindustrialized SMITs, such as political radicalism, xenophobia or social homogenisation.

7. Annexes

Annex 1: Correlation matrix between industry and development indicators.

Group of indicators	Indicator	Share of employment in the secondary sector
Employment	Commuting ratio	-.208*
	Average salary (gross)_1/x	.019
	Added value per employee (net)_log10x	.052
	Share of employment in the primary and tertiary sector	-1,000**
	Share of unemployed_log10x	-.049
	Share of long-term unemployed _log10x	-.024
	Share of foreign workforce_log10(x+1)	-.072
Economic performance	Share of medium-tech companies	.456**
	Share of high-tech companies	.106
	Share of medium and high-tech companies_log10(x+1)	.401**
	Share of employed in medium and high-tech companies	.193
	Share of medium and big companies	.502**
	Share of employed in medium and big companies_x*x	.588**
	Investment index per capita_log10x	.139
	Share of high-growing companies	.141
	Number of patents 1991–2016 per 1000 inhabitants_sqrtx	.239*
Demography	Population in 2016_1/x	-.033
	Population growth 1991-2016_log10(x+1)	-.095
	Population growth 1991-2000_log10(x+1)	-.052
	Population growth 2000-2010_1/(x+1)	.104
	Population growth 2010-2016_1/(x+1)	.087
	Aging index	-.221*
Living environment	Average net usable area (m^2) per dweller	-.286**
	Finished dwellings 2007–2016 per 1000 inhabitants_log10x	-.009
	Share of dwellings without appropriate basic infrastructure_log10x	-.104
	Share of dwellings built before 1946_sqrtx	-.163
	Days of sick leave per employee	.157
	Mortality index	.024
	Convicted adults and minors 2006–2015 per 1000 inhabitants	.019
Voting behaviour	Voter turnout on parliamentary elections	.031
	Share of vote for right-wing parties on parliamentary elections	.125
	Share of vote for left-wing parties on parliamentary elections	-.091
	Share of vote for centrist parties on parliamentary elections	-.074

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Annex 2: Breakdown of economic performance of SMTs in Slovenia (N = 100).

	Industrial SMTs (N = 24)				Non-industrial SMTs (N = 76)			
	Mean	STD	Minimum	Maximum	Mean	STD	Minimum	Maximum
Share of medium-tech companies	1.24	0.46	0.42	2.40	0.83	0.38	0.00	1.99
Share of high-tech companies	0.18	0.21	0.00	0.89	0.16	0.20	0.00	0.89
Share of medium and high-tech companies	1.42	0.57	0.42	2.61	0.99	0.47	0.00	2.31
Share of employed in medium and high-tech companies	9.19	10.56	0.00	37.37	4.49	5.76	0.00	27.75
Share of medium and big companies	1.45	0.53	0.64	2.75	1.02	0.42	0.22	2.26
Share of employed in medium and big companies	54.51	11.58	35.75	81.02	37.62	16.25	0.00	64.13
Investment index per capita	2.34	1.48	0.52	6.13	1.77	1.44	0.03	9.81
Share of high-	0.27	0.22	0.00	0.85	0.31	0.21	0.00	0.97

growing companies								
Number of patents 1991–2016 per 1000 inhabitants	0.0023	0.0021	0.005	0.0096	0.0019	0.0016	0.0000	0.0081

Annex 3: Breakdown of employment of SMTs in Slovenia (N = 100).

