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Post-Industrial Development and Manufacturing on the Periphery: The Case of Pécs, Hungary

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Abstract: This paper takes a look at the evolution of manufacturing industries of Pécs, a shrinking regional centre in Southern Hungary. Industrialisation and de-industrialisation processes are considered in the context of the city's peripheral geographic position, and its aspirations to abandon its mining and industrial heritage in favour of becoming a cultural city. The paper contests the reality of these plans, drawing attention to how a simplified understanding of economic restructuring encourages the formation of "hidden sectors", important secondary and tertiary activities which can get caught in vicious circles of decline, policy neglect, and network disintegration. It examines the transformation of the city's industries, and the divergent evolutionary patterns they form in a city characterised by industrial decline. FDI-based, endogenous and knowledge-based industries are examined, along with the institutional background which influences their evolution, and gives rise to hidden sectors. The paper aims to highlight the importance of diversified industrial structures, the relevance of localities, and the role institutions play in influencing the future of manufacturing in the post-transition era.
Keywords: manufacturing, periphery, hidden sectors, de-industrialisation, shrinking cities, path-dependence

1. Introduction

While the post-socialist transformation of regions and cities in Central Europe has brought about profound change in political life and socio-economic systems, recent studies have put renewed emphasis on the interplay between historically embedded legacies and new phenomena, emphasising the *longue durée* of systemic transformations (Lux and Faragó 2018; Gorzelak 2020; Gorzelak and Smętkowski 2020). Productive, institutional, cultural and even political legacies matter – sometimes more than we would like to admit. The majority of case studies concerned with urban transformation inadvertently deal with the eye-catching and the dramatic: spectacular successes and unqualified failures. The former often enter best practice manuals without sufficient attention to special or even unique circumstances which had made them so (Lovering 1999); the latter, typically less studied, become cautionary tales in academia, and sometimes a testing ground for new regeneration schemes in policy.

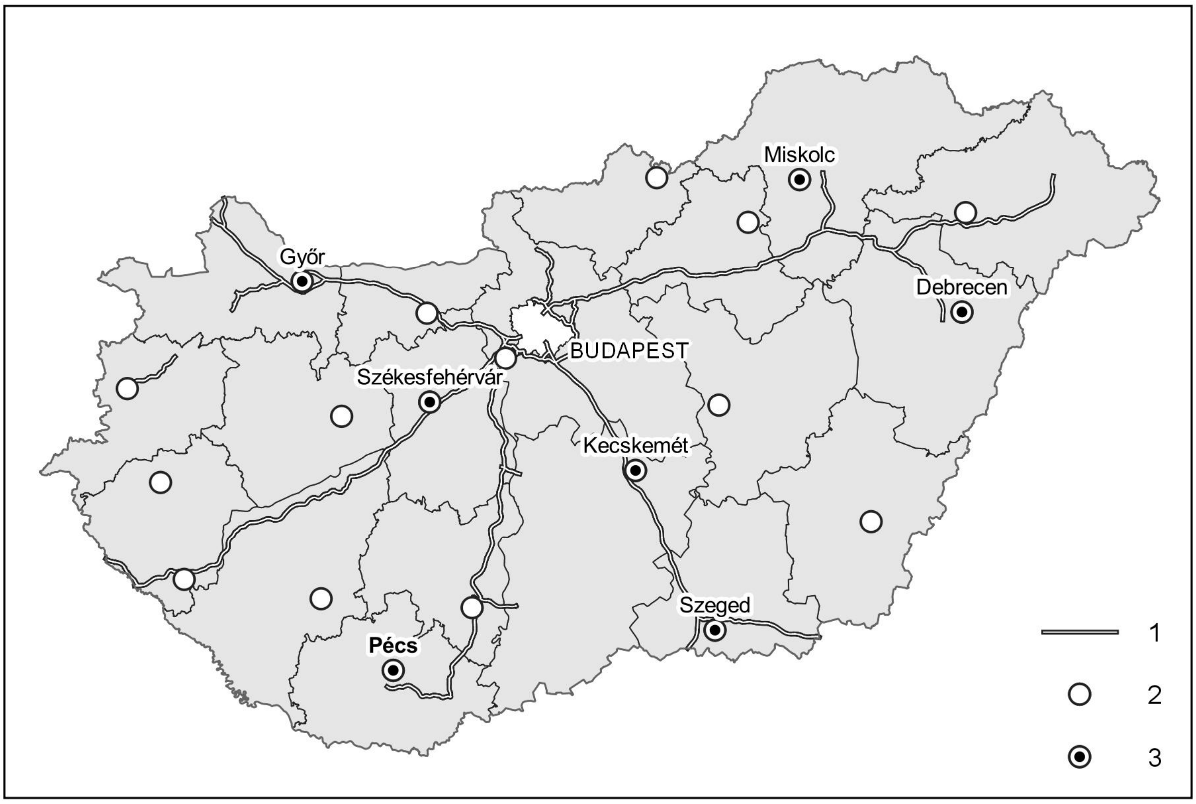
Yet highlighting dramatic processes and outliers neglects the existence and problems of the several "in-betweens", the "mixed types": regions and cities which do not fit neatly into either category, exhibiting dubious development patterns or moderate success/failure. Cartographic visualisation – usually based on the horizontal division of space (Nemes Nagy 2009) – results in the secondary and tertiary aspects of spatial units "dropping off the map", while a stylised approach to the study of patterns and processes reduces space "into points devoid of any territorial dimension" (Capello 2016, 8). Furthermore, even cases which fit a specific analytical framework (e.g. metropolitan areas, Old Industrial Regions, shrinking cities, etc.) are rarely pure specimens, but complex entities with specific characteristics and contradictions. Even cities with strong specialisation in specific activities have secondary or tertiary branches which play a considerable role in employment and value creation, even if they are rarely mentioned.

