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Mapping deindustrialisation in post-apartheid Gauteng: Decay or restructuring?

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Mapping deindustrialisation in post-apartheid Gauteng: Decay or restructuring?

Jason F. Bell[1] and Justin Visagie[2]

Abstract

Gauteng has long been the centre of South Africa's industrial economy, yet the nature and geography of manufacturing change within the province remain poorly understood. Using the Spatial Tax Panel, a novel administrative dataset derived from firm-level tax records, this paper examines changes in manufacturing employment, industrial composition, and industrial geography between 2014 and 2024. The findings confirm substantial manufacturing employment decline, with losses exceeding national trends. However, these declines conceal a more complex process of industrial restructuring and spatial change. Employment contraction was concentrated in traditional heavy industries and mineral beneficiation activities, while growth occurred in more diversified and potentially higher-value manufacturing sectors. Manufacturing activity remained concentrated within Gauteng's historic industrial core, although several secondary nodes recorded employment gains. Many regions also expanded the range of specialised manufacturing activities in which they demonstrated a comparative advantage. The paper argues that Gauteng's experience of deindustrialisation is a more complex process of industrial restructuring and spatial change.

Keywords: Location quotient, Agglomeration economies, Regional diversification, Industrial policy, Deindustrialisation, Gauteng

JEL classification: L60, R12, R11, O14, J21

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EXECUTIVE SUMMARY

Deindustrialisation is a key concern in debates about South Africa's (SA) economic development. SA's manufacturing sector has struggled to deliver on the promise of export-led industrial growth. The democratic era has been characterised by industrial decline on aggregate with manufacturing's share of GDP halving between 1990 and 2011, falling to roughly 12%, where it has remained since (Driver, 2023). Similarly, manufacturing's share of employment has fallen from about one in six jobs in 1994 to about one in ten today. The bulk of SA's export basket is still comprised of minerals or mineral-related products (Edwards, Chien and Stern, 2024).

Industrial competitiveness is closely associated with urbanisation. Firms and workers seek out a critical density of markets, suppliers, skills, know-how and infrastructure in which to do business—the role of 'agglomeration economies' (Enright, 1996; Isaksen, 1997; Cooke, 2001; Rosenthal & Strange, 2004; Spencer, Vinodrai, Gertler, & Wolfe, 2010). Therefore, reversing the trajectory and extent of industrial decline across and within geographies arguably depends on this nexus between industrial development and urban infrastructure.

Gauteng is the centre of SA's economy, and has long since diversified beyond the gold-driven mining of the Pretoria-Witwatersrand-Vereeniging region, into industrial, business and financial services. Yet little is known about the evolution of manufacturing activities beyond national averages. In addition, the sub-national pattern of manufacturing specialisation and concentration across and within Gauteng is complex, influenced collectively by apartheid-era industrial decentralisation and racial segregation, and the evolving political economy of industrialisation throughout the post-apartheid period. Manufacturing employment is spread across the province including urban core nodes in Johannesburg and Ekurhuleni, such as Germiston and Boksburg, but also peripheral zones closer to townships, such as Clayville–Olifantsfontein near Tembisa, and into the surrounding municipalities such as Vanderbijlpark and Vereeniging in Emfuleni.

This paper sets out new evidence, based upon the mining of administrative employment data available in the Spatial Tax Panel, about what SA's deindustrialisation implies about industrial change in Gauteng. Specifically, it asks: i) How has the sectoral composition of manufacturing employment in Gauteng changed between 2014 and 2024, and how does this compare with national trends? ii) To what extent do these changes suggest industrial upgrading, diversification, or erosion within Gauteng's manufacturing base? iii) How has the spatial distribution of manufacturing employment within Gauteng changed between 2014 and 2024? iv) Do these changes suggest a decentralisation and restructuring of Gauteng's historic manufacturing nodes? v) What are the implications for the reproduction or reconfiguration of spatial-industrial inequalities and the post-apartheid urban form in Gauteng?

Our exploratory findings point to a more complex process of industrial restructuring, both sectorally and geographically, beneath the headline decline.

First, Gauteng's manufacturing trajectory aligns with national deindustrialisation, but Gauteng's decline was even more severe. Total manufacturing employment (measured as formal full time equivalent jobs) in Gauteng declined by 6.4% (compared with a 3.6% national decline), falling from 525,544 jobs in 2014 to 491,777 in 2024.

Second, we find that the overall manufacturing decline masks potentially important shifts in the composition of manufacturing within Gauteng. For example, employment losses were concentrated in traditional manufacturing activities such as basic metals, fabricated metals, chemicals and rubber and plastics, while growth occurred in sectors including motor vehicles, computer and electronics,

pharmaceuticals, beverages, and food products. Although employment data alone cannot demonstrate industrial upgrading, these trends suggest a restructuring of the industrial composition from some historically resource-linked activities towards potentially more sophisticated forms of production.

Third, these sectoral shifts were accompanied by a reconfiguration of Gauteng's industrial geography. Manufacturing employment remains heavily concentrated within the province's historic industrial core, particularly in Johannesburg and Ekurhuleni. However, several established industrial nodes experienced substantial employment losses, while secondary nodes such as Midrand, Centurion, Midvaal, and eastern Tshwane recorded limited growth. The evidence therefore points to some spatial restructuring within Gauteng's manufacturing core.

Fourth, employment decline did not always coincide with a narrowing of local industrial specialisations. Many planning regions increased the number of manufacturing activities (at the most detailed 5-digit standard industrial classification coding (SIC) level) in which employment was relatively concentrated or specialised compared with national patterns, even where their overall manufacturing employment declined. This was particularly evident in Johannesburg, while Ekurhuleni displayed a more uneven pattern of gains and losses across its sub-regions.

Viewed through this evidence, Gauteng's industrial transformation appears more complex than conventional dichotomous accounts of either deindustrialisation or decentralisation would suggest. Rather, these findings point towards deeper processes of diversification, specialisation, and capability reconfiguration, although further research is required to confirm the extent and nature of industrial and technological change. Our analysis indicates that there is both a continuation and evolution of the geography of manufacturing employment in the province. This is seen through the evidence of declines in the historical hubs of manufacturing activity but a potential deepening of sub-sector competencies within these same landscapes.

For policy, this means rejecting one-size-fits-all interventions in favour of regionally attuned approaches that strengthen existing industrial ecosystems while supporting new ones to emerge. Granular administrative data, such as the Spatial Tax Panel, can help identify local manufacturing specialisations and inform efforts to strengthen supplier linkages within and across regions. The aim should be to translate these local strengths and connections into sustained manufacturing employment and wider access to industrial opportunities across Gauteng.

1. Introduction

Deindustrialisation is a key concern in debates about South Africa's economic development. South Africa's manufacturing decline began in the 1980s (Black & Stanwix, 1987), and accelerated in the wake of liberal trade reforms in the 1990s, following democratic elections and re-integration into global markets (Rodrik, 2008). Illustrating this decline, the manufacturing sector's share of GDP halved between 1990 and 2011, falling to roughly 12%. The sector has since been characterised by stagnation and low growth (Driver, 2023). Such erosion in manufacturing raises concerns about the country's capacity to sustain and develop its productive capabilities, diversify its mineral-heavy export basket, and create decent-paying jobs.

Yet, while South Africa's manufacturing decline is well documented at the national level, less is known about the extent and character of deindustrialisation within Gauteng – South Africa's industrial heartland. For more than a century, Gauteng has been at the centre of South Africa's industrial economy. Emerging from the gold-driven development of the Pretoria-Witwatersrand-Vereeniging region, Gauteng evolved into a prominent manufacturing and business hub (Todes & Turok, 2018). Spatial development during this period followed an east–west mining axis and a north–south transport corridor. Early manufacturing clustered around Johannesburg and Germiston, alongside steel production in Pretoria and Vereeniging (Fair & Mallows, 1959; Mabin, 2013). Apartheid-era industrial planning created decentralised nodes of industrial activity, intentionally outside of the urban core, in order to locate cheap Black labour far away from Whites-only economic centres (Mubiwa & Annegarn, 2013; Bell, 2025).

South African metropolitan municipalities are still extremely segregated today, mirroring population settlement patterns that reflect apartheid-era geography. As a consequence, there remains a large spatial mismatch between where most people work and live (Mosiane & Murray, 2021; Ballard et al., 2021). Yet there is emerging evidence of an industrial spatial restructuring towards the peripheries (Geyer, Geyer, du Plessis, & van Eeden, 2012; Hassen, Naidoo, Modiba, Mushongera, & Labuschagne, 2024).

The location of manufacturing matters because proximity between firms, suppliers and workers can support specialised capabilities and agglomeration economies (Enright, 1996; Isaksen, 1997; Cooke, 2001; Rosenthal & Strange, 2004; Spencer, Vinodrai, Gertler, & Wolfe, 2010). Examining where manufacturing contracts, persists or expands therefore helps connect debates on deindustrialisation with questions of regional development and spatial inequality.

As such, this paper contributes to the literature on post-apartheid industrial restructuring by providing a sub-provincial analysis of Gauteng's evolving manufacturing geography. Specifically, it asks: i) How has the sectoral composition of manufacturing employment in Gauteng changed between 2014 and 2024, and how does this compare with national trends? ii) To what extent do these changes suggest industrial upgrading, diversification, or erosion within Gauteng's manufacturing base? iii) How has the spatial distribution of manufacturing employment within Gauteng changed between 2014 and 2024? iv) Do these changes suggest a decentralisation and restructuring of Gauteng's historic manufacturing nodes? v) What are the implications for the reproduction or reconfiguration of spatial-industrial inequalities and the post-apartheid urban form in Gauteng?

To answer these questions, the paper explores a novel source of administrative firm-level tax returns known as the Spatial Tax Panel (Nell & Visagie, 2025). Rather than treating deindustrialisation as a

uniform process, the paper argues that manufacturing decline in Gauteng has been accompanied by uneven forms of sectoral restructuring, spatial reconfiguration, and changes in industrial capabilities. The paper argues that Gauteng's manufacturing decline combines continuity in its historical industrial geography with selective sectoral and spatial restructuring. Established industrial nodes remain dominant despite substantial job losses, while selected secondary nodes and manufacturing sub-sectors have expanded. Moreover, employment contraction has not always meant a narrowing of local industrial specialisations. Some regions losing manufacturing jobs have increased the range of activities in which they specialise. This broadening of industrial specialisations raises the possibility of upgrading, although further research is needed.

The paper proceeds as follows: Section 2 reviews relevant literature on industrial specialisation, diversification, and externalities. Section 3 outlines the data and methodology. Section 4 presents spatial mapping and analysis of Gauteng's industrial geography. Section 5 concludes with reflections on the policy and research implications of Gauteng's apparent shifts in its industrial geography, offering directions for future research.

2. Literature review: Agglomeration, externalities, complexity, and geographic change

2.1 Urbanisation and localisation economies

Agglomeration economies are central to theories of industrial location and regional development (Feldman, 2000). Firms tend to concentrate or physically cluster together because of the productivity advantages which arise from proximity to other firms, workers, infrastructure, and markets. Yet while the overall relationship is well established in the literature, there is less clarity about how these agglomeration advantages are expected to operate. Understanding why firms co-locate is crucial to this paper's discussion of manufacturing geographic change.

The economic geography literature commonly distinguishes between two broad forms of agglomeration economies: urbanisation economies, which arise from the diversity and scale of large urban regions; and localisation economies, which emerge from the spatial concentration of firms within the same industry. Underpinning both types of advantage are a range of mechanisms such as knowledge spillovers, labour market pooling, reduced transport and transaction costs, specialised supplier networks, and shared infrastructure (Fujita & Thisse, 2002; Rosenthal & Strange, 2004).

So-called Jacobs externalities, associated with urbanisation economies, arise when firms across sectors benefit from shared infrastructure, a skilled labour force, and knowledge spillovers. Empirical studies support the idea that such diversity fosters entrepreneurship, innovation and value-added growth (Fan & Scott, 2003; Baldwin, Beckstead, Brown, & Rigby, 2008; Ashton, 2009; Pessoa, 2014). Case studies of South Africa, Morocco, and Ethiopia demonstrate that well-targeted strategic clustering projects can promote institutional collaboration and create linkages with the local economy (Rodríguez-Pose, Bartalucci, Frick, Santos-Paulino, & Bolwijn, 2022).