	Industrial SMTs (N = 24)				Non-industrial SMTs (N = 76)			
	Mean	STD	Minimum	Maximum	Mean	STD	Minimum	Maximum
Commuting ratio	56.59	13.50	26.90	78.00	61.90	14.89	25.40	86.30
Average salary (gross)	1,421.89	124.88	1,180.78	1,695.78	1,408.07	164.87	1,157.98	2,348.26
Added value per employee (net)	37,709.13	7,038.67	26,398.17	52,212.10	35,919.62	7,156.86	24,819.75	61,992.77
Share of employment in the secondary sector	53.35	9.07	42.70	77.90	30.96	8.68	5.70	42.50
Share of employment in the primary and tertiary sector	46.65	9.07	22.10	57.30	69.04	8.68	57.50	94.30
Share of unemployed	11.32	3.29	5.20	17.60	11.89	3.80	5.90	23.90
Share of long-term unemployed	5.82	2.04	2.10	10.30	6.19	2.51	2.50	15.10
Share of foreign workforce	5.87	3.32	1.10	16.53	6.36	3.05	1.00	16.36

Annex 4: Breakdown of demographic statistics of SMTs in Slovenia (N = 100).

	Industrial SMTs (N = 24)				Non-industrial SMTs (N = 76)			
	Mean	STD	Minimum	Maximum	Mean	STD	Minimum	Maximum
Population in 2016	11,034.38	6,963.81	5,007.00	32,747.00	14,297.47	10,587.38	5,138.00	56,115.00
Population growth 1991-2016	0.05	0.12	-0.18	0.34	0.12	0.21	-0.16	1.07
Population growth 1991-2000	0.02	0.04	-0.05	0.09	0.04	0.06	-0.06	0.26
Population growth 2000-2010	0.02	0.06	-0.10	0.15	0.06	0.10	-0.06	0.39
Population growth 2010-2016	0.00	0.03	-0.08	0.06	0.01	0.05	-0.16	0.23
Aging index	119.98	25.65	67.50	171.70	126.83	30.70	62.70	215.80

Annex 5: Breakdown of living environment statistics of SMTs in Slovenia (N = 100).

	Industrial SMTs (N = 24)				Non-industrial SMTs (N = 76)			
	Mean	STD	Minimum	Maximum	Mean	STD	Minimum	Maximum
Average net usable area (m^2) per dweller	28.08	1.70	25.20	31.00	28.89	2.18	24.30	36.60
Finished dwellings 2007–2016 per 1000 inhabitants	15.81	6.96	4.60	27.30	14.47	9.07	3.70	61.10
Share of dwellings without appropriate basic infrastructure	4.83	2.47	1.30	13.00	4.67	2.61	1.30	15.20
Share of dwellings built before 1946	21.52	10.44	4.84	57.24	20.99	7.50	7.27	44.38
Share of degraded urban areas	0.0007	0.0011	0.0000	0.0041	0.0008	0.0015	0.0000	0.0061
Days of sick leave per employee	14.53	2.30	9.18	18.59	14.06	2.53	9.42	19.55
Mortality index	1,031.97	182.50	753.05	1,378.01	1,018.13	182.01	600.05	1,430.73

Convicted adults and minors 2006–2015 per 1000 inhabitants	3.41	1.49	1.15	6.09	3.58	1.71	0.68	8.90

Annex 6: Breakdown of voting behaviour of SMTs in Slovenia (N = 100).

	Industrial SMTs (N = 24)				Non-industrial SMTs (N = 76)			
	Mean	STD	Minimum	Maximum	Mean	STD	Minimum	Maximum
Voter turnout on parliamentary elections	50.32	3.45	44.43	57.78	49.84	4.39	37.89	59.16
Share of vote for right-wing parties on parliamentary elections	37.72	11.05	13.10	54.70	34.53	8.20	17.10	54.10
Share of vote for left-wing parties on parliamentary elections	1.11	0.14	0.88	1.34	1.13	0.12	0.87	1.42
Share of vote for centrist parties on parliamentary elections	45.31	8.49	30.48	61.49	48.08	5.93	32.90	59.27

Annex 7: Statistical differences between industrial and non-industrial SMTs (results of Levene's test for equality of variances and independent t-test).

