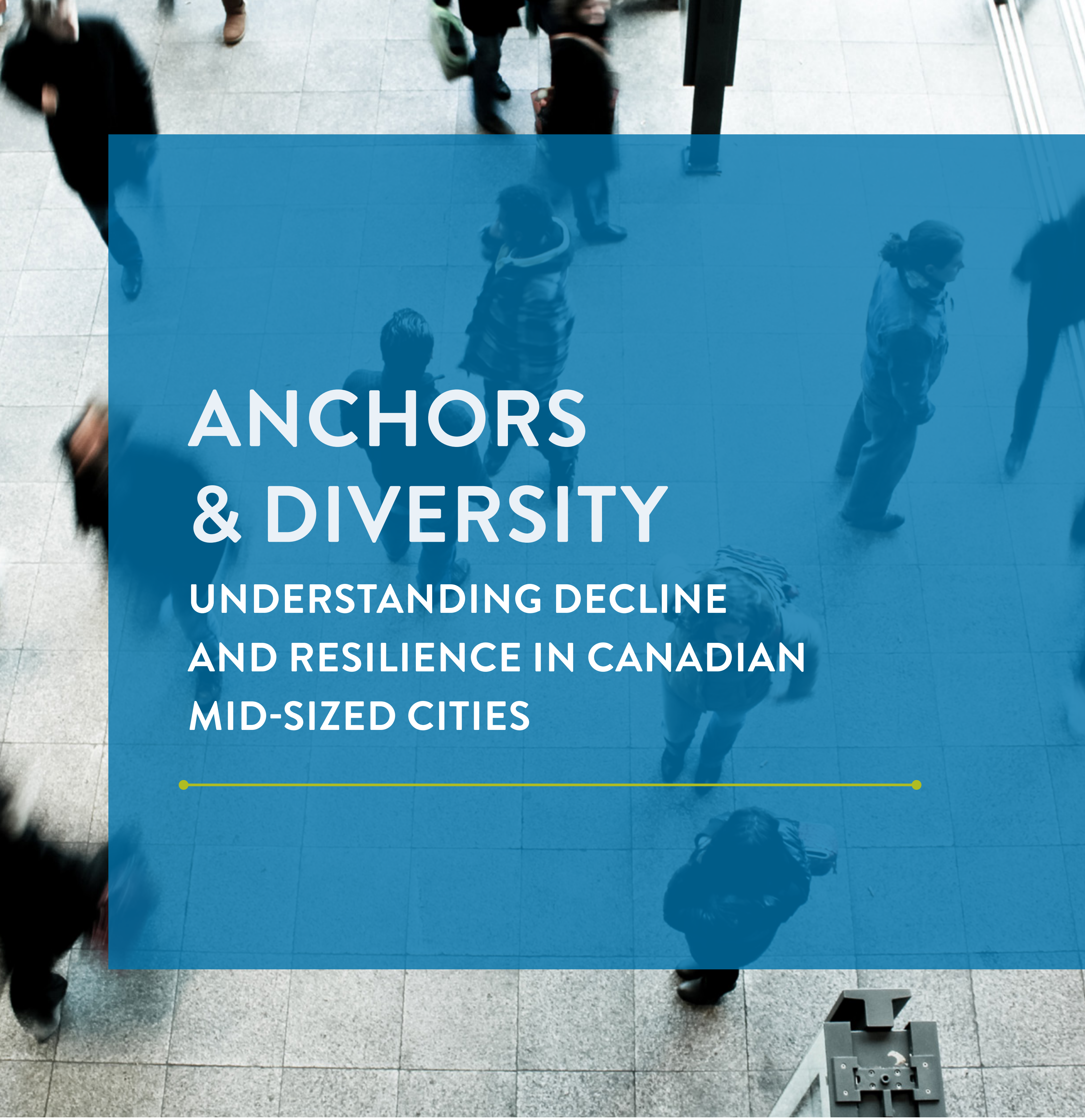

ANCHORS & DIVERSITY

UNDERSTANDING DECLINE AND RESILIENCE IN CANADIAN MID-SIZED CITIES

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EVERGREEN

INTRODUCTION

There is no shortage of writing on the cycles of death and rebirth in global cities (Sassen, 2001), from deindustrialization (Grogan and Proscio, 2000) to the emergence of economic superclusters (Glaeser, 2011). Yet often overlooked in this literature is the question of whether mid-sized cities—with smaller population bases and often less diverse economies—are following comparable economic cycles. Considering that currently over a third of Canadians live in mid-sized cities[1] and that all major metropolitan areas[2] are becoming increasingly unaffordable, policymakers now view mid-sized cities as the key to Canada's future growth (Keesmaat, 2018). Although the potential for mid-sized cities to play a key role in Canada's future growth exists, most mid-sized cities must first overcome global economic forces that have led to the growth of megacities at the expense of their smaller counterparts. As a result, investigating how Canadian mid-sized cities are overcoming the decline caused by this global economic realignment is of fundamental importance. In this paper, we hone in on these issues by asking: what role do economic resilience and anchor institutions play in stabilizing population loss and stimulating local economic development?

Descriptions of declining cities have taken on a variety of terminology, including "shrinking" (Hollander et al., 2009), "declining" (Beauregard, 1993), "legacy" (Mallach and Brachman, 2013), and others. Definitions introduced in the academic literature, including the definition recommended by the Shrinking Cities International Research Network, generally focus on two concurrent causes: population loss and economic decline (Wiechmann and Pallagst, 2012). Most of the shrinking cities scholarship has concentrated exclusively on simultaneous instances of population loss and economic decline (Bernt et al., 2012; Wiechmann, 2008; Wu et al., 2014). However, they are in fact distinct phenomena (Dewar and Thomas, 2012; Ryan, 2012) that do not always occur jointly.

Considering that currently over a third of Canadians live in mid-sized cities and that all major metropolitan areas are becoming increasingly unaffordable, policymakers now view mid-sized cities as the key to Canada's future growth

The study of economic resilience, often described as how and why regions bounce back from adversity, has become increasingly popular among economic development scholars (Cowell, 2013; OECD, 2016). Definitions of "resilience" vary. Simmie and Martin (2010) discuss resilience in terms of a region's ability to resist a sudden economic shock, while Christopherson et al. (2010) refer to the "inevitable adaptation" required by city-regions over time to face new challenges. Other authors describe "adaptive resilience" or whether regions have the ability to structurally, functionally and organizationally "bounce-back" from an economic crisis (Dawley et al., 2010; Martin, 2012; Martin and Sunley, 2014).

[1] 36.7% using the Evergreen definition of 50,000 to 500,000 and 2011 Census data

[2] Vancouver, Montreal, and Toronto

In order to have a clearer understanding of different circumstances, which may require dissimilar policy remedies, this paper takes a number of steps to better understand the situation of Canadian mid-sized cities. First, we discuss implications of economic cycles on growth and decline as they apply to different Canadian cities. Second, we use data from the 2011 Census to develop a typology of terminology surrounding concepts of urban decline. Next, we elaborate on our typology by exploring the case study of Sudbury, Ontario. Finally, we conclude with brief policy recommendations and directions for future research.

IMPLICATIONS FOR GROWTH AND DECLINE

In the past three decades, the spatial scope of economic cycles has shifted from local to global (Berge, 2012; Kose et al., 2003). As a result, cycles of growth and decline are increasingly disconnected from local actions and decisions (Hartt and Warkentin, 2017). Seminal works by Friedmann (1986) and Sassen (2001) articulate the restructuring of urban areas in response to modern economic globalization. Their work initiated a paradigm shift in how urban scholarship understood globalization and its impact on the evolution of urban areas (Mccann and Ward, 2013). The global cities literature argues that economic globalization did not diminish the importance of place, location, and distance, but rather reinforced and heightened the importance of select cities in a global market, ultimately, widening the gap between the haves and the have-nots. Soja (2000) argues that governmental responses to these shifts have also grown less influential as the nation-state is no longer the political, economic, or cultural epicentre, with territories being (cognitively) redrawn and new forms of economic organizations and cultural identities emerging at the transnational level.