In contrast, localisation economies, also known as Marshall-Arrow-Romer externalities, emphasise intra-industry clustering. These externalities benefit firms through access to specialised suppliers, concentrated labour markets, and industry-specific knowledge flows (Marshall, 1890; Baldwin et al., 2008). Dense clusters of co-located firms operating in similar industries and activities have been found

to experience collective efficiencies that enhance productivity, innovation, and competitive performance (Schmitz & Nadvi, 1999).

However, not all industries benefit from agglomeration to the same degree (Kleynhans, 2022). Nor should it be assumed that the local environment is conducive and capable of managing higher densities. The benefits of agglomeration depend heavily on good governance and investment into the built environment, otherwise concentration will lead to crowding and congestion (Jargowsky, 1997; Delgado & Zeuli, 2016; Li, Yang, Lin, & Wu, 2023).

In South Africa, patterns of industrial location also reflect the logic of agglomeration economies. A firm's choice of location is influenced by access to infrastructure and services, proximity to markets, site-specific characteristics, proximity to lead firms and suppliers, and quality-of-life considerations (Kleynhans & Drewes, 2008a; 2008b). Consistent with this, Naudé and Matthee (2010) found that most manufacturing exports originate within 100 km of an export hub, suggesting that export-oriented production remains closely tied to established centres of economic activity.

Yet the relationship between agglomeration and productivity is not unlimited. Krugell and Naudé (2005) identify diminishing returns to both localisation and urbanisation economies in South African cities, suggesting that the productivity benefits of agglomeration weaken beyond a certain scale. Visagie and Turok (2022) find that place-based effects explain as much of the variation in regional growth as nationwide industry effects. In theory, if established cities exceed their optimal size, rising congestion and other diseconomies may encourage firms to locate in competing emerging centres, leading to a more dispersed spatial distribution of economic activity.

Overall, the literature suggests that both urbanisation and localisation economies continue to shape the spatial organisation of economic activity in South Africa. Firms benefit from proximity to markets, infrastructure, workers, suppliers, and knowledge networks, helping to explain the persistence of manufacturing concentration in established industrial centres. At the same time, the benefits of agglomeration are neither uniform nor unlimited. They vary across industries and locations, and may be weakened by congestion, governance failures, and diminishing returns associated with increasing city size. Therefore, while agglomeration economies help explain why manufacturing activity remains geographically concentrated, they are less effective in explaining how and why industrial activity shifts between locations over time. Understanding these dynamics requires attention not only to the advantages of concentration, but also to processes of industrial diversification, specialisation, and spatial restructuring. The following section examines these processes in greater detail.

2.2 Industrial diversification, specialisation, geographic change, and resilience

Economic diversification and specialisation have become central to contemporary debates on growth, inequality, and resilience (Balland, Broekel, Diodato, Giuliani, Hausmann, O'Clery, & Rigby, 2022). Development theory increasingly highlights the interplay between these processes in shaping regional transformation and structural change. Structural change, defined as the transition into new and more complex economic activities, is closely linked to diversification, which is seen as a driver of long-term growth and innovation (Lu, 2024).

A study of German cities found mixed evidence for Jacobs externalities and revealed a U-shaped relationship between specialisation and growth. This suggests that both excessive clustering and excessive diversification can lead to diminishing returns (Illy, Hornych, Schwartz, & Rosenfeld, 2009). These dynamics are strongly influenced by factors such as industry complexity and regional learning

capacities (Kemeny & Storper, 2020). In addition, industrial linkages and spillovers frequently operate across wider regional networks rather than focusing on isolated urban nodes alone (Boschma, 2005).

Traditional approaches in economic geography emphasise land use, transport costs, and agglomeration economies in determining spatial patterns of productivity (Duranton & Kerr, 2015). Krugman's (1991) influential core-periphery model explains how increasing returns and market size can lead to spatial concentration in 'core' regions, leaving peripheral areas relatively underdeveloped. However, such models often oversimplify the real world and can ignore the role of institutional, political, and historical factors (Currie & Kubin, 2006; Chen, Lu, & Xu, 2011).

Another perspective of regional change emerges from Smith's (1984) theory of 'seesaw development,' which argues that capital seeks spatial fixes through cyclical patterns of investment and disinvestment based on regions' profitability. This approach highlights the instability and unevenness of market-led development, where unrestrained capital flows generate simultaneous development and underdevelopment across scales, urban, regional, and national (Hudson, 2015; Jones III, Leitner, Marston, & Sheppard, 2017). These dynamics are evident in the decentralisation of manufacturing toward peripheral zones, often driven by infrastructure development, lower costs, and policy incentives, processes contributing to urban sprawl and spatial inequality (Bull, 1978; Rogerson, 2018). Case studies from Germany (Krenz, 2024), South Africa (Wellings & Black, 1986), and China (Xu, 2024) illustrate these divergent spatial-industrial transitions.

More recent perspectives incorporate the role of historical trajectories and institutional contexts. Path dependence, institutional variation, and the co-evolution of knowledge and regional capabilities explain why similar development strategies often yield different outcomes (Boschma & Frenken, 2006; Forslid & Okubo, 2024). In the South African context, this helps to explain how apartheid spatial legacies continue to reproduce an uneven economic geography. Additionally, global value chain restructuring, where production, design, and R&D functions are increasingly decoupled from geography, has created fragmented and uneven regional dependencies (Smith, 1984; Boschma, 2022).

From a capabilities-based perspective, Hidalgo and Hausmann (2009) argue that the diversity and sophistication of a country's economic structure underpin its complexity and potential for sustained growth. Industrial diversification fosters economic complexity through mechanisms such as cross-sectoral learning, shared infrastructure, and the development of specialised labour pools (Alibekova, Alzhanova, Osmanov, & Omarov, 2023; Saad, Brahim, Schaffar, Guesmi, & Saad, 2023). However, these processes are often path-dependent (Freitas, Britto, & Amaral, 2024), helping to explain persistent underdevelopment and low economic complexity in many African economies (Yameogo, Nabassaga, Abebe, & Ncube, 2014).

Despite its potential, the relationship between diversification and development in marginalised or peripheral regions remains underexplored (Ferraz, Falguera, Mariano, & Hartmann, 2021). Strengthening economic resilience through diversification is widely seen as key to building more stable and adaptive regional economies (Goschin, 2019; He, Miao, & Qureshi, 2022). However, resilience must be understood not just as the ability to bounce back from shocks, but also to adapt and evolve in response to long-term structural transformations (Simmie & Martin, 2010; Caldera Sanchez, Serres, Gori, Hermansen, & Röhn, 2016).

Research conducted after apartheid shows that Gauteng's economic activity has shifted to some extent from established nodes to its peripheral and outlying areas, many of which have lower concentrations of urban populations (Geyer, Geyer, du Plessis, & van Eeden, 2012; Mosiane & Murray,

2021; Hassen, Naidoo, Modiba, Mushongera, & Labuschagne, 2024). Notwithstanding this, Turok and Visagie (2025) observe a persistent clustering of manufacturing jobs in major urban centres, although manufacturing is a minority share across all settlement types. The spatial mismatch established during apartheid persists, with large populations remaining distant from commercial and industrial centres (Ballard et al., 2021).

Overall, this literature suggests that industrial geographic change reflects the interaction between agglomeration economies, diversification and specialisation processes, and broader structural transformations within the economy. These dynamics are shaped by historical trajectories, institutional conditions, and evolving regional capabilities, resulting in uneven patterns of development across space. While studies of Gauteng point to important shifts in the location of economic activity, the extent and nature of change within the manufacturing sector remain unclear. This highlights the need for a closer examination of how the geography of manufacturing has evolved over time.

3. Data and methodology

3.1 Data, sectoral, and geographic focus

This section outlines the data and methodological approach used to analyse changing patterns of manufacturing employment, industrial composition, and spatial restructuring within Gauteng between 2014 and 2024. The analysis is based on the Spatial Tax Panel (STP), which offers a bottom-up approach to measuring local economies based on the curation of administrative tax returns (Nell & Visagie, 2025). Granular spatial economic information for South African municipalities (including their neighbourhoods/suburbs) is not collected and published in official survey statistics—while commercially available alternatives depend on a high degree of top-down modelling, which lacks transparency (Von Fintel, 2016).

The STP is primarily constructed from employment information (IRP5/IT3a tax submissions) reported at a branch or establishment level. Employment is aggregated to Full Time Equivalents (FTEs) based on the number of months worked in the year. This offers a near-universe of formal economic activity at the local level. The main limitations include the potential for inaccuracies from human error in the filing process, data maturity where tax submissions are outstanding, instances of tax evasion, and inconsistencies in how firms report branch-level information (Nell & Visagie, 2025).

Figure 1: Map of the Gauteng Province



Source: Authors

Notes: EKU_A: Kempton Park to Boksburg; EKU_B: Tembisa to Edenvale; EKU_C: Daveyton; EKU_D: Benoni to Springs; EKU_E: Kwa-Thema to Nigel; EKU_F: Alberton to Vosloorus; GT421: Emfuleni; GT422: Midvaal; GT423: Lesedi; GT481: Mogale City; GT484: Merafong City; GT485: Rand West City; JHB_A: Midrand; JHB_B: Randburg; JHB_C: Roodepoort; JHB_D: Soweto; JHB_E: Alexandra/Sandton; JHB_F: Johannesburg; JHB_G: Orange Farm; TSH_1: Akasia/Soshanguve; TSH_2: Sinoville/Hammanskraal; TSH_3: Pretoria; TSH_4: Centurion; TSH_5: Cullinan/Rayton; TSH_6: East; TSH_7: Bronkhorstspruit

Along with the spatial granularity of the STP, a distinctive advantage is the level of detail of sectoral information which is available down to a 5-digit level of disaggregation according to the Standard Industrial Classification (SIC version 7) coding system. This means that we can explore detailed changes within the manufacturing sector for different clusters or sub-sectors (for example, Manufacturing (1D), Manufacturing of food products (2D), Manufacture of dairy products (3D), Manufacture of dairy products (4D), Manufacture of butter and cheese (5D)).

We focus only on industrial change in Gauteng (i.e. manufacturing) in the data analysis proxied through employment figures. This choice is not to negate the important contribution of other economic sectors. Rather, the prioritisation of these manufacturing sectors is due to the documented positive contributions to economic growth and development through value creation (Mazzucato & Ryan-Collins, 2022), the sector's designation as an engine of growth (Cantore, Clara, Lavopa, & Soare, 2017), and the strength of backward (input) and forward (output) linkages between these sectors.

The STP spatial data has been transformed from its original postal codes[3] to match up with a contiguous layout of 26 planning regions for Gauteng based on sub-city administrative boundaries covering all 3 Gauteng metros and 2 remaining districts. In other words, this analysis uses the postal-code version of the Spatial Tax Panel, available in the National Treasury Secure Data Facility or by special request, rather than the publicly available hexagon-based version. Because postal codes are the original spatial fields from which the hexagons are derived, they allow more accurate assignment to sub-municipal planning regions. Where a postal code overlaps more than one planning region, its employment was allocated proportionally across those regions.

Under the data disclosure rules, postal-code industry cells with fewer than 10 full-time equivalent employees (FTEs) are fully suppressed and therefore contribute zero to the aggregated employment figures. The STP methodology report estimates suppression at approximately 5% for five-digit industry data based on postal codes, compared with more than 12% for hexagon-based data. The resulting undercount is expected to be relatively small in aggregate, although suppression remains a limitation for highly disaggregated analysis.

Figure 1 shows the spatial coverage of the transformed Spatial Tax Panel for Gauteng which is divided up into 26 planning regions: 7 regions in Johannesburg metro, 7 in Tshwane metro, and 6 in Ekurhuleni metro; 3 regions in Sedibeng district (Emfuleni, Midvaal, Lesedi) and 3 in West Rand district (Mogale City, Merafong City, Rand West City). The average FTE manufacturing employment in 2024 across the planning regions was 16,527 (a median of 13,167), with a maximum of 56,519 (EKU_A) and a minimum of 1,074 (JHB_D).

