

SEAD_{SA}
SPATIAL ECONOMIC
ACTIVITY DATA
South Africa

CITIES ECONOMIC OUTLOOK 2023

Insights into South Africa's
spatial economy from tax data



national treasury
Department:
National Treasury
REPUBLIC OF SOUTH AFRICA

dtiES SUPPORT
PROGRAMME



HSRC EEE
Human Sciences
Research Council
Equitable Education and Economies

Research that transforms educational outcomes and increases economic participation

CITIES ECONOMIC OUTLOOK 2023: INSIGHTS INTO SOUTH AFRICA'S SPATIAL ECONOMY FROM TAX DATA

Developed by National Treasury Cities Support Programme and Human Sciences Research Council with the support of the Swiss State Secretariat for Economic Affairs (SECO) and UK International Development through the World Bank.

Copyright © 2023 Spatial Economic Activity Data, South Africa. All rights reserved.

The material contained in these documents may not be used, published or redistributed without the prior written consent of SEAD-SA. The opinions expressed are in good faith and while every care has been taken in preparing these documents, SEAD-SA will not be liable for any incorrect data and for errors in the conclusions, opinions and interpretations emanating from this information.

PUBLISHED BY

SEAD-SA (Spatial Economic Activity Data, South Africa)
Private Bag X41, Pretoria, 0001
134 Pretorius Street, Pretoria 0002
South Africa
T: +27 (0)12 302 2000
E: JPVisagie@hsrc.ac.za
W: www.spatialtaxdata.org.za

ACKNOWLEDGEMENTS

This publication represents the combined effort of people from all over South Africa, either as authors, editors, reviewers or organisations sharing information. Sincere gratitude is due to everyone involved for their contributions and insights.

Project managers: Karen Harrison (CSP-NT) and Justin Visagie (HSRC)
Edit, design and layout: Ink Design Publishing Solutions, Cape Town

These materials may contain links for third party websites. We have no control over, and are not responsible for, the contents of such third party websites. Please use care when accessing them.

The inclusion of any specific companies, commercial products, trade names or otherwise does not constitute or imply its endorsement or recommendation by SEAD-SA or any of its partners.

The Cities Support Programme (CSP) is located within the intergovernmental relations (IGR) division of the National Treasury. Acting as a change agent and a vehicle for collaboration and integration, the CSP aims to improve the capacity of cities and create an enabling intergovernmental fiscal system and policy environment to support city-led transformation.

The Human Sciences Research Council (HSRC) is South Africa's statutory research agency and has grown to become the largest dedicated research institute in the social sciences and humanities on the African continent, doing cutting-edge public research in areas that are crucial to development.



CONTENTS

Chapter 1

A breakthrough in spatial economic data

Authors: Karen Harrison, Andrew Nell, Ivan Turok and Justin Visagie

01

Chapter 2

Urbanisation and economic development

Authors: Ivan Turok and Justin Visagie

02

Chapter 3

What's special about each metropolitan economy?

Author: Justin Visagie and Ivan Turok

03

Chapter 4

The impact of Covid-19 on South African cities

Author: Andrew Nell and Justin Visagie

04

Chapter 5

Cities and productivity in South Africa

Authors: Justin Visagie and Ivan Turok

05

Chapter 6

Cities are at the centre of South Africa's wage inequalities

Authors: Msawenkosi Dlamini and Justin Visagie

06

Appendix

Explore South African Tax Data: An introduction to the Spatial Tax Portal

Primary partnership



national treasury
Department:
National Treasury
REPUBLIC OF SOUTH AFRICA

dtiEs **SUPPORT PROGRAMME**



HSRC EEE
Human Sciences
Research Council
Equitable Education and Economics
Research that transforms educational outcomes and increases economic participation

National partners



stats sa
Department:
Statistics South Africa
REPUBLIC OF SOUTH AFRICA



science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA



the dtic
Department:
Trade, Industry and Competition
REPUBLIC OF SOUTH AFRICA

SARS
South African Revenue Service



**UNITED NATIONS UNIVERSITY
UNU-WIDER**



**South African
CitiesNetwork**

8 SALGA
SOUTH AFRICAN LOCAL
GOVERNMENT ASSOCIATION
Inspiring service delivery

UFS



**CHAIR IN
CITY-REGION
ECONOMIES**

SA-TIED

Southern Africa – Towards Inclusive Economic Development

Metro partners



**BUFFALO CITY
METROPOLITAN MUNICIPALITY**



**CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD**



**Ekurhuleni
METROPOLITAN MUNICIPALITY**



**ETHEKWINI
MUNICIPALITY**



Joburg
a world class African city



MANGAUNG



**nelson mandela bay
MUNICIPALITY**



**CITY OF
TSHWANE
IGNITING EXCELLENCE**

Donor partners



**UK International
Development**
Partnership | Progress | Prosperity



**Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra**

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO

Technical partners

deep current

OrigenSoftware

1

A BREAKTHROUGH IN SPATIAL ECONOMIC DATA

Authors

Karen Harrison^a, Andrew Nell^b, Ivan Turok^c and Justin Visagie^d

Highlights

- 1 The creation of an open access Spatial Tax Panel is a great leap forward in the availability of credible spatial data about the economic geography of the country. The database includes comprehensive coverage of every municipality in the country as well as suburb-level (hexagons) information for metros.
- 2 An absence of spatial economic data has been a handicap for government policymakers, officials and private investors who lack reliable information on which to base crucial decisions. Local stakeholders have lacked an evidence base from which to advocate for change or hold leaders to account.
- 3 Credible spatial data is also critical for vital policy and research questions about urbanisation, uneven development, territorial disparities and the productivity of cities and towns. There is a risk that the country's economic challenges and possibilities are misdiagnosed without a spatial lens.
- 4 The Spatial Tax Panel has been produced through the collaboration of a broad range of stakeholders who make up the 'spatial data value chain'. The project is a good example of the importance of working outside of organisational silos to promote a public-service culture which encourages innovation, experimentation and data sharing.
- 5 A user-friendly web interface is available to help make it simple and easy to explore and download the data: www.spatialtaxdata.org.za

^a **Karen Harrison** is the Economic Development Component Lead for National Treasury's Cities Support Programme.

^b **Andrew Nell** is an independent consultant, researcher and data scientist.

^c **Professor Ivan Turok** is DSI/NRF Research Chair in City-Region Economies at the University of the Free State and Distinguished Research Fellow at the Human Sciences Research Council

^d **Dr Justin Visagie** is a Senior Research Specialist at the Human Sciences Research Council and a Senior Lecturer at the Department of Economics and Finance, University of the Free State.

1.1 | INTRODUCTION

There are serious deficiencies in the coverage and quality of spatial economic data in South Africa. Up-to-date information on local and regional conditions has been missing. This is a handicap for government policymakers, officials and private investors who lack reliable information on which to base crucial decisions. Robust data is essential for monitoring changing economic circumstances and sectoral and spatial shifts over time. A lack of reliable data also hinders research and advocacy about the important role of cities in economic development. This, in turn, means that policymakers are not held sufficiently to account for the lack of progress in strengthening local economies and narrowing urban and regional divides.

The research presented in this *Cities Economic Outlook* is largely based on a recent breakthrough in the availability of spatial economic data by mining tax records: the Spatial Tax Panel. This new data source offers an impressive array of economic indicators for jobs and firms which can be broken down by industry/sector, wage levels, gender, youth and age, export status and firm size. Importantly, the data is fairly current (from 2013/14 to 2021/22 tax years) and can be easily updated with each new tax year. The data coverage is also comprehensive, which enables databases to be curated and released at a municipal level for the whole country and at a suburb level (hexagons) within metros. This is the first time that 'intra' metro spatial economic data has ever been released for the country.

The data has certain limitations as is inevitable in drawing information from administrative sources. Some of the constraints include the absence of information collected on informal workers and firms, the omission of race-based identifiers, inaccuracies in working with postal codes, and assumptions about the way economic activity is distributed across larger multi-establishment firms. Despite these shortcomings, the data is released with a transparent methodology in order to be open to scrutiny. This contrasts with other spatial data sources, which are hidden behind paywalls and lack transparency. The raw data is published as an open-access database with no user charges in order to serve as a public good. Another positive is that the quality of the data is likely to improve over time as refinements are made to the methodology. These can then be applied retrospectively to prior years.

The Spatial Tax Panel is a great leap forward in the availability of credible spatial data about the economic geography of the country. For the first time, granular spatial data exists to help answer vital policy and research questions about urbanisation, uneven development, territorial disparities and the productivity of cities and towns. It is our sincere ambition that this new innovation in spatial economic data will help to spark renewed interest in the role of urbanisation in economic development and the dynamic inter-relationship between urban and rural spaces. This will ultimately better equip local officials, organised business, civil society groups and communities in strengthening their local economies.

