

# Chapter 4

## Dynamic Sustainability: Back to History to Advocate for Small- and Medium-Sized Towns



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**Abstract** A debate related to the “net” value of agglomeration economies created in the long run is proposed. Some volatile assets such as strategic planning, knowledge creation, shared innovation, and advanced skills are identified. The perspective of urban dynamics adds a glimpse over the potential capacity of medium- and small-sized towns (SMTs) to be capable participants in the development process throughout extensive periods.

The concept of agglomeration economies, pointing out to efficiency gains due to the proximity among agents, is an “unrefuted truth” to be revisited: Immediate efficiency gains are frequently suggested by policymakers whose good intentions for regional development have aggravated discrepancies with shrinking effects for SMTs. Costly consequences must be mentioned: pollution, loss of biodiversity, climate change, pockets of social stress, and extreme poverty are long-term impacts. Not often are impacts directly measurable, for example: The recent pandemic of COVID-19 has shown the fragility of large urban cores to immediately address complexity.

This chapter is composed of (1) introduction, an insightful approach, (2) case studies, illustrating the empirical capacity of SMTs to survive long-term challenges, (3) discussion, highlighting some theoretical insights from the case studies analyses, and, finally, (4) conclusion.

**Keywords** Small- and medium-sized towns · Sustainability · Territorial revenue distribution · Governance · Rural areas · Redistributive public policy · New urban architecture · Long-term negative externalities

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## 4.1 Introduction: Dynamic Sustainability for SMT

The dramatic changes faced in the last couple of decades brought a general trend of populations moving from SMTs in the rural world to intensively urbanized contexts and eventually to mega towns. Migratory movements have since long been at the origin of spatial transformations that altered urban areas. Inside established limits, there has been a tendency evolving together with a systematic asymmetric distribution of opportunities to rural areas and their small or medium-size towns which, meanwhile, have become associated with peripheries and low-potential areas (O'Brien and Ahearn 2016).

Small- and medium-sized towns (SMTs) have shown a potential for high-tech agriculture, their increasingly important role as a playground for creative and innovative small business activities, and their sustainability function in ecologically protected areas as well as a recently new role in the spread of multiculturalism (Woods 2018). Rural regions have brought new hope towards a sustainable opportunity for growth. The socio-economic potential of towns in rural areas is also evident, as they are often the anchors for new developments (Grunwell and Ha 2014). SMT also forms a bridge between social community capital and landscape cultural heritage (Vaz 2020) and, on the one hand, abridge the new growth and creativity trends which must be accepted and enhanced (Vaz and Bowman 2013).

What we will try to prove during the development of this chapter is that rural medium-sized towns are not irrelevant players in the protected and stagnating rural areas (Hospers 2013). They always have been agents of change throughout history; thus, a long-term observation with a historical “bird’s eye” is of utmost importance. Future will expose increasingly to internationalization, social networks, modern information and communication technologies (ICTs), and many other possible technological developments. In other words, the primary goal of this study is to discuss and eventually find out, if there are pathways that may link the historical growth of SMTs to the challenges of a high-technological society. We recognize that, in the context of an open space-economy, towns must gather all their capabilities to be able to survive. Thus, depending on how innovative each one can be and enhancing their own potential, they can reach a complex combination of rurality and modernity, in a new understanding of urban networking architecture.

In a democratic context, solutions require a consensus and the capacity of citizens to be aware and act in times of change. We believed that policymakers are no longer free to act independently from public opinion. However, the results of recent elections across the world are proving unclearness about what citizens wish of democracies and their decision processes. Clear is that, if democracy is supposed to consolidate, citizens (even those located in remote and peripheral areas) expect better local living conditions and better amenities for quality living. In general, the population is reluctant to let small towns vanish, as they are part of poetic imagery of childhood and enchantment (de Noronha and Nijkamp 2015)—a historical view of hope and expectation of glory that demonstrates social development and well-being. Some literature (Kourtiti et al. 2015) points to market forces that would probably

slowly shrink rural environments and their towns. However, some recent scientific arguments classify such environments as guardians of a redistributive model wishing we should not lose, thus calling the attention for alternative strategies of survival and possible reinforcement of SMTs vitality (de Noronha and Vaz 2015). Technological innovation and new products combined with improved transportation systems may, indeed, facilitate a new concept of distance for which distant places are much near than we have considered them to be. Although we think that necessary public policies will most likely fail in the design of successful SMTs (Halseth and Ryser 2016) we do trust that there are other, different forms, most of them tailor suited, for which the self-reliance and self-organization capacity of these towns optimized.