3.2 Assessing the spatial distribution of industrial activity

This paper also utilises location quotients to examine patterns of industrial concentration, specialisation, and diversification across the Gauteng province. Location quotients have long been utilised as a tool for unpacking the spatial distribution of economic activities over time (Isard, 1960; Miller, Gibson, & Wright, 1991). A location quotient is measured as a ratio of ratios that captures a specific sector's importance to a given geography compared to a wider geography (see Equation 1). To comprehend sub-provincial changes in relation to national trends in manufacturing, this paper uses the national share as the reference area. Therefore:

$$LQ_{ir} = \frac{\left(\frac{X_{ir}}{X_r}\right)}{\left(\frac{X_{iN}}{X_N}\right)} \quad \ldots . (1)$$

[3] The public version of the Spatial Tax Panel releases sub-municipal information only through a hexagonal raster layer. This hexagon grid is derived from an underlying postal code spatial layer, which is accessible only within the National Treasury Secure Data Facility or through special request.

where, “X” represents total FTE employment, the subscript “i” indexes the industry sector, the subscript “r” indexes the region, and the subscript “N” represents the benchmark economy (see Pominova, Gabe, & Crawley, 2021).

Intuitively, location quotients help uncover relative comparative advantages in regions compared to the national benchmark and therefore provide insights into the specialisation of regions. They can also be leveraged to identify opportunities for diversification into new, value-adding, and higher productivity industries to target into the future. Thus, location quotients are widespread as a spatial analytical tool to inform regional policy (Baer & Brown, 2006; Crawley, Beynon, & Munday, 2013).

Location quotient values are centred around a neutral score of 1 (aligning with the national benchmark) and range from a lower bound of 0 to an upper bound of infinity. Therefore, a location quotient > 1 implies that, compared to the reference area, the study area shows greater industry geographic concentration, implying specialisation, comparative advantage, and export potential. If location quotient = 1, the geography has the same proportion of activity in the industry as the reference area, indicating no specialisation. For location quotient < 1, the region’s industry is less concentrated, suggesting a lack of specialisation and comparative advantage.

In practice, an index of > 1.2 has been used by many scholars as a cutoff to identify specialisation (see Baer & Brown, 2006; Morrissey, 2016). However, some papers have argued against the arbitrary nature of location quotient cutoffs calling for more context-sensitive, evidence-based policy decision aids (Crawley, 2013). For instance, Benassi, Crisci, & Rimoldi (2022) use multiple location quotient cut-offs such as <= 0.8 for under-representation, 0.8-1.2 for evenness, 1.2-2 for over-representation, and > 2 for relevant over-representation.

Besides deciding on the cut-off, some caution is warranted when interpreting location quotients. Use of the location quotient for estimating regional economic impact multipliers has long been criticised on theoretical and empirical grounds (Isserman, 1977; Guimarães, Figueiredo, & Woodward, 2009). For instance, location quotient analysis tends to neglect other critical features of industrial development such as the labour market and skills supply, value chains and supplier networks, and the quality of enabling local infrastructure available within a particular geography (Miller et al., 1991).

The interpretation of location quotients is also sensitive to the level of industrial and spatial aggregation used in the analysis. More detailed industrial classifications provide richer insights into specific manufacturing activities, but may produce volatile estimates where employment numbers are small. Conversely, broader industrial aggregation improves robustness but can obscure important differences within sectors. Similar trade-offs exist spatially. Larger geographic units may obscure localised industrial clusters, while smaller units may produce fragmented patterns. Researchers must therefore select an appropriate level of industrial and spatial aggregation based on the objectives of the analysis (Billings & Johnson, 2012).

4. Findings: Post-apartheid Gauteng’s evolving manufacturing geography, 2014-2024

Today, the Gauteng city-region is a cluster of cities, towns, and urban nodes that together make up the economic heartland of South Africa (Sihlongonyane, 2017). As of July 2020, population estimates for the Gauteng city-region are over 15 million, with the economic output of the city-region continuing to contribute to a significant portion of South Africa’s economic output and employment (Statistics

South Africa, 2020). The urban core of the Gauteng city-region includes Johannesburg, the once significant gold-producing city and today the financial capital of South Africa, Pretoria, South Africa's administrative capital, and other commercial, industrial, and mining centres such as Germiston, Springs, Alberton, Boksburg, Benoni, Vereeniging, Vanderbijlpark, Krugersdorp, Randfontein and Westonaria. Outside of these historical nodes of manufacturing activity are periphery spaces that have experienced poor rates of manufacturing activity (TIPS, 2021).

This section details the location of the Gauteng province's industrial capabilities between 2014 and 2024. It outlines how Gauteng's sub-sectoral manufacturing employment has changed over the period compared to the performance of South Africa. It further examines the changes to Gauteng's industrial geography, detailing how the pattern of industrial decay and diversification has impacted where industrial activities are located. Last, the section examines Gauteng's changing industrial geography in the context of its composition unfolding over the period.

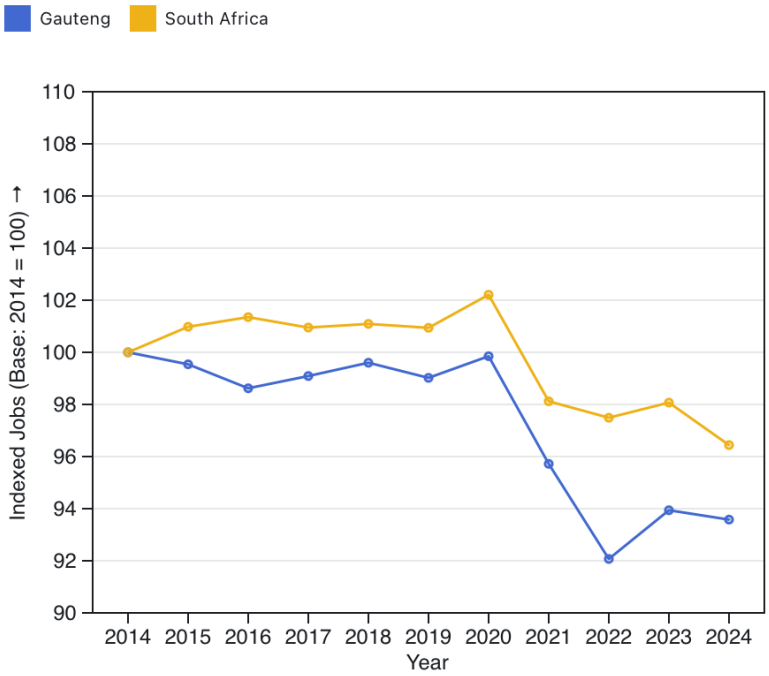
4.1 Deindustrialisation and sectoral restructuring in Gauteng

Gauteng's manufacturing activity has for many decades accounted for the majority of South Africa's economic activity (Gauteng Province, 2024). However, it has also undergone significant changes due to a combination of policy choices and alterations in the global manufacturing order.

We find new evidence that Gauteng lost significant ground as South Africa's main manufacturing region: both in absolute terms and relative to other provinces (Figure 2). Over the last decade, total formal employment (counting full-time equivalent employees) in manufacturing declined by 6.4%, falling from 525,544 in 2014 to 491,777 in 2024. While manufacturing jobs also declined elsewhere, South Africa's manufacturing decline was less severe, falling from 1,246,444 in 2014 to 1,202,050 in 2024 – a decline of 3.6%.

A closer look at the figure suggests that the economic shock of the Covid-19 pandemic exacerbated the crisis. Before the pandemic, national manufacturing growth was stagnant although still slightly positive. However, the onset of the pandemic initiated large job losses and there has been little sign of recovery since. Moreover, these losses were comparatively larger for Gauteng manufacturers.

Figure 2: Gauteng and South Africa's manufacturing growth or decline, 2014-2024

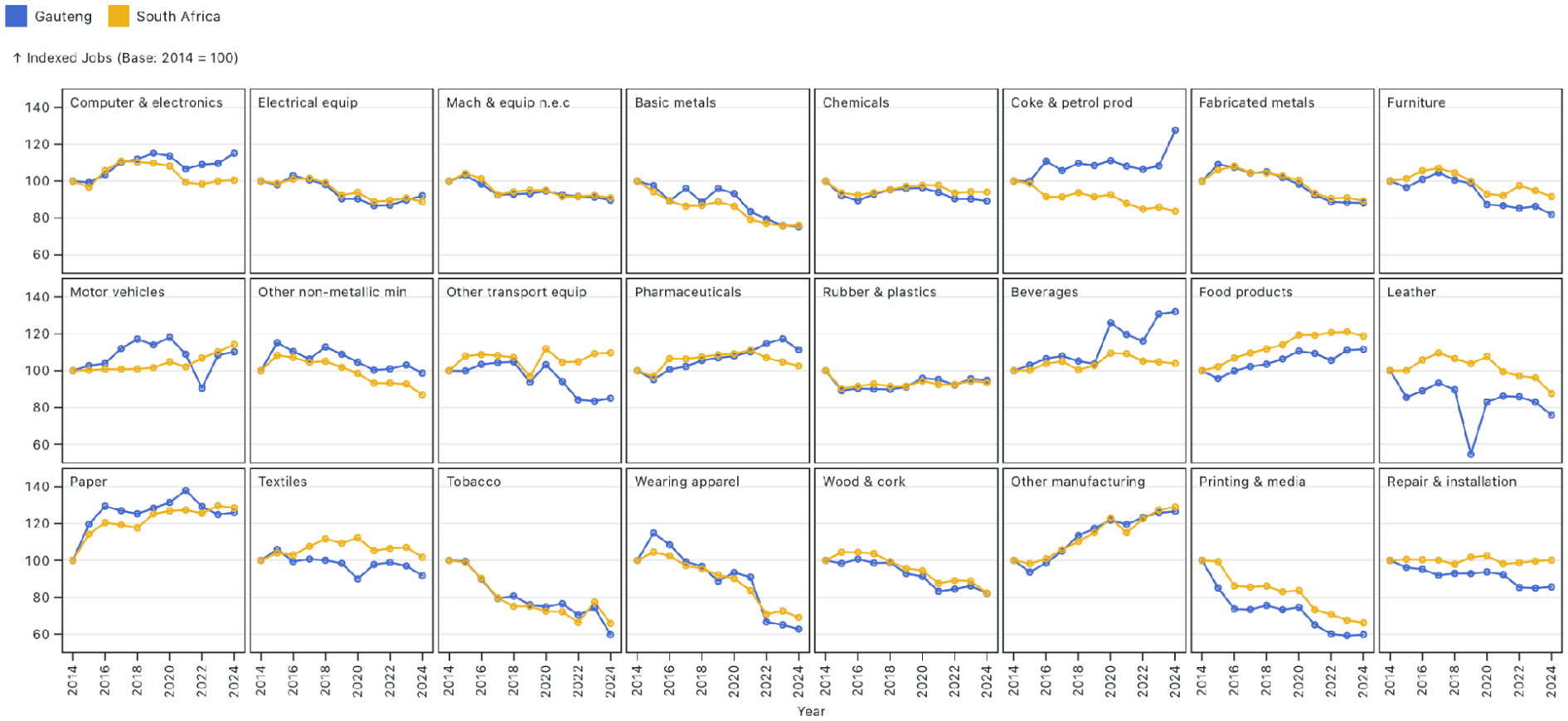


Source: Authors' calculations using the Spatial Tax Panel, version 6.0

These aggregated numbers mask some important distinctions about changes to the composition of manufacturing in Gauteng (Figure 3). A number of sub-sectors did manage to grow. The highest growth in Gauteng came from beverages (32%; 3,682 new jobs), coke and petroleum products (28%; 1,771 new jobs), paper (26%; 2,199 new jobs) and computer and electronics (15%; 1,592 new jobs). Interestingly, all of these sub-sectors showed solid growth whereas their national performance was stagnant (with the exception of paper which also showed strong national growth). Food products are also worth mentioning because of their large base, growing by 11% and adding 6,886 jobs, more than any other sector.

In contrast, most of Gauteng's manufacturing sub-sectors experienced significant declines over the ten-year period. Discounting sub-sectors with a low base, the largest contracting sub-sectors included printing and media (-40%; 11,713 jobs lost), basic metals (-25%; 12,417 jobs lost) and furniture (-18%; 2,086 jobs lost). Fabricated metals (-12%; 8,764 jobs lost) also shed significant jobs off of a large base. The experience of these sub-sectors matched up with national trends which similarly showed sharp declines.

Figure 3: Gauteng and South Africa's manufacturing growth or decline, 2014-2024



Source: Authors' calculations using the Spatial Tax Panel, version 6.0

A key question is whether these shifts simply represent industrial decay or some form of deeper industrial upgrading and evolution. Another important question is whether these changes were unique to Gauteng.