1.2 | WHY FOCUS ON CITIES AND SPATIAL ECONOMIC DATA?

The growth of cities is an inexorable and positive feature of contemporary economic development. As much as 80% of global GDP is concentrated in urban areas (World Bank, 2022). The underlying reasons for this are debated but include cost advantages and higher returns for firms, such as through access to larger markets and specialised labour. They also include the stimulus to innovation and entrepreneurship because of greater scope for collaboration, learning, and the diffusion of ideas.

South Africa is no exception. Nearly two-thirds (62%) of South Africa's formal employment is concentrated in only six metropolitan municipalities. This rises to nearly 80% if secondary cities are included. It is not only the concentration of activity but also the sophistication of production that matters, in other words, higher levels of 'value added' in cities. The economic profile of metros is relatively diversified and skewed towards the private sector. By contrast, the rest of the country is more dependent on non-tradable local and government services, with pockets of activity in agriculture and mining, and reliant on cities for additional value-add and access to broader markets and services.

Cities generally lead in innovation, productivity and job creation, but the economic benefits from urbanisation are not automatic. This is because there are significant costs to agglomeration which demand investment in the built environment for cities to be prosperous and liveable. Transport congestion, overburdened infrastructure, housing shortages, residential segregation and environmental degradation are all symptoms of poorly planned and governed cities. More than 50 million South Africans are projected to live in urban areas by 2050, which is eight out of every ten (UNDESA, 2018). The country needs to prepare for this and get ahead of the curve with more investment in urban land and infrastructure.

Despite the strategic importance of cities for national development, South Africa has generally lacked a coherent economic agenda to realise the potential of its metropolitan areas. Economists have also ignored the role of geography when diagnosing the country's constraints. Most explanations for the economic malaise – such as premature deindustrialisation, weak integration into global and regional value chains, labour market rigidities, inadequate skills supply and inequalities in the distribution of productive assets – are embedded within a local context where the institutions, actors and infrastructure have a decisive influence on outcomes. The neglect of geography and the influence of the dysfunctional urban form on the economy is surprising considering the centrality of space to apartheid, and the structural hardships caused by separating people from economic opportunities. Put simply, there is a risk that the country's challenges and possibilities are misdiagnosed without a spatial lens.

1.3 | A DATA VACUUM FOR LOCAL ECONOMIC DEVELOPMENT

One of the main reasons for the lack of applied research and policy on the economic role of cities is the lack of robust spatial data. Statistics South Africa (StatsSA) collect a range of household surveys, yet these are limited in scope for municipal and sub-municipal analysis (apart from the decennial Census). Headline economic indicators like GDP are released for provinces, but not for metros, whilst micro firm-level survey data is never published. This is partly because the costs of implementing a business census or similar large-sample instrument are prohibitive. StatsSA originally built a business register and sampling frame at enterprise level (i.e. national), and this has resulted in strong inertia for reporting business statistics at a national level.

The absence of robust sub-national and city-level data is not well publicised. This is partly because people are able to purchase modelled data by subscribing to 'regional' databases offered by private economic consulting companies. While commercial companies offer a valuable data aggregation and packaging service, the modelling of sub-national estimates is very dubious considering a lack of quality inputs. In addition, these companies do not publish their methods in order to protect their intellectual property, yet this goes against international standards of good practice. The situation has been compounded by the longstanding tendency of government departments to restrict external access to their administrative datasets and a failure to understand the value of such access to improve local economic statistics.

In summary, the country has been trapped in a cycle that tolerates unreliable local statistics with scant public understanding of the constraints on spatial economic data. A consequence is sparse empirical research about cities, and a frustrated and limited appetite within government and civil society for improving knowledge and evidence about local economies.

1.4 | A BREAKTHROUGH IN SPATIAL ECONOMIC DATA BY MINING TAX RECORDS

An opportunity for spatial data reform emerged when National Treasury began to explore the potential for assembling tax records to better understand the South African economy. This led to the launch of the programme Southern Africa – Towards Inclusive Economic Development (SA-TIED) in partnership with the UNU-WIDER in November 2017. This was a research initiative focused on mining administrative (tax) sources and matching researchers with policymakers in the process. A primary investment of the programme was the establishment of a secure data facility (SDF) at the National Treasury in Pretoria to host anonymised administrative tax data for policy relevant research through an agreement with the South African Revenue Services (SARS). The intention was that researchers, policymakers, government officials, civil society, think

tanks, private companies and active citizens could uncover new insights about formal sector employment and businesses in South Africa.

Whilst the SA-TIED programme did not include a spatial or urban research agenda, it paved the way for exploring how administrative data could be compiled into robust sub-national statistics. This idea was first mooted by an informal grouping of government officials, researchers and practitioners as part of the Economies of Regions Learning Network (ERLN) – a community of practice about cities and economic development facilitated by the National Treasury’s Government Technical Advisory Centre (GTAC). It was the ERLN lobby which eventually resulted in the National Treasury’s Cities Support Programme (NT:CSP) decision in 2020 to commission exploratory work on the feasibility of spatialising tax data for policy and planning. This spatial tax pilot study was an overwhelming success and concluded in the publication of a series of City Spatialised Economic Data Reports in May 2021.

To take the agenda forward in a sustainable manner, the NT:CSP entered into a partnership with the Human Sciences Research Council (HSRC) in July 2021 to curate, improve and make publicly available spatial tax data for research and policy. Through the support and close collaboration of the South African Revenue Services, UNU-WIDER (who manage the secure data facility) and StatsSA, the HSRC/NT secured approval to regularly release an open-access ‘Spatial Tax Panel’. The aggregated spatial tax panel (where the unit of analysis is a place) does not compromise the anonymity of any firm or individual and can therefore be freely shared outside the SDF. The data can be downloaded online at a spatial tax portal along with tools to readily explore the data (www.spatialtaxdata.org.za). The spatial tax portal is also profiled in the appendix ‘Explore South African Tax Data

1.5 | LOOKING AHEAD

The success of mining tax data for spatial analysis has spurred renewed vigour for an urban economic research agenda. The HSRC/NT partnership has evolved beyond these two organisations and reflects a genuine collective effort from a variety of stakeholders in government, industry and civil society with a new round of donor financing from the Foreign, Commonwealth and Development Office (FCDO, UK) and an interest from State Secretariat for Economic Affairs (SECO, Switzerland). The opportunity is bigger than spatial tax data mining and includes adding new sources of administrative data, translating data into policy insights, training and capacitation in data use, peer-to-peer learning, and advocacy for a focus on city regions and the spatial economy. This opportunity is encapsulated in a report on *Addressing the Gaps in the Availability of Economic Data in South Africa, September 2021* that was prepared by National Treasury and financed by SECO through broad stakeholder engagement.

Hence the launch of Spatial Economic Activity Data: South Africa (SEADsa) in June 2023 as a collective brand to unify a range of outputs and recognise a growing consortium

of stakeholders who share a common interest in understanding the spatial economy of South Africa. The intention is to widen the circle and enlarge the community of practice, with different participants making distinctive contributions to the spatial data value chain. Some people will be responsible for refining the supply of data and converting it into accessible packages and dashboards. Others will be using the data for policy analysis and research purposes. The dynamic interaction between the supply and demand for the data will determine how much value is ultimately generated.

Looking ahead, realising the full possibilities of this initiative depends on four critical ingredients:

First, spatial economic data needs to be arranged in user-friendly formats to maximise take-up. An attractive web interface and online tutorials are already available to help simplify data extraction, exploration and manipulation (see www.spatialtaxdata.org.za). Some useful lessons can be learnt from the marketing efforts of private data suppliers.

Second, the spatial tax panel should be regularly updated and extended over time to incorporate other economic and administrative datasets for localities. This would enhance its usefulness and enable the existing statistical patterns and trends to be corroborated, and new and deeper insights to be generated. The strong partnership between the HSRC and National Treasury and recent launch of SEADsa is a promising start but needs to be sustained.

Third, public officials and policy analysts should be encouraged to take full advantage of the database to ensure that it achieves a significant impact. Data analytics training and capacity building of public servants and NGOs will help to widen the network of active users. The City of Cape Town and eThekweni Metro Municipality have led the way so far in showcasing the potential for tax data to inform spatial economic planning, but the circle needs to be made larger.

Finally, it is important to mobilise the broader research community to participate in spatial economic analysis. A larger cohort of scholars and civil society activists interested in the development of their local and regional economic ecosystems will help to invigorate the public discourse and improve the accountability of decision-makers.