Repeating what has already been questioned by us, sociologists, economists, and architects seems to be in favor of assets concentration in and around the large cities (Kourtit and Nijkamp 2013). Also, new technologies are available and able to manage agglomerations efficiently to the point that cost reductions become unbeatable. Still, why do we assume that, in a context of limitless spreading of the networking systems, the rural world will stay apart from technological innovation and knowledge sharing? Some authors have confirmed that the rise of urban network externalities, defined as external economies—from which firms and households can benefit by being located in agglomerations on networks that connect with other agglomerations—could bring new advantages and positive influences upon urban performances of SMTs. This poses the following question (Fertner et al. 2015): Why should it not be assumed that any innovative inputs can be available outside the big agglomerations as much as inside, thus, allowing smaller towns to undertake or participate in novel social functions? Most probably, many citizens are ready to learn further to contribute to different conditions for their rural environments. Multitasking is possible in the rural world, indicating that small- and medium-sized towns do have a precise and essential role in promoting economic activities outside big urban agglomerations (de Noronha Vaz and Nijkamp 2009). Simultaneously, reflecting the past and envisioning the future, policymakers should, in any case, act to consider the potential major role of small towns (de Noronha and Vaz 2015; Vaz et al. 2012a). We claim that SMTs have a strategic position for rural development. They may become, for example, hotspots for knowledge creation and diffusion, such a significant condition for business life and innovation, and social networks and community bonds, as they can better handle the processes of socio-economic decline and promote a geographically balanced income distribution and sustainable production structure, meaning they are able to become much more resilient and stop shrinking (Panagopoulos et al. 2015). We should face such urban structures as potential nuclei for change and balance of extended rural areas. The goal of our suggestion is to prove that SMTs should be a target as instruments of regional balance and development. To launch the idea, the authors have recently published a theoretical framing to justify how this has a solid theoretical ground (de Noronha and Vaz 2020). This chapter sheds some light on the vast potential offered by SMTs, addressing specific cases where competitiveness and economic activity have been stimulated after long periods of historical constricted industrial progress.

## 4.2 Methodology: Historical and Critical Approach of SMTs

Our theoretical main framing was briefly described in the previous introductory chapter and deeply explained in the previous reference, which due to open access can be followed by the readers. In this discussion, we expect to call the attention to the effective role that history has played along town and city development. Only time has decided their path either for progress or decay. Many towns have been the birth of prosperous activities, given the needed time to consolidate their most efficient activities, others kept resilient for a long time, and many have not resisted to the many shocks of unexpected evolutive processes. We have chosen a methodological approach based on an evolutionary (historical) analysis of three successful towns. These three case studies will be presented, and similar situations compared from an analytical point of view, to better identify the main socio-economic advantages generated by the small urbanized populations that SMTs can provide. We will not be able to escape the critical characteristic of most of SMT, since most are in rural areas and have, or had, in their history, a dominant position within the agricultural sector. None of them is today a rural small town. But in the past, they have been, they have moved from their fundamental role and have become today advanced cities with valid and independent urban contexts. All of them were critical providers of specific services to large cities. But it is undeniable that not only is the production process of farms different from that of organizations but also the lifestyle of those persons active in the agricultural sector often differs from the rural lifestyle of those who are engaged in other non-farm activities (van Leeuwen et al. 2007).

Historically, the decreasing economic importance of agriculture and fisheries has been substituted by new economic activities that may be directly connected to related activities, and yes, pointing to cluster dynamics. By studying the maritime clusters across Europe, there is a connection between fisheries that are developing exciting activities related to biotechnology, actively promoting the sector in advanced research environments of their regional universities (Monteiro et al. 2013). Such kind of case studies can be identified across many different countries.

Moreover, and just before we describe our case studies, we would like to add that rural areas and their SMTs are places increasingly appreciated by the different experiences of the idyllic rural landscape (de Noronha Vaz et al. 2013). In this regard, the esthetics of the landscape plays a fundamental role in well-being and touches the very core of the subjective well-being of humans (Vaz and Agapito 2020). SMT should take advantage from their very precious, frequently unusual, cultural, and architectural heritages that contribute to the richness of their legacy, landscape, and esthetics. The international accreditations of such historical or modern outstanding environments allocate different economic activities and attract people, as residents or tourists, pulling further development opportunities such as investments and jobs. As suggested, labels must be created to emphasize the cultural attributes of such towns (Akgun et al. 2013). In other words, the “idolization” of

towns depends not only on their qualities but also on their creative capacity and openness to today's network society.

### 4.3 The Case Studies

In this section, we have chosen to observe, describe, compare, and enhance the pillars of sustainability and eventual growth of some medium-sized towns. Our observation set is composed of Oeiras in Portugal, Markham in Canada, and Poznan in Poland. Furthermore, in all cases, we call their historical roots to grasp some of their patterns of change better. With similar conditions related to their inclusion in the proximity of great cities, the first two medium towns take advantage, rather than long-term costs (happening if they had persisted as oversized satellites) from their proximity to Lisbon and Toronto, respectively. Though, part of their progress has been justified by well thought and carefully designed growth strategies. The second remarkable feature of these two towns is the fact that there is a clearly defined path dependency arriving from very well-established historical contexts. The same can be reported about our third case study. The case of Poznan is also quite interesting, but, contrary to the previous two, it does not locate in the vicinity of a big city. Warsaw, the Polish capital, is about 300 km away. Thus, Poznan benefits from nurturing a significative network of dozens of small towns, which populate its surroundings. In common, all the cases have emerged from agricultural and rich historical pasts.