This paper uses the example of the manufacturing sector of Pécs, a Central European city better known for its culture to higlight the significance of what will be henceforth referred to as "hidden sectors"; economic activities which are obscured by other, locally dominant development patterns. Overshadowed or obscured by socio-economic phenomena commanding more attention, they exist in the background – either taken for granted, or, as in our case, neglected due to their poor fit with dominant development narratives. Hidden sectors exist everywhere, even in developed core regions; however, the peripheries can be most sensitive to their problems. Hidden sectors can easily "fall through the gaps", either dwindling into irrelevance, or never "taking off".

Contemporary development in Central European manufacturing has mostly been studied on the examples of regions with a strong industrial specialisation, either deeply integrated into foreign direct investment (FDI) networks (e.g. Pavlínek, Domanski and Guzik 2009; Wójtowicz and Rachwał 2014; Pavlínek 2015) or dealing with the consequences of industrial restructuring (Drobniak, Kolka and Skowroński 2012; Sucháček et al. 2012; Pástor, Šipikal and Rehák 2013). Studies on peripheral branches such as textiles and light industries, or the industry of the peripheries have been a lot more scarce (Pickles et al. 2006; Molnár 2013), and are more often the subject of domestic publications. And yet, cities with struggling industries are commonplace in Central Europe, and may be closer to the norm than the exception when it comes to smaller cities on the periphery. While reindustrialisation has been the prevailing trend of the decade after the 2008-2010 crisis, this, too, comes with uneven consequences.

Pécs, the city being investigated in this paper, is a regional centre of 142 thousand inhabitants in the region of Southern Transdanubia, Hungary. With a history stretching back to the Roman era, Pécs has long had to contend with the duality between its peripheral geographical position in Hungary's Budapest-centric space economy (Figure 1), and its higher aspirations in the field of culture and education. The present paper will focus on the city's manufacturing industries, whose development has taken place in an adverse context. Pécs and the surrounding region lie outside Hungary's modern-day manufacturing core areas, which have been integrated into global production networks (GPNs) through FDI inflows. Likewise, recent reindustrialisation processes, gathering pace after the 2008-2010 crisis and particularly since 2012, have bypassed the city and the entire region, accompanied by a gradual decline in development rankings, and a decrease of both population (from 170 to 142 thousand between 1990 and 2019) and employment numbers. Accordingly, Pécs can be fairly characterised as a cultural centre, an industrial periphery, and a shrinking city.

Figure 1: The location of Pécs within Hungary



Legend: 1 – highways, 2 – county seats, 3 – regional centres.
Source: Author's construction.

In academia, Pécs has been one of the more studied Hungarian urban centres. Particular attention has been dedicated to the city's transformation from mining under socialism into a city of culture, its bid for European Capital of Culture 2010, and the controversary aftermath of this programme. Papers have focused on the city's urban structure and functional transformation (Trócsányi 2011), processes of culture-based regeneration (Faragó 2012; Tubaldi 2014; Turşie 2015; Keresnyei and Egedy 2016), managing a cultural flagship event (Pálné Kovács 2013; Lähdesmäki, 2014; Pálné Kovács and Grünhut 2015; Németh 2016), the city's gateway role (Pap, Gonda and Raffay 2013), and the tourism impacts of building a cultural economy (Aubert, Marton and Raffay 2015). Compared to this abundance, reflections on the city's development outside the cultural sphere have been scarce. The previous papers make occasional mention of the city's manufacturing industries, but mainly do so in passing, or as a problematized industrial heritage to be superseded by a more modern development model. The manufacturing industries of the city are "there" in the background, somewhere, but either taken for granted, or viewed with an implied scepticism regarding their growth prospects. Studies on the city's industry include a few broad overviews on economic and industrial transformation (Hrubi 2006a, 2006b; Rácz, Kovács and Horeczki 2020), a policy-oriented book on reindustrialisation (Hrubi 2009; Szerb 2009; Póla 2009), as well as two papers and part of a monograph by this paper's author on the city's industrial evolution and economic governance (Lux 2010a, 2015, 2017).

The paper draws on the approach and terminology of evolutionary economic geography (Boschma and Martin 2010), particularly path dependence (David 2007) and the less studied concept of path dissolution (Martin and Sunley 2012). It aims to provide a look at the industrial evolution of Pécs, and the way its industrial legacies have evolved under unfavourable post-industrial circumstances. The paper also considers how the city's self-image as a cultural centre has been able to "overwrite" socio-economic reality, relegating its manufacturing to the position of a hidden sector, and how the lack of sufficient attention dedicated to its development has contributed to a self-fulfilling prophecy of industrial shrinkage and decline. The research methods used for this paper encompassed literature analysis, field work, and in-depth interviews with local entrepreneurs and policymakers.[1]

2. Pécs: Transformation Processes in a Peripheral City

2.1. Historical background

Through much of its history, the distinguishing feature of Pécs has been its role as a cultural hub and episcopal seat, as well as a centre of high-skilled craftmanship. With a history stretching back to the Roman provincial seat of Sopianae, it became a bishopry in the mediaeval Kingdom of Hungary, serving as a south-western gateway towards Dalmatia, Italy, and the Balkans. Pécs served as the seat of Hungary's first university (established 1367, destroyed during the Ottoman occupation, and re-established as an academy in 1833), emerging as one of the main hubs of renaissance culture and learning. Its role as a conduit for Italian influences was cut short by the Turkish conquest (1526/1543–1686), a period which saw it function as a military outpost and a hub of Balkans trade networks; and ended with the city's almost complete destruction by the liberation wars and the plague, which left the city in ruins, and mostly depopulated.