Figure 4 helps make sense of the overall pattern of manufacturing employment change in Gauteng by plotting each manufacturing sub-sector in relation to growth within the region (x-axis) and its growth in the rest of South Africa (y-axis) over the period 2014 to 2024. Employment totals are indexed to 100 in 2014 such that values over 100 are indicative of overall growth since 2014, while figures below 100 indicate sub-sectoral employment decline. This divides each manufacturing sub-sector growth or decline within four quadrants or scenarios:

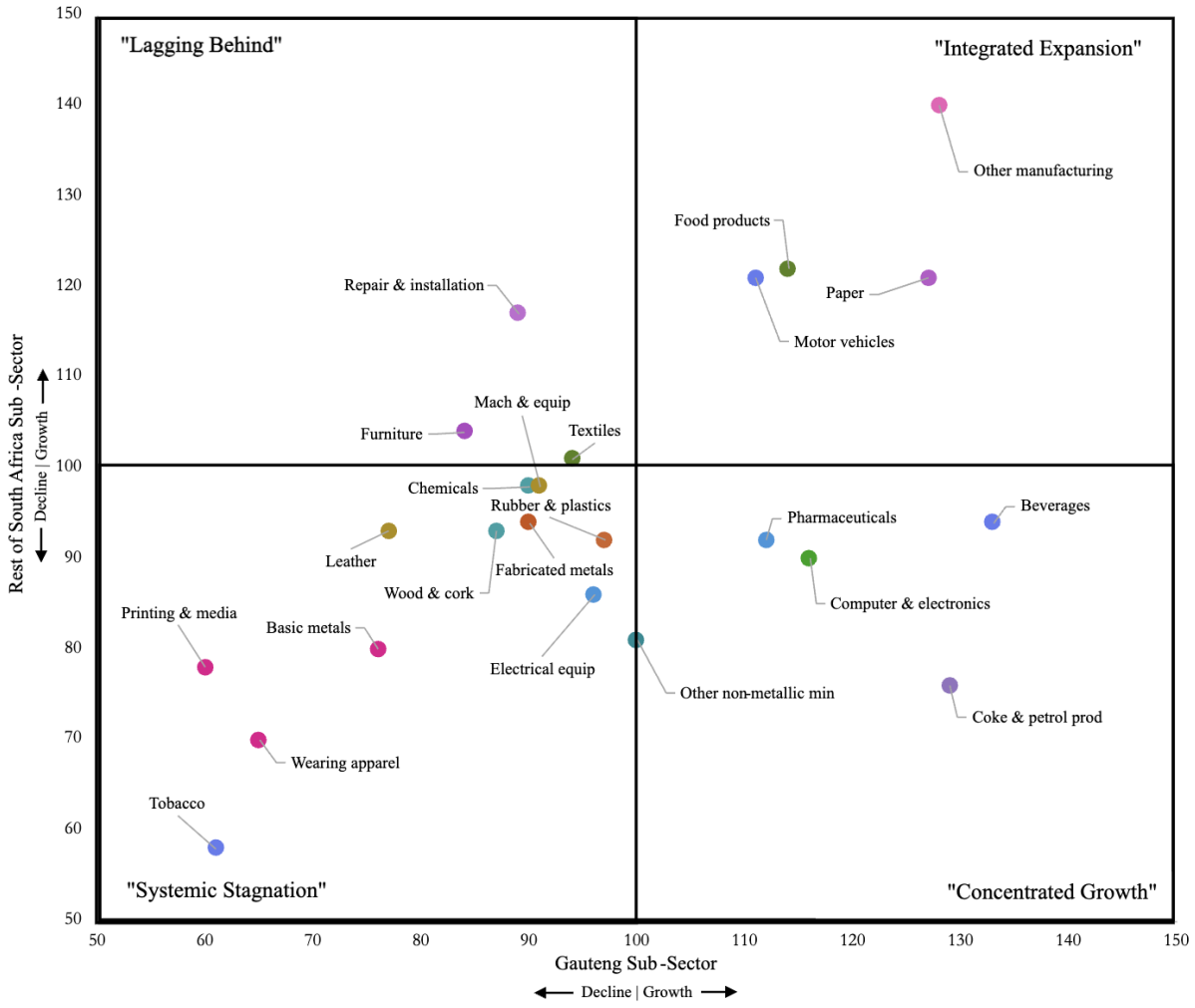
(1) 'Integrated expansion' (the upper-right quadrant): this scenario shows sub-sectors where Gauteng experienced growth along with the rest of the country over the period. Clear examples in this category include: paper; food products; motor vehicles; with other manufacturing a significant growth sub-sector in both cases.

(2) 'Concentrated growth' (the bottom-right quadrant): this scenario shows sub-sectors where Gauteng's employment expanded but the rest of South Africa registered employment contraction. The coke and petroleum products, beverages, computer and electronics, and pharmaceuticals sub-sectors meet this definition.

(3) 'Lagging behind' (upper-left quadrant): this scenario shows where Gauteng has experienced declines in a sub-sector while the rest of South Africa demonstrated growth. Other transport equipment, textiles, and furniture fit this category neatly.

(4) 'Systematic stagnation' (bottom-left quadrant): this scenario shows where both Gauteng and the rest of South Africa experienced sub-sector declines. This quadrant includes the majority of manufacturing sub-sectors—the most significant declines were in tobacco; less so in wearing apparel, printing and media, and basic metals.

Figure 4: Gauteng and Rest of South Africa growth and decline in manufacturing sub-sectors, 2014-2024



Source: Authors' calculations using the Spatial Tax Panel, version 6.0

Notes: Manufacturing sectors are reported at the 2-digit level

Taken together, the evidence is fairly mixed although there are a few emerging trends worth highlighting. First, Gauteng's manufacturing outlook looks bundled up with broader national trends. The overwhelming majority of Gauteng manufacturing sub-sectors either expanded or contracted in step with the rest of the country and there is a strong positive correlation visible in the figure.

Second, the types of manufacturing activities that did manage to grow in Gauteng were not related to South Africa's historic mining and minerals beneficiation.

Deeper examinations of the 2-digit sub-sectors driving growth within Gauteng (Table A1 in the appendix) demonstrate that across the different planning regions, several sub-sectors appear frequently among the top five. Food products is the most widespread growth sub-sector across Gauteng, growing in 13 regions, adding about 12,000 employees over the period. This growth was led by JHB_F (+2,909), EKU_B (+2,347), TSH_4 (+2,020) and GT422 (+1,957), with several regions more than doubling their food employment. Rubber and plastics is nearly as broad, appearing in 12 regions with a net gain of roughly 4,450 FTEs and very high growth rates in JHB_A (+328%) and GT481 (+214%). Only TSH_7 experienced contraction in employment of rubber and plastics. Other manufacturing and non-metallic minerals also recur (nine and ten regions respectively, each adding roughly 3,000 to 3,700 FTEs), though the minerals sub-sector employment growth was concentrated in JHB_E (+1,368).

Other sub-sectors appear far more geographically concentrated in the province. For example, motor vehicles added approximately 4,100 employees. However, around 86% of that growth was located in Tshwane (TSH_6 +2,390 and TSH_1 +1,124), making it a regional story rather than a broad trend. This indicates positive payoffs for national industrial support and policies targeting specific industrial sectors, such as the South African Automotive Masterplan 2035 (since 2018) and the employment growth in automotives through spatial-industrial clustering policies such as the Tshwane Automotive Special Economic Zone. Fabricated metals was another stronger sub-sector grower, concentrated mostly in Ekurhuleni (EKU_A +2,488, EKU_C +1,191), which reinforces the area's metals and engineering base, but it shrinks in EKU_D, GT423 and GT485. Finally, the pharmaceuticals sub-sector's employment growth was mainly located in JHB_A (+2,088, +107%).

The main takeaways are that, first, food and plastics are the most dependable sources of growth, appearing in a majority of regions with mostly positive employment growth. Second, motor vehicles, pharmaceuticals and non-metallic minerals show large gains, but each depends heavily on one or two regions, so regional policy appears to matter for these sub-sectors, rather than any single national trend. Third, the fabricated metals sub-sector's trends confirm Ekurhuleni's industrial specialisation in this sector, but also that its presence remains weak elsewhere. Finally, because each region shows only its top five sectors by absolute change, a sector's frequency here reflects how often it ranks highly, not its share of total manufacturing employment.

Overall, the insights in this section highlight the extent of sectoral change in Gauteng. Taking this examination further, the next section interrogates how Gauteng's industrial geography has changed since 2014, revealing patterns of de-industrialisation in older industrial nodes alongside new forms of sectoral diversification and spatial reconfiguration.

4.2 Gauteng's changing industrial geography: Growth, decay, diversification, and stagnation

The spatial-industrial composition inherited from apartheid was designed to retain economic profit and control among the White minority. Industrial activities and associated linkages were originally spatially concentrated around White urban spaces that developed in proximity to natural resource endowments. However, these spatial industrial patterns were later influenced by the apartheid state's attempts to reconcile its industrial planning with its forced resettlement of Black urban populations on the economic periphery of the province through industrial decentralisation (Wellings & Black, 1986). The uneven patterns of manufacturing activity that formed in the wake of these efforts were part of apartheid's broader territorial political economy, which deliberately organised industrial activity to reinforce segregation and sustain a racially and class-structured economy (see Bell, 2025).

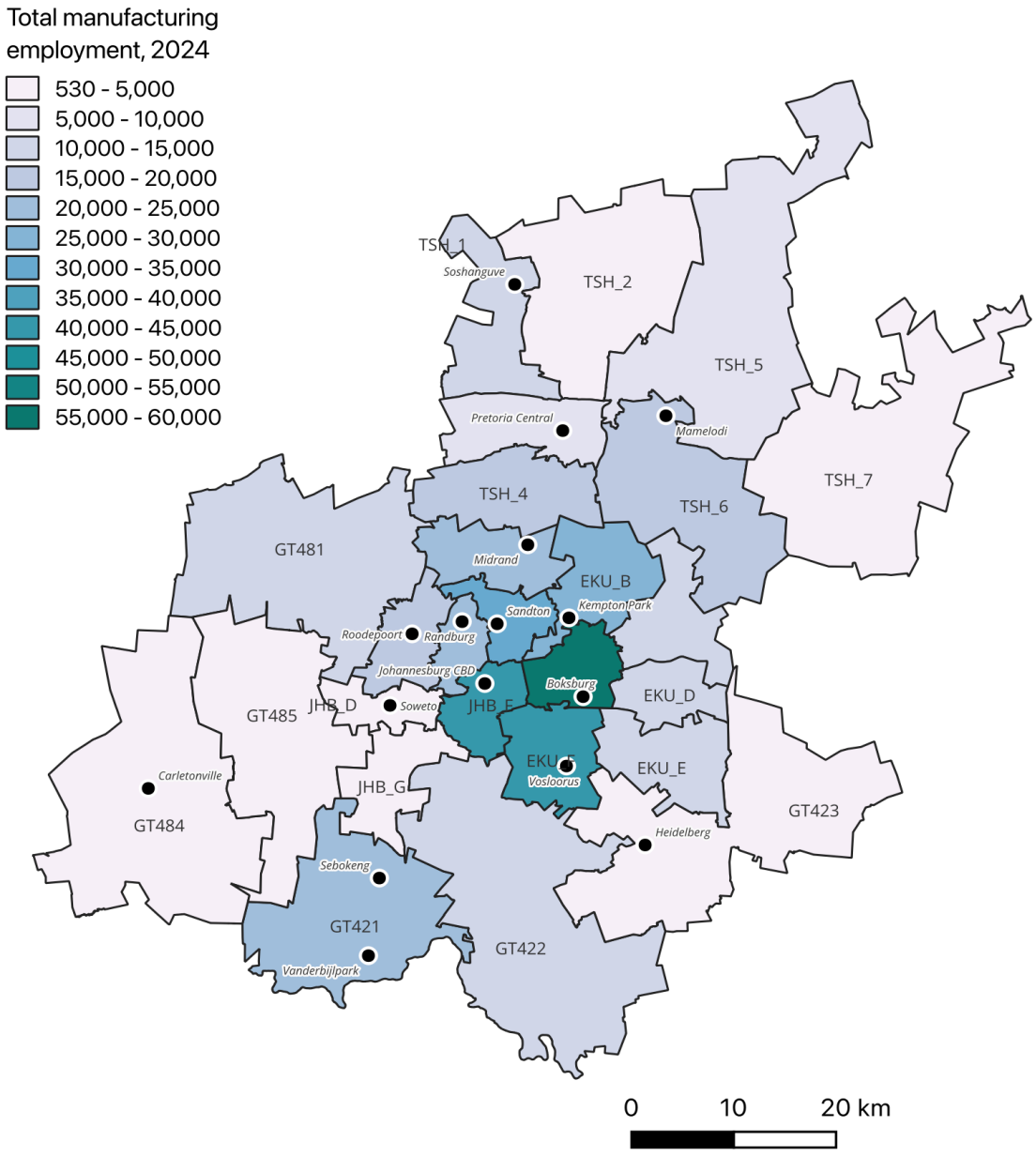
Spatial shifts in manufacturing employment

Against this historical backdrop, the key question is whether Gauteng's inherited industrial geography has persisted or been reconfigured over the past decade.