The global restructuring of production, distribution, and consumption in recent decades is considered characteristic of a shift towards a new global economic order which has resulted in the concentration of resources, key infrastructure, and intellectual assets in a small number of "global" cities (Castells, 2004; Martinez-Fernandez, Audirac, Fol, and Cunningham-Sabot, 2012; Soja, 2000). Financial and human capital are relocating away from small and mid-sized cities, leaving a myriad of social, economic, and environmental challenges in their wake (Audirac, Fol, and Martinez-Fernandez, 2010). These small and mid-sized cities have been dubbed a number of terms, such as "shrinking cities" and "legacy cities," and recent academic literature has consistently concluded that this emergent phenomenon is a lasting symptom of globalization, not simply a step in an evolutionary cycle (Großmann, Bontje, Haase, and Mykhnenko,

These large, place-based institutions, such as universities and hospitals, employ hundreds or even thousands of people, contribute to the local economy, and often generate other community benefits and knowledge spillovers that can provide stability in the face of economic shocks.

2013; Hartt, 2017; Pallagst, 2010). Our view is that the ongoing challenges that mid-sized cities face in continuing to provide a high quality of life is in line with the concept of "adaptive resilience" as defined by Martin and Sunley (2014). In this paper, we will explore, conceptually and empirically, the notion of resilient mid-sized cities in the Canadian context.

In the past, cyclical models of innovation, expansion, propagation, and eventual decline may have explained local demographic and economic change. However, advances in economic, urban, and social theory have demonstrated that local cultures and economies are increasingly linked to global trends (Hartt, 2017). The presumption that stages of growth follow decline no longer holds at the local level. The trajectory of a city's economy or population is increasingly impacted by the contemporary restructuring of production and consumption, and, as such, is increasingly difficult to generalize. Some cities are able to adapt and flourish, while others are confronted with difficult adjustments (Newman and Thornley, 2011; Hollander et al., 2018). Regardless of the success or failure of cities, it is clear that generalized cyclical models of growth and decline are no longer applicable to the majority of cities. Martinez-Fernandez et al. (2012) contend that, in the modern context, shrinking cities are arguably not simply at a temporary stage in a cyclical process, but, rather, reflect a more permanent spatial symptom of an emerging global progression.

The common rationale in the literature for this growth disparity is related to globalization and structural economic shifts (Schatz, 2010). Canadian cities in resource- and manufacturing-based regions have experienced significant job losses due to the growth of the service sector, the concentration of knowledge-based jobs in large metropolitan areas, and the decline of the resource and manufacturing sectors themselves (Bourne and Simmons, 2003; Hall and Hall, 2008; Hartt, 2018). Leadbeater explains that changing conditions at the community and macro-level have shifted the development prospects and created a new "crisis of hinterland development" (2009, p. 94). These changes have resulted in declining employment and an exodus of residents in search of economic well-being elsewhere (Shearmur and Polèse, 2007).

This crisis is characterized by: (1) an increase in productivity in resource industries; (2) massive increases in the concentration of both domestic and international capital; (3) major shifts in state policy resulting in cutbacks in employment and social programs; (4) environmental limits on production and consumption; and (5) increased political resistance regarding sovereignty and land claims from Aboriginal peoples.

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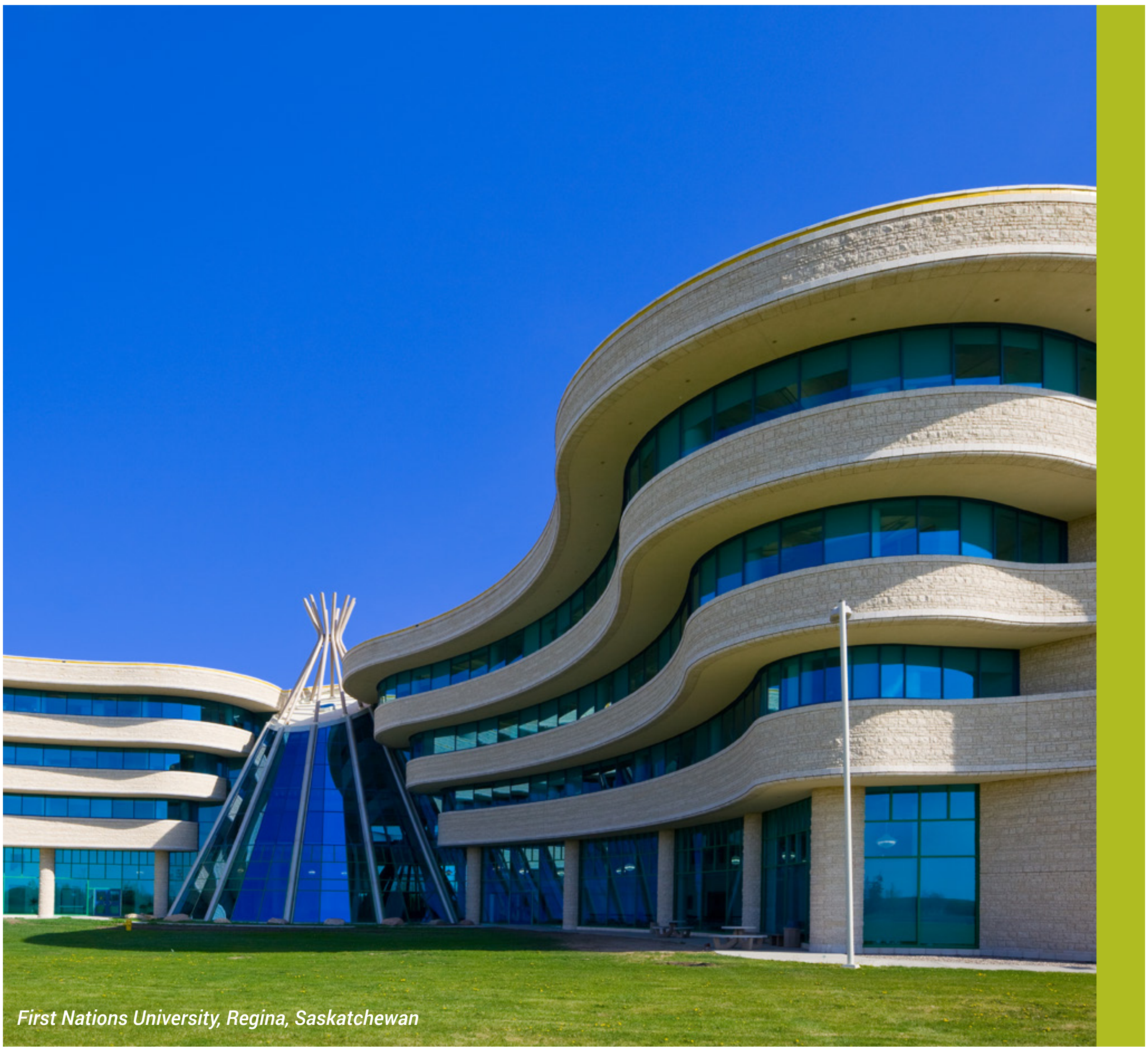
ROLE OF ANCHORS AND DIVERSIFICATION

According to Wolfe (2010), a key focus in the study of resilience should be on the ability of regions in the face of economic, technological, and environmental challenges to engage in collaborative processes to plan and implement change, within the constraints endowed by their existing regional assets (including public and private research infrastructure, and the infra-structure of their regional institutions). We believe that this development of resilience can occur through two distinct strategies: anchoring and diversifying. In the following section, we summarize the literature on anchor institutions and diversification and their roles in making cities more resilient.