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Commuting ratio	.784	.378	-1.554	98	.123	-5.30	3.41	-12.08	1.47
Average salary (gross)_1/x	.002	.966	-.594	98	.554	0.00	0.00	0.00	0.00
Added value per employee (net)_log10x	.185	.668	1.156	98	.251	0.02	0.02	-0.02	0.06
Share of employment in the secondary sector	.080	.778	10.899	98	.000	22.39	2.05	18.31	26.46
Share of employment in the primary and tertiary sector	.080	.778	-10.899	98	.000	-22.39	2.05	-26.46	-18.31
Share of unemployed_log10x	.296	.588	-.715	98	.476	-0.02	0.03	-0.08	0.04
Share of long-term unemployed _log10x	.000	.993	-.638	98	.525	-0.02	0.04	-0.10	0.05
Share of foreign workforce_log10(x+1)	1.029	.313	-.967	98	.336	-0.04	0.04	-0.13	0.05
Share of medium-tech companies	.874	.352	4.288	98	.000	0.41	0.09	0.22	0.59
Share of medium and high-tech companies_log10(x+1)	.010	.919	3.403	98	.001	0.08	0.02	0.04	0.13
Share of medium and big companies	1.591	.210	4.075	98	.000	0.43	0.11	0.22	0.64
Share of employed in medium and big companies_x*x	1.621	.206	5.532	98	.000	1424.12	257.42	913.27	1934.96
Investment index per capita_log10x	.034	.854	1.852	98	.067	0.15	0.08	-0.01	0.30
Share of high-growing companies	.027	.870	-.688	98	.493	-0.03	0.05	-0.14	0.07
Number of patents 1991–2016 per 1000 inhabitants_sqrtx	.004	.949	1.157	98	.250	0.00	0.00	0.00	0.01

Population in 2016_1/x	1.856	.176	1.222	98	.225	0.00	0.00	0.00	0.00
Population growth 1991-2016_log10(x+1)	3.100	.081	-1.627	98	.107	-0.03	0.02	-0.06	0.01
Population growth 1991-2000_log10(x+1)	1.279	.261	-1.545	98	.126	-0.01	0.01	-0.02	0.00
Population growth 2000-2010_1/(x+1)	4.568	.035	2.126	55.334	.038	0.03	0.01	0.00	0.06
Population growth 2010-2016_1/(x+1)	1.006	.318	.656	98	.514	0.01	0.01	-0.01	0.03
Aging index	1.043	.310	-.990	98	.325	-6.86	6.93	-20.61	6.89
Average net usable area (m2) per dweller	1.512	.222	-1.661	98	.100	-0.81	0.49	-1.77	0.16
Finished dwellings 2007–2016 per 1000 inhabitants_log10x	.533	.467	.870	98	.386	0.05	0.05	-0.06	0.15
Share of dwellings without appropriate basic infrastructure_log10x	.247	.620	.319	98	.750	0.02	0.05	-0.08	0.12
Share of dwellings built before 1946_sqrtx	.676	.413	.034	98	.973	0.01	0.20	-0.40	0.41
Days of sick leave per employee	.887	.349	.815	98	.417	0.47	0.58	-0.68	1.62
Mortality index	.042	.838	.325	98	.746	13.84	42.64	-70.78	98.47
Convicted adults and minors 2006–2015 per 1000 inhabitants	.053	.819	-.444	98	.658	-0.17	0.39	-0.95	0.60
Voter turnout on parliamentary elections	1.700	.195	.492	98	.624	.48217	.98084	-1.46426	2.42861
Share of vote for right-wing parties on parliamentary elections	3.265	.074	1.519	98	.132	3.18263	2.09538	-.97559	7.34085
Share of vote for left-wing parties on parliamentary elections	1.429	.235	-.553	98	.581	-.01600	.02894	-.07343	.04142
Share of vote for centrist parties on parliamentary elections	5.030	.027	-1.488	30.406	.147	-2.77068	1.86210	-6.57146	1.03010

Annex 8: Statistical differences between industrial and non-industrial SMTs (Mann-Whitney test).