References

World Bank (2022) Urban Development: Overview. <https://www.worldbank.org/en/topic/urbandevelopment/overview>

UNDESA (United Nations Department of Economic and Social Affairs). (2018) World Urbanisation Prospects: The 2018 Revision. New York: UN Population Division

2

URBANISATION AND ECONOMIC DEVELOPMENT

Authors

Ivan Turok^a and Justin Visagie^b

Highlights

- 1 The six largest metros are home to almost two-thirds of all formal jobs in the country. So, the ratio of jobs to population is much healthier than elsewhere.
- 2 Recent employment growth has been weak across the board, indicating serious obstacles to investment and development. The coastal metros have performed somewhat better than the Gauteng metros.
- 3 The metros have more jobs in tertiary industries (business and consumer services) than the rest of the country and fewer in primary and secondary industries.
- 4 Retailing, health, education, tourism and financial services were the main sources of net job creation. Construction, manufacturing, logistics and utilities were the biggest job casualties.
- 5 The metros have a more balanced size structure of firms than the rest of the country, with more small and micro enterprises.

^a Professor Ivan Turok is DSI/NRF Research Chair in City-Region Economies at the University of the Free State and Distinguished Research Fellow at the Human Sciences Research Council

^b Dr Justin Visagie is a Senior Research Specialist at the Human Sciences Research Council and a Senior Lecturer at the Department of Economics and Finance, University of the Free State.

2.1 | INTRODUCTION

South Africa's large cities attract plenty of negative attention. Hardly a day goes by without another media report deploring rising homelessness, overloaded water and sewage systems, dysfunctional public transport, crumbling infrastructure and escalating social unrest. The impression given is that when people crowd together in dense urban areas, the inevitable outcome is more congestion, conflict, crime and contagious disease, epitomised by the recent experience of the Covid pandemic. All these problems are compounded in South Africa's case by the stubborn spatial legacy of apartheid, which imprinted on cities a highly unjust and inefficient physical form.

Yet focusing on these manifest downsides and drawbacks of urbanisation means that the less visible upsides and advantages for social and economic progress are often neglected. Throughout contemporary world history, cities have proved to be powerhouses of human creativity, inventiveness and all-round development. By bringing people to live and work in close proximity, cities foster interaction between them and the exchange of all kinds of ideas and information. Mutual learning generates knowledge and spurs technological progress, which attracts investment and boosts growth. Cities also enable firms to trade with abundant customers and suppliers, and to source the varied skills they require from the reservoir of available labour. Workers maximise their choice of jobs or training opportunities, and consumers find it easier to locate their preferred goods and services. Public authorities also benefit because supplying many forms of infrastructure and services is much cheaper in large dense cities than where people live in more dispersed settlements.

The economic advantages of major cities stem partly from the specialisation that occurs among firms and workers. The sheer number of producers, consumers and workers in cities encourages and enables firms and individuals to focus on particular products,

THROUGHOUT
CONTEMPORARY
WORLD HISTORY, CITIES
HAVE PROVED TO BE
POWERHOUSES OF
HUMAN CREATIVITY,
INVENTIVENESS
AND ALL-ROUND
DEVELOPMENT.

tasks and expertise. By specialising they become more proficient and efficient, which raises productivity and results in higher levels of output and rising average incomes. The process of specialisation within a city's economy means that firms are less self-sufficient and depend more on a host of other firms. In other words, a sophisticated division of labour emerges between firms and between workers. Firms benefit more from external resources and economies of scale than from their internal capacity.

Divisions of labour have underpinned successive industrial revolutions throughout the world and the subsequent structural transformation of economies from primary industries, such as agriculture and mining, to manufacturing and service industries.

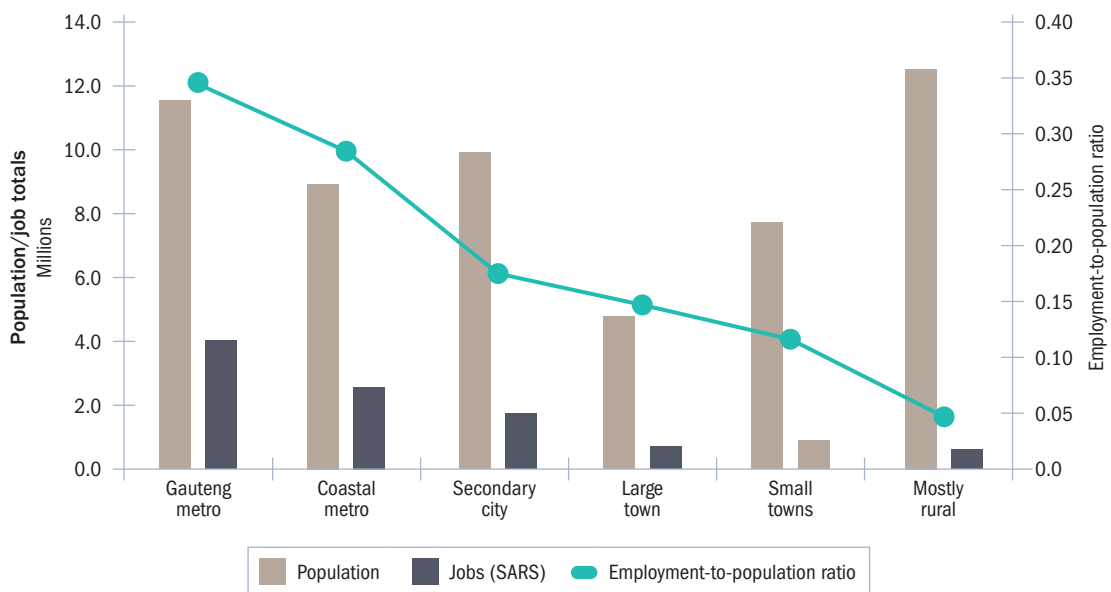
Specialisation can also occur at the level of the city. Many cities benefit from developing unique functions and capabilities that others cannot match, which gives them a distinct advantage and avoids head-to-head competition based on price alone. They exchange outputs with cities that specialise in other, complementary products and tasks. These 'tradable' goods and services are crucial to the city's prosperity because their growth is not constrained by local demand, and they often generate sizeable multiplier effects elsewhere within the local economy. Producing tradable goods and services that are competitive enough to sell in wider markets is an important mechanism for stimulating economic growth. Their success depends not just on the individual exporting firm, but on the entire local cluster or ecosystem of related and supporting firms that provide specialised inputs and services to them. Dynamic industrial clusters can give cities exceptional economic strengths and enable them to stay ahead of their rivals and adapt over time to changes in technology and consumer demand.

Specialisation is not automatically a recipe for success. Other cities can benefit from diversity and not having all their eggs in one basket. This is especially important in the context of volatile economic conditions and periodic shocks that can devastate cities with restricted foundations. The largest cities tend to be the most diversified. They bring together a very wide range of productive firms, workforce skill-sets, economic infrastructure and social and cultural amenities in ways that smaller cities and towns cannot match. The concentration of these assets, resources and information generates output, jobs, taxes and many other types of opportunity that attract population and investment in a self-reinforcing feedback loop. The failure of key stakeholders to recognise the virtuous cycle and higher returns on public and private investment created by the special advantages of big cities can compromise the performance of the national economy and restrain employment growth.

2.2 | EMPLOYMENT PATTERNS

South Africa's six biggest metros house 6.6 million formal jobs compared with only 4 million in the rest of the country (Figure 2.1). That amounts to nearly two-thirds (62.4%) of all formal employment in South Africa. The six metros are clearly dominant as the powerhouses of the national economy. The three Gauteng metros house the lion's share with 4 million formal jobs compared with 2.6 million in the coastal metros of Cape Town, eThekweni and Nelson Mandela Bay.