First Nations University, Regina, Saskatchewan

ANCHORS

One overarching approach deemed by its proponents to help reinvigorate shrinking cities and retain residents concentrates on anchor institutions—large, immobile employers who act as stabilizers of local economies, such as universities and medical centres. Building upon the work of Birch (2009), Silverman et al. argue that in shrinking American cities, "anchor institutions have emerged as a critical component of inner-city revitalization strategies" (2014, p. 162). Post-industrial shrinking cities in particular have embraced "anchor institutions"-based economic development strategies as they attempt to mimic Pittsburgh's much-celebrated *eds and meds*[3] approach (Neumann, 2016).

The academic literature praises the innumerable benefits of universities in their ability to act as anchor institutions. Gertler and Vinodrai (2005) emphasize the positive effect universities have by attracting and retaining talented students and academic staff. Beyond acting as a talent aggregator, Munro et al. (2009) show that universities draw domestic and international students, who contribute to the local economy through spending and provide flexible part-time labour. Universities are significant purchasers of local goods and services that, magnified by multiplier effects, have considerable direct and indirect impacts on their wider local economy (Siegfried et al., 2007). "All this economic activity increases the linkages within the local economy" (Malizia and Feser, 1999, p. 183), acting as a regional magnet for consumer spending and investment from the hinterlands.

Further, universities create new knowledge and new work, diversifying local economies. Cohen et al. (2002) emphasize the importance of university–industry knowledge transfer. Cohen and Levinthal (1989) argue that universities increase a local economy's "absorptive capacity"—the ability to capture increased knowledge spillovers and commercialize research. New industries often arise out of college towns, as universities and supporting organizations are "critical components of the cluster" and "crucial factors to the cluster's competitiveness" (Austrian, 2000, p. 103). Feldman (2005, p. 219) writes that "anchor firms located in bounded knowledge rich environments are expected to realize higher rates of innovation, increased entrepreneurial activity, and increased productivity due to the localized nature of knowledge creation and deployment." Some evidence suggests that anchor universities in smaller cities can even act as a substitute for the agglomeration effects offered by larger cities, effectively allowing them to punch above their economic weight (Drucker, 2016; Goldstein and Drucker, 2006; Goldstein and Renault, 2004).

Anchor institutions—and in particular universities—are undoubtedly significant actors in local and regional economic development. With the majority of Ontario's public universities located in mid-sized cities (16 out of 22 primary campuses are located outside Toronto and Ottawa), they offer important potential for promoting urban resilience in their host communities. Universities are often among the largest individual employers in their urban regions (Birch, 2014), offering both high-skilled teaching, research, and administrative jobs as well as a host of low-skilled work (for example, in cleaning and foodservice). More importantly, a number of university outputs can favourably contribute to economic development (Goldstein et al., 1995; cited in Goldstein and Renault, 2004):

[3] *Eds and meds* refers to economic strategies that concentrate on the development of the higher education and medicine industries

- Knowledge creation;
- Human capital creation;
- Transfer of existing knowledge;
- Technological innovation;
- Capital investment;
- Provision of regional leadership;
- Production of knowledge infrastructure; and
- Production of a favourable regional milieu.

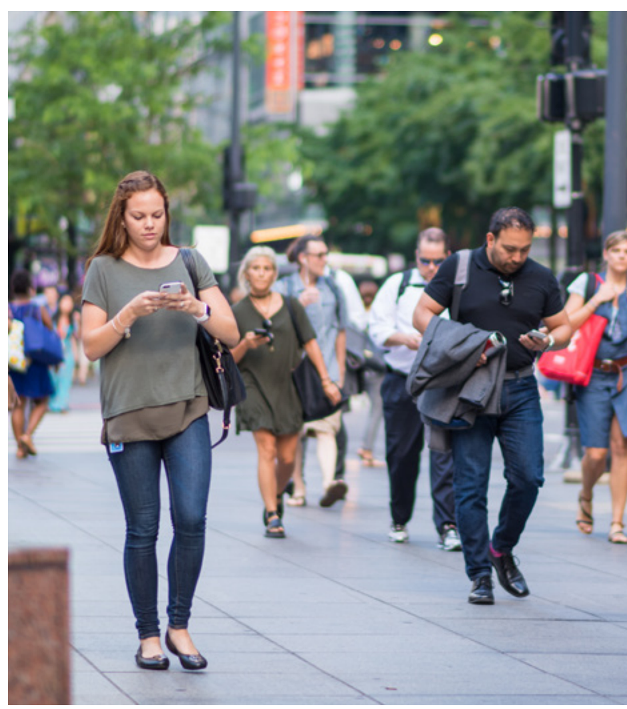
Together, these outputs can lead to productivity gains, business innovation, new business start-ups, increased regional economic development capacity, regional creativity, and direct and indirect spending. Some private sector companies may fulfill some of these functions as well, but unlike private companies, universities are generally not footloose and do not relocate to other cities for competitive tax rates or generous municipal subsidies (Adams, 2003).

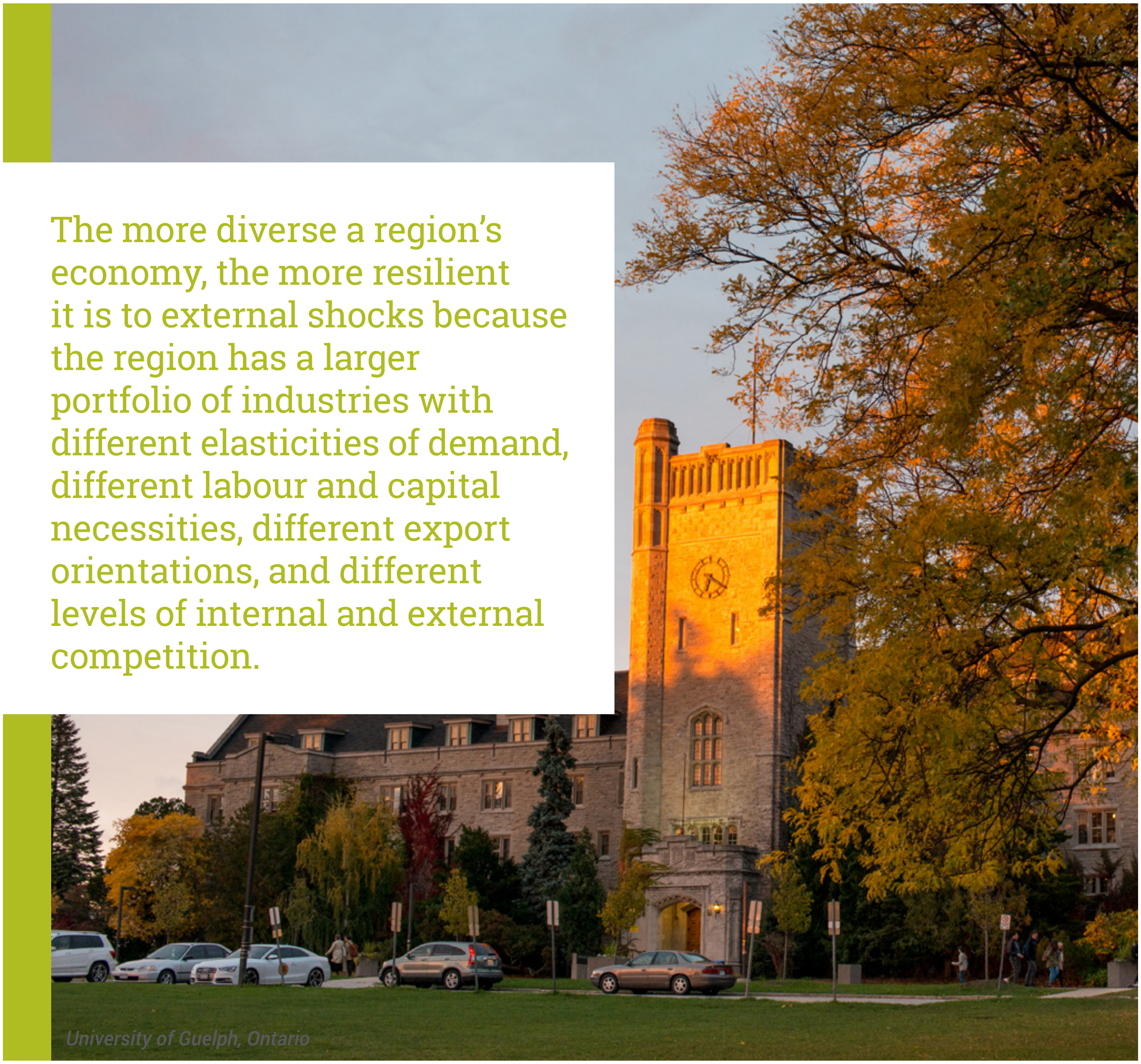
They also tend to be recession-proof as they are the local sites of considerable economic redistribution from higher levels of government—for example, in the form of subsidies for teaching and research—and therefore are not solely dependent on the local economy. While cumulative causation implies that the loss of a major industry can have profound negative implications for other local businesses in a city, this is typically not the case for universities. Instead, universities continue to receive government and private funding for teaching and research activities, with positive spillovers for the local economy. Moreover, universities have a built-in public service mandate that may make them more likely to contribute to other public initiatives than private companies (Adams, 2003). Anchor-based economic development strategies attempt to direct these advantages to benefit local communities—which, in turn, helps reverse economic decline.