Figure 5 shows the present-day mapping of manufacturing employment within Gauteng. The majority of manufacturing activity remains concentrated within planning regions located in Ekurhuleni, Johannesburg, Tshwane, and Emfuleni, which make up 321,658 manufacturing jobs or 74.9% of the total in Gauteng (429,699). Within these metropolitan areas, EKU_A: Kempton Park to Boksburg (56,519), JHB_F: Johannesburg (41,991), EKU_F: Alberton to Vosloorus (41,199), JHB_E:

Alexandra/Sandton (33,883), and EKU_B: Tembisa to Edenvale (27,975) represent 66% of manufacturing employment in Johannesburg and Ekurhuleni. Outside of these primary manufacturing nodes, prominent secondary nodes include JHB_B: Randburg (23,435), JHB_A: Midrand (22,304), and GT421: Emfuleni (21,172), employing approximately 15.6% of Gauteng's total manufacturing employment in 2024.[4] There is evidently still strong continuity with apartheid-era patterns of industrial spatial organisation in terms of its primary nodes, while some secondary nodes are now prevalent.

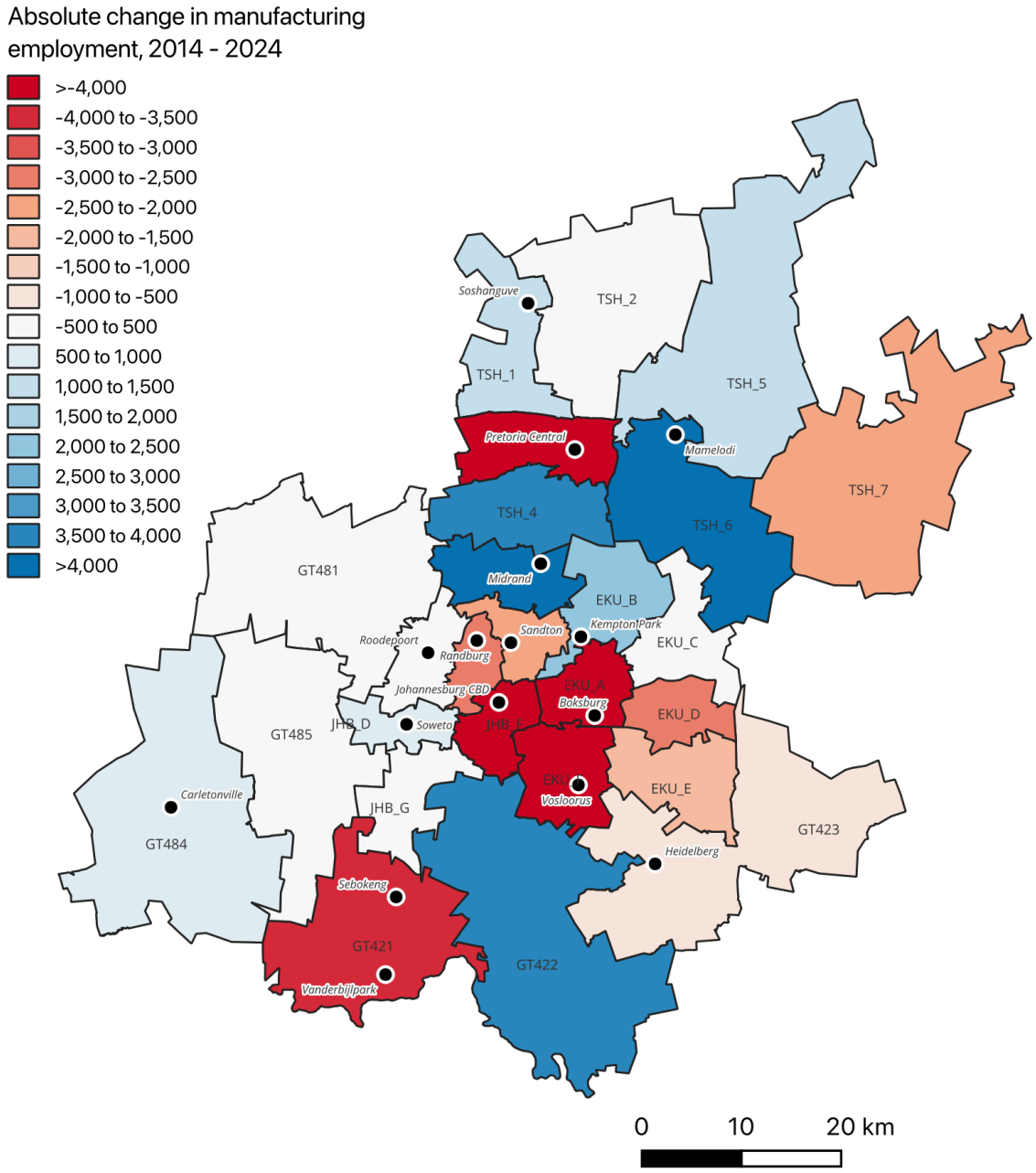
Figure 5: Gauteng's total manufacturing employment, 2024



Source: Authors' calculations using the Spatial Tax Panel, version 6.0

[4] All secondary nodes of industrial activity in 2024 include EKU_C: Daveyton; EKU_D: Benoni to Springs; EKU_E: Kwa-Thema to Nigel; GT421: Emfuleni; GT481: Mogale City; JHB_A: Midrand; JHB_B: Randburg; JHB_C: Roodepoort; TSH_1: Akasia/Soshanguve; TSH_3: Pretoria; TSH_4: Centurion; TSH_6: East.

Figure 6: Gauteng's change in manufacturing employment, 2014-2024



Source: Authors' calculations using the Spatial Tax Panel, version 6.0

Yet focusing directly on the changes in manufacturing employment between 2014 and 2024 (Figure 6) shows that some degree of spatial restructuring is also underway. For instance, four of the most prominent manufacturing hubs in Gauteng in 2024—EKU_A: Kempton Park to Boksburg; EKU_F: Alberton to Vosloorus; JHB_E: Alexandra/Sandton; JHB_F: Johannesburg—together lost approximately 29,970 manufacturing jobs since 2014. Several secondary nodes also experienced declines in manufacturing between 2014 and 2024. These included TSH_3: Pretoria (8,700), GT421: Emfuleni (3,509), JHB_B: Randburg (2,918), and EKU_D: Benoni to Springs (2,544). In contrast, the figure also clearly highlights that manufacturing was not in decline in all planning regions evenly. There was a minor outward spread of manufacturing employment growth clustered around JHB_A: Midrand (4,958), TSH_6: East (4,548), TSH_4: Centurion (3,849), and EKU_B: Tembisa to Edenvale.

Overall, there is continuity with Gauteng's historical industrial geography but selective spatial restructuring.

Sectoral shifts in manufacturing employment

How do these spatial shifts relate to the composition of manufacturing within each region? Tables A1 and A2 in the appendix identify the five manufacturing sub-sectors (at the 2-digit level) with the largest absolute employment gains and losses, respectively, in each region. This is a key consideration in the literature which recognises that clusters of co-located firms might share in collective gains or losses from the spillovers or agglomeration economies shared between them.

Within the established industrial core, substantial losses occurred in both heavy industry and older light-manufacturing activities. Basic metals employment fell by approximately 2,400 FTEs in Kempton Park–Boksburg, 4,200 in Alberton–Vosloorus and 2,100 in Johannesburg's Region F. Together, these losses amounted to around 8,700 FTEs. Beyond this common decline, the sectoral composition of losses differed. Kempton Park–Boksburg also experienced large reductions in food products, machinery and motor vehicles, while Alberton–Vosloorus lost employment in fabricated metals, wood products and chemicals. In Johannesburg's Region F, printing was the largest source of job losses, followed by basic metals, wood products, wearing apparel and machinery.

However, contraction within these regions was accompanied by growth in other manufacturing activities. Kempton Park–Boksburg gained approximately 2,500 FTEs in fabricated metals, despite losing employment in basic metals and machinery. Johannesburg's Region F gained around 2,900 FTEs in food products, even as several of its established manufacturing activities contracted. These contrasts show that aggregate regional decline can coexist with substantial expansion in particular sub-sectors. They also reveal divergent trajectories within the same industry. For instance, fabricated metals grew in Kempton Park–Boksburg but contracted in Alberton–Vosloorus, while food products expanded in Johannesburg's Region F but declined in Kempton Park–Boksburg.

The regions recording overall manufacturing employment growth likewise followed different sectoral trajectories. Food products featured prominently in Tembisa–Edenvale, Centurion and Midvaal, adding approximately 2,300, 2,000 and 2,000 FTEs, respectively. Other sources of growth were more locally concentrated. Midrand's largest gains were in pharmaceuticals (+2,088 FTEs) and rubber and plastics (+1,194), while eastern Tshwane's gains were led by motor vehicles (+2,390) and chemicals (+1,252). These differences suggest that growth across emerging nodes reflects several distinct industrial trajectories rather than a single expanding manufacturing activity.

Growth also extended across several sub-sectors within individual regions. In Centurion, food products expanded alongside machinery, pharmaceuticals, electronics and other manufacturing. Tembisa–Edenvale recorded gains in machinery, fabricated metals, electronics and electrical equipment, in addition to food products. Midvaal combined food-processing growth with gains in basic metals, other transport equipment, non-metallic mineral products and chemicals. Its expansion in basic metals is particularly notable against the substantial losses in several established industrial nodes.

The collective gains and losses in these clusters appear to be consistent with both urbanisation and localisation economies and their impact in shaping the evolving spatial organisation of manufacturing activity in Gauteng over the period. Furthermore, employment growth during the period is concentrated in regions that boast diversified manufacturing bases (Midrand, Centurion) or strong

sector clusters (automotive in East Tshwane), while decline is concentrated in the traditional heavy-industry and older light-manufacturing areas of Ekurhuleni and Johannesburg.

This appears to suggest that regions' existing capabilities in 2014 conditioned their later trajectories, and that gains or losses may be reinforced in planning regions with similar industrial structures. If so, current trends in one region may offer signals about where future gains or losses might occur, and investors may have responded to perceived trends in comparable or neighbouring regions and to local conditions amenable to particular types of industrial activity.

However, the data cannot test the relationship directly and targeted spatial-industrial policy (such as the Automotive Masterplan and the Tshwane Automotive SEZ), combined with data effects such as plant closures or reclassification may also explain part of these patterns. Further analysis of firm-level data, regional linkages and investment flows would be needed to establish the existence of positive spillover or neighbourhood effects. Another interesting insight from the data is that Midvaal (GT422) represents an island of growth, sandwiched between the decline cluster already discussed and Emfuleni as an island of decline, with losses concentrated in metals and related manufacturing. More work is needed to understand the underlying causes of Midvaal's growth among regions of extreme decline.

In summary, we note that Gauteng's industrial geography is one of continuity and selective restructuring. The province's inherited apartheid-era industrial skeleton remains largely intact, with established nodes in Ekurhuleni, central Johannesburg, and Emfuleni continuing to anchor manufacturing employment in absolute terms (refer back to Figure 5) – albeit with this cluster experiencing significant losses. Notable disruptions have occurred in the last ten years. Deindustrialisation has led to job losses in the established core, but manufacturing activity has also begun to decentralise to some degree when examining the changes over the period, with modest employment gains in peripheral nodes such as Midrand, Centurion, East Tshwane, and Midvaal (recall Figure 6). The overall trajectory is thus not one of simple decline or spatial transformation. Instead, the data indicates a gradual loosening of well-established industrial geography, with primary nodes of manufacturing activity gradually weakening and select secondary nodes gaining importance and stature over time.