FIGURE 2.1 Population and employment size, 2019/20



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

Notes: Population size is for all ages; BCM and MAN classified as secondary cities

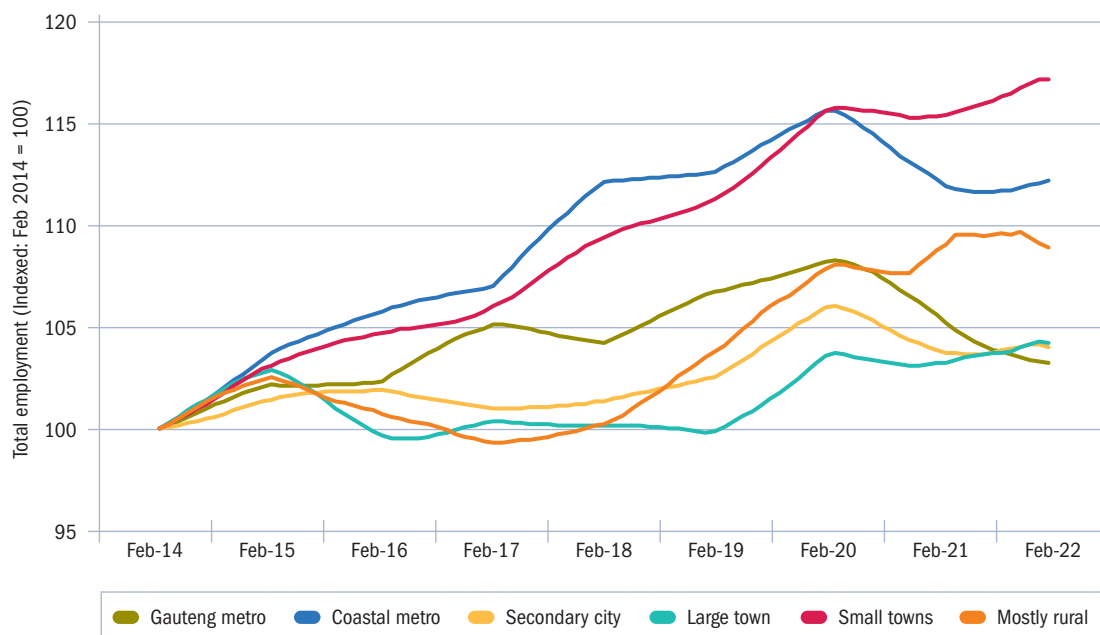
The six largest metros are home to 20.6 million people compared with 35.1 million in the rest of the country (Figure 2.1). The 20.6 million amounts to just over a third (37%) of the country's total population. Consequently, the ratio of jobs to population (one measure of the 'employment rate') is much healthier in the big cities than it is elsewhere. Roughly one in three people in the metros has a formal job compared with less than one in six in the towns. This is despite the steady movement of population from the countryside towards the cities. People migrating to the metros clearly recognise that their chances of getting a job there are better than if they stay in the rural areas.

The ratio of jobs to population falls in line (monotonically) with settlement size, shifting from the Gauteng metros to mostly rural municipalities. Formal jobs are very sparse in rural areas with a gulf between population and jobs (an employment ratio of only 0.05). In other words, there are only 5 formal jobs supporting every 100 people in rural municipalities, compared to 35 in the Gauteng metros and 29 in the coastal metros. It is well documented that rural areas, particularly the former homelands, have the highest and most persistent levels of poverty and reliance on social grants and household remittances in the country.

2.3 | EMPLOYMENT TRENDS

National economic output has experienced prolonged stagnation for more than a decade. Employment has also been suppressed by the growing tendency for activity to be capital intensive or skewed to high skills. Employment trends based on the tax data for the period 2013/14 to 2021/22 confirm a depressed economy (Figure 2.2). They also reveal a mixed picture of relative strength and weakness which does not correspond in any simple way to settlement size or urban hierarchy.

FIGURE 2.2 Trends in employment, 2013/14–2021/22



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

Notes: 12-month rolling average; BCM and MAN classified as secondary cities

The biggest cities have not been performing well in recent years, especially in terms of formal employment. The coastal metros were performing better than the Gauteng metros between 2013/14 and 2019/20, with formal jobs increasing by 16% in the former and only 8% in the latter (Figure 2.2). However, the Covid-19 pandemic appears to have hit both groups of metros particularly hard. They lost about 4–5% of their formal jobs between 2019/2020 and 2021/22. The larger role of the private sector and the vulnerability of industries such as construction and tourism to the lockdown is likely to be part of the explanation (see below).

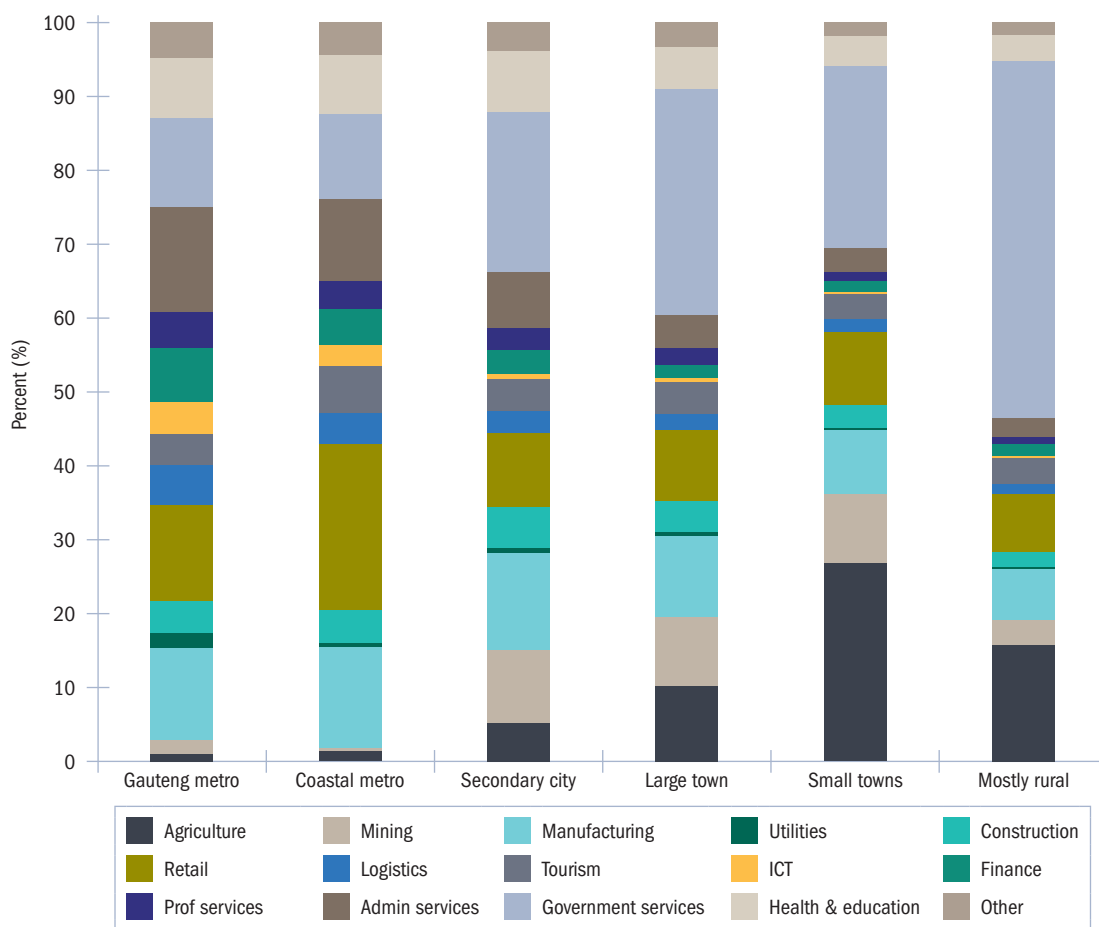
Secondary cities and large towns have generally struggled for at least the last decade, with barely any increase in formal employment (Figure 2.2). Small towns and rural areas have performed better than one might have expected, mainly because agriculture has enjoyed a period of relatively strong growth in recent years (see below), linked with favourable weather conditions and international commodity prices. The recent underperformance of the metros is clearly a serious concern considering how important they are to the national economy.

2.4 | ECONOMIC DIVERSITY

Analysing total employment by settlement type overlooks important differences in the composition of jobs between places. The metros have more diverse economies than other parts of the country, with a wider variety of jobs and a broader range of industries producing different goods and services (Figure 2.3). Diversity should offer several benefits, including greater stability and resilience against shocks and downturns that affect individual sectors from time to time. Hence it should prevent a widespread recession. Diversity also promotes creativity and innovation as different industries can learn from each other and share knowledge and technology.

A distinctive feature of metro economies is that they have more employment in business and consumer services than smaller cities, towns and rural areas (Figure 2.3). Information technology and finance are good examples of dynamic service industries that tend to be concentrated in cities. The metros have benefited from the stronger nation-wide growth of business and consumer services compared with manufacturing and mining industries in recent years. The metro economies also have less employment in agriculture, mining and government services than the rest of the country, but slightly more jobs in manufacturing.