#### 4.3.1 *Oeiras, Portugal*

The proposed comparison was carefully composed having in mind the different general conditions in both countries: A very different population history (the oldest country in Europe, surpassing poverty with emigration waves and the new world still in expansion with immigration factors as the most critical determinant to economic growth), clearly different dimensions, and quite the opposite climates. Even though frequent similar traces in the functioning and survival strategies of these SMTs have been found.

From an overly broad perspective, the two parliamentary systems, at the country level, differ: Fiscal obligations extremely regulate one and a three-level public policy context (national, regional, and municipal) affects citizens and firms. The other offers a non-interventionist background for companies and different agents. The significant difference between the two countries that we could emphasize, however, is that in the case of Canada, the selected town is located in the province of Ontario, thus submitted to a provincial legislative context, adding to the fact, an inexistent public policy for regional development and cohesion. However, at the national level, there is a reliable support system to firms, namely de-bureaucratizing the creation and consolidation of SMEs (small and medium enterprises).

Contrarily, in Portugal, firms must deal with a weighty legal and fiscal context, although this situation improved in recent years. This is partially compensated by the considerable effort of the European Union to leverage as much as possible the different regions within the EU, creating similar opportunities for citizens and business, accordingly, simplifying processes and achieving a better social balance. Many programs launched by the EU have focused on lagging areas, and the incentives to promote growth at the micro-level have been significant. So, in general, SMTs in Portugal, if located in rural areas make profit from an active public policy, either directed towards regional development or business innovation. Despite this, it took a significant amount of time for regions, towns, and business to be able to fully absorb the support that has been made available for Portugal by the EU (Vicente-Galindo and Noronha Vaz 2009).

We have selected for the present chapter the cases of Oeiras, in Portugal, and Markham, in Canada, due to the several similarities these towns have, establishing a common ground to the analyses: Both belong to the excellent areas of the countries' most significant cities, Lisbon and Toronto; Both having significant historical roots based upon narrow but flourishing segments of agricultural activity; Both have been important points of passage for travelers; Both have been the reason that the rural world has become a significant environment for high-tech, eventually, even potential high-tech hubs soon have suggested how such can become possible (Knoke et al. 2017).

Towards the middle of the last century, after significant housing prices increases in both capitals, Toronto and Lisbon, citizens used these towns as dormitory alternatives. Transportation, via train, has been improved to allow a more frequent connexion between both country capitals and these two SMTs, increasingly intensifying as their land prices increased. In both cases, this first significant growth period took place between 1970 and 2000.

Strategically, a different approach was carried out by the stakeholders in charge of these two municipalities' development. In Oeiras, and despite the heavy national interventionist context emerging from a recent integration of Portugal in the, then called, European Community so well accompanied by several agendas to renew and reshape skills and industry in the whole country, growth took place at its own speed, and very little long-term planning was done. Most of the first set of investments was oriented, at a national level, towards firms' support to innovation, new business creation, and governmental social needs such as the creation of new universities, advanced schools, logistic platforms, financing of commercial centers, and health care improvements. However, and despite the rise of many new opportunities, there was not the will, or capacity, to plan a structured strategy able to redefine how the urban areas should develop under such new conditions for the decades to come. Oeiras was a clear example of this general attitude. Although for the municipality, there was an effort to improve the town life quality, basically profiting from the natural proximity of the Tagus river, from very easy accessibility to the oldest highway in the country, most of the urban agglomeration did not change almost until the 2000s.

One of the most important data to follow a SMT dynamic capacity is related to its population composition and growth. It is expected that this SMT (at municipality level) will reach 180,000 inhabitants by 2021, having grown up about 80,000 inhabitants in the last 50 years. Population density grew significantly from 3500 to 3800 per square km in the last 15 years.

The historical context of Oeiras municipality is largely marked by its heritage based upon the remarkable construction of *Palacio do Marques de Pombal*, built in the second half of the eighteenth century. The building is remarkable, an imposing palace with its long, curved stone staircases and its austere Baroque style, the summer residence of King D. José and his royal family during the summer periods. Observing the palace, one can get an idea of the immense wealth of Sebastião José de Carvalho and Melo, for this is a building of very palatial dimensions, ornate as a royal palace. It is today one of the best examples of the eighteenth-century Portuguese manor house, following the Baroque and Rococo styles. Beyond the palace, the magnificent gardens of fantasy inspirations also extend to the right bank of *Ribeira da Lage*. Symbol of their deep culture, typical of a Europe of Lights, the gardens retain architectural landmarks of rare beauty. The owner, Prime Minister and Secretary of State, the second prelate and also holding various essential positions and titles, employed their income also to benefit *Quinta de Oeiras*, inherited fertile farmland from his first wife consisting of farmland with vineyards, olive groves, and fruit trees. In the second half of the twentieth century, this property was sold and fractioned, purchased by the State and replaced by the National Agronomic Station. The property belongs to Oeiras City Hall since 2004.