Diversification and specialisation across planning regions

Another key consideration for this paper is how spatial industrial shifts relate to changing proficiencies in manufacturing. In other words, did employment gains or losses induce deeper expansion or contraction in the number and types of products manufactured?

While the STP does not publish product-level data, it does include very granular sectoral information down to a 5-digit level (i.e. sub-sub-sub-sub sector level). Therefore, we can at least investigate whether there were changes in the total number of granular industries in which specific places reported a proficiency. This is shown in Figure 7 which reports the number of 5-digit manufacturing sectors with a location quotient score of >1.2 in 2014 and 2024 for each planning region. To put it another way, the figure explores whether there were changes in the specialisation of each region.

Sensitivity of the results to alternative measures of industrial change is reported in Table A3 of the appendix[5].

Figure 7 requires careful interpretation and further case-study research is needed to understand the types of activities emerging or falling away within each specific planning region. However, we can offer several broad observations.

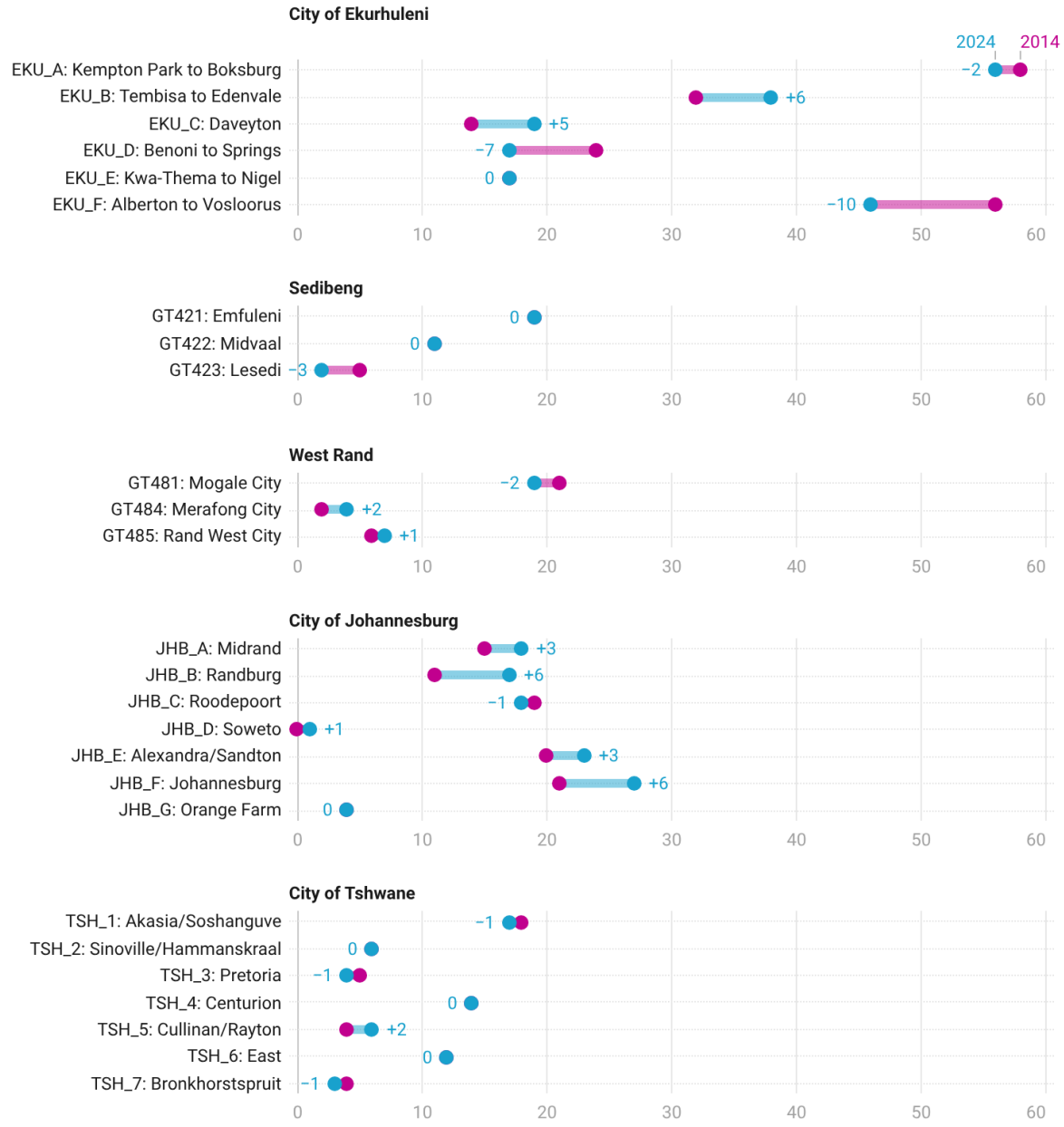
The first is that there was an impressive number of specialised industrial activities taking place in many of Gauteng's manufacturing regions, exceeding more than 30 distinctive granular 5-digit industries in some places.[6] Such diversification was particularly high in historic industrial nodes, including EKU_A: Kempton Park to Boksburg (56); EKU_F: Alberton to Vosloorus (46); EKU_B: Tembisa to Edenvale (38); and JHB_F: Johannesburg (27).

Second, what is also striking was the extent of change both in terms of places adding or losing industries in which they registered a proficiency. This is illustrated in the case of Ekurhuleni where some of its well-known industrial nodes lost a significant number of industries (EKU_A: Kempton Park to Boksburg; EKU_F: Alberton to Vosloorus; EKU_D: Benoni to Springs lost 19 industries combined). Yet, at the same time, the secondary node of EKU_B: Tembisa to Edenvale, along with EKU_C: Daveyton, added 11 proficiencies combined. So it was a mixed pattern overall but which was characterised by a surprising degree of change across and within the various planning regions.

[5] The location quotient can be sensitive to fairly small changes in employment particularly because this analysis is reported at a 5D level (for instance, where there is a small national or local base). The LQ could also reflect arbitrary changes such as where nationwide employment is in rapid decline (but local employment is declining more slowly). Therefore Table A3 shows related metrics of industrial specialisation (the number of 5D manufacturing sectors with more than 200 employees; the number of 5D sectors growing or declining by 10% or more) and how these have changed between 2014 and 2024 across each region. While there are some differences between regions comparing indicators, the overall pattern is fairly robust in identifying places of growing industrial concentration or diversification.

[6] There were a total of 165 manufacturing 5-digit industries in South Africa in 2024.

Figure 7: Gauteng industrial changes based on location quotient, 2014-2024



Pink lines indicate more concentration; Blue lines indicate more diversification

Source: Authors' calculations using the Spatial Tax Panel, version 6.0

Note: Manufacturing sectors are reported at the 5-digit level; sub-sectors with less than 200 employees in both 2014 and 2024 were excluded to avoid sensitivity to a small base

Johannesburg was more consistent by comparison. Even though many of Johannesburg's regions had lost significant numbers of manufacturing jobs over the period, most of these same areas increased their total number of proficiencies (JHB_A: Midrand, JHB_B: Randburg, JHB_E: Alexandra/Sandton, and JHB_F: Johannesburg added 18 industries). Only JHB_D: Soweto and JHB_G: Orange Farm showed little change, which is perhaps unsurprising considering that these have never been industrial areas. The rest of the province was more static with most planning regions within Tshwane, Sedibeng and the West Rand maintaining a similar number of capabilities over the period.

Given this relatively stable manufacturing landscape in terms of industrial proficiencies, our analysis finds limited support for Smith's (1984) seesaw theory applied to Gauteng over this period, which predicts that manufacturing capital will move from developed core regions to less developed peripheral ones. However, we recognise that the study period is relatively short and employment is used as a proxy for investment. A more detailed study of investment and property prices over a longer time horizon could try to establish whether the conditions for relocation exist, as Smith's (1984) theory would predict.

Nonetheless, when we read these changes in the context of deindustrialisation in the province—a loss of over 36,000 employees since 2014—this analysis highlights that manufacturing employment decline has also come with a gain in proficiencies in many instances. On the one hand, Gauteng appears to be undergoing deindustrialisation in terms of overall manufacturing employment but on the other hand it is gaining proficiency and diversity in the number of its manufacturing sub-sectors.

5. Conclusion: Beyond deindustrialisation and geographic restructuring

South Africa's post-apartheid manufacturing sector is often described as deindustrialising. Yet a lack of detailed analysis at the sub-provincial level limits our understanding of how historical trajectories, institutional conditions, and evolving regional capabilities shape this process in Gauteng. This gap makes it difficult to identify the drivers of industrial decline and weakens the design and impact of industrial policy.

Drawing on new evidence from the Spatial Tax Panel—a novel source of administrative firm-level tax returns—this paper confirms substantial manufacturing employment decline and shows that these losses have been particularly severe in Gauteng over the last decade. However, the findings also point to a more complex process of industrial restructuring, both sectorally and geographically, beneath the headline decline.

First, Gauteng's manufacturing trajectory largely mirrors broader national trends. Most manufacturing sub-sectors expanded or contracted in step with the rest of South Africa. Yet important shifts in industrial composition are evident. Employment losses were concentrated in traditional manufacturing activities such as basic metals, fabricated metals, chemicals and rubber and plastics, while growth occurred in sectors including motor vehicles, computer and electronics, pharmaceuticals, beverages, and food products. Although employment data alone cannot demonstrate industrial upgrading, these trends suggest a shift away from some historically resource-linked activities towards potentially more sophisticated forms of production.

Second, these sectoral shifts were also accompanied by a reconfiguration of Gauteng's industrial geography. Manufacturing employment remains heavily concentrated within the province's historic industrial core, particularly in Johannesburg and Ekurhuleni. However, several established industrial nodes experienced substantial employment losses, while secondary nodes such as Midrand, Centurion, Midvaal, and eastern Tshwane recorded limited growth. The evidence therefore points to some restructuring within Gauteng's manufacturing core.

Third, manufacturing decline has not necessarily been accompanied by a narrowing of industrial capabilities. Many planning regions increased the number of specialised 5-digit manufacturing activities in which they demonstrated a comparative advantage, even where employment declined.

This was particularly evident in Johannesburg, while Ekurhuleni displayed a more uneven pattern of gains and losses across its sub-regions.

Taken together, these findings point towards deeper processes of diversification, specialisation, and capability reconfiguration, although further research is required to confirm the extent and nature of industrial change. It also provides support for the effectiveness of diversifying local industrial bases, though how this translates into broader socio-economic gains is uncertain. More broadly, the analysis in this paper demonstrates the value of administrative tax data for understanding regional economic geography changes. The Spatial Tax Panel makes it possible to move beyond aggregate measures of manufacturing decline and examine how industrial restructuring unfolds unevenly across places, sectors, and capabilities within Gauteng.

Viewed through this lens, Gauteng's industrial transformation appears more complex than conventional accounts of either deindustrialisation or decentralisation would suggest. Our analysis indicates that there is both a continuation and evolution of the geography of manufacturing employment in the province. This is seen through the evidence of declines in the historical hubs of manufacturing activity and a deepening of sub-sector competencies within these landscapes. Therefore, future efforts to address South Africa's persistent spatial inequalities should place sub-provincial industrial geography at the centre of policy design and implementation. Only by engaging with the specificities of local economic structures and development conditions can policymakers identify and mobilise the resources necessary for a more even and resilient regional industrial geography.

For policy, this means rejecting one-size-fits-all interventions in favour of regionally attuned approaches that strengthen existing industrial ecosystems while supporting new ones to emerge. Research such as this contributes to strengthening these ecosystems by helping with the identification of local industrial capabilities and the development of local value chains. Supporting the development of local value chains demands a fine-grained understanding of each region's industrial complexity, its structures, activities, and products, both within and across sub-provincial boundaries. With this information, policymakers can design industrial policies that are targeted to different localities' industrial capabilities and the needs and skills of their stakeholders. Moreover, such a spatially-targeted policy approach should also be cognisant of the potential to create linkages to other capabilities across the province thereby creating a robust and resilient industrial ecosystem in the province.

While this paper provides new evidence on the geography of manufacturing change in Gauteng, it also highlights important gaps in our understanding of the underlying processes driving these shifts. Two important questions emerge from this analysis for future research: First, what types of manufacturing capabilities are emerging in Gauteng's growing nodes, and do they represent genuine industrial upgrading or simply lateral moves? Second, how are these spatial shifts affecting employment quality and inequality in the region? Answering both will require extended firm-level and product/industry-level investigations of regional value chains.