In the 18th and early 19th century, Pécs regained its position as a bishopry and clerical stronghold, purchasing its free royal city status in 1777. As the city was distant from the major river routes, it became specialised in complex, easily transported, high-value goods for luxury markets (Kaposi 2006). Light and food industries represented the first wave of industrialisation, developing into its iconic brands: watches (several smaller workshops forming what would now be called a cluster), cosmetic soaps, champagne (Littke – 1859), glovemaking (the "Hamerli" manufacture – 1861), church organs (Angster – 1867), and decorative ceramics. The Zsolnay Porcelain Factory (1853) came to symbolise the city in Europe, with products ranging from household porcelain to lustrous roof tiles and distinctive art pieces, based on continuous technological innovation and contemporary design. This mixture of industry and culture, organised by prominent industrialists and supported by a flowering of local banks (Gál 2009), was joined by more typical industrial branches. The arrival of steamboat shipping (1833), and the railway network (1859) gave rise to coal mining and an ironworks, and a growing tradition of machine industry (Horváth 2006; Kaposi 2006). The city's "capitalist" industrial structure proved enduring, experiencing modest growth, but remaining stable until 1945. In this era, Pécs had a diversified economy, both in its mixture of industries, and its other city functions: public administration, higher education, trade, and multiple artistic schools drawn to the city's sub-

[1] Some of the empirical work for the chapter was undertaken in three previous research projects over the span of the last decade, with repeated inquiries providing an insight into ongoing evolutionary processes. These projects included OTKA grant #81789 ("Specific questions of institutionalising agglomerations within and beyond administrative structures"; 2010–2012); OTKA grant #K75906 ("The effects of industrial investments and transportation linkages on spatial structures"; 2010–2012); and NKFIH grant #K115577 ("The role of medium-sized enterprises in regional industrial competitiveness"; 2015–2019).

Mediterranean climate and intellectual ambience (literature, fine and applied arts, and multiple prominent members of the Bauhaus movement).

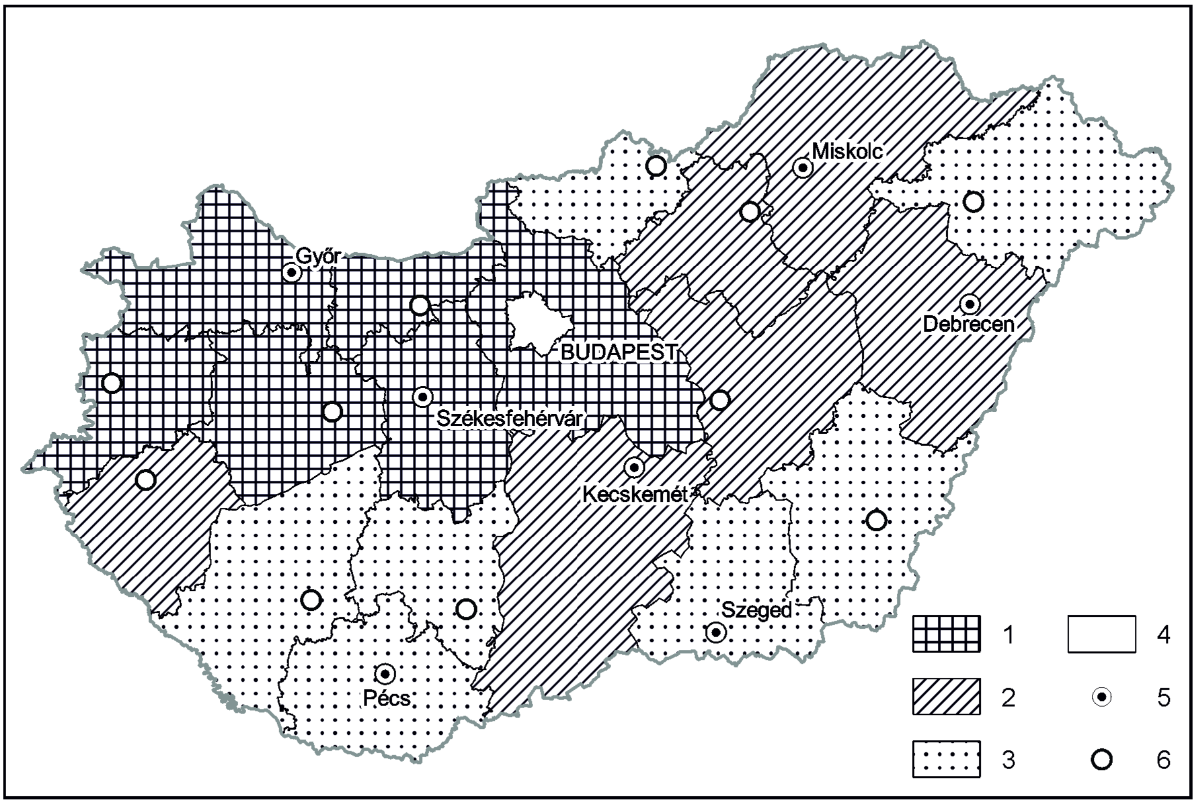
Socialist industrialisation after World War 2 (WW2) resulted in the city's radical and thorough socio-economic restructuring. Most of its traditional industries were deliberately shut down or downsized, and its cultural functions atrophied while the city would expand at a rapid pace due to the massive expansion of coal and uranium mining. The population of Pécs grew from 88 to 165 thousand inhabitants between 1949 and 1970, and multiple new housing estates were constructed on its perimeter. The definitive economic geography handbook of the time (Markos 1962) describes Pécs as a settlement with developed mining, industry and culture, noting that 42% of its active workers were now employed in mining and industry. These figures masked a more sobering reality. While mining provided unusually high incomes for 18 thousand coal and approximately eight thousand uranium miners (precise figures conspicuously omitted from contemporary statistical yearbooks), the economy of the city took on a distorted, mono-structural character, and was effectively dominated by low-skilled work producing raw materials for distant steelworks, and the Soviet nuclear programme. Hidden unemployment among inhabitants who were not accounted for by official statistics but could not find a job in the mining-dominated economy (a problem mainly affecting married women), and shortages of housing, public services and household goods became overwhelming concerns.