Another important legacy of this SMT is its early industrial activity, starting with the construction of the *Oeiras Metallurgy and Metallurgical Construction Factory*, commonly known only as of the *Fundição de Oeiras*, one of the most important, imposing and interesting historical traces of the industry in the Oeiras Municipality, producing at a national scale since its start. It is one of the few survivors of the hundreds of industries that existed in Portugal and that significantly supported its development. It was undoubtedly one of the largest factories in the county and one that employed the most significant number of workers. It has a long history and constitutes a relevant heritage. It was built in the nineteenth century, in the wake of the movement caused by the Industrial Revolution. Perhaps it began only as a metallurgist foundry, later expanded its area, and embarked on metalworking, expanding its facilities. The company was founded in 1921 as a public limited company, the Foundry of Oeiras from early on gained significant socio-economic importance in the municipality. With an initial area of 6500 m<sup>2</sup> and 60 workers, the main activity in the early days was the casting of ferrous metal to support the electrical installations and, generally, the entire national industrial foundry.

As pointed out earlier, economic activities are an excellent indicator to follow the vitality of cities. The specialization profile, business location patterns, and positioning in international markets not only reflect the opportunities that urban agglomerations create for their people and organizations but do also indicate their capacity to survive to future challenges related to years to come. From this point of view, the Lisbon metropolitan area has, just like most of all the other Great Metropolitan areas

across the world, unique advantages at the national level: it is the country's capital with a significant geographical accumulation of strategic resources for development and can attract qualified people and activities from other regions and countries, thus a relevant presence in supranational networks of cooperation and exchange.

The municipality of Oeiras, representing a center of economic activity and consumption of international value, thereby plays an essential role of intermediation between the whole country and the world, made good use of this advantage, but only in the last decades. Meanwhile, Portuguese business location patterns start to indicate the beginning of overcoming a metropolitan model excessively dependent on a central pole, with the consolidation of new peripheral centralities capable of attracting and incubating innovative initiatives as well, a kind of services decentralization mostly resulting from intensive knowledge creation combined with lower costs in the real estate market. Also, the strengthening of openness abroad reflects an expansion of international investments and activities. Stakeholders confirm that Oeiras is a municipality with a postmodern profile with its spot in the international economic environment.

Today, the town and the municipality are both able to attract not only the most extensive national companies but the largest advanced services and technology companies, which are usually owned by external entities mostly in the services sector, namely commerce, information and communication technologies, financial and real estate activities, leasing and business services. Following a historical strategy, Oeiras is finally awaking for a wide range of research and technology areas of knowledge that guarantee a good offer of this kind of business support services. Just to name some of them: Technology Transfer Center, Welding and Quality Institute; Technology Transfer Center of Universities—UMIC—Agency for the Knowledge Society I.P.; Research Institutions—Institute of Experimental Biology and Technology and the Gulbenkian Institute of Science; Institute of New Technologies—Institute of Experimental Biology and Technology; Associated Laboratory—Institute of Chemical and Biological Technology; State Laboratory—General Directorate of Crop Protection; Research Units—Center for Developmental Biology, Genetics and Natural Tolerance Development, Institute of Biomedical Technology and Life Cycle R&D Unit for Welded Industrial Components and Products. Also, to mention the existence of four large industrial parks in that municipality: Arquiparque (Miraflores), Lagoas Park (Porto Salvo), Quinta da Fonte (Paço de Arcos), and Taguspark (Porto Salvo).

### ***4.3.2 Markham, Ontario, Canada***

Our next observed case is in Ontario, Canada. Markham is a SMT of large size, located 30 km away from Toronto, approximately the same distance that Oeiras is from Lisbon. This SMT has already been classified as the City of Markham and just like our previous case also benefits from a powerful historical legacy. In 1791, John Graves Simcoe was appointed the first Governor of Upper Canada, and his actions



strongly influenced Markham urban evolution. Concerned in improving the military security of the new territory, he conceived a system of free land grants, which promoted the growth of what became later the Township of Markham. The first European settlement in Markham took place when William Berczy, a German artist, and developer guided a group of about 64 German families to North America. After their arrival around New York State, they moved further by negotiating 64,000 acres in Markham Township. So that Markham has its roots in the so-called German Company Lands. The settlement was difficult. 64 families arrived in 1794, and their start was limited by the harsh winters and many crop failures. Some settlers moved back to Niagara, but those who stayed, finally, managed to succeed. Later, other settlers arrived (French Revolutionary Émigrés, United Empire Loyalists, Pennsylvania Germans, and migrants from the British Isles) in the search for improved life quality.

From 1794 to 1830, growth in Markham was described by the difficulties of homesteading and the expansion of some agricultural trades. The township's many rivers and streams facilitated water-powered energy such as Woollen Mills. Small towns such as German Mills, Almira, Buttonville, Cedar Grove, and Unionville flourished in those mill sites, favoring the building of new transportation routes such as Yonge Street, expending urbanization increase. Around 1860, most of the surrounding lands were cultivated, and new villages such as Thornhill and Unionville expanded to share with Markham growing specialized industries such as wagon works, farm instrument builders, and furniture factories, for example.

The expansion of the railway system in the surrounding small towns pressured Markham to start the Toronto and Nipissing Railway Company. At first, the railway brought renewed prosperity and rapid development and Markham increased its population to 1100 at the end of the nineteenth century.