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Table A1: The 5 largest growing 2-digit manufacturing sectors by planning region

	Description	FTE 2014	FTE 2024	Abs change	% change
EKU_A	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	8,359	10,847	2,488	29.8%
	17. Manufacturing of Paper and Paper Products	1,312	1,766	454	34.6%
	27. Manufacture of Electrical Equipment	2,482	2,922	440	17.7%
	20. Manufacture of Chemicals and Chemical Products	3,642	3,923	281	7.7%
	26. Manufacture of Computer, Electronic and Optical Products	1,002	1,147	145	14.5%
EKU_B	10. Manufacturing of Food Products	1,937	4,284	2,347	121.2%
	28. Manufacture of Machinery and Equipment N.E.C.	1,642	2,440	798	48.6%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	3,897	4,401	503	12.9%
	26. Manufacture of Computer, Electronic and Optical Products	598	995	397	66.3%
	27. Manufacture of Electrical Equipment	1,432	1,825	392	27.4%
EKU_C	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	1,347	2,538	1,191	88.4%
	22. Manufacture of Rubber and Plastic Products	397	750	353	88.9%
	26. Manufacture of Computer, Electronic and Optical Products	50	393	343	687.4%
	27. Manufacture of Electrical Equipment	511	805	294	57.5%
	23. Manufacture of Other Non-Metallic Mineral Products	333	626	293	87.8%
EKU_D	10. Manufacturing of Food Products	825	976	151	18.3%
	23. Manufacture of Other Non-Metallic Mineral Products	1,054	1,175	122	11.5%
	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	309	295	-14	-4.6%

	Description	FTE 2014	FTE 2024	Abs change	% change
	28. Manufacture of Machinery and Equipment N.E.C.	1,715	1,663	-52	-3.0%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	3,219	3,149	-69	-2.2%
EKU_E	23. Manufacture of Other Non-Metallic Mineral Products	621	1,042	421	67.8%
	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	316	465	149	47.2%
	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	299	375	76	25.6%
	10. Manufacturing of Food Products	633	706	72	11.4%
	33. Repair and Installation of Machinery and Equipment	354	383	29	8.3%
EKU_F	28. Manufacture of Machinery and Equipment N.E.C.	4,313	4,531	218	5.1%
	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	2,146	2,339	193	9.0%
	32. Other Manufacturing	1,055	1,238	183	17.3%
	26. Manufacture of Computer, Electronic and Optical Products	400	567	167	41.8%
	23. Manufacture of Other Non-Metallic Mineral Products	1,076	1,100	24	2.3%
GT421	10. Manufacturing of Food Products	1,132	1,549	417	36.9%
	17. Manufacturing of Paper and Paper Products	55	372	318	581.2%
	33. Repair and Installation of Machinery and Equipment	817	948	131	16.0%
	22. Manufacture of Rubber and Plastic Products	173	268	95	54.8%
	13. Manufacturing of Textiles	246	330	84	34.0%
GT422	10. Manufacturing of Food Products	1,739	3,697	1,957	112.6%
	24. Manufacture of Basic Metals	738	1,705	967	131.1%
	30. Manufacture of Other Transport Equipment	5	429	425	9433.6%

	Description	FTE 2014	FTE 2024	Abs change	% change
	23. Manufacture of Other Non-Metallic Mineral Products	994	1,384	390	39.3%
	20. Manufacture of Chemicals and Chemical Products	172	406	234	136.4%
GT423	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	250	345	95	38.0%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	573	442	-131	-22.8%
	17. Manufacturing of Paper and Paper Products	237	95	-142	-59.9%
	10. Manufacturing of Food Products	480	333	-146	-30.5%
	12. Manufacturing of Tobacco Products	734	280	-454	-61.8%
GT481	22. Manufacture of Rubber and Plastic Products	403	1,262	859	213.5%
	20. Manufacture of Chemicals and Chemical Products	704	1,241	537	76.3%
	11. Manufacturing of Beverages	475	706	231	48.6%
	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	447	637	190	42.6%
	13. Manufacturing of Textiles	320	490	169	52.9%
GT484	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	200	694	494	247.2%
	13. Manufacturing of Textiles	78	240	161	205.8%
	33. Repair and Installation of Machinery and Equipment	143	218	75	52.6%
	28. Manufacture of Machinery and Equipment N.E.C.	406	441	35	8.6%
	20. Manufacture of Chemicals and Chemical Products	206	208	2	0.9%
GT485	28. Manufacture of Machinery and Equipment N.E.C.	92	531	439	475.6%
	22. Manufacture of Rubber and Plastic Products	185	438	253	137.0%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	304	279	-25	-8.3%

	Description	FTE 2014	FTE 2024	Abs change	% change
	23. Manufacture of Other Non-Metallic Mineral Products	853	806	-47	-5.5%
	13. Manufacturing of Textiles	444	291	-153	-34.5%
JHB_A	21. Manufacture of Pharmaceuticals, Medicinal Chemical and Botanical Products	1,953	4,041	2,088	106.9%
	22. Manufacture of Rubber and Plastic Products	364	1,557	1,194	328.3%
	32. Other Manufacturing	439	1,301	862	196.1%
	30. Manufacture of Other Transport Equipment	127	732	605	475.0%
	11. Manufacturing of Beverages	1,032	1,438	405	39.2%
JHB_B	20. Manufacture of Chemicals and Chemical Products	1,798	2,568	770	42.9%
	32. Other Manufacturing	609	1,194	585	96.0%
	17. Manufacturing of Paper and Paper Products	479	941	462	96.3%
	11. Manufacturing of Beverages	104	500	396	378.8%
	24. Manufacture of Basic Metals	381	682	301	78.9%
JHB_C	28. Manufacture of Machinery and Equipment N.E.C.	705	1,461	756	107.3%
	22. Manufacture of Rubber and Plastic Products	847	1,383	535	63.2%
	32. Other Manufacturing	837	1,208	371	44.3%
	26. Manufacture of Computer, Electronic and Optical Products	297	649	352	118.8%
	18. Printing and Reproduction of Recorded Media	1,199	1,483	284	23.7%
JHB_D	10. Manufacturing of Food Products	67	414	347	520.1%
JHB_E	23. Manufacture of Other Non-Metallic Mineral Products	1,312	2,679	1,368	104.3%
	30. Manufacture of Other Transport Equipment	24	669	644	2641.5%

	Description	FTE 2014	FTE 2024	Abs change	% change
	32. Other Manufacturing	713	1,248	535	75.0%
	21. Manufacture of Pharmaceuticals, Medicinal Chemical and Botanical Products	1,482	2,004	523	35.3%
	11. Manufacturing of Beverages	714	1,174	460	64.4%
JHB_F	10. Manufacturing of Food Products	4,483	7,393	2,909	64.9%
	27. Manufacture of Electrical Equipment	1,869	2,331	462	24.7%
	31. Manufacture of Furniture (for Manufacture of Furniture of Ceramics, Concrete and Stone, See 2393, 2395, 2396)	2,581	2,809	228	8.8%
	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	780	906	126	16.2%
	17. Manufacturing of Paper and Paper Products	1,447	1,556	108	7.5%
JHB_G	10. Manufacturing of Food Products	656	927	270	41.2%
	22. Manufacture of Rubber and Plastic Products	300	514	214	71.4%
	14. Manufacturing of Wearing Apparel	314	431	117	37.2%
	20. Manufacture of Chemicals and Chemical Products	214	199	-15	-7.1%
	31. Manufacture of Furniture (for Manufacture of Furniture of Ceramics, Concrete and Stone, See 2393, 2395, 2396)	285	126	-160	-56.0%
TSH_1	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	2,694	3,818	1,124	41.7%
	10. Manufacturing of Food Products	298	742	445	149.5%
	17. Manufacturing of Paper and Paper Products	137	497	360	262.3%
	15. Manufacturing of Leather and Related Products	504	683	178	35.4%
	23. Manufacture of Other Non-Metallic Mineral Products	241	413	172	71.3%
TSH_2	22. Manufacture of Rubber and Plastic Products	41	510	469	1135.4%

	Description	FTE 2014	FTE 2024	Abs change	% change
	18. Printing and Reproduction of Recorded Media	80	256	176	219.8%
	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	237	338	100	42.3%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	677	753	76	11.2%
	24. Manufacture of Basic Metals	172	218	45	26.3%
TSH_3	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	218	573	355	163.2%
	32. Other Manufacturing	401	626	225	56.2%
	20. Manufacture of Chemicals and Chemical Products	389	526	137	35.1%
	22. Manufacture of Rubber and Plastic Products	342	448	106	30.8%
	10. Manufacturing of Food Products	1,179	1,237	58	4.9%
TSH_4	10. Manufacturing of Food Products	1,417	3,437	2,020	142.6%
	28. Manufacture of Machinery and Equipment N.E.C.	492	1,009	516	104.9%
	21. Manufacture of Pharmaceuticals, Medicinal Chemical and Botanical Products	795	1,274	479	60.3%
	26. Manufacture of Computer, Electronic and Optical Products	1,682	2,146	464	27.6%
	32. Other Manufacturing	417	812	394	94.5%
TSH_5	10. Manufacturing of Food Products	594	1,739	1,145	192.8%
	28. Manufacture of Machinery and Equipment N.E.C.	37	203	166	442.0%
	32. Other Manufacturing	178	323	145	81.3%
	23. Manufacture of Other Non-Metallic Mineral Products	454	549	94	20.8%
	22. Manufacture of Rubber and Plastic Products	146	235	89	60.7%

	Description	FTE 2014	FTE 2024	Abs change	% change
TSH_6	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	1,451	3,841	2,390	164.7%
	20. Manufacture of Chemicals and Chemical Products	729	1,981	1,252	171.8%
	22. Manufacture of Rubber and Plastic Products	648	1,084	436	67.3%
	32. Other Manufacturing	542	926	384	70.7%
	31. Manufacture of Furniture (for Manufacture of Furniture of Ceramics, Concrete and Stone, See 2393, 2395, 2396)	195	529	334	171.4%
TSH_7	23. Manufacture of Other Non-Metallic Mineral Products	267	441	174	65.2%
	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	204	165	-39	-19.1%
	22. Manufacture of Rubber and Plastic Products	531	379	-152	-28.7%
	24. Manufacture of Basic Metals	357	15	-342	-95.8%
	19. Manufacture of Coke and Refined Petroleum Products	841	28	-813	-96.7%

Source: Authors' calculations using the Spatial Tax Panel, version 6.0

Note: Manufacturing sectors are reported at the 2-digit level; sub-sectors with less than 200 employees in both 2014 and 2024 were excluded to avoid sensitivity to a small base

Table A2: The 5 largest declining 2-digit manufacturing sectors by planning region

	Description	FTE 2014	FTE 2024	Abs change	% change
EKU_A	10. Manufacturing of Food Products	6,629	3,465	-3,164	-47.7%
	24. Manufacture of Basic Metals	9,088	6,671	-2,417	-26.6%
	28. Manufacture of Machinery and Equipment N.E.C.	8,356	6,559	-1,796	-21.5%
	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	3,474	2,000	-1,475	-42.4%
	21. Manufacture of Pharmaceuticals, Medicinal Chemical and Botanical Products	1,149	341	-808	-70.3%
EKU_B	33. Repair and Installation of Machinery and Equipment	2,823	1,596	-1,227	-43.5%
	11. Manufacturing of Beverages	958	154	-804	-83.9%
	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	1,478	848	-630	-42.6%
	30. Manufacture of Other Transport Equipment	950	562	-388	-40.9%
	21. Manufacture of Pharmaceuticals, Medicinal Chemical and Botanical Products	829	448	-381	-46.0%
EKU_C	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	1,203	87	-1,116	-92.8%
	10. Manufacturing of Food Products	1,319	304	-1,015	-77.0%
	13. Manufacturing of Textiles	275	70	-205	-74.7%
	24. Manufacture of Basic Metals	1,138	948	-190	-16.7%
	33. Repair and Installation of Machinery and Equipment	1,073	925	-148	-13.8%