	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Share of high-tech companies	858.00	-.449	.653
Share of employed in medium and high-tech companies	765.50	-1.191	.234
Share of degraded urban areas	885.00	-.227	.820

Annex 9: Rotated component matrix (N = 24).

	Rotated component loadings				
	Transformed socialist industry	Highly profitable industry	Promising and growing industry	High-tech industry	Unsuccessful industry
Indicators	1	2	3	4	5
Investment index per capita	**.873**	.056	-.135	-.172	-.084
Share of medium and big companies	**.805**	.024	-.366	.008	.189
Share of high-growing companies	**.533**	-.242	**.478**	-.173	**-.437**
Average salary (gross)	-.044	**.884**	-.176	.030	-.057
Share of employed in medium and high-tech companies	.294	**.736**	.026	.132	.060
Added value per employee (net)	-.209	**.713**	.061	.257	-.102
Number of patents 1991–2016 per 1000 inhabitants	-.025	-.031	**.802**	-.157	.082
Share of employed in medium and big companies	**.468**	-.116	**-.694**	-.126	-.189
Commuting ratio	-.276	-.131	**.692**	.280	-.167
Share of high-tech companies	-.172	.123	.086	**.852**	-.143
Share of medium and high-tech companies	-.050	.372	-.050	**.798**	.219
Share of unemployed	.096	-.217	-.022	.251	**.835**

Share of foreign workforce	-.084	.083	.104	-.355	**.662**
Eigenvalues	2.17	2.13	2.04	1.82	1.53
Share of variance	16.70	16.41	15.70	14.00	11.73

Note: Component loadings over .40 appear in bold.

Annex 10: Breakdown of economic performance of SMITs and deindustrialised towns in Slovenia.