FIGURE 2.3 Composition of industry, 2019/20



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

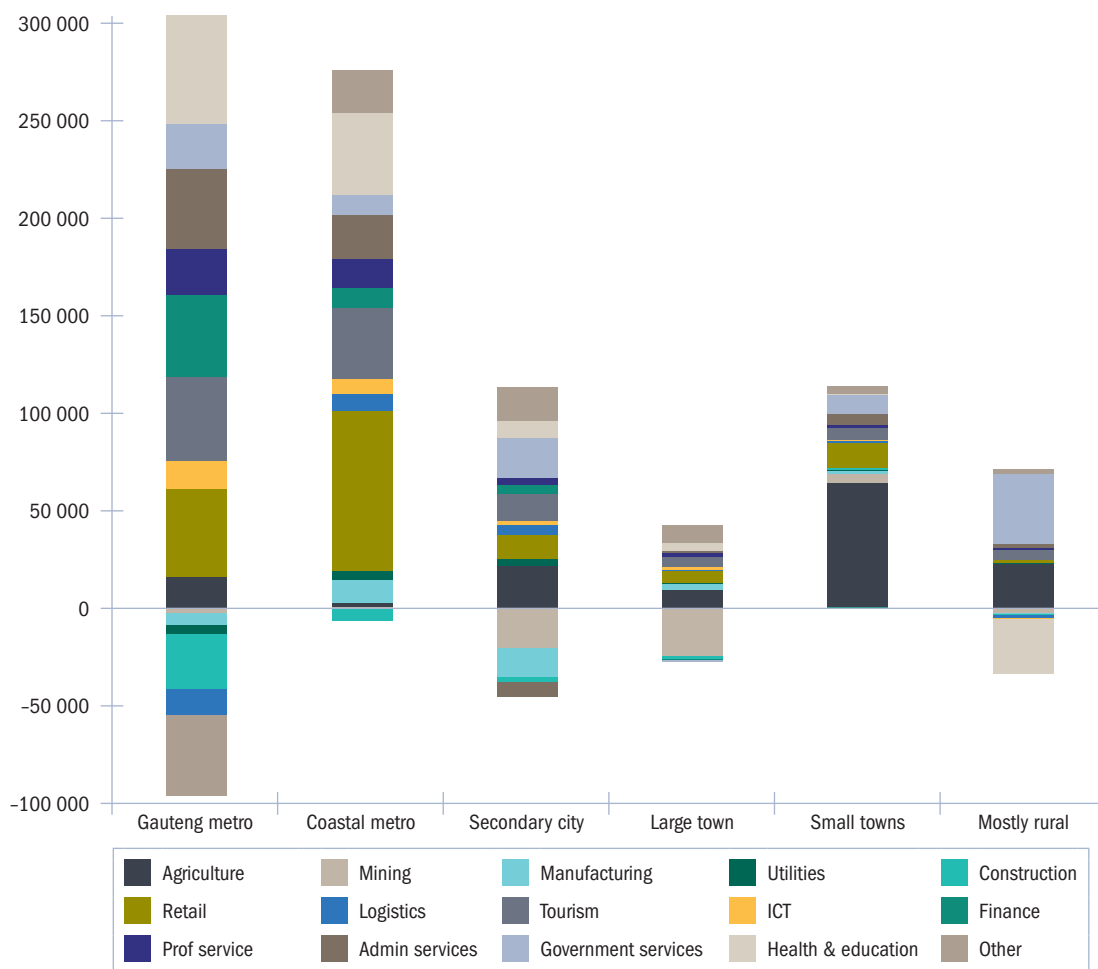
Notes: Industry classifications derived from StatsSA SIC7-1 digit level. BCM and MAN classified as secondary cities

The sectoral composition of South African cities is broadly similar to cities in other middle- and high-income countries, with more jobs in tertiary industries and fewer in primary and secondary industries. The country's traditional minerals and mining base remains important in many large towns and secondary cities, but barely features in the metros. Small towns, rural areas and even large towns are heavily dependent on public services and agriculture. Mostly rural municipalities don't have much of a formal economy, and a staggering half of their jobs are in government services.

2.5 | SECTORAL TRENDS

Almost all the jobs growth in the metros over the period between 2013/14 and 2021/22 arose in service industries (Figure 2.4). Consumer and personal services were larger job generators than business services. These sectors tend to be less affected by technological change and are generally considered less important drivers of economic growth because of their modest productivity improvements over time and limited multiplier effects on other industries.

FIGURE 2.4 Net job creation by sector, 2013/14–2021/22



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

Notes: BCM and MAN classified as secondary cities

For example, health and education added 55 000 jobs in the Gauteng metros and 42 000 in the coastal metros. Retailing added 82 000 jobs in the coastal metros and 46 000 in the Gauteng metros. Tourism added 43 000 jobs in the Gauteng metros and 37 000 in the coastal metros. Financial services added 42 000 jobs and administrative services another 41 000 jobs in the Gauteng metros. Other sectors were far less important sources of job creation.

The growth in services employment in the metros was offset by the decline in other sectors. Construction was the biggest casualty, losing 29 000 jobs in the Gauteng metros and 6 000 in the coastal metros. Some jobs were also lost in manufacturing, logistics and utilities, especially in the Gauteng metros. These sectors tend to employ more manual workers than service industries. The loss of manual occupations as a result of deindustrialisation is a major concern for workers with limited education and training.

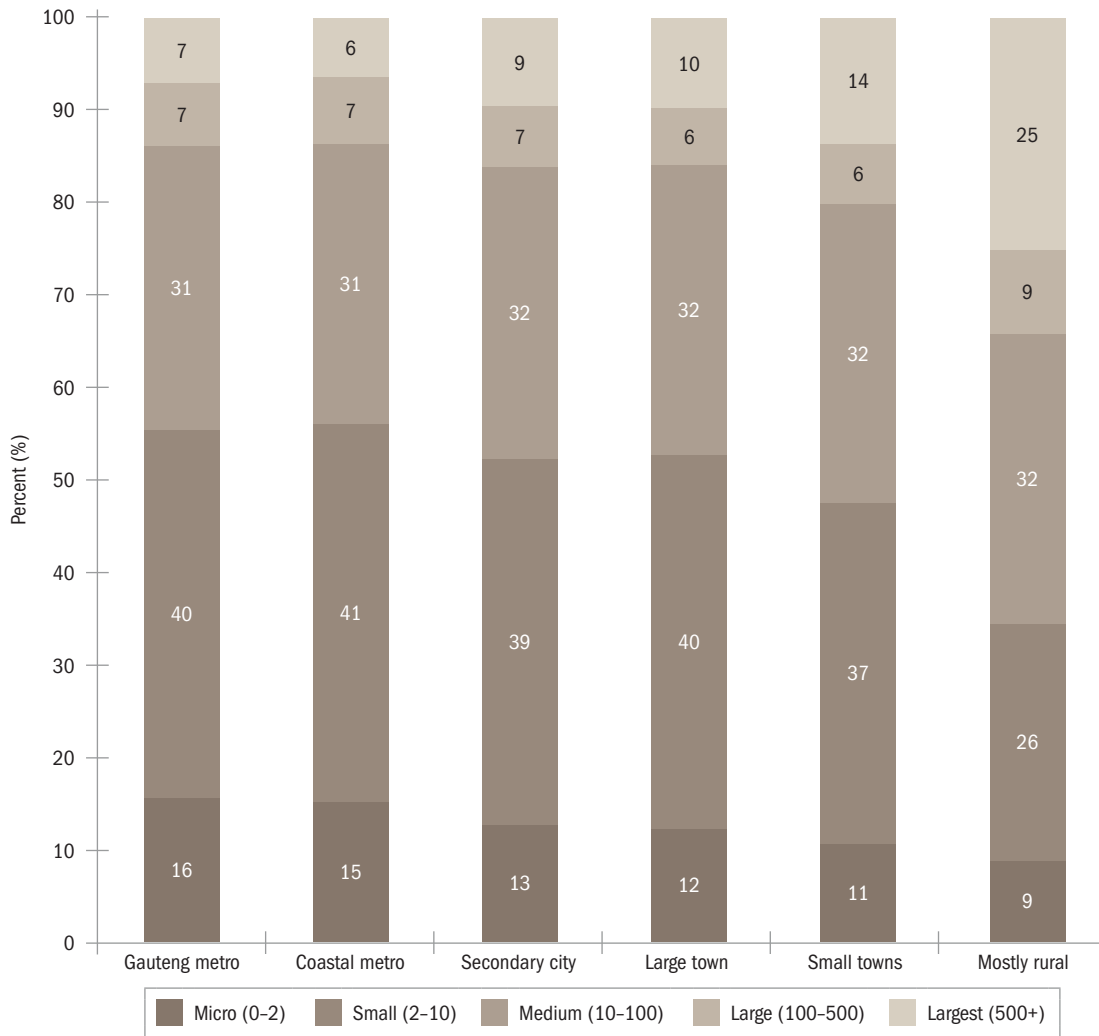
Outside the big cities, agriculture was the biggest source of employment growth, especially in the small towns and rural areas. Government services also contributed some additional jobs to all areas. Mining was the biggest casualty outside the metros, losing 21 000 jobs in the secondary cities and 25 000 in the large towns. The negative impact of Covid-19 was less severe in large towns, small towns and mostly rural municipalities than in the metros, perhaps because of their greater reliance on government services, which were unaffected by business closures and contractions.