It was after this period that the exchanges with Toronto intensified and soon after were enhanced by the rail line, the telegraph, telephone, and automobile. At the same time, after the turn of the century, a local business could not easily fight with suppliers in the city, and the township stagnated to an agricultural community. Its next growth phase occurred as a post-war urban advance from Toronto. Industrialized by the war effort and experiencing a strong baby boom, it became the host for many immigrants from all over the world. The Regional Municipality of York was established in 1971 by the Province of Ontario. A large portion of the municipality was incorporated into the Town of Markham. The second connection system-initiated Highway 404 and rapid urbanization. Markham has served as an example of environmental protection and restoration to accommodate 150,000 people (Gordon and Tamminga 2002). It holds one of North America's largest concentration of new communities planned with traditional neighborhood design principles—part of an exercise to confirm whether New Urbanism could collaborate with pre-emptive ecosystem planning. The results of the comparison indicate that the plans met or exceeded most objectives for environmental protection.

Today, Markham is considered Canada's High-Tech Capital secured by more than 1500 technology companies and creating about 37,000 jobs. This significant development and consequent growth had its origin not only on the rich heritage

earlier described but, and above all, on a set of very well-planned communities whose stakeholders and policymakers saw the huge opportunity arising from proximity to Toronto.

As land prices in Toronto started to rise, urban planners and real estate companies set together to define priorities and a long-term agenda for the region calling before all for high-quality infrastructure and talented workforce to design a pro-business environment. That was about 20 years ago, but today's Markham's business community includes companies and organizations able to excel by providing globally competitive banking, financing, engineering, design, technical, and commercialization services. Of the 10,400 companies located in Markham, there is a high concentration of Canadian head offices, including industry leaders such as IBM, AMD, Redline Communications, Real Matters, OnX Enterprise Solutions, Huawei Technologies, Nightingale Informatix, Lenovo, GE Energy, Nexeya, Toshiba, Adastra, CDI, Qualcomm, and Genesys.

Moreover, and due to this substantial economic activity, Markham is booming in terms of real estate prices, seconding Toronto and as one of the most active municipalities of the Great Toronto Area (GTA). The rise of housing prices has a significant impact on the population educational level moving to Markham and on the number of investors who are engaging in acquiring properties within the municipality. The process triggers a new cycle of fast but risky growth. Markham has become one of the most diverse residential areas in Ontario, and many of the investors are Indian residents or Chinese, some of these foreigners. Some of these houses were bought and stay empty, waiting for increase in their values, a typical situation related to fast growth that requires national public policies of control and contention. Prices may reach an unsustainable maximum and fall fast to a loss for many resident families.

From a strategic point of view, the City of Markham adopted a 10-year Economic Strategy—Markham 2020 | Markham's Global Future in 2008. This strategy is a design of Markham for the future, bringing up plans with important details. So far, this strategy has proven to be successful, protecting, and orienting city's economic development towards a robust and growing local economy. In 2015, the City Council approved a four-phase performance review of Markham 2020: In phase 1, the research performance data was monitored, and consultation with stakeholders was done; phase 2, concerning community engagement, thus a series of open house-style public meetings and webinars were organized in 2015 and the start of 2016; further, in phase 3, in the Spring of 2016, within an open house concept Keynote Speakers, a webinar was organized counting with the participation of industry experts from TD Bank, York University, Seneca College, Scotia Bank. Lastly, phase 4 presented findings and recommendations to the Economic Development Council and published a publish report in Open House Meeting Series.

Before passing the last case study, a few additional considerations would improve the understanding of the reason why from many other SMTs these two have been selected to be discussed together. Their different ecosystems have been mentioned, but their similarities still remain to be shown. Both Oeiras and Markham have progressed and have within a similar timeframe become classified as cities. Their

fast growth and patterns towards sustainability and landscape integration allowed to provide most of those services necessary to keep the population satisfied, attracting further business and activities, and leading to economic growth. Their proximity to large urban cores facilitated this process. However, not all towns next to large cities can deal with the gravitational pull that large urban cores exert. Most of them weaken and become semi-functional suburban regions.

Both cases started with an impressive historical legacy, where the existence of dominant families. Their power brought the capacity of creating networks of influences able to spread the significant characteristics of the growing small towns, even in rural settings. This legacy further emphasizes the potential of branding a historically present product, where both in the cases of agricultural and manufactured products, a strong identity prevails. Branding products, together with their origin and pushing town development, at those times, also deserve a significant emphasis in this study. Local or regional knowledge growing from such circumstances developed much faster in Oeiras than in Markham. This indicates that we could have to expect a much earlier growth in that case. However, that did not occur because, under no circumstances, advanced knowledge was such an essential tool for growth at the end of the nineteenth, beginning of the twentieth century, as 100 years later. Thus, not surprising that Oeiras stagnated at a more advanced level than Markham.

Two vital advantages promoted a real change in Markham, around the 1970s. Firstly, the vastly expanding immigration in Canada, seconded by the capacity to develop early on a very sophisticated vision of urban planning that stayed remained an essential tool of growth for the region since then. Within the Greater Toronto Area, around the 1980s, several municipalities joined together to create a significant critical mass that led to the capacity to generate agglomeration economies. The fast zoning of land and the architected design and construction of many complementary buildings pushed towards benefits for industrial location, bringing a considerable number of new firms, linked to the emerging sector, such as information and communication technologies. The growth was much slower in the case of Oeiras. A similar foresight did not exist in the case of Oeiras, and it did take the town approximately four decades to surpass that phase of the dormitory for demographics employed in Lisbon.