Clusters		Commuting ratio	Average salary (gross)	Added value per employee (net)	Share of employment in the secondary sector	Share of unemployed	Share of long-term unemployed	Share of foreign workforce	Share of medium-tech companies	Share of high-tech companies	Share of medium and high-tech companies	Share of employed in medium and high-tech companies	Share of medium and big companies	Share of employed in medium and big companies	Investment index per capita	Share of high-growing companies	Number of patents 1991–2016 per 1000 inhabitants
1	Mean	53.1000	1335.2980	31882.1029	48.9200	13.7800	7.5600	8.0220	1.2642	.0565	1.3207	3.9615	1.4875	51.0164	1.3967	.1587	.001464
	SD	6.11269	63.19776	4639.25442	3.63277	3.17364	2.62640	5.20083	.74544	.08796	.82865	5.45528	.36312	5.08135	.66266	.20242	.0005338
	Minimum	46.90	1255.43	26398.17	46.20	9.60	4.90	2.80	.43	.00	.43	.00	.85	42.42	.52	.00	.0006
	Maximum	61.60	1431.13	37679.24	55.20	17.60	10.30	16.53	2.40	.20	2.61	10.72	1.78	55.19	1.95	.49	.0019
2	Mean	48.9000	1515.2833	40742.5103	54.7333	10.2333	5.0222	5.6378	1.3656	.2014	1.5671	13.7412	1.5931	60.3914	2.8394	.1792	.003961
	SD	14.06556	114.06802	6183.02400	7.54354	3.29735	1.65437	1.33122	.31043	.30537	.44616	11.49824	.33029	11.85437	1.20673	.19998	.0025987
	Minimum	26.90	1311.81	32661.87	44.40	5.40	2.50	3.04	1.00	.00	1.00	.00	1.03	46.92	.91	.00	.0011
	Maximum	68.80	1695.78	52048.18	68.80	16.10	7.60	7.07	1.90	.89	2.24	37.37	2.14	81.02	4.42	.60	.0096
3	Mean	52.2500	1324.2700	30121.5989	65.4000	12.8000	6.3000	2.2400	.7755	.1610	.9365	7.6814	2.5848	69.0986	5.2021	.5848	.001661
	SD	15.06137	132.72394	3452.82856	17.67767	4.52548	2.68701	1.61220	.49744	.22773	.72517	10.68642	.23955	9.14137	1.30933	.37151	.0001562
	Minimum	41.60	1230.42	27680.08	52.90	9.60	4.40	1.10	.42	.00	.42	.13	2.42	62.63	4.28	.32	.0016
	Maximum	62.90	1418.12	32563.12	77.90	16.00	8.20	3.38	1.13	.32	1.45	15.24	2.75	75.56	6.13	.85	.0018
4	Mean	68.5125	1395.3350	39835.3450	51.5500	10.6250	5.5125	5.6938	1.1982	.2318	1.4300	7.7229	.9694	46.4385	1.6476	.3633	.001091
	SD	8.16516	107.12369	6884.17156	9.55465	2.74161	1.54867	3.35194	.40161	.13343	.50688	11.53491	.24677	8.07623	1.07425	.13539	.0004136
	Minimum	52.50	1180.78	34056.02	42.70	5.20	2.10	1.39	.71	.00	.81	.00	.64	35.75	.58	.23	.0005
	Maximum	78.00	1485.51	52212.10	67.80	12.80	6.80	10.47	1.86	.46	2.32	26.59	1.40	58.18	3.90	.64	.0019
Total SMITs	Mean	56.5917	1421.8858	37709.1277	53.3500	11.3167	5.8208	5.8700	1.2395	.1780	1.4175	9.1927	1.4459	54.5129	2.3385	.2701	.002293
	SD	13.50310	124.88331	7038.66690	9.06796	3.29356	2.03854	3.32228	.46441	.21426	.56629	10.56485	.53153	11.58487	1.47604	.22401	.0020557
	Minimum	26.90	1180.78	26398.17	42.70	5.20	2.10	1.10	.42	.00	.42	.00	.64	35.75	.52	.00	.0005
	Maximum	78.00	1695.78	52212.10	77.90	17.60	10.30	16.53	2.40	.89	2.61	37.37	2.75	81.02	6.13	.85	.0096
6	Mean	57.3263	1387.6074	34490.2063	36.8895	12.9368	7.0158	6.1932	1.0824	.1783	1.2607	7.0093	1.0736	41.1354	1.5637	.2587	.001788
	SD	12.10766	98.85537	4475.90613	4.60095	4.24228	2.80085	2.04531	.36207	.18967	.39505	7.28439	.30507	9.98238	1.04673	.15721	.0012181
	Minimum	34.50	1185.93	26371.92	26.20	8.50	4.50	3.19	.61	0.00	.72	0.00	.61	21.61	.03	.08	.0005
	Maximum	81.60	1584.81	44070.57	42.50	23.90	13.90	9.94	1.99	.75	2.31	27.75	1.60	56.78	3.76	.59	.0045

1 = less successful SMITs (N = 5)
2 = highly profitable SMITs (N = 9)
3 = transformed socialist and high-tech SMITs (N = 2)
4 = promising and growing SMITs (N = 8)
6 = deindustrialised towns (N = 19)

Annex 11: Results of the Kruskal-Wallis test of differences in economic performance between clusters of SMITs.

	Commuting ratio	Average salary (gross)	Added value per employee (net)	Share of employment in the secondary sector	Share of unemployed	Share of long-term unemployed	Share of foreign workforce	Share of medium-tech companies	Share of high-tech companies	Share of medium and high-tech companies	Share of employed in medium and high-tech companies	Share of medium and big companies	Share of employed in medium and big companies	Investment index per capita	Share of high-growing companies	Number of patents 1991–2016 per 1000 inhabitants
Chi-Square	10.912	9.190	9.948	3.636	3.432	2.590	4.212	2.963	4.349	1.833	3.559	13.744	8.822	9.762	8.407	13.736
Df	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Asymp. Sig.	.012	.027	.019	.304	.330	.459	.240	.397	.226	.608	.313	.003	.032	.021	.038	.003

Annex 12: Results of the Kruskal-Wallis test of differences in economic performance between SMITs and deindustrialised towns.