DIVERSIFICATION

Both scholars (Cowell, 2013) and policy experts (OECD, 2016) have emphasized that more diverse regions are more resilient economies, whereas less diverse regions are more economically vulnerable. The more diverse a region's economy, the more resilient it is to external shocks because the region has a larger portfolio of industries with different elasticities of demand, different labour and capital necessities, different export orientations, and different levels of internal and external competition (Davies and Tonts, 2010; Martin and Sunley, 2014). The cyclical fluctuations of one industry can be offset by the cyclical fluctuations of another. This idea has roots in Jacobs' *Economy of Cities*

> People have long observed that poor regions ... typically import more than they can afford or else are terribly deprived because they fail to produce wide ranges of things for themselves... goods for export – the work that pays for the imports – helps feed the import replacing process... the root of all economic expansion. (1969, pp. 35–42)





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University of Guelph, Ontario

Jacobs (1969) then goes on to describe how import-replacing in one field can create new work in other fields as firms look to expand their products to new markets; leading to a more diversified economy. There is widespread agreement that new work is necessary to replace old work, yet there remains "little understanding of how regions diversify into new growth paths, and to what extent public policy may affect this process" (Asheim et al. 2011, p. 894).

We see resilience not as a stationary condition, but rather as an ongoing dynamic that cities can increase through using economic development strategies. In this light, we view the tension in the academic literature between anchoring and diversifying as two differing strategies: cities can increase resilience either through (a) developing a network around their anchor institutions, which we call **anchored resilience**; or (b) developing the conditions to attract a diverse set of industries, which we call **diverse resilience**.

TYPOLOGY OF TERMINOLOGY IN CANADA

As the academic literature uses terminology in different ways, it becomes necessary to create a typology of terminology. Our definition may not perfectly align with all other sources, but it coincides with how the two major factors in the shrinking cities literature are discussed: population loss and economic decline (Wiechmann and Pallagst, 2012). We use "shrinking" to mean population loss and its antonym "growing" to mean population gain. We use "declining" to explicitly mean a decrease in real median income and "prospering" to mean an increase in real median income. Both of these numbers are calculated by the difference between 2011 and 1981 using Canadian Census data, with the latter being adjusted for inflation. Table 1 summarizes our typology.

Table 1: Typology of Terminology of the Economic Attributes of Cities

		MEDIAN HOUSEHOLD INCOME[A]	
		PROSPERING CITIES (INCREASING)	DECLINING CITIES (DECREASING)
POPULATION	GROWING CITIES (INCREASING)	**Emergent Cities** Oakville Gatineau Surrey	**Diverse Cities** Markham Windsor Niagara
	SHRINKING CITIES (DECREASING)	**Anchored Cities[B]** Sudbury Jonquiere Chatham	**Legacy Cities** Thunder Bay Sault Ste. Marie Saint John

DIVERSIFYING

ANCHORING

Data Source: 1981 Canadian Census and 2011 Canadian Census

A: Inflation Adjusted to 2011 dollars using Bank of Canada (2018) CPI Calculator

B: All of these cities would have decreased in population if not for municipal amalgamations in the late 1990s; all former cities experienced population loss even as the newly amalgamated cities gained population. Sudbury is now part of Greater Sudbury. Jonquiere is now part of Saguenay. Chatham is now part of Chatham-Kent.

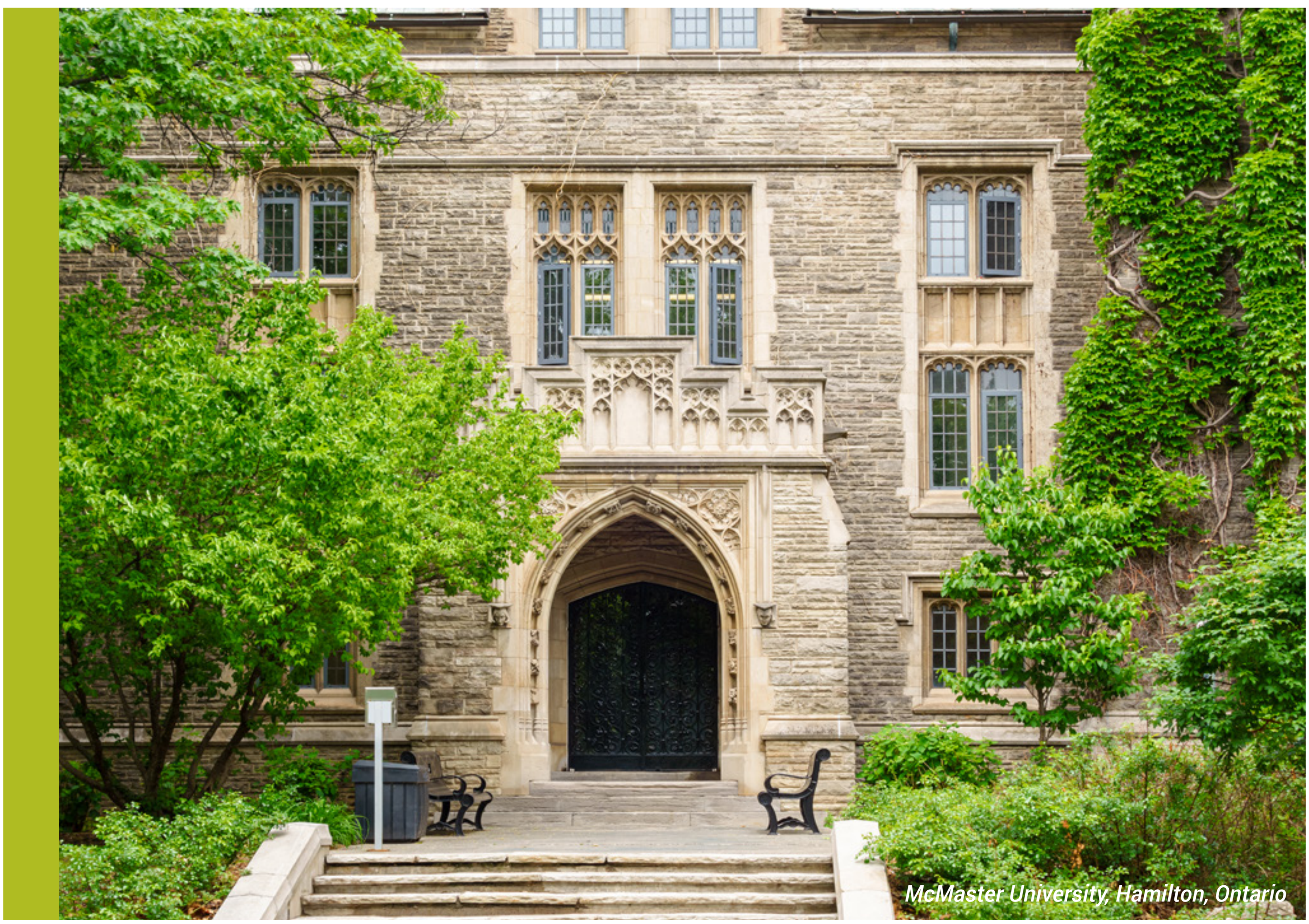
Legacy Cities (Shrinking, Declining) have been experiencing decreases in both population and median income. We hypothesize that legacy cities have borne the brunt of global economic restructuring, experiencing the harshest deindustrialization, and have since become economically stagnant. Without government intervention, it is unlikely that these cities will find new pathways to generate new work, either through diversification or specialization.