2.6 | THE SIZE OF FIRMS

Cities are typically seedbeds of entrepreneurship and innovation, with high rates of business formation and growth. This is linked to the concentration of talent and resources, but also an environment that tends to encourage enterprise and experimentation. There are more diverse markets and more support from institutions such as incubators and investors.

Against this, South Africa has a serious deficit of small firms compared with other countries, reflecting the legacy of apartheid controls on enterprise and the concentrated structure of many economic sectors. Small firms have also not performed well over the last decade and were hit hard by the pandemic. Despite this, the metros hold around 60% of all formal small businesses in the country (TIPS, 2023).

FIGURE 2.5 Employment share by size of establishment, 2019/20



Source: Nell, A. and Visagie, J. 2022. *Spatial Tax Panel 2014–2021: version 2*

Notes: The share of employment has been derived from a database on the number of establishments in each FTE category using the midpoint of each category; BCM and MAN classified as secondary cities

According to the tax data, the metros have a more balanced size structure of firms than towns and rural areas, with more small and micro enterprises (Figure 2.5). More than half (56%) of their formal jobs are in businesses employing less than 10 workers, compared with only just over a third (35%) in rural areas and less than half (48%) in small towns. The greater size diversity of businesses is probably beneficial for the stability and resilience of metro economies. They are likely to be less vulnerable to the disruptions and setbacks that can affect large corporations periodically.

2.7 | CONCLUSION

The metros clearly dominate the national economy, and their share of jobs and activity has been increasing over time. The concentration of employment opportunities in cities explains why their population has been growing more strongly than the rest of the country. The connection between urbanisation and economic growth is a global phenomenon, reflecting the benefits of geographical proximity between businesses and people, underpinned by investment in transportation networks and other shared infrastructure. Yet the recent trajectory of employment growth in South African cities has been weak, indicating serious challenges for the government and other stakeholders to address. The very poor performance of manufacturing and construction industries is also a major concern for the millions of less-skilled workers that live in cities. This analysis of the metro economies in recent years indicates that there is no room for complacency.

References

Nell, A. and Visagie, J. (2022) Spatial Tax Panel 2014–2021: version 2

Nell, A. and Visagie, J. (2023) Spatial Tax Panel 2014–2022: version 3

TIPS (Trade & Industrial Policy Strategies). (2023) The Real Economy Bulletin – Fourth Quarter 2022.

3

WHAT'S SPECIAL ABOUT EACH METROPOLITAN ECONOMY?

Authors

Justin Visagie^a and Ivan Turok^b

Highlights

- 1 There is currently a dearth of knowledge about the relative importance of industrial specialisation and diversity in South African cities. This is symptomatic of a wider ambivalence in economic and industrial policy about the distinct economic problems and potential of metropolitan areas.
- 2 A review of spatial tax data for metropolitan economies highlight the unique role of each city within a broader urban, regional and national system. Viewing the metropolitan areas as equivalent or interchangeable economic entities conceals their differentiated characteristics.
- 3 We characterise each metro by their unique industrial profile and assess their outlook: JHB '*Financial centre*'; EKU '*Manufacturing-logistics*'; TSH '*National government and professional services*'; CPT '*Diversified tourism-centric*'; ETH '*Manufacturing-logistics*'; NMB '*Automotive centre*'; BUF '*Provincial government*'; MAN '*Health and education*'.
- 4 The employment performance of metros was uneven between 2014 and 2022. These differences are apparent even when comparing employment growth in the same sector. This is because of all kinds of local features and the role of local actors, which can be decisive for local economic development.
- 5 Acknowledging what is special about each metro calls for a more devolved approach to national industrial and economic policy which builds on the strengths of every metro. The national economy is hamstrung if only some regions manage to grow.

^a Dr Justin Visagie is a Senior Research Specialist at the Human Sciences Research Council and a Senior Lecturer at the Department of Economics and Finance, University of the Free State.

^b Professor Ivan Turok is DSI/NRF Research Chair in City-Region Economies at the University of the Free State and Distinguished Research Fellow at the Human Sciences Research Council

3.1 | INTRODUCTION

South Africa is among the most urbanised countries on the continent with nearly 70% of the population classified as living in an urban area (World Bank, 2023). Yet urban development has never been a strong feature of national development plans or economic policy agendas (Todes & Turok, 2017; Turok, 2021; Visagie & Turok, 2022; Robbins, forthcoming). This is all too apparent in the current approach to industrial policy, which involves sector masterplans that ignore the impact of geography and location. Special economic zones and industrial park programmes tend to prioritise economic development outside the metros. Where the dynamic role of cities has been acknowledged, there has been a tendency to treat metro economies in much the same way, without regard for their distinctive strengths and limitations. Meanwhile, there has been growing political contestation for control of the big cities. No political party secured a majority vote in five of the eight metros in the 2021 local government elections. Therefore, the stakes are high for building a shared vision for the future of metro economies that everyone can rally behind.

This chapter motivates for a stronger grasp of the differentiated spatial economy and highlights the distinctive features of each metropolitan economy. We start with a brief review of the employment performance of the metros and show that they grew at different rates and were impacted unevenly by the Covid-19 pandemic. This is followed by a breakdown of the industrial profile of each city that shows their unique role and relationship within the wider urban system. The final section explores the economic outlook for each metro based on recent employment growth and areas of relative specialisation.

The information in this chapter is based on a new source of fine-grained spatial data: the Spatial Tax Panel. While this does not include informal employment, it captures the bulk of activity in key tradable sectors which are primary drivers of economic growth and decent work. The power of drawing on this administrative data stems from allowing in-depth coverage of local economies which have been chronically underrepresented in official economic statistics to date.

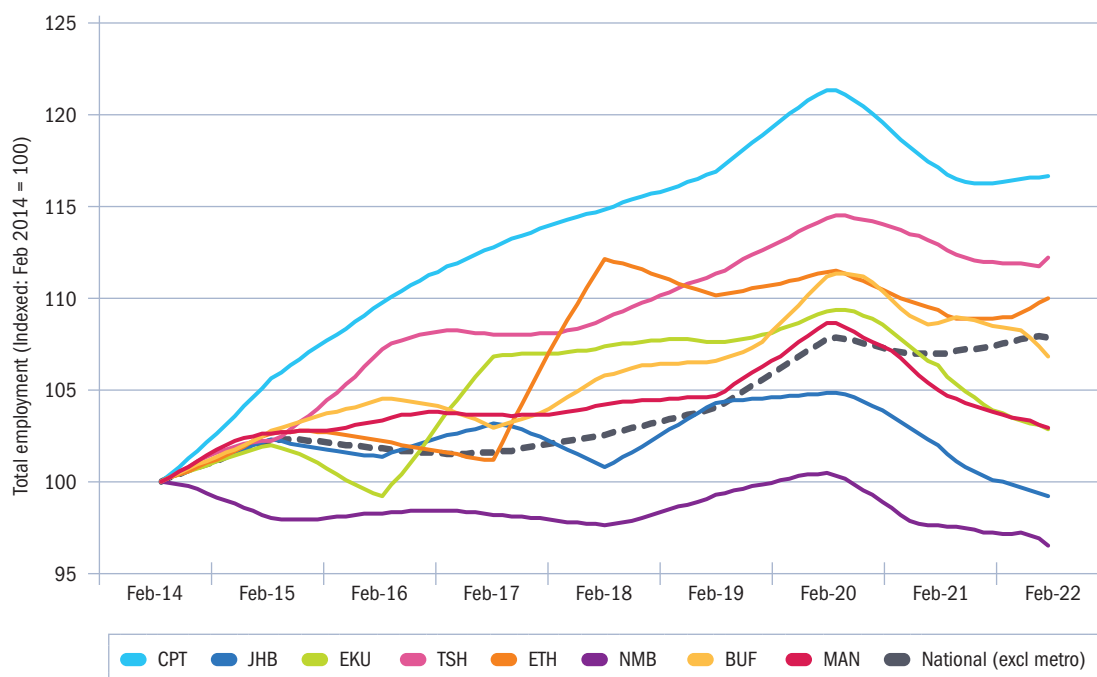
3.2 UNEVEN PERFORMANCE AMONGST METRO ECONOMIES

Figure 3.1 presents the aggregate jobs profile for the metropolitan municipalities over the period February 2014 to 2022. A key message is that all metros have struggled to create and sustain new jobs in any number. This is not surprising considering the lacklustre performance of the national economy over the past decade, and more recently, the global economic slump induced by Covid-19.