The problems of industrial development, coupled with the rise of a reformist generation in the local party organs over the 1960s, resulted in an ambitious restructuring plan to modernise the local economy by halving mining employment by 1980, and re-specialising in new, more advanced "basic industries" (Lux 2010b). A rare example of bottom-up initiatives in a socialist state, the plans had no realistic chance of success even in a decade of careful economic reform, but nevertheless achieved some results. Traditional food and light industries were revived to create new jobs, and "branch-plant companies", the subsidiaries of Budapest-based firms were opened in the machinery, electronics and optical sector – the second pillar of the city's current manufacturing base.

2.2. Post-socialist development processes

The post-socialist transformation of Pécs resulted in the rapid unravelling of its mining complexes. Already massively unprofitable, both the coal and uranium mines were shut down over the 1990s, followed by comprehensive recultivation efforts, and the early retirement of the majority of workers. Structural change was almost as rapid and radical as the great expansion of mining over the 1950s and 1960s. "Branch-plant" manufacturing companies experienced severe difficulties in transition, as these units were not independent firms, but externally managed subsidiaries without independent management, R&D, or design functions. Unlike Hungary's north-western industrial cities, Pécs did not benefit much from the first wave of FDI inflows due to its geographic isolation, the lack of motorway access (only completed in 2010, and then towards Budapest instead of Hungary's western export markets – c.f. Figure 1), and the proximity of the Yugoslavian conflict. Hence, three larger firms represented the majority of FDI: Hauni Hungaria (machinery), Hantarex (electronics, 1991–1994; later superseded by Nokia, 1994–2001; and by Elcoteq, 1998–2011), and British American Tobacco (tobacco). Successive investment waves also found little interest in the city's limited labour market. Through the steady decline of manufacturing, Pécs, previously in the middle of the national rankings, converged towards Hungary's de-industrialised southern periphery (Figure 2).

Figure 2: Pécs in the spatial structure of Hungarian manufacturing



Legend: 1 – integrated industrial counties, 2 – reindustrialising counties, 3 – industrial peripheries, 4 – service-based core area, 5 – regional centres, 6 – county seats.
Source: Author's construction based on regional typologies by Nemes Nagy – Lőcsei (2015), Lengyel *et al.* (2016), and Lux (2017).

Partly through necessity, partly through a revival of earlier traditions, the cultural and political elite reimagined Pécs as a city of culture and higher education, contrasted in the public imagination with declining manufacturing, and a now rejected, quickly forgotten mining past. The University emerged as the city's most important employer next to the Local Government, growing to 33 thousand students and 6300 staff by the mid-2000s. The sizable public sector served as a buffer from the depression experienced by other industrial crisis regions, and offered a hopeful way out – in the medium term. References to complex cultural products and "cultural industry" started to appear in early revitalisation plans (Faragó, Horváth and Hrubi 1990; Pécs Városfejlesztési Koncepciója 1995), and eventually came to dominate development discourse. As the most important expression of these aims, a new, two-pronged growth strategy was formulated (Borderless City 2005; The Pole of Quality of Life 2005). Three industry/service clusters with good future potential were identified in the health, environmental and cultural industries; furthermore, the city submitted and won a bid for the 2010 "European Capital of Culture" (ECoC) title (although shared with the vastly larger Essen and Istanbul). The growth pole strategies are just as interesting for what they were missing as what they actually contained: the city's actually functioning industries, or indeed references to manufacturing in general were conspicuously absent from the picture, and from the programmes' future images.

The 2008 crisis had shaken the city economy particularly badly. Consumption-oriented cultural functions had to contend with a severe drop of real demand, damaging the already problemriddled ECoC event. The University, one of the cornerstones of the local economy, had undergone its own crisis, brought about by the region's sharp demographic decline and the *de facto* introduction of tuition fees, which had been particularly severe for the university's main focus, humanities and social sciences. The number of students decreased from 33 to 20 thousand, a change only partially compensated by its growing specialisation in international medical students (growing from 1200 to 5000 between 2012 and 2019). The city's service-based branches proved to have remarkably weak resilience; in years of severe austerity, they proved dangerously dependent on transfers from the central government.

Table 1: Main structural indicators of Pécs and Baranya county (1950–2015)

		1950	1960	1970	1980	1990	2000	2010	2019**
Population (1000)	Baranya	362.8	400	421.2	423.5	418.6	400.8	391.5	361.0
	Pécs	87.5	114.1	141.3	168.7	170.0	157.3	157.7	142.9
Employment (BA, %)	agric.	56.5	39.2	29.7	19.9	18.3	8.1	4.8	4.6
	industry	19.9	30.2	41.1	42.2	38.7	33.1	26.4	28.9
	services	23.6	30.6	29.2	37.9	43.0	58.8	68.8	66.5
Unemployment (BA, %)		-	-	-	-	4.2*	3.4	7.2	3.5
Investmt (BA, %)	agric.	n/a	10.9	25.1	25.1	25.7	5.7	8.5	13.0
	industry	n/a	65.1	41.6	37.6	37.5	54.9	23.9	45.2
	services	n/a	24.0	33.3	37.3	36.8	39.4	67.6	41.8
Coal production (1000 t)		1,400	2,847	4,151	3,065	1,735	753	0	0

* Peaked at 13.5% in 1993. ** First two quarters

Source: Author's calculations and construction based on data from statistical yearbooks (Baranya Megye Statisztikai Évkönyve 1956, 1960, 1970, 1980, 1990, 2000, 2019).