Anchored cities (Shrinking, Prospering) have been experiencing population loss but are still able to provide an increasing median income. We hypothesize that anchor institutions, which have a vested interest in the communities they operate within, are reinvesting in maintaining a high quality of life for their employees and other residents and are resisting downward pressure on wages. These anchors provide an economic buffer to prevent further population loss.

Resilient cities (Growing, Declining) have been experiencing decreases in median income but have been able to attract new residents. We hypothesize that these cities have been able to attract (low-income) migrant populations through the formation of new work opportunities. These cities might not have higher-paying jobs found in anchored and emergent cities, but the diversification of industry provides a resilient foundation for the future.

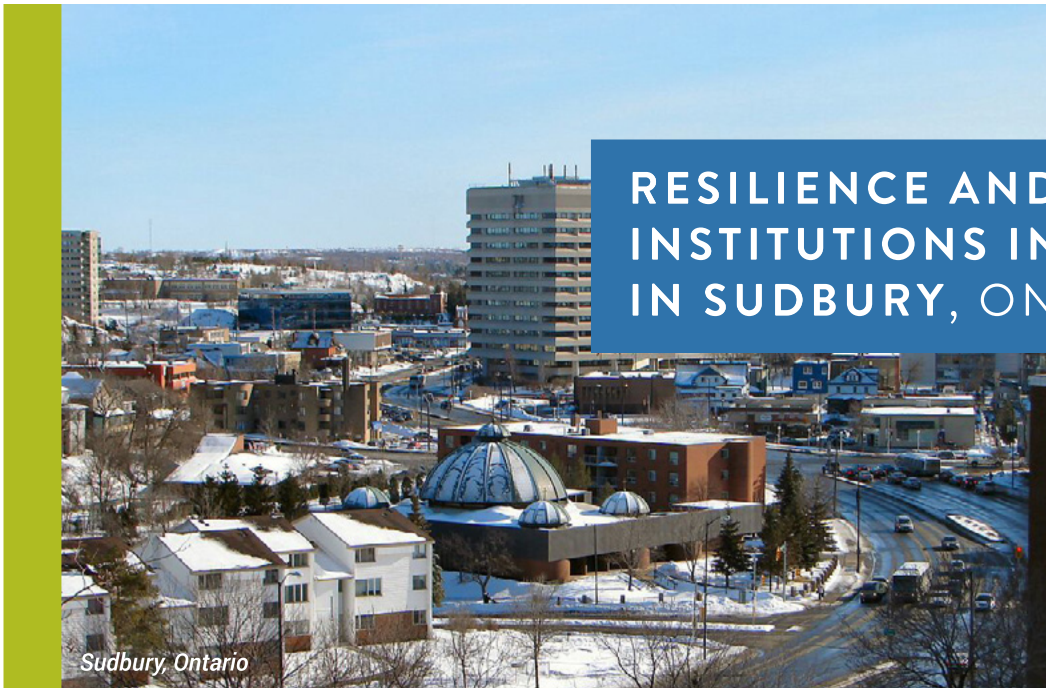
Emergent cities (Growing, Prospering) have been able to both grow in population while providing an increasing median income. We hypothesize that these cities have benefited from global economic realignment, channeling either diversification or specialization strategies in order to offer a higher quality of life that in turn attracts (higher-income) migrants from the other three kinds of cities.

The goal of most cities is to become emergent, growing in both income and population. There are two different pathways—**diversification** or **specialization** in which "legacy cities" can overcome global economic restructuring to become "emergent cities," thereby achieving a greater degree of resilience. To reflect the two pathways to emergence, we subdivide resilience strategies into **diverse resilience** (focus on job creation now and income increases will come later) and **anchored resilience** (focus on quality of life now and job and population growth will come later). Depending on the current assets and capacities of the region in which the city lies, one strategy or the other may be more practical.