While the national economic environment has been tepid, it is important to note the varied rates of employment growth among metros, which fluctuated around the national average. Cape Town, Tshwane and eThekweni were the top performers in terms of formal jobs growth between 2014 and 2022. Cape Town experienced the strongest growth of any metro with a 21% increase in employment up to the pandemic, which equates to a compound annual growth rate of 3.3%. This was followed by Tshwane, with a 14% increase to its peak in February 2020.

Johannesburg, in contrast, had very weak employment growth, with an increase of only 5% by 2020, translating to less than 1% per year. Given Johannesburg's status as the country's largest city and employment hub, its lacklustre performance is very concerning. Among all the metros, Nelson Mandela Bay had the poorest performance and suffered a slight net loss of jobs over the period.

FIGURE 3.1 Trends in employment, 2013/14–2021/22



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

Notes: 12-month rolling average

A DYNAMIC URBAN SYSTEM RELIES ON THE COMPARATIVE ADVANTAGES AND SYNERGIES BETWEEN CITIES TO REINFORCE THEIR SPECIFIC ROLES, ENHANCE THEIR CAPABILITIES, AND BOOST THEIR PRODUCTIVITY.

Although all the metros were hit hard by the pandemic, Tshwane was the most shielded, probably because of its higher share of government jobs (see [Section 3.3](#) below). None of the metros had managed to recover to their pre-pandemic levels by the end of the period in February 2022. Only Cape Town, Tshwane and eThekweni had begun to turn things around in a noticeable way (see [Chapter 4](#) for a detailed review of the impact of Covid-19 on municipal growth and recovery).

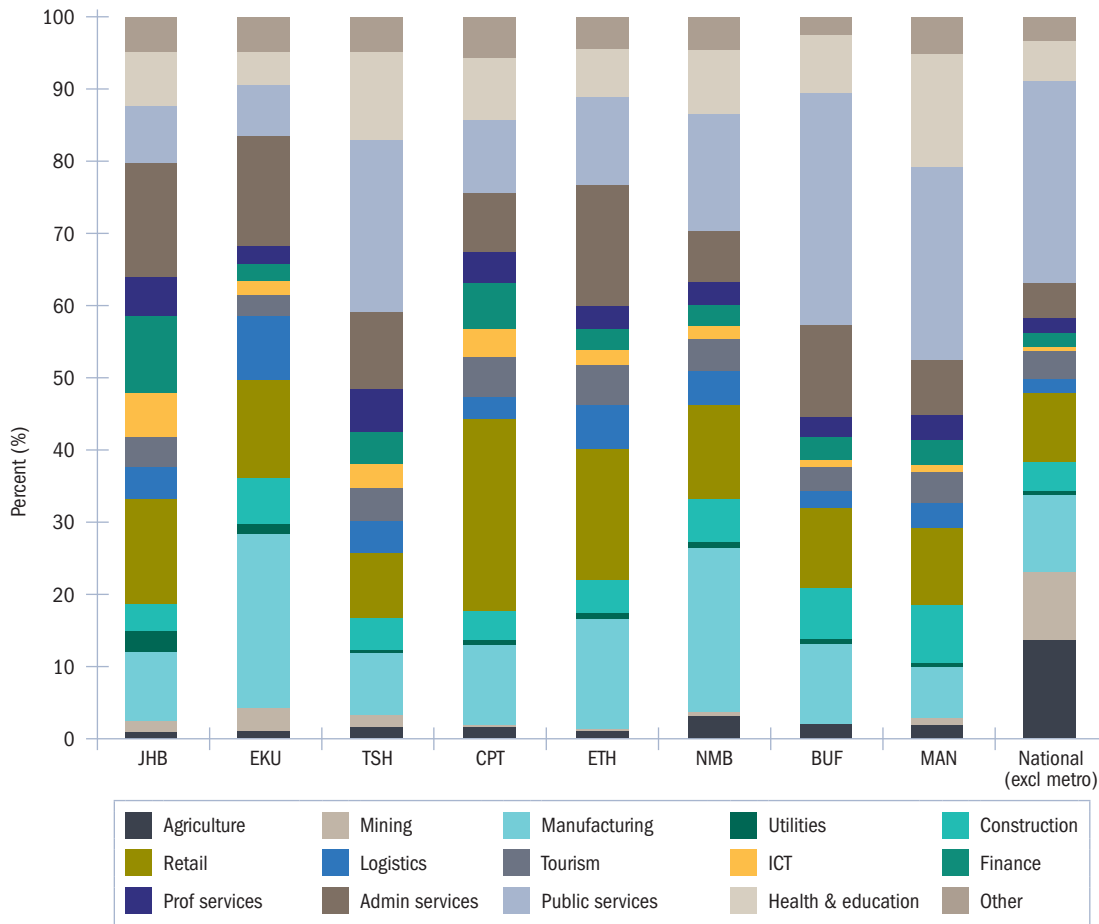
Overall, there appears to be no obvious relationship between metro employment growth and city size or geographical region. Further research is needed to better understand the underlying reasons for these differences in trajectory between the cities.

3.3 | DISTINCTIVE FEATURES OF METRO ECONOMIES

Improving the performance of each metro demands a deeper understanding of their industrial composition and competitive strengths. Examining the employment breakdown of each city more closely reveals significant differences between them. Although they share some similarities, such as being major economic centres that serve broader regions, their makeup is diverse, as indicated in [Figure 3.2](#). This demonstrates the significance of specialisation within the national urban system. While cities may compete, they also complement and exchange goods and services based on their particular assets, infrastructure, natural resources, local institutions, labour force, politics, and historical strengths. A dynamic urban system relies on the comparative advantages and synergies between cities to reinforce their specific roles, enhance their capabilities, and boost their productivity.

To gain a thorough understanding of the unique features of each city's economy, it is necessary to conduct a detailed historical and qualitative analysis. At the risk of oversimplification, we provide a concise summary of the main function of each metro based on the industry employment tax data:

FIGURE 3.2 Composition of industry, 2019/20



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

Notes: 12-month rolling average

Johannesburg *'Financial centre'*. Finance makes a much bigger contribution to the local economy than it does in other cities. Johannesburg houses the headquarters of most of the banks, pension funds and insurance companies, the Johannesburg Stock Exchange (JSE), Industrial Development Corporation (IDC) and Public Investment Corporation (PIC). Many related business services are also clustered in Johannesburg, including Information and Communication Technology (ICT), administrative and professional services such as accountants and lawyers.

Ekurhuleni *'Manufacturing-logistics'*. The East Rand used to be known as the workshop of the country. Manufacturing is still the largest employer in the metro, with prominent industrial districts such as Germiston, Boksburg, Nigel and Springs. The transport sector plays an important support function, including airport-logistics in Kempton Park near OR Tambo International Airport, one of Africa's busiest.

Tshwane *'National government and professional services'*. Tshwane is the administrative capital of the country and the seat of the executive branch of government, with most national departments located there. Hence it benefits from many recession-proof public-sector activities, including research councils and foreign embassies. Various other industries feed off, or are funded by, the government, including teaching hospitals and universities.

Cape Town '*Diversified tourism-centric*'. The economy of Cape Town is relatively diversified and therefore difficult to summarise. There are clear strengths in retail and tourism-related activities, although the latter was hit hard by the pandemic. Some of South Africa's largest retailers have their headquarters in Cape Town, including Shoprite, Pick n Pay, Woolworths, Foschini, Pep, Truworths and online vendor Takealot. The city is also the country's second largest centre of financial services, after Johannesburg.

eThekweni '*Manufacturing-logistics*'. eThekweni has always been an important manufacturing centre. The Port of Durban has since become a major anchor of the busy logistics corridor to Gauteng. Less-skilled tourism and administrative services (including call centres, private security and outsourcing) are an emerging feature of the local economy.

Nelson Mandela Bay '*Automotive centre*'. The city is known for its automotive cluster, including various foreign-owned vehicle manufacturers and related suppliers, such as Volkswagen, Ford, Goodyear, Bridgestone, Isuzu, Continental Tyre, Shatterprufe and, more recently, First Automotive Works (FAW). It has struggled to diversify its manufacturing sector despite substantial investment in infrastructure such as the Coega Industrial Development Zone (IDZ).