The 2011 shuttering of Elcoteq, the city's largest employer in manufacturing, dealt a severe blow to electronic industry, and the inability to find a new investor lead to the mass emigration of skilled workers. For two decades, the declining fortunes of Pécs had been relatively bearable due to a large public sector and generous social policy: the new crisis of 2008-2010 had exposed the severity of its economic and political problems. A now rapidly declining population, indebted and ineffectual Local Government, and general sense of depression placed the city where its middle-class citizens had never considered being: among Hungary's underdeveloped regions. This is not always borne out by the most outwardly visible statistics (Table 1) – unemployment had peaked and receded, and the transition from industrial to post-industrial city is considered a natural consequence of post-socialist modernisation – but it is reinforced by finer economic indicators. For all intents and purposes, the entire county is an industrial periphery (Lux 2010a), and a "persistent loser" of post-1970s industrial development trends (Nemes Nagy and Lőcsei 2015). The county (NUTS-3 level) ranks low in per capita GDP (declining from 11th to 16th among Hungary's 19 counties between 2000 and 2017), and its manufacturing productivity has been ranked persistently last between 2001 and 2018 (the annual 14.6% growth rate is close to the national average).

Post-transition Pécs is, of course, a complex entity with multiple possible identities: it is, fitting its self-image, still a city of culture and a college town, with a relatively high quality of life that is not always reflected in the "hard numbers". Considering the *genius loci* and its self-image, it is a post-industrial city with a vibrant cultural life. Between the 1970s and about 2004 (the year of EU accession), it would show many characteristics of industrial crisis regions, although this status has receded into the past after thorough de-industrialisation. Today, it is perhaps most accurately described as a shrinking city. The combination of economic decline and population loss puts it solidly within the group of cities found across the developed world which must contend with managing long-term decrease (Martinez-Fernandez et al. 2012; Richardson and Woon Nam 2014), a process now helped along by seemingly irreversible processes of cumulative causation (Hospers 2014).

3. Manufacturing in the Post-Industrial City

Despite its peripheral status and post-industrial character, even the industries of Pécs show a fairly diverse picture. The mining industries which had once made the city take on a mono-structural character are completely gone, leaving very little of their traditions except a housing estate named "Uranium City" (ironically, a much more pleasant place than it sounds). The remaining industries are small both individually and collectively. All of them are rooted to some extent in local productive traditions, and represent different forms of path development (Figure 3).

Figure 3: The industrial mix of Pécs in four periods

Traditional (1850–1944)	State Socialist (1945–1989)	Post-socialist (1990–2008)	Post-transition (2009–)
Cultural functions (core)	Coal & uranium mining (core)	Cultural economy (supplementary → core)	Cultural economy (core)
Food & light (core)	Machine & electronics (supplementary)	Machine & electronics (supplementary)	Machine & electronics (hidden)
Heavy (supplementary)	Food & light (hidden→supplementary)	Food & light industries (supplementary→hidden)	Food & light (hidden)
	Cultural functions (hidden, reduced)	Coal & uranium mining (disintegrating)	Knowledge-based (early-stage)

Source: Author's construction

The first group of local industries concerns *FDI-based manufacturing activities*. This segment of the city's economy concentrates its largest employees outside the public sector and utilities. Even for Central Europe's geographic and economic peripheries, Pécs has a very low FDI presence. As Rácz, Kovács and Horecki (2020) note, ony 250 out of 9,000 registered companies in the city have foreign capital, and machine industrial firm Hauni Hungaria (1300 employees) is the only one with more than 1000 jobs – making Pécs unique in this respect among Hungary's eight large cities. Three other foreign-owned manufacturing companies employ over 250 staff (British American Tobacco – 835, tobacco; Bader Gruppe – 516, metal cabinets; Harman Professional Ltd. – 432, electronics), and four more employ over 100.

With a few exceptions (most notably Hauni), these firms are specialised in low-to-medium-tech assembly functions, with low local added value, and strong external control over local management. They represent the lower range, or perhaps *peripheral form* of Central Europe's typical FDI-based manufacturing development path, and are the current manifestations of path-dependent evolution. The city's foreign-owned companies are built on previous knowledge sets, some in machinery, some in electronics, and some in food and light industries. Without good transport connections (Pécs only gained its highway connection in 2010), the investors of the 1990s were mostly attracted by available pools of skilled labour or privatisation opportunities. However, while the investing firms have brought modern equipment and efficient management methods to the city, their presence has not led to the sustainable modernisation, or even stabilisation of growth paths in these mature industries. No comprehensive efforts had been undertaken – by either the public or the private sector – to update the knowledge sets of these branches, or even ensure their continued viability through strong vocational education. Manufacturing *in general* was considered a thing of the past, something not worth the effort and scarce resources to maintain; and development policy in the city has focused on allocating resources to cultural and education functions to the neglect of the productive sector. Consequently, the city's manufacturing base has been slowly shrinking, falling behind national trends in both employment and productivity.

Whereas the prevailing post-crisis trend in Central Europe's manufacturing sector has been local re-investment in existing sites and slowly increasing embeddedness (Pavlínek 2015; Rechnitzer 2016; Józsa 2019; Rechnitzer and Fekete 2019), the FDI-driven industry of Pécs has experienced an opposite process. Elcoteq, its dominant FDI plant became disembedded, and with its closure in 2011 due to external causes (the collapse of the parent firm), the formerly 5-8,000 jobs in electronics dwindled away as former employees moved to more dynamic regions in north-western Hungary and abroad. Low-value added routine activities are easily uprooted: Elcoteq was eventually succeeded by smaller investment projects (most notably Harman), and a few mid-sized, locally owned companies, but these collectively represent much less employment and production potential than the original plant.