	Commuting ratio	Average salary (gross)	Added value per employee (net)	Share of employment in the secondary sector	Share of unemployed	Share of long-term unemployed	Share of foreign workforce	Share of medium-tech companies	Share of high-tech companies	Share of medium and high-tech companies	Share of employed in medium and high-tech companies	Share of medium and big companies	Share of employed in medium and big companies	Investment index per capita	Share of high-growing companies	Number of patents 1991–2016 per 1000 inhabitants
Chi-Square	.001	1.055	2.299	31.093	.776	1.161	.521	1.744	.004	1.378	.054	6.848	11.722	3.187	.010	.469
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	.980	.304	.129	.000	.378	.281	.471	.187	.950	.240	.816	.009	.001	.074	.922	.493

Annex 13: Breakdown of demographic statistics of SMITs and deindustrialised towns in Slovenia.

Clusters		Population in 2016	Population growth 1991-2016	Population growth 1991-2000	Population growth 2000-2010	Population growth 2010-2016	Aging index
1	Mean	**10001.40**	**.0013**	**-.0003**	**.0166**	**-.0169**	**127.6800**
	SD	2628.841	.09229	.02618	.03881	.03728	27.66183
	Minimum	8339	-.16	-.04	-.05	-.08	101.20
	Maximum	14623	.08	.03	.06	.01	171.70
2	Mean	**13065.33**	**.0266**	**.0184**	**.0080**	**-.0018**	**116.9889**
	SD	9003.225	.08833	.03791	.04057	.02215	22.15634
	Minimum	6395	-.13	-.05	-.06	-.03	90.90
	Maximum	32747	.16	.06	.08	.04	151.50
3	Mean	**7458.00**	**-.0572**	**-.0108**	**-.0205**	**-.0267**	**145.4500**
	SD	1426.941	.04722	.05427	.00820	.01280	10.25305
	Minimum	6449	-.09	-.05	-.03	-.04	138.20
	Maximum	8467	-.02	.03	-.01	-.02	152.70
4	Mean	**10289.25**	**.1204**	**.0296**	**.0557**	**.0255**	**112.1500**
	SD	7218.548	.15497	.04499	.07808	.03755	28.96560
	Minimum	5007	-.18	-.03	-.10	-.06	67.50
	Maximum	25413	.34	.09	.15	.06	162.30
Total SMITs	Mean	**11034.38**	**.0456**	**.0158**	**.0233**	**.0021**	**119.9750**
	SD	6963.810	.12262	.03937	.05767	.03458	25.64896
	Minimum	5007	-.18	-.05	-.10	-.08	67.50
	Maximum	32747	.34	.09	.15	.06	171.70
6	Mean	**16906.63**	**.1042**	**.0301**	**.0490**	**.0052**	**128.7421**
	SD	10852.487	.28500	.07172	.10638	.06365	29.55987
	Minimum	6135	-.16	-.05	-.06	-.07	81.00
	Maximum	56115	1.07	.26	.35	.23	196.10

1 = less successful SMITs (N = 5)
2 = highly profitable SMITs (N = 9)
3 = transformed socialist and high-tech SMITs (N = 2)
4 = promising and growing SMITs (N = 8)
6 = deindustrialised towns (N = 19)

Annex 14: Results of the Kruskal-Wallis test of differences in demographic statistics between clusters of SMITs.