Despite the different trajectories, significant similarities between the two pathways followed by this growing SMTs are noticeable. The historical legacy of both towns played a fundamental role in planning and supporting local firms to cluster. This agglomeration economy building led to diversified economic activities. Furthermore, SMTs have managed to go beyond being considered as dormitories from major cities. In this process, these towns leveraged independent promotion. In Oeiras, this occurred as soon as Portugal became eligible for structural funds supporting skills and innovation in corporations (de Noronha Vaz et al. 2015; Vaz et al. 2014). Hence, we must consider that, in this case, the primary driver for urban growth was due to the incoming external funds, a very distinct situation of what occurred in Markham. In Markham, foreign investors were attracted by the existing skills of the growing demographics of immigration arriving predominantly from India and China. Canada's history and strategic development are, still today, based

upon immigration trends. Markham used this opportunity well by facilitating the concept of living and working on a high-tech hub, with all benefits of education, culture, and economic activity fostered by the proximity to North America's second-largest financial market, Toronto.

### ***4.3.3 Poznań, Poland***

To better observe the dynamics of growth of SMTs across the world, we have searched for another, different, but also a remarkably interesting case. The city of Poznan located in Poland. The reason why we have selected this case for our publication is that it was once a medium-sized town, today emerging to a city and aspiring to be a smart city. It grew from historical legacy into modernity, and, such as the other two cases, it has created specific knowledge circuits to develop its agricultural and industrial capacities further into technological innovation and quality living. However, differently from the recent development of the previous two case studies, Oeiras and Markham, Poznan took a long time to become the city it is today, developing at a much regular and steady pace.

Poznan legacy dates from a long time ago as this historic town is one of the oldest in Poland. Its roots go back to the beginnings of the Polish state, formally established in 966. It was in Poznan that the first Polish bishopric was created, as early as 1000. That was also the year when the Holy Roman emperor, Otto III, passed through Poznan with his suite on a pilgrimage to the tomb of St. Adalbert in Gniezno, the first capital of Poland, situated 50 km from Poznan. Otto III planned to restore the Roman empire through the association of four kingdoms: Gaul, Germany, Rome (Italy), and Scлавinia, the main part of which was Christian Poland, already well organized politically at that time. A thousand years later, this idea of a universal community of European states was invoked by the 11 fathers of European integration. Then, in the twelfth century, Poznan became the second capital of Poland. The sixteenth and early seventeenth centuries were the city's golden years; it was then one of the richest, if not the richest, city in Poland. This was due to the many royal privileges it had been granted to.

The history of Poznan has seen many events that stimulated the city's socio-economic development. For this case study description, we have considered that one of the most significant dates from 1650, when its Jesuit College has been transformed into a university by King Sigismund III Vasa, an act later confirmed by kings John Casimir in 1650 and John III Sobieski in 1678. Because of its location in the western borderland of old Poland and on the main West-East axis, Poznan has often been an object of fights, attacks and plunders by Czech, Brandenburg, Swedish, German, and Russian armies. However, each act of destruction and humiliation stimulated its inhabitants to rebuild their city even more beautiful and better organized. This is a feature that people living in Poznan and the region also display today by showing a strong sense of unity and pride in their urban environment.

An essential part of the Poznan urban environment is the interesting green spaces as part of a city layout unique in Europe. They are known as the Poznan Green Wedges. There are five of them, and their conception was worked out by Prof. Władysław Czarnecki between 1895 and 1983. The green spaces occupy a total of 68.1 km<sup>2</sup> (26% of the city area). Woodland predominates among them, at 37.5 km<sup>2</sup> (14.3% of city area), followed by housing-estate green spaces, at 0.2 km<sup>2</sup> (4%) and then gardens, parks, cemeteries, sporting grounds, etc. There are 24 parks and 7 gardens in the city. As much as 15% (39.2 km<sup>2</sup>) of the green spaces are legally protected areas. They include Natura 2000 areas, protected landscape areas, ecologically valuable sites, and nature reserves. The city has a highly diversified hydrographic network. Its main river is the Warta (third in terms of length in Poland, at 808 km). Other rivers include the Główna and Bogdanka. In all, the city features six rivers and more than 30 lesser streams. Because it is situated in the Wielkopolska Lakeland, Poznan also has many lakes and ponds. The largest are Lakes Kiekrz, Malta, Rusalka, and Strzeszyn, while lesser water bodies exceed 60 in number.

In 2010, PricewaterhouseCoopers made an analysis of types of development of different Poland's capitals of 11 biggest cities: institutional-democratic capital, technical and infrastructural capital, quality-of-life capital, human and social capital, the capital of culture and image, the capital of investment attractiveness, and the capital of financing sources. In the case of Poznan, the assessment of its position confirmed that the city favored five major factors shaping self-organizing innovative complexes that were able to promote and shape the future of Poznan and its evolution till today.