McMaster University, Hamilton, Ontario

RESILIENCE AND ANCHOR INSTITUTIONS IN ACTION IN SUDBURY, ONTARIO



Sudbury, Ontario

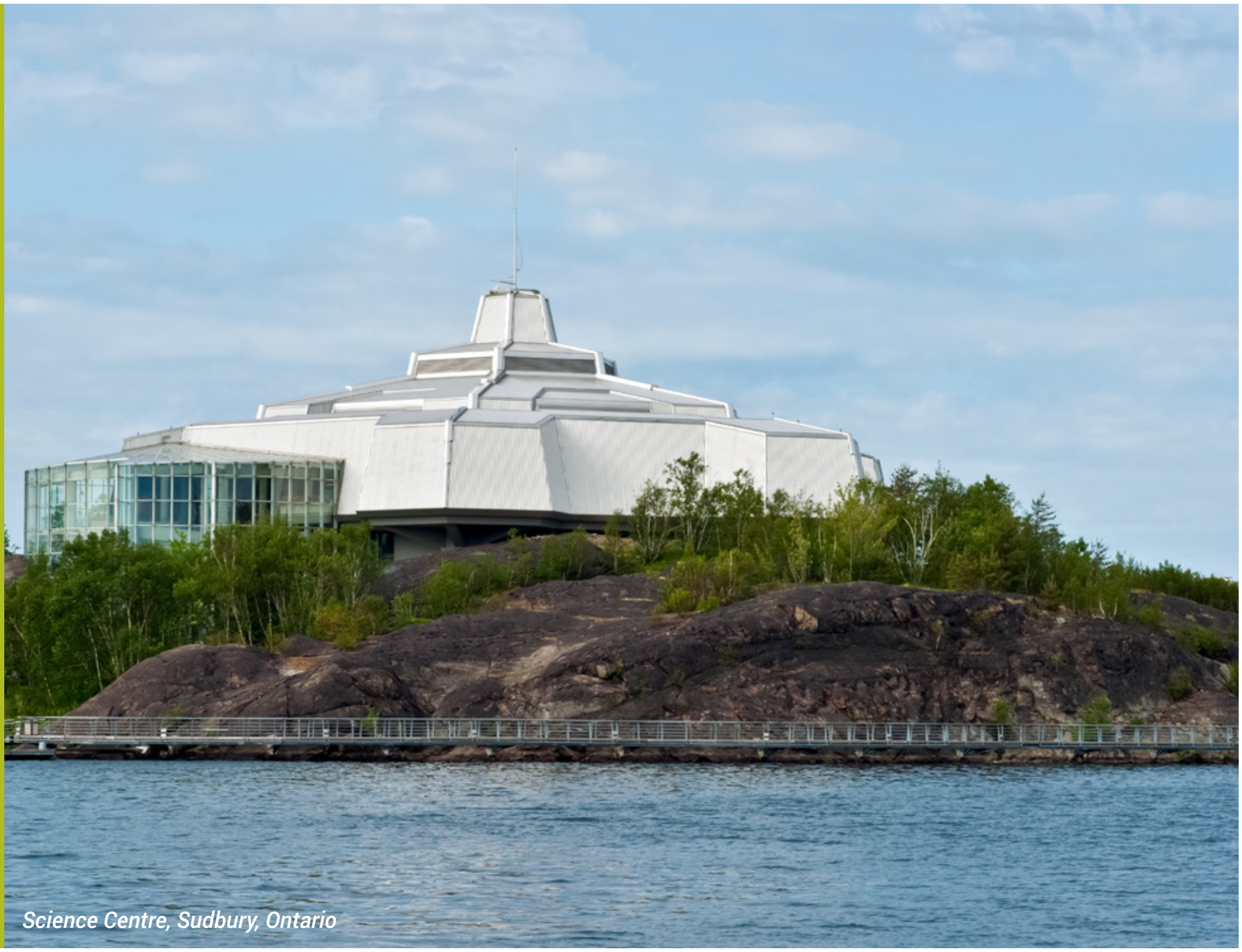
Source: See References

Sudbury, Ontario has long experienced fluctuating boom–bust cycles typical of a resource-based economy and its population has never surpassed its peak (of about 170,000 residents in 1971); however, median income has continued to increase during this time frame.[4] This occurred because, as direct employment in the mining sector declines and the industry becomes more capital-intensive, the city has been able to partially reinvent itself, largely due to the presence of anchor institutions. Sudbury is therefore an **anchored city** in our framework.

Sudbury supplemented its declining natural resource industry by **specializing** in health care and education. In addition to hosting a number of major health care facilities, Sudbury is also the "educational capital" of northeastern Ontario (Hall, 2009, p. 7), home to Laurentian University, the Northern Ontario School of Medicine, Cambrian College, and Collège Boréal.

These institutions establish Sudbury as a regional service centre, but more importantly, they have contributed to resilience by playing to the region's existing economic strengths. Laurentian University, Cambrian College, and Collège Boréal all offer programs in mining engineering and geology, with Laurentian holding more federal research funding in this field than any other comparable university program in Canada (Harquail School of Earth Sciences, 2017). NOSM in particular upholds the anchor mission of a broader public service mandate, engaging with local minority groups such as Aboriginal, Francophone, and remote communities (NOSM, n.d.). NOSM has also been involved in research to discover drugs derived from the boreal forest through partnerships with the region's existing forestry expertise (Hall and Donald, 2011).

[4] According to our dataset, Sudbury increased in population by 65,936 and experienced an $8,065 per-household increase in real median income between 1981 and 2011. During this time period the city underwent an amalgamation that turned the old Regional Municipality of Sudbury into the City of Greater Sudbury, which accounts for the population increase. Using the old City of Sudbury borders, Sudbury decreased in population by 3,879 people.

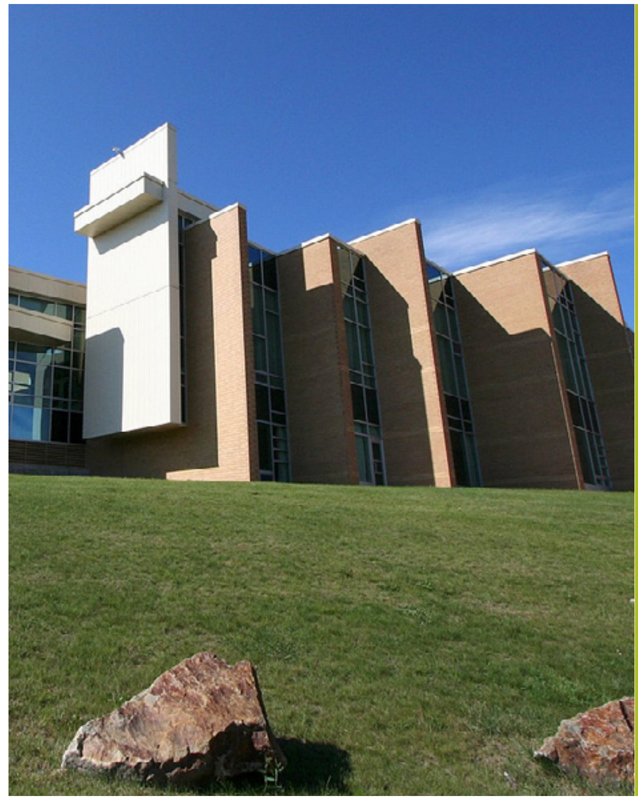


Science Centre, Sudbury, Ontario

These anchors have also spawned several other local organizations promoting innovation. For example, the Northern Centre for Advanced Technology (NORCAT), a non-profit organization supporting entrepreneurship and innovation, spun out of Cambrian College in 1995 and provides a number of training and development programs for sectors including mining, oil/gas, and healthcare. NORCAT also operates a demonstration mine for training, product testing, and prototyping; it also incubates small businesses (NORCAT, 2018; Hall and Donald, 2011). Meanwhile, the Mining Innovation Rehabilitation and Applied Research Corporation (MIRARCO) was established in 1998 as a not-for-profit corporation of Laurentian University linking industry and academia to promote innovation in the mining sector (MIRARCO Mining Innovation, 2018). Laurentian is also partnered with Sudbury's Centre for Excellence in Mining Innovation (CEMI), a non-profit organization dedicated to developing commercially viable "practices, procedures, tools, techniques and technologies to help generate a significant improvement in the performance of mines" (CEMI, 2018). In combination with existing, locally-held knowledge of the mining sector, these initiatives originating in the academic sector play a crucial role in supporting the local mining supply and services cluster (Hall and Donald, 2011).

RECOMMENDATIONS AND FUTURE RESEARCH

When it comes to the role of anchor institutions in economic development, it is important not to place too much emphasis on a small number of exceptional successes (Coenen, 2007). While they may hold lessons for other places, Pugh (2017) cautions that policy must nonetheless adapt to regional circumstances and cannot be overly prescriptive. A focus on mining innovation worked for Sudbury given its historical and geographical context. Such a focus would probably not be helpful for Niagara or Windsor; conversely, the Sudbury case would not likely have been as successful had it centred on a sector with little regional importance. Cities and anchor institutions should start by establishing shared priorities tailored to regional needs, as well as forums to keep these connections intact (Kleiman et al., 2015). These partnerships can start small, establish what works (or doesn't work), and build from there (Dragicevic, 2015).