Without upgrading to higher value-added, more embedded functions, manufacturing branches relying on routine activities and cost advantages prove particularly footloose and "slippery". Moreover, even the scarce attractions which had once drawn these FDI projects are no longer present. With shrinking industries, the pool of skilled labour to draw on, and the knowledge sets which might be reused by new investors, are depleted due to retirement, out-migration, and insufficient replacement (due to a downsized vocational education system). While Pécs is at realistic risk of losing even some of its existing industries, it can offer precious little incentives to attract new ones. Neither the construction of a previously missing motorway (2010), nor the city's three well-equipped but under-used industrial estates have been able to change this situation. Indeed, all they show is that the 1990s approaches of investment promotion are no longer sufficient: cities must offer attractive industrial milieus, an active and skilled labour force, and investment-friendly local authorities to succeed.

A second group of industrial firms encompasses a group of *locally owned medium-sized enterprises.* These companies, while their numbers are not large (our recent study[2] identified 23 in Pécs and 16 more in nearby settlements), show a more promising picture than FDI plants. They are deeply rooted in the local industrial traditions, representing path-dependent endogenous development. While they cover a diverse set of industries, these firms show certain similarities as a group:

- they are family owned firms characterised by slow, stable growth, with a preference for self-funding and conservative business strategies;

[2] NKFIH grant #K115577 ("The role of medium-sized enterprises in regional industrial competitiveness"; 2015–2019).

- while most of them were established in the early and mid-1990s, they reuse and develop traditional knowledge sets found in the city, mainly in machine industry, electronics, and light industrial activities;
- they are often specialised in niche markets, with relatively high exporting activity, reliance on skilled labour, and, in recent years, incremental innovation behaviour based on a mixture of continuous improvement and new product design. The group also includes Tier 2 automotive suppliers, although these companies try to hedge their bets by also developing own products which reduces their dependency on FDI-controlled value chains.

Our recent comparative study of domestic medium-sized manufacturing firms in Hungary (Kovács, Lux and Páger 2016) has concluded that Pécs had a higher than expected number of these companies, especially in comparison with more successful industrial cities. It seems safe to conclude that they have emerged in the absence of large-scale FDI, by reusing the legacy (manpower and knowledge sets) of defunct state socialist enterprises. The closest analogy to these companies is the German Mittelstand, a group of locally embedded family firms typically found in Germany's smaller cities and rural areas. The mid-sized firms of Pécs are of course separated from this much more robust and numerous group by multiple criteria, most prominently their multi-generational development (most are near their first generation change), but there are valid parallels with the generalised Mittelstand model (Lehrer and Schmid 2015; Welter et al 2016; De Massis et al 2018), most prominently the ability to mobilise endogenous capabilities to sidestep resource scarcity, high local embeddedness, and a reliance on local social capital. That is to say, medium-sized manufacturing companies in Pécs are not *yet* full Mittelstand-type firms, but many of them *may* develop in this direction, given sufficient time and opportunities.

It must be noted that, despite its moderate success and healthy development patterns, this group is also facing problems. The diversified industrial mix also implies a lack of effective specialisation outside machine industry (which has formed an effective and active regional cluster) and winemaking (whose production base lies outside the city in a rural wine region), leaving the local Small and Medium Enterprise (SME) sector fragmented, without sufficient critical mass. Other clusters, while they exist, are either very small (the remnants of glovemaking) or dominated by public actors which are not active in actual production functions (cultural cluster). Some industrial traditions, notably organ-building and ceramics, are rooted in one or two companies, and do not seem to generate new spinoffs or cluster-type networks. Some companies operate in branches exposed to intense cost-based competition from East Asia. As the experiences of shrinking light industries in Hungary show (Molnár 2013), holding together local production networks in the generational perspective is a formidable challenge. Access to skilled labour is a critical concern, and an area where interviewed firms and policymakers have been consistently ringing alarm bells. The resilience of the city's endogenous development path has been tested by the 2008 crisis, but it is yet to be tested by time. It is a question for the future whether it can withstand further de-industrialisation processes, or (paradoxically) stand its own if the city eventually succeeds at attracting larger FDI projects. Our research in FDI-dominated regions suggests that crowding-out and congestion effects are very much at play.

A third, prospective group of industrial firms encompasses *innovative, knowledge-based industries.* Innovative firms are the "Holy Grail" of regional development, and a commonly suggested panacea to the ills of underdevelopment and low competitiveness. But, as literature shows (Malory 1485), grails are elusive and hard to obtain. Knowledge-based industries require high capitalisation, and show immense agglomeration tendencies in a few global centres, with limited development potential on the periphery (Audretsch 1998; Kilar 2015; and in particular Kasabov 2011). In Pécs, two small groups of innovative firms are of particular note, both connected to the University. One is made up of minor IT startups and the subsidiaries of Budapest-based IT firms, and has very few connections to manufacturing. The second group represent university spinoffs active in the biomedical sector, founded by academic entrepreneurs. In-depth studies (Erdős and Varga 2012, 2013) have found that while these entities generate valuable knowledge, there are significant barriers to their commercialisation, particularly in a peripheral region distant from the major innovation hubs. Without a supportive business environment, adequate financing, and business know-how, the work of academic entrepreneurs is more likely to be purchased and put to use by firms in global core regions, promptly delocalised from their region of origin. Likewise, previous attempts to link up the University's medical knowledge base and local manufacturing companies (as in the 2005 growth pole programme) have met major hurdles. While local firms have sufficient capabilities to manufacture high-quality medical instruments, even relatively simple tools (e.g. surgical metal) must surpass significant barriers to entry posed by international quality standards – a practice benefitting large corporations. Nevertheless, biomed and broadly understood health industries may be one of the seeds for the city's future development, a rare area where it has comparative advantages – but the exploitation of this potential will require a concentrated, long-term development effort.