	Description	FTE 2014	FTE 2024	Abs change	% change
EKU_D	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	1,222	117	-1,105	-90.4%
	24. Manufacture of Basic Metals	2,570	1,984	-585	-22.8%
	17. Manufacturing of Paper and Paper Products	437	238	-199	-45.6%
	27. Manufacture of Electrical Equipment	595	402	-194	-32.5%
	33. Repair and Installation of Machinery and Equipment	806	613	-193	-23.9%
EKU_E	11. Manufacturing of Beverages	710	136	-574	-80.9%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	3,527	3,049	-478	-13.6%
	22. Manufacture of Rubber and Plastic Products	1,316	1,044	-273	-20.7%
	24. Manufacture of Basic Metals	1,774	1,533	-241	-13.6%
	30. Manufacture of Other Transport Equipment	972	746	-226	-23.3%
EKU_F	24. Manufacture of Basic Metals	9,430	5,266	-4,164	-44.2%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	12,824	11,033	-1,791	-14.0%
	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	1,791	766	-1,025	-57.2%
	20. Manufacture of Chemicals and Chemical Products	2,624	1,645	-979	-37.3%
	33. Repair and Installation of Machinery and Equipment	2,257	1,784	-473	-20.9%

	Description	FTE 2014	FTE 2024	Abs change	% change
GT421	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	4,938	3,423	-1,515	-30.7%
	24. Manufacture of Basic Metals	11,083	9,625	-1,458	-13.2%
	28. Manufacture of Machinery and Equipment N.E.C.	1,334	791	-543	-40.7%
	23. Manufacture of Other Non-Metallic Mineral Products	1,626	1,210	-417	-25.6%
	27. Manufacture of Electrical Equipment	1,373	1,038	-334	-24.4%
GT422	32. Other Manufacturing	459	81	-378	-82.4%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	1,217	1,142	-74	-6.1%
	27. Manufacture of Electrical Equipment	251	321	70	27.7%
	22. Manufacture of Rubber and Plastic Products	192	278	86	44.8%
	33. Repair and Installation of Machinery and Equipment	129	218	89	69.0%
GT423	12. Manufacturing of Tobacco Products	734	280	-454	-61.8%
	10. Manufacturing of Food Products	480	333	-146	-30.5%
	17. Manufacturing of Paper and Paper Products	237	95	-142	-59.9%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	573	442	-131	-22.8%
	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	250	345	95	38.0%
GT481	10. Manufacturing of Food Products	2,725	2,090	-635	-23.3%

	Description	FTE 2014	FTE 2024	Abs change	% change
	28. Manufacture of Machinery and Equipment N.E.C.	1,598	1,110	-488	-30.5%
	24. Manufacture of Basic Metals	922	524	-398	-43.1%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	2,385	2,048	-337	-14.1%
	23. Manufacture of Other Non-Metallic Mineral Products	702	593	-109	-15.6%
GT484	20. Manufacture of Chemicals and Chemical Products	206	208	2	0.9%
	28. Manufacture of Machinery and Equipment N.E.C.	406	441	35	8.6%
	33. Repair and Installation of Machinery and Equipment	143	218	75	52.6%
	13. Manufacturing of Textiles	78	240	161	205.8%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	200	694	494	247.2%
GT485	10. Manufacturing of Food Products	1,858	944	-914	-49.2%
	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	594	374	-219	-36.9%
	13. Manufacturing of Textiles	444	291	-153	-34.5%
	23. Manufacture of Other Non-Metallic Mineral Products	853	806	-47	-5.5%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	304	279	-25	-8.3%
JHB_A	18. Printing and Reproduction of Recorded Media	1,136	769	-368	-32.3%

	Description	FTE 2014	FTE 2024	Abs change	% change
	20. Manufacture of Chemicals and Chemical Products	2,276	1,942	-334	-14.7%
	10. Manufacturing of Food Products	2,104	1,773	-331	-15.7%
	28. Manufacture of Machinery and Equipment N.E.C.	2,121	1,950	-171	-8.0%
	26. Manufacture of Computer, Electronic and Optical Products	1,050	1,037	-13	-1.3%
JHB_B	18. Printing and Reproduction of Recorded Media	4,171	2,198	-1,973	-47.3%
	19. Manufacture of Coke and Refined Petroleum Products	1,427	279	-1,148	-80.4%
	28. Manufacture of Machinery and Equipment N.E.C.	1,106	460	-646	-58.4%
	31. Manufacture of Furniture (for Manufacture of Furniture of Ceramics, Concrete and Stone, See 2393, 2395, 2396)	2,122	1,526	-596	-28.1%
	33. Repair and Installation of Machinery and Equipment	790	332	-459	-58.0%
JHB_C	31. Manufacture of Furniture (for Manufacture of Furniture of Ceramics, Concrete and Stone, See 2393, 2395, 2396)	1,216	674	-542	-44.6%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	2,502	2,135	-367	-14.7%
	24. Manufacture of Basic Metals	936	574	-361	-38.6%
	20. Manufacture of Chemicals and Chemical Products	1,386	1,030	-356	-25.7%
	14. Manufacturing of Wearing Apparel	283	3	-281	-99.0%
JHB_D	10. Manufacturing of Food Products	67	414	347	520.1%
JHB_E	20. Manufacture of Chemicals and Chemical Products	6,597	4,874	-1,722	-26.1%

	Description	FTE 2014	FTE 2024	Abs change	% change
	19. Manufacture of Coke and Refined Petroleum Products	1,918	394	-1,524	-79.4%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	4,221	2,845	-1,376	-32.6%
	10. Manufacturing of Food Products	5,069	3,914	-1,154	-22.8%
	27. Manufacture of Electrical Equipment	2,112	1,513	-600	-28.4%
JHB_F	18. Printing and Reproduction of Recorded Media	5,490	2,586	-2,905	-52.9%
	24. Manufacture of Basic Metals	4,894	2,804	-2,090	-42.7%
	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	2,130	836	-1,294	-60.8%
	14. Manufacturing of Wearing Apparel	2,464	1,252	-1,213	-49.2%
	28. Manufacture of Machinery and Equipment N.E.C.	4,322	3,183	-1,140	-26.4%
JHB_G	31. Manufacture of Furniture (for Manufacture of Furniture of Ceramics, Concrete and Stone, See 2393, 2395, 2396)	285	126	-160	-56.0%
	20. Manufacture of Chemicals and Chemical Products	214	199	-15	-7.1%
	14. Manufacturing of Wearing Apparel	314	431	117	37.2%
	22. Manufacture of Rubber and Plastic Products	300	514	214	71.4%
	10. Manufacturing of Food Products	656	927	270	41.2%
TSH_1	30. Manufacture of Other Transport Equipment	861	25	-836	-97.1%

	Description	FTE 2014	FTE 2024	Abs change	% change
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	1,315	1,048	-268	-20.4%
	31. Manufacture of Furniture (for Manufacture of Furniture of Ceramics, Concrete and Stone, See 2393, 2395, 2396)	244	100	-144	-59.1%
	22. Manufacture of Rubber and Plastic Products	915	799	-116	-12.7%
	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	563	484	-79	-14.1%
TSH_2	10. Manufacturing of Food Products	1,021	596	-425	-41.6%
	31. Manufacture of Furniture (for Manufacture of Furniture of Ceramics, Concrete and Stone, See 2393, 2395, 2396)	363	38	-325	-89.6%
	14. Manufacturing of Wearing Apparel	273	1	-272	-99.6%
	28. Manufacture of Machinery and Equipment N.E.C.	213	111	-102	-47.8%
	23. Manufacture of Other Non-Metallic Mineral Products	548	470	-78	-14.2%
TSH_3	18. Printing and Reproduction of Recorded Media	6,925	289	-6,636	-95.8%
	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	2,896	1,918	-978	-33.8%
	29. Manufacture of Motor Vehicles, Trailers and Semi-Trailers	1,241	371	-869	-70.1%
	27. Manufacture of Electrical Equipment	959	382	-577	-60.1%
	28. Manufacture of Machinery and Equipment N.E.C.	390	217	-173	-44.3%
TSH_4	25. Manufacture of Fabricated Metal Products, except Machinery and Equipment	1,602	1,144	-458	-28.6%

	Description	FTE 2014	FTE 2024	Abs change	% change
	23. Manufacture of Other Non-Metallic Mineral Products	1,220	870	-350	-28.7%
	18. Printing and Reproduction of Recorded Media	563	283	-280	-49.8%
	30. Manufacture of Other Transport Equipment	1,439	1,194	-245	-17.0%
	11. Manufacturing of Beverages	571	408	-163	-28.6%
TSH_5	33. Repair and Installation of Machinery and Equipment	354	217	-137	-38.6%
	31. Manufacture of Furniture (for Manufacture of Furniture of Ceramics, Concrete and Stone, See 2393, 2395, 2396)	210	83	-127	-60.4%
	24. Manufacture of Basic Metals	360	234	-126	-35.0%
	20. Manufacture of Chemicals and Chemical Products	270	219	-51	-18.7%
	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	199	203	4	2.0%
TSH_6	24. Manufacture of Basic Metals	482	182	-300	-62.2%
	13. Manufacturing of Textiles	339	109	-230	-67.8%
	15. Manufacturing of Leather and Related Products	307	95	-213	-69.2%
	10. Manufacturing of Food Products	1,896	1,715	-182	-9.6%
	12. Manufacturing of Tobacco Products	234	82	-153	-65.2%
TSH_7	10. Manufacturing of Food Products	1,943	595	-1,347	-69.4%

	Description	FTE 2014	FTE 2024	Abs change	% change
	19. Manufacture of Coke and Refined Petroleum Products	841	28	-813	-96.7%
	24. Manufacture of Basic Metals	357	15	-342	-95.8%
	22. Manufacture of Rubber and Plastic Products	531	379	-152	-28.7%
	16 Manufacturing of Wood and of Product of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials	204	165	-39	-19.1%

Source: Authors' calculations using the Spatial Tax Panel, version 6.0

Note: Manufacturing sectors are reported at the 2-digit level; sub-sectors with less than 200 employees in both 2014 and 2024 were excluded to avoid sensitivity to a small base

6.2 Table A3: Measures of industrial change at the 5-digit level

	Number of 5D manufacturing industries (FTE > 200)			Number of LQs >1.2 (FTE > 200)			Number of 5D manufacturing industries growing by more than 10%	Number of 5D manufacturing industries declining by more than 10%	Absolute Change
	2014	2024	Absolute Change	2014	2024	Absolute Change			
EKU_A	67	66	-1	58	56	-2	30	31	-1
EKU_B	41	44	3	32	38	6	22	13	9
EKU_C	15	19	4	14	19	5	16	2	14
EKU_D	24	17	-7	24	17	-7	8	7	1
EKU_E	17	18	1	17	17	0	9	7	2
EKU_F	61	52	-9	56	46	-10	20	23	-3
GT421	22	19	-3	19	19	0	6	8	-2
GT422	11	11	0	11	11	0	9	0	9
GT423	5	2	-3	5	2	-3	1	1	0
GT481	23	21	-2	21	19	-2	15	4	11
GT484	2	4	2	2	4	2	2	0	2
GT485	6	7	1	6	7	1	4	3	1
JHB_A	21	29	8	15	18	3	20	7	13
JHB_B	31	30	-1	11	17	6	18	10	8
JHB_C	24	24	0	19	18	-1	12	9	3
JHB_D	0	1	1	0	1	1	1	0	1
JHB_E	41	49	8	20	23	3	25	16	9
JHB_F	55	54	-1	21	27	6	23	23	0
JHB_G	4	4	0	4	4	0	4	0	4
TSH_1	18	18	0	18	17	-1	9	4	5

	Number of 5D manufacturing industries (FTE > 200)			Number of LQs >1.2 (FTE > 200)			Number of 5D manufacturing industries growing by more than 10%	Number of 5D manufacturing industries declining by more than 10%	Absolute Change
	2014	2024	Absolute Change	2014	2024	Absolute Change			
TSH_2	6	6	0	6	6	0	5	1	4
TSH_3	11	13	2	5	4	-1	8	2	6
TSH_4	21	27	6	14	14	0	18	6	12
TSH_5	4	6	2	4	6	2	6	0	6
TSH_6	21	21	0	12	12	0	13	4	9
TSH_7	4	3	-1	4	3	-1	2	1	1
Total	**555**	**565**	**10**	**418**	**425**	**7**	**306**	**182**	**124**

Source: Authors' calculations using the Spatial Tax Panel, version 6.0

Note: Manufacturing sectors are reported at the 5-digit level; sub-sectors with less than 200 employees in both 2014 and 2024 were excluded to avoid sensitivity to a small base; the colour scale is graded for negative (max: dark red) and positive values (max: dark blue) where zero is neutral (white).