Source: ***Mysudbury.ca*** *flickr account*

Top-down approaches have focused on using "hard" policy instruments—such as the use of public subsidies and infrastructure investments—to relocate economic activity to declining regions (Halkier and Danson, 1997; Huggins and Izushi, 2007). However, more recent policy has turned away from that approach; rather, it focuses on creating environments that are conducive to the growth of specific industries (Huggins and Williams, 2009) and fostering entrepreneurship (Acs and Szerb, 2007). Some scholars (Mackinnon et al. 2009; Morgan 2012) suggest that policymakers' lack of capacity to intervene is responsible for regions failing to adapt to economic change. This problem is particularly acute at the local level, which may highlight a necessary role for the provincial and federal governments. Federal and provincial funding for education and research should retain a redistributive function lest those places that stand to benefit most from added resilience (shrinking, declining, and legacy cities, in our typology) are not further marginalized (Rosen and Razin, 2007; Goddard, Coombes, Kempton and Vallance, 2014).

This discussion paper is the launch point of this research project. Future research would further test our model by exploring how and why cities move between our defined typology over time. We will be coupling quantitative findings with interviews of local planning officials, specifically inquiring into what policy strategies and planning efforts different cities took to reach their goals and how successful these efforts were. We invite scholars and practitioners from Ontario's mid-sized cities to partner with us to further understand the causes and outcomes of their economic development plans with the goal of helping municipalities more effectively reach their economic development objectives.

REFERENCES

Acs, Z.J. and Szerb, L. Small Business Economics (2007) 28: 109. https://doi.org/10.1007/s11187-006-9012-3

Adams, C. (2003). The Meds and Eds in Urban Economic Development. *Journal of Urban Affairs, 25*(5), 571-588.

Asheim, B.; Boschma, R.; and Cooke, P. 2011. Constructing regional advantage: Platform policies on related variety and differentiated knowledge bases. *Regional Studies 45*:893–904.

Audirac, I., Fol, S., and Martinez-fernandez, C. (2010). Shrinking Cities in a Time of Crisis. *Berkeley Planning Journal, 23*(1), 51–57.

Austrian, Z. (2000). Cluster case studies: The marriage of quantitative and qualitative information for action. *Economic Development Quarterly*, 14, 97-110.

Bank of Canada (2018). Inflation Calculator. Accessed January 12, 2018. https://www.bankofcanada.ca/rates/related/inflation-calculator/

Beauregard, R. A. (1993). Voices of Decline: The Postwar Fate of US Cities. Cambridge, MA: Blackwell Publishers.

Berge, T. J. (2012). Has Globalization Increased the Synchronicity of International Business Cycles? Federal Reserve Bank of Kansas City Economic Review, Third Quar, 5–40.

Bernt M, Cocks M, Couch C, et al. (2012) The Governance of Shrinkage and Future Directions – Research Brief No. 2: Policy Response, Gov- ernment and Future Directions. Leipzig: Shrink Smart.

Birch, E.L. (2009). Downtown in the New American City. Annals of the American Academy of Political and Social Science, 624, 134-153.

Birch, E.L. (2014). Anchor Institutions in the Northeast Megaregion: An Important But Not Fully Realized Resource. In S.M. Wachter and K.A. Zeuli (eds.), Revitalizing American Cities (pp. 207-223). Philadelphia: University of Pennsylvania Press.

Bourne, L and Simmons, J. (2003). New fault lines? Recent trends in the Canadian urban system and their implications for planning and public policy. *Canadian Journal of Urban Research*, 12 (1): 22-47.

Castells, M. (2004). The Network Society. Cheltenham, UK: Edward Edgar Pubishing Ltd.

CEMI. (2018). CEMI leads mining innovation in Canada. https://www.cemi.ca/about-us/

Christopherson S, Michie J and Tyler P (2010) Regional resilience: Theoretical and empirical perspectives. *Cambridge Journal of Regions, Economy and Society 3*(1): 3–10.

Coenen, L. (2007). The role of universities in the regional innovation systems of the North East of England and Scania, Sweden: Providing missing links? Environment and Planning C: Government and Policy, 25, 803-821.

Cohen, W., Levinthal, D. (1989). Innovation and learning: the two faces of RandD. *The Economic Journal 99*, 569–596.

Cohen, W., Nelson, R., and Walsh, J., (2002). Links and impacts: the influence of public research on industrial RandD. *Management Science 48* (1), 1–23.

Cowell, M. (2013). “Bounce Back or Move On: Regional Resilience and Economic Development Planning.” *Cities 30*(1): 212–222.

Davies, A. and Tonts, M. (2010). Economic Diversity and Regional Socioeconomic Performance, Geographical Research 48, pp. 223,234.

Dawley S, Pike A and Tomaney J (2010). Towards the resilient region? *Local Economy 25*(8): 650–667

Dewar, M., and Thomas, J. M. (Eds.). (2012). The City After Abandonment. Philadelphia: University of Pennsylvania Press.

Dragicevic, N. (2015). Anchor Institutions. Toronto: Mowat Centre and Atkinson Foundation.

Drucker, J. (2016). Reconsidering the Regional Economic Development Impacts of Higher Education Institutions in the United States. *Regional Studies, 50*(7), 1185-1202.

Feldman, M. (2005). The Locational Dyanmics of the U.S. Biotech Industry. In Curzio, A. “Research and Technological Innovation: The Challenge for a New Europe.” Physica.

Friedmann, J. (1986). The World City Hypothesis. *Development and Change, 17*(1), 69–83.

Gertler, M. S., and Vinodrai, T. (2005) Anchors of creativity: how do public universities create competitive and cohesive communities? In Iacobucci F. Tuohy C. (eds) Taking Public Universities Seriously, pp. 293–315. Toronto: University of Toronto Press.

Glaeser, E. L. (2011). Triumph of the City. New York: Penguin Press.

Goddard, J., Coombes, M., Kempton, L. and Vallance, P. (2014). Universities as anchor institutions in cities in a turbulent funding environment: vulnerable institutions and vulnerable places in England. *Cambridge Journal of Regions, Economy and Society*, 7, 307-325.

Goldstein, H. and Drucker, J. (2006). The Economic Development Impacts of Universities on Regions: Do Size and Distance Matter? *Economic Development Quarterly*, 20(1), 22-43.

Goldstein, H. and Renault, C. (2004). Contributions of Universities to Economic Development: A Quasi-experimental Approach. *Regional Studies*, 38(7), 733-746.

Grogan, P. S., and Proscio, T. (2000). Comeback Cities: A Blueprint for Urban Neighborhood Revival. Boulder, Colorado: Westview Press.

Großmann, K., Bontje, M., Haase, A., and Mykhnenko, V. (2013). Shrinking Cities: Notes for the Further Research Agenda. *Cities, 35*, 221–225.

Halkier H and Danson M (1997) Regional development agencies in western Europe: A survey of key characteristics and trends. *European Urban and Regional Studies 4*(3): 243–256.

Hall, H.M. (2009). Slow Growth and Decline in Greater Sudbury: Challenges, Opportunities, and Foundations for a New Planning Agenda. *Canadian Journal of Urban Research*, 18(1), 1-26.

Hall, H.M. and Donald, B. (2011). Clarifying creativity and culture in a small city on the Canadian periphery: Challenges and opportunities in Greater Sudbury. In A. Lorentzen and B. van Heur (eds.), Cultural Political Economy of Small Cities. New York: Routledge.

Hall, H.M. and Hall, P.V. (2008). Decline and No Growth: Canada's Forgotten Urban Interior. Canadian *Journal of Regional Science, 31*(1), 1-18.