	Population in 2016	Population growth 1991-2016	Population growth 1991-2000	Population growth 2000-2010	Population growth 2010-2016	Aging index
Chi-Square	2.326	6.220	3.183	5.313	**8.931**	3.318
df	3	3	3	3	**3**	3
Asymp. Sig.	.508	.101	.364	.150	**.030**	.345

Annex 15: Results of the Kruskal-Wallis test of differences in demographic statistics between SMITs and deindustrialised towns.

	Population in 2016	Population growth 1991-2016	Population growth 1991-2000	Population growth 2000-2010	Population growth 2010-2016	Aging index
Chi-Square	**7.773**	.001	.048	.015	.404	.981
df	**1**	1	1	1	1	1
Asymp. Sig.	**.005**	.980	.826	.903	.525	.322

Annex 16: Breakdown of living environment statistics of SMITs and deindustrialised towns in Slovenia.

Clusters		Average net usable area (m^2) per dweller	Finished dwellings 2007–2016 per 1000 inhabitants	Share of dwellings without appropriate basic infrastructure	Share of dwellings built before 1946	Share of degraded urban areas	Days of sick leave per employee	Mortality index	Convicted adults and minors 2006–2015 per 1000 inhabitants
1	Mean	27.3600	18.4400	4.8000	21.3222	.001350	15.7080	1193.7500	4.4880
	SD	1.49265	8.86217	.73824	2.97991	.0011725	2.08875	115.76950	.70361
	Minimum	25.30	5.90	3.80	18.56	.0003	12.31	1102.00	3.89
	Maximum	29.40	27.30	5.80	26.27	.0033	18.00	1358.36	5.65
2	Mean	27.7889	12.2111	3.4222	17.6792	.000725	14.2256	936.7200	3.4933
	SD	1.33739	4.38476	2.08793	8.65236	.0014611	2.83543	115.51610	1.68688
	Minimum	26.20	4.60	1.30	4.84	.0000	9.18	775.47	1.62
	Maximum	30.60	19.60	8.10	29.40	.0041	18.59	1112.04	6.09
3	Mean	29.4500	10.7000	4.8500	16.4894	.000066	15.4750	1095.8450	4.5250
	SD	.49497	7.49533	.49497	6.93386	.0000934	1.32229	133.39569	1.52028
	Minimum	29.10	5.40	4.50	11.59	.0000	14.54	1001.52	3.45
	Maximum	29.80	16.00	5.20	21.39	.0001	16.41	1190.17	5.60
4	Mean	28.5250	19.4875	6.4375	27.2333	.000277	13.8975	1022.0588	2.3550
	SD	2.20762	6.32059	3.04065	14.03466	.0003277	1.92292	228.79651	.97458
	Minimum	25.20	5.80	3.80	13.95	.0000	9.70	753.05	1.15
	Maximum	31.00	26.40	13.00	57.24	.0009	15.57	1378.01	4.15
Total SMITs	Mean	28.0833	15.8083	4.8333	21.5237	.000651	14.5292	1031.9746	3.4071
	SD	1.69748	6.96375	2.47187	10.43826	.0010961	2.30462	182.50124	1.48862
	Minimum	25.20	4.60	1.30	4.84	.0000	9.18	753.05	1.15
	Maximum	31.00	27.30	13.00	57.24	.0041	18.59	1378.01	6.09
6	Mean	28.1000	12.4789	3.9526	21.2312	.001207	13.6795	1022.4242	3.7400
	SD	1.97765	5.62164	1.70860	8.31777	.0017326	2.58494	193.19318	1.71738
	Minimum	24.30	4.00	1.30	9.71	0.0000	9.42	600.05	1.43
	Maximum	31.80	26.40	6.80	44.38	.0061	18.32	1430.73	7.48

1 = less successful SMITs (N = 5)
2 = highly profitable SMITs (N = 9)
3 = transformed socialist and high-tech SMITs (N = 2)
4 = promising and growing SMITs (N = 8)
6 = deindustrialised towns (N = 19)

Annex 17: Results of the Kruskal-Wallis test of differences in living environment between clusters of SMITs.