4. The Institutional Context of Industrial Change

During its transformation from industrial to post-industrial city, the institutional setting of Pécs had also changed profoundly. Despite significant personal continuity between the state socialist and post-socialist city elite, the leaders of the emerging new *urban regime* in Pécs accepted and eventually embraced the radical structural change of the local economy. The resulting regime, somewhat uncharacteristically among Central Europe's former industrial cities, does not have the traditional industrial and business affiliation of the typical "caretaker" and "developmental" regime types (Stone 1993; De Socio 2007). Rather, the city's political machine could be described as *an early-stage progressive regime*. As De Socio notes in his study of US urban regimes, progressive regimes prioritise civic functions, the service economy, multimedia services, high technology and, most notably for our case, culture-based development and the creative class.

> "Progressiveness in this context more closely resembles the (…) middle-class arts-and-culture progressive regime type that focuses on historical preservation, quality of urban design, tourism, or environmental quality rather than a low-income, opportunity-expanding progressive regime prototype." (De Socio 2007, 358)

Concomitantly with the rise of the city's reorientation towards its cultural, consumption and higher education functions, interest groups representing manufacturing industries became marginalised in policymaking. Similar to De Socio's (2010) description of "sunset firms" in US Rustbelt cities, industry as a whole became "tainted" by the legacy of mining's failure: operating at a communicative disadvantage, they were persistently side-lined in the rush for priority-setting and resource mobilisation. For a long time, the Local Government had no formal investment / business promotion team at all, and only through the lobbying efforts of local entrepreneurs would this office be established – very late, well into the late 2010s. Likewise, Hungary's central government – regardless of its political affiliation – had either considered Pécs as a cultural city without need for manufacturing development (and, as under state socialism, not poor enough to be prioritised in development funding), or written it off as a hopeless case.

Absent a cohesive policy effort to organise the local economy, these responsibilities fell on the city's business community. The *Chamber of Commerce and Industry of Pécs and Baranya (PBKIK)* has emerged as the main lobbyist for local entrepreneurs, and is considered one of the more active actors in Hungary's network of economic chambers. Much like in the German model (Maenning and Ölschläger 2011), local chambers play a vital role in the reproduction of relational and social capital; in Hungary, they have been at the centre of bottom-up reindustrialisation initiatives. Póla (2020) lists seven areas where chambers should have a role in local manufacturing development:

1. improving the availability of skilled labour;
2. assisting generational change in enterprises;
3. interior market development;
4. fostering innovation and knowledge transfer;
5. increasing local added value;
6. fostering digitalisation and the spread of Industry 4.0 solutions;
7. developing reformed vocational education systems.

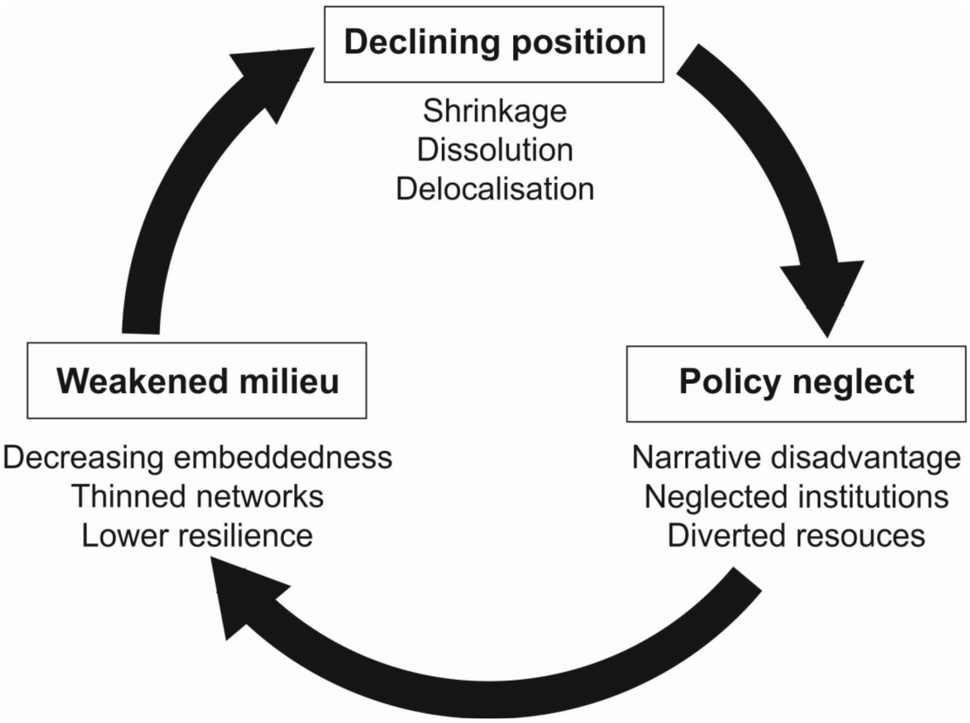
These aims, which form a comprehensive set of objectives to develop local and regional industrial milieus, have been in the focus of PBKIK, particularly in cluster-building, business matchmaking, and re-establishing an effective dual vocational education system after a long period of neglect. For decades, the Chamber's efforts had fallen on deaf ears; and it is only when the city's decline have become clearly visible that they have made some inroads.