Harquail School of Earth Sciences. (2017). We stand for excellence in undergraduate and graduate level research and education in the geosciences. http://hes.laurentian.ca/About-Us

Hartt, M.D. (2017). The diversity of North American shrinking cities. Urban Studies. http://doi.org/10.1177/0042098017730013

Hartt, M.D. (2018). How Cities Shrink: Complex Pathways to Population Decline. *Cities, 75* (2018): 38-49.

Hartt, M.D. and Warkentin, J.F. (2017). The Development and Revitalisation of Shrinking Cities: A Twin City Comparison. *Town Planning Review, 88*(1): 29-41.

Hollander, J. B., Pallagst, K., Schwarz, T., and Popper, F. (2009). Planning Shrinking Cities. *Progress in Planning, 72*(special issue: Emerging Research Areas), 4:223-232.

Hollander, J.B., Hartt, M.D., Wiley, A., and Vavra, S. (2018). Vacancy in Shrinking Downtowns: A Comparative Study of Quebec, Ontario, and New England. *Journal of Housing and the Built Environment*.

Huggins, R. and Izushi, H. (2007) Competing for Knowledge: Creating, Connecting and Growing. London: Routledge

Huggins, R., and Williams, N. (2009). "Enterprise and Public Policy: A Review of Labour Government Intervention in the United Kingdom." Environment and Planning C: *Government and Policy 27*(1): 19–41

Jacobs, J. (1969). The economy of cities. New York: Random House.

Keesmaat, J. (2018). "Toronto's unaffordable. Why can't Halifax or Saskatoon take advantage?" Macleans. January 16, 2018. http://www.macleans.ca/economy/torontos-unaffordable-why-cant-halifax-or-saskatoon-take-advantage/

Kleiman, N., Getsinger, L., Pindus, N. and Poethig, E. (2015). Striking a (Local) Grand Bargain: How cities and anchor institutions can work together to drive growth and prosperity. Washington, DC: National Resource Network.

Kose, M. A., Prasad, E. S., and Terrones, M. E. (2003). How Does Globalization Affect the Synchronization of Business Cycles? (Western Hemisphere Department, Asia and Pacific Department, and Research Department No. WP/03/27). Washington, DC.

Leadbeater, D. 2009. Single-Industry Resource Communities, 'Shrinking' and the New Crisis of Hinterland Economic Development. In The Future of Shrinking Cities: Problems, Patterns and Strategies of Urban Transformation in a Global Context, 89–100. Berkeley, California: Center for Global Metropolitan Studies, Institute of Urban and Regional Development, and the Shrinking Cities International Research Network.

MacKinnon, D., Cumbers, A., Pike, A., Birch, K. and McMaster, R. (2009) "Evolution in economic geography: institutions, political economy and adaptation", *Economic Geography, 85*, 129-150.

Malizia, E., and Feser, E. (1999). Understanding local economic development. New Brunswick, NJ: Center for Urban Policy Research.

Mallach, A., and Brachman, L. (2013). Regenerating America's Legacy Cities.

Martin R (2012) Regional economic resilience, hysteresis and recessionary shocks. *Journal of Economic Geography 12*(1): 1–32.

Martin, R. and P. Sunley (2014). On the notion of regional economic resilience: conceptualisation and explanation, *Journal of Economic Geography*, July:1-42.

Martinez-Fernandez, C., Audirac, I., Fol, S., and Cunningham-Sabot, E. (2012). Shrinking Cities: Urban Challenges of Globalization. *International Journal of Urban and Regional Research, 36*(2), 213–225.

Mccann, E., and Ward, K. (2013). A Multi-Disciplinary Approach to Policy Transfer Research: Geographies, Assemblages, Mobilities and Mutations. *Policy Studies, 34*(1), 2–18. http://doi.org/10.1080/01442872.2012.748563

MIRARCO Mining Innovation. (2018). About. https://www.mirarco.org/about/

Morgan, K. (2012). Path dependence and the state: The politics of novelty in old industrial regions. In Re-framing regional development: Evolution, innovation, transition, ed. P. Cooke, 318–40. Abingdon, U.K.: Routledge

Munro, M., Turok, I., and Livingston, M. (2009). Students in cities: a preliminary analysis of their patterns and effects. *Environment and Planning* A, 41(8), 1805-1825.

Neumann, T. (2016). Remaking the Rust Belt: The Postindustrial Transformation of North America. University of Pennsylvania Press.

Newman P and Thornley A (2011) Planning World Cities: Globalization and Urban Politics. Second Edition. New York, NY: Palgrave Macmillan.

NORCAT. (2018). About NORCAT. http://www.norcat.org/about-norcat/

NOSM. (n.d.). About NOSM. https://www.nosm.ca/about_us/default.aspx

Organization for Economic Cooperation and Development (2016). Resilient Cities. June 2016. http://www.mlit.go.jp/common/001136418.pdf

Pallagst, K. (2010). Viewpoint: The Planning Research Agenda: Shrinking Cities – A Challenge for Planning Cultures. *Town Planning Review, 81*(5), i–vi.

Pugh, R. (2017). Universities and economic development in lagging regions: 'triple helix' policy in Wales. *Regional Studies, 51*(7), 982-993.

Rosen, G. and Razin, E. (2007). The college chase: Higher education and urban entrepreneurialism in Israel. *Tijdschrift voor Economische en Sociale Geografie, 98*(1), 86-101.

Ryan, B. D. (2012). Design After Decline: How America Rebuilds Shrinking Cities. Philadelphia: University of Pennsylvania Press.

Sassen, S. (2001). The Global City: New York, London, Tokyo (2nd ed.). Princeton, NJ: Princeton University Press.

Schatz LK (2010) What helps or hinders the adop- tion of 'good planning' principles in shrinking cities? A comparison of recent planning exer- cises in Sudbury, Ontario and Youngstown, Ohio. University of Waterloo PhD Thesis, University of Waterloo.

Shearmur, R. and Polèse, M. (2007). Development in Peripheral Canada: Oxymoron or Reasonable Policy? *Plan Canada*, 47 (2): 33-37.

Siegfried, J. J., Sanderson, A. R., McHenry, P. (2007). The economic impact of colleges and universities, *Economics of Education Review*, 26: 546–558.

Silverman, R.M., Lewis, J. and Patterson, K.L. (2014). William Worthy's Concept of "Institutional Rape" Revisited: Anchor Institutions and Residential Displacement in Buffalo, NY. *Humanity and Society, 38*(2), 158-181.

Simmie J and Martin R (2010) The economic resilience of regions: Towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society 3*(1): 27–43.

Soja, E. W. (2000). Postmetropolis: critical studies of cities and regions. Oxford, UK: Blackwell Publishers.

Taylor, H.L. Jr. and Luter, G. (2013). Anchor Institutions: An Interpretive Review Essay. New York: Marga Inc.

Wiechmann T (2008) Errors expected – Aligning urban strategy with demographic uncertainty in shrinking cities. *International Planning Studies 13*(4): 431–446.

Wiechmann, T. and Pallagst, K. (2012). Urban Shrinkage in Germany and the USA: A Comparison of Transformation Patterns and Local Strategies. *International Journal of Urban and Regional Research 36* (2), 261-280.

Wolfe, D. (2010). The strategic management of core cities: Path dependence and economic adjustment in resilient regions, Cambridge Journal of Regions, Economy and Society, Volume 3, Issue 1, 1 March 2010, Pages 139–152, https://doi.org/10.1093/cjres/rsp032

Wu CT, Zhang X-L, Cui G-H, et al. (2014) Shrinkage and expansion in peri-urban China: Exploratory case study from Jiangsu Province. In: Pallagst K, Wiechmann T and Martinez-Fernandez C (eds), Shrinking Cit- ies: International Perspectives and Policy Implications. New York, NY: Routledge, pp. 164–185.

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