The geographical infrastructure of Poznan is a junction of seven roads of international and inter-regional importance. One of them, the A-2 highway, joins Warsaw with Berlin and Lisbon. The international airport at Ławica meets the aerotropolis criterion and is located 10 min away from the center of Poznan. It serves 1.5 million passengers a year and has connections with 22 European cities. Also, the railway offers passenger links with the biggest cities in Poland and Europe. About 130 trains are stopping daily at the Poznań Główny Central station. They are served by the Integrated Communication Centre opened in 2012. Freight trains go through the Poznan Franowo station, which is one of the largest freight-service stations in Poland. Poznan is a participant in the European Union's Rail Baltica Growth Corridor project.

Among the Polish cities, Poznan counts as one that is highly advanced economically. In 2011, its per capita GDP was 71% of the European Union average. The productive structure of the Poznan economy is diversified on the basis of services (about 70% of gross added value) and industry and construction (more than 29%). There are over 100,000 economic agents based in Poznan. Among them, some have global reaches such as Bridgestone Poznań, GlaxoSmithKline Pharmaceuticals, Nivea Poland, Volkswagen Poznań, Wrigley Poland, Kompania Piwowarska, and Cegielski S.A. Poznań. Also, Poznań is a city of high-tech and clustering activities such as: Wielkopolska Chemical Cluster, Wielkopolska Cluster of Advanced Automation Technologies, Wielkopolska Cluster of Furniture Design, Wielkopolska ICT Cluster. No surprise that the unemployment rate is under 4%.

Poznan pursues and develops those fields of knowledge and activity which serve to generate technological progress, especially based on higher-level education. There are 28 higher education schools in Poznan, both public and private, with a total enrolment of more than 131,000 students, producing yearly more than 40,000 graduates. Higher schools employ an academic staff of 8,500, including 1,100 full professors. A special role in Poznan is played by 79 R&D units, employing 5500 workers. Of special significance in creating new technological systems are the two scientific-technological parks: the first and oldest one in Poland, viz. the Poznan Science and Technology Park, and the first non-public one in Poland, viz. the Nickel Technology Park Poznan. Also based in Poznan are Business Process Offshoring (BPO) centers of such well-known global firms as Microsoft, Bridgestone, Carlsberg, Arvato-Bertelsmann, GlaxoSmithKline, and others.

The systematic effort of the Poznan authority to support and reinforce the leading role of the creative sector in the city also manifests itself in its unique Academic and Scientific Poznan program. Its chief, though not the only, aim is arranging open lectures by eminent scholars, artists, and specialists from all over the world in such fields as nanotechnology, mathematics, renewable energy, molecular genetics, spatial management, philosophy, architecture, design, graphics, contemporary art, early music, and others. Poznań has a rich social superstructure, which is a foundation for its creative milieu because it possesses a wealth of information connected with creativity and transmits it to the world outside (Törnqvist 1983); it creates productive knowledge; it engages in a variety of creative activities. In 2005, one in six firms operating in Poznan was registered in the creative sector. In particular: one in three, in the sector of the legal service of firms, one in six, in financial intermediation, one in eight, in the architectural sector, and one in ten, in the trade of works of art and artistic articles.

This high level of development of social supra-structure in Poznan has been recognized both at home and abroad. The city has taken first place in 39 competitions organized by domestic and international organizations, associations, and government institutions. Poznan does not lie in a central place of the European Union, but rather on its eastern periphery. In its 1000-year-long history, with the tradition of persistent organic work and talents of its inhabitants, the city has managed to develop a specific climate of tolerance, coexistence, and cooperation, organizational skills, and the ability to look forward to the future.

#### 4.4 Discussion

The presented case studies of three distinct SMT stem from settlements with critical historical roots. These roots provide a solid foundation for discussion. Human settlement patterns have shown great diversity globally. Despite this diversity, however, a common foundation on the spatial allocation in urban and rural areas exists. The literature has explored mostly urbanized regions throughout the world, neglecting the scholarly observations of the rural world. The rural world, however, is

a common phenomenon, interlinking major urban regions to hinterlands, and SMT correspond to the scope that abridges both these very distinct silos of the Anthropocene. In this sense, SMT are the tool that connects two different spheres of reality. By focusing on the possible contribution of SMTs to development, and better understand how sustainable these regions are.

It is important to emphasize that towns, even the smallest, can resist processes of the structural decline of regions by acting as catalysts for geographically balanced income distribution and for a sustainable, productive structure.

In contemporary societies, SMT is an essential element of the global settlement system. In terms of the most significant proportions of the world's population, large cities are followed by small- and medium-sized towns. Big cities, as well as SMT result from different specificities of human nature: big cities, resulting from the human propensity to live in a group. Conversely, small towns reflect the human desire to live in harmony with nature. Nature's rhythm makes individuals and groups pursue their goals in the most effective way possible. Small towns gain particular importance in this respect.

Towns continue to be important places for local households, economic activities, and employment. In countries such as Poland and Portugal, households are still very dependent on the local economy. However, it is also in these countries that economic diversity is relatively low. In particular, the Polish rural areas still have a large share of total employment in agriculture. This means that new developments, such as novel farming regulations, new technologies, or modernization, will have strong local effects. People that lose their jobs will have little opportunities to find a new one and thus will have less money to spend in the local economy. In such cases, SMTs are essential places from which to start new economic activities and local development projects and, at the same time, to preserve the vital ecosystem services. In this sense, they form a bridge between social community capital and ecological, cultural heritage, on the one hand, and the new growth and creativity trends, on the other.