	Average net usable area (m^2) per dweller	Finished dwellings 2007–2016 per 1000 inhabitants	Share of dwellings without appropriate basic infrastructure	Share of dwellings built before 1946	Share of degraded urban areas	Days of sick leave per employee	Mortality index	Convicted adults and minors 2006–2015 per 1000 inhabitants
Chi-Square	3.083	6.912	7.660	2.718	6.126	4.147	7.584	7.625
df	3	3	3	3	3	3	3	3

Asymp. Sig.	.379	.075	.054	.437	.106	.246	.055	.054

Annex 18: Results of the Kruskal-Wallis test of differences in living environment between SMITs deindustrialised towns.

	Average net usable area (m^2) per dweller	Finished dwellings 2007–2016 per 1000 inhabitants	Share of dwellings without appropriate basic infrastructure	Share of dwellings built before 1946	Share of degraded urban areas	Days of sick leave per employee	Mortality index	Convicted adults and minors 2006–2015 per 1000 inhabitants
Chi-Square	.002	2.766	1.747	.015	1.816	1.030	.022	.316
df	1	1	1	1	1	1	1	1
Asymp. Sig.	.961	.096	.186	.903	.178	.310	.883	.574

Annex 19: Breakdown of voting behaviour of SMITs and deindustrialised towns in Slovenia.

Clusters		voter turnout	share of vote for right-wing parties	share of vote for left-wing parties	share of vote for centrist parties
1	Mean	48.3120	35.5520	14.4220	47.1520
	Std. Deviation	2.61506	15.04285	6.50548	9.87998
	Minimum	44.43	13.10	8.84	33.91
	Maximum	51.47	54.70	21.64	61.49
2	Mean	51.4922	36.7844	15.1444	44.6544
	Std. Deviation	3.48736	10.83907	3.69848	8.06711
	Minimum	46.20	20.77	11.04	31.68
	Maximum	57.78	51.83	20.99	56.32
3	Mean	47.2600	36.9050	13.8300	45.1650
	Std. Deviation	2.47487	11.50463	3.21026	5.46594
	Minimum	45.51	28.77	11.56	41.30
	Maximum	49.01	45.04	16.10	49.03
4	Mean	51.0325	40.3163	10.9275	44.9313
	Std. Deviation	3.54308	10.30793	2.90733	9.96901
	Minimum	46.92	26.60	7.54	30.48
	Maximum	56.49	53.45	16.69	59.42
Total SMITs	Mean	50.3238	37.7150	13.4788	45.3096
	Std. Deviation	3.45129	11.04889	4.32348	8.49206
	Minimum	44.43	13.10	7.54	30.48
	Maximum	57.78	54.70	21.64	61.49
6	Mean	49.2674	33.1384	14.4589	49.1437
	Std. Deviation	5.11431	6.87241	3.98023	5.52467
	Minimum	37.89	17.82	9.60	37.14
	Maximum	56.82	43.53	25.08	59.27

1 = less successful SMITs (N = 5)
2 = highly profitable SMITs (N = 9)
3 = transformed socialist and high-tech SMITs (N = 2)
4 = promising and growing SMITs (N = 8)
6 = deindustrialised towns (N = 19)

Annex 20: Results of the Kruskal-Wallis test of differences in voting behaviour between clusters of SMITs.

	voter turnout	share of vote for right-wing parties	share of vote for left-wing parties	share of vote for centrist parties
Chi-Square	4.551	.393	5.118	.285
df	3	3	3	3
Asymp. Sig.	.208	.942	.163	.963

Annex 21: Results of the Kruskal-Wallis test of differences in voting behaviour between clusters of SMITs.

	voter turnout	share of vote for right-wing parties	share of vote for left-wing parties	share of vote for centrist parties

Chi-Square	.183	2.299	1.378	3.015
df	1	1	1	1
Asymp. Sig.	.669	.129	.240	.082

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