The third actor in the city's institutional network is the *University of Pécs*. In spite of its history and prestige, the University has mostly been an absent player in Pécs's economic development. One reason for this is its *disciplinary structure*: like Hungary's other old provincial universities, it is specialised in medicine, the humanities and social sciences, lacking a strong technical faculty. The Faculty of Engineering and Information Technology (est. 1970) had only provided three-year education on the college level until 2004. It had first specialised in architecture and mechanical engineering, and has been very slow to develop beyond a small provincial college. To this date, it is under-developed for the city's needs (IT as a universally applicable discipline; a sufficient number of mechanical engineering and electronics graduates). The second reason has to do with *institutional rigidity*. The University maintains limited relations with the local economy, and its attitudes have been described by interviewed economic stakeholders as "distant", "bureaucratic", "aristocratic", and "a useless humanities-based elite" (sic). There are strong organisational and cultural barriers that limit the University's knowledge transfer role – even beyond the aforementioned disciplinary mismatch. The University of Pécs has been far less successful in contributing to local and regional development than smaller, less prestigious but more entrepreneurial "mid-range" universities in Hungary and other Central European countries (Gál and Ptaček 2011, 2018; Rechnitzer 2016; Rechnitzer and Fekete 2019). Recognising this problem, the University's Szentágothai Research Centre (2012) has been established to provide a supportive environment for knowledge transfer and the commercialisation of innovation (particularly in biomed), but this institution is rather new, and its effects on regional development are yet to be properly surveyed.

5. Conclusions

While they may be out of the public eye, “hidden sectors” represent a substantial slice of post-transition regional structures in Central Europe. Beyond a non-negligible role in employment and value creation, they should be understood to contribute to the diversification and resilience of regions and cities. From the perspective of evolutionary economic geography, they contribute to the mixture of activities which characterise the modern city. Some of these sectors may contribute to new path creation (e.g. the seeds of medical industry in Pécs), some are relatively stable (e.g. the city’s machine industrial cluster), while others are mature branches with limited growth potential, but still capable of renewal and a shift towards high value-added production (e.g. industries rooted in traditional craftsmanship). The neglect of specific activities can also lead to the decline, disintegration and eventual disappearance of productive traditions. Mining has entirely vanished from Pécs along with its specialised knowledge base, while the long-term future of electronics industry is constrained by low upgrading performance. Neither traditions have strong successor industries.

Figure 4: Hidden sectors and path dissolution



Source: Author’s construction

Hidden sectors – typically mature branches taken for granted or experiencing decline – may move towards path dissolution and the loss of valuable development potential. A vicious circle emerges (Figure 4):

- Hidden sectors must often contend with a real or perceived declining position in local and regional economies due to external and internal factors. The consequences may involve slow shrinkage, or in more extreme cases dissolution (the falling apart of production systems needed to sustain competitive firms), and delocalisation (the flight of remaining companies to more advantageous investment locations).
- Hidden sectors typically experience policy neglect. They are at a narrative disadvantage in political agenda-setting due to their assumed failure or diminished attractiveness, and

may be written off as “out of fashion” or “unfixable”. Consequently, background institutions (education, training, business support, etc.) which are vital to the efficient operation of industrial milieus are often downsized or shuttered, introducing further difficulties for local firms. Public resources are spent on new, promising activities, and loans for SMEs may prove just as hard to secure.

- The neglect or marginalisation of hidden sectors usually results in a slow, often imperceptible erosion of the intangible factors which maintain a local industrial mileu. Yet one by one, these binding forces can become disconnected: firms become disembedded from their locality, business and knowledge networks are thinned as actors and networking opportunities fade. In the end, the resulting milieus are weaker, less able to generate common value, and become more vulnerable to exogenous shocks – which produce new waves of decline.

Vicious circles, as it is well known, are hard to escape. Yet they do not represent the only possible future for hidden sectors.

In the example of Pécs, reducing the “idea” of a city into a pure concept (the former “mining city” vs. the new “city of culture”), and failing to account for sectors which did not fit this ideal picture has reduced the *diversity* of the local economy. The consequences can be felt in both concrete losses and (more importantly) opportunity costs, missed or underexploited potential. While external factors had played a role in the adverse de-industrialisation of the city and the surrounding city-region, many of the causes were endogenous, and can be traced back to poor policy decisions or public sector neglect. Whereas the abandonment of a previously diversified industrial mix under state socialism had created a mono-functional city, the abandonment of manufacturing and the milieus which would sustain it during post-socialism has contributed to a loss of economic potential and processes of urban shrinkage. Over the last decades, a wide gap has emerged between the city’s post-industrial aspirations and the realities of its actual position in the post-industrial economy.

Yet there is no easy return to the “typical”, more successful growth path followed by the majority of Central European industrial regions. In the peripheral context, FDI inflows are limited, and they mostly just reinforce peripherality. It is more likely that the way forward lies in the exploitation of endogenous growth potential found mainly in domestic companies, and strongly localised sources of development. Going beyond rhetoric, the city must rediscover that its former successes as a peripheral city were once found in high-quality products in niche markets; and that its cultural functions had once been closely intertwined with its industrial innovation and industrial production – not merely publicly funded cultural consumption. Therein lies a path forward, towards re-specialisation and future prosperity in a high value-added niche role which will, again, be different from the globally integrated spaces of mass production and mass employment. This is not a straight and wide road, nor does it come without costs. Pécs must accept that its destiny may be that of a minor city in the 100-110 thousand inhabitant range, and that being a successful “city of culture” is untenable without also being a successful “city of industry”: that is, its self-image and aspirations should be that of a diversified city, where culture and industry are not rival future images, but complementary parts of a unified vision.

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