One of the most intriguing issues in the discussion of SMT concerns the potential of supporting their sustainability. The complexity and the variety of methods to achieve sustainable development in SMT fluctuate, however, depending on different factors that build on their success.

It is not possible to harmonize comparable information for these three case studies, but hereby we provide some interesting remarks of evolutive accents common to all of them: (1) In all three case studies, the ability to engage in knowledge creation during recent decades was crucial. The generation of precise knowledge spots that emerged has always played an essential role in their growth while fostered with the collaboration between stakeholders and government match the previously defined needs of the towns. It is in such cases that public-private partnerships could facilitate achieving pre-established goals.

Another important factor in rural environments is the transfer of knowledge to SMTs within rural environments. The literature demonstrates that the key features that relate to a town's innovative capacity depend on complementarities and networking systems between internal and external knowledge sources. (2) The ability

for technological transfer grows with the increasing number of entrepreneurs, particularly when linked to the creative industries as well as knowledge-intensive business services. Additionally, it may be concluded that the presence of several small firms in different sectors has a positive effect on new firm formation in all industries. (3) These small towns have reinforced their innovation processes by extending ICT, creating infrastructure, developing the agri-food chain, and cooperating in R&D related to the specific fields or sectors with specific and applied know-how. This means that the central governments must consider them as full partners in the knowledge sharing process and call them to active participation, which in most cases does not happen. It is frequent to see regional universities being put aside from the significant discussions in their specific fields of competences, for example, and much less will be the involvement of professional schools. There is an urgent need to alter such governmental attitudes, they delay solutions that benefit the overall sustainability of regions.

The affordability of ICT is redefining the productive models based upon diffusion of information. Web 2.0 has made the usage of e-learning, e-commerce, e-production, and social-networking highly adaptable, ubiquitous, and efficient. For more significant gains of efficiency, the effectiveness of actions focusing on the transfer of knowledge and innovation through the development of internet technologies should consider the functional typologies of small towns. These typologies have the distinction between peripheral, agricultural, tourism, or residential/industrial towns that have different critical historical and landscape characteristics in which ICT cooperates. For instance: Labor force allocated to local businesses; higher rates of self-employment in tourism-recreational communities; better diffusion of information about cities surrounding areas and towns; increases in access to data from SMT and rural communities; profiting farmers who are searching for new technologies or markets and wish to search for seasonal non-agricultural jobs, or even in support of home-based work in residential-rural areas.

When considering sustainability, one cannot escape a grounding thought: Today's peri-urban areas cannot be regarded as a stock for future urban expansion. The green belt surrounding the town represents a strong economic and ecologic asset to be protected (de Noronha Vaz et al. 2011; Vaz 2016). Small towns may manage such areas even better than other urban structures and can guarantee their protection. For that, the most necessary requisite is the survival of professional actors with conditions to support a sustainable multifunctional economy. A fair alternative being the development of new eco-friendly neighborhoods (Eric Vaz and Bowman 2013; Vaz et al. 2012b), with the purpose to save natural resources, adequately address energy consumption, to decrease traveling.



## 4.5 Conclusion

One of the goals of this chapter is to discuss the real “net” value of agglomeration economies generated when in the presence of volatile assets such as history, strategic planning, created knowledge, trust, shared innovation, and advanced specific skills at the global level. This chapter, however, provides just a glimpse of the potential capacity that SMTs must be full participants in the development process throughout longer observed periods. The concept of agglomeration economies has been pointing out to efficiency gains due to the proximity of agents. We argue that this “irrefutable truth” should be revised and assessed from a long-term perspective.

The efficiency gains of agglomeration economies have received significant attention from stakeholders towards immediate efficiency gains. Particularly when intertwined with policymakers that promote strategies that albeit worthy intentions have caused aggravating discrepancies with shrinking effects for SMT (Kourtit and Nijkamp 2012) as well as negative externalities from intensive resources exploration to use of urban infrastructures (Vaz and Jokar Arsanjani 2015).

Agglomeration economies further add to pollution, loss of biodiversity, climate change, as well as a loss of livability and social justice. A very recent example is the impact of COVID-19. Rapid spread within urban cores leads to a stringent effort in planning, making management and policies challenging to implement, directly resulting in a potential hazard of incremental cases.

Finally, our analyses claim for the observation of new innovative processes and products as tools for development in SMTs. It is also emphasized that by promoting networking, consolidation of the triple helix model of innovation, or increase in resilient modes, for instance, these urban structures can recombine natural assets and innovation in more productive and sustainable ways. Although “one size fits all” development policies are not recommended (Donnermeyer and Hollifield 2003), this is conducted by the creation of new activities, clustering of startups within the economic landscape, landscape designing for regenerative cities (Girardet 2017), and employing innovative ecosystems by enhancing high-tech in small and medium enterprises as suggested by Song et al. (2020).

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