Buffalo City '*Provincial government*'. Buffalo City is the headquarters of the Eastern Cape government and has the largest share of workers in government of any metro. Besides the civil service, East London has some manufacturing capabilities including Mercedes-Benz, Daimler Chrysler and several upstream suppliers in the East London IDZ.

Mangaung '*Health and education*'. Mangaung is the smallest metro and benefits from the headquarters of the Free State provincial government. A distinctive feature is the high concentration of workers in healthcare and education. The metro has a long history of education facilities (including two universities) and significant private health facilities (three private hospitals, many private day clinics and an increasing number of medical research institutions), as well as several public health facilities.

Viewing the metropolitan areas as equivalent or interchangeable economic entities conceals their differentiated characteristics. Further research is necessary to gain a deeper understanding of the unique contribution of each metro to the national economy. This is crucial to guide local economic and industrial policy, which should target their comparative advantages and proven strengths.

3.4 | METRO ECONOMIC OUTLOOK

It follows that the economic outlook for each metro is also different because of their distinctive industrial profile and contrasting job trajectories. While local economies are influenced by national and international factors and forces (such as global technological change, commodity price cycles or national trade and tax policy), recent research suggests that local factors may be just as important in shaping success (see Visagie & Turok, 2022).

Figure 3.3 combines industry size, specialisation and recent employment growth to give a better sense of the economic outlook for each metro. The intention of these charts is not to speculate about future prospects – which are always difficult to predict – but rather to design a diagnostic tool to help identify which sectors show signs of potential or stress for each metro, and what this means for the overall economy of the city. The x-axis captures the location quotient (LQ) for each sector, which is a measure of relative industry specialisation. The y-axis captures the absolute change in employment for that sector over the period 2015–2022. The size of the bubble reflects total employment in that sector. The combination of these three variables conveys valuable insights into the distinctive character and strengths of each metro economy.

At risk of oversimplification, sectors can be categorised according to their position within the figure. Sectors which fall into the upper right-hand quadrant are classified as ‘solid bets’ i.e. they are a relative specialisation for the metro and created new jobs over the period. Sectors which fall into the bottom right-hand quadrant are called ‘underperforming’ i.e. they are a relative specialisation but lost jobs. Sectors which fall into the top left-hand quadrant are ‘emerging’ i.e. they are not a particular strength of the metro but did generate new jobs. Last, sectors which fall into the bottom left-hand quadrant are ‘low prospects’ i.e. they are neither a specialisation, nor did they generate any new employment. In general, sectors which fall towards the extremes of the figure (i.e. the corners) are easier to label than those that fall towards the centre (i.e. where the x-axis and y-axis cross), which are more neutral in character. The scale of the x-axis should also be looked at on each figure to provide an indication of the change in employment over the period 2015–2022.

ACKNOWLEDGING WHAT IS SPECIAL ABOUT EACH METRO CALLS FOR A MORE DEVOLVED APPROACH TO NATIONAL INDUSTRIAL AND ECONOMIC POLICY WHICH BUILDS ON THE STRENGTHS OF EVERY METRO. THE NATIONAL ECONOMY IS HAMSTRUNG IF ONLY SOME REGIONS MANAGE TO GROW.

Cities with the most promising outlook would have all their bubbles well above the x-axis (showing positive job trajectories) in either the 'solid bets' or 'emerging' categories. They would also have their bubbles for tradable sectors (such as business services and manufacturing) in the 'solid bets' category because these are the sectors in which they need to be competitive to ensure future growth. Finally, these bubbles for tradable sectors would be relatively large to indicate that these cities had real strengths in tradables and were not over-dependent on government services or non-tradables (like many consumer services). Tradable sectors are more reliable sources of long-term growth than non-tradables because they are not restricted to local markets or constrained by depressed local demand.

Johannesburg South Africa's largest metro was hampered by the uneven performance of its service economy, which was also its main specialisation. On the one hand, 'Finance' and 'Professional services' continued to create jobs, skewed towards higher-earning professionals. These are tradable sectors and they have been performing relatively well nationwide over the last decade. On the other hand, lower-skilled service workers, specifically within 'Administrative and support services' and 'Construction', experienced significant decline. 'Other' services were the biggest drag on employment. Johannesburg also has strengths in ICT, but surprisingly this created no additional jobs over the period. All things considered, Johannesburg has been dealt a good hand in terms of its sectoral composition, but it has failed to capitalise on this in recent years.

Ekurhuleni The economy was set back by a collapse in its core specialisation of 'Manufacturing', which lost nearly 18 000 jobs. Firms in downstream 'Logistics' also shed jobs in the wake of its industrial decline. In contrast to Johannesburg, Ekurhuleni has not been dealt a good hand in terms of being endowed with growth sectors, especially services. Yet, there was one exception to this in 'Administrative and support services', which were the biggest source of job creation in Ekurhuleni, again in contrast to Johannesburg. This suggests some relocation of these activities within the Gauteng city-region. Admin-related services cover diverse activities, such as labour brokering, private security, travel agencies and general office administration, but with low margins. They could be sensitive to place-based cost advantages.

Tshwane The administrative capital continued to benefit from its proximity to government and expanded jobs in its specialisation of 'Health and education' sectors as well as 'Government/Public administration'. Public sector employment has been a source of relative stability for Tshwane, but is non-tradable and therefore offers modest long-term growth prospects. Health and education are somewhat different in that some advanced health and higher education activities are tradable. A concentration of jobs in 'Professional services' is also apparent, probably as a spin-off from government-related universities, science councils and training hospitals, which also added jobs over the period. Whilst 'Manufacturing' and 'Logistics' shed significant jobs in Tshwane, manufacturing is not a core dependency.

Cape Town The city's economy managed to limit jobs losses across the board, even in manufacturing, while experiencing moderate growth from a cluster of service activities including 'Finance', 'Tourism', 'Professional services' and 'Health and education'. The exception was a sizeable boost of more than 100 000 jobs in 'Retail', which was also an important sector specialisation for the city. While closer inspection of the data suggests that some of this retail performance could reflect a 'head office' reporting problem, nevertheless the city would still have benefited indirectly as headquarters for many of the country's leading retail chains. Cape Town's distinctive strengths tend to be in consumer services and, to a lesser extent, business services. There are some tradable activities in both of these categories, such as tourism, finance, professional services and ICT.

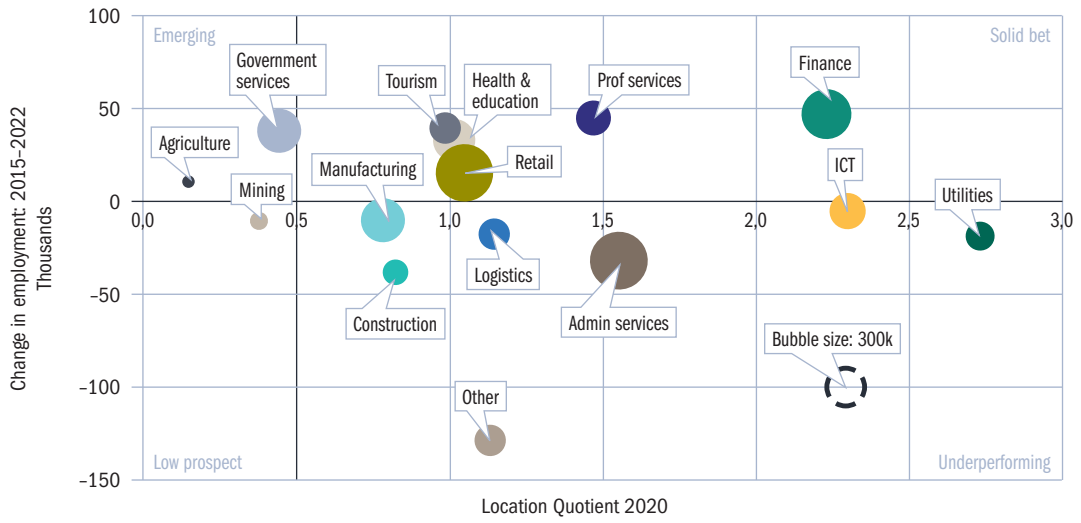
eThekweni The country's busiest port city and logistics gateway to Gauteng was boosted by a strong showing from 'Retail' but also positive growth from its dual specialisations in 'Manufacturing' and 'Logistics'. This is noteworthy considering the national decline in manufacturing as experienced by other metros. A deeper dive into manufacturing for eThekweni by sub-sector suggests that better performance was because of 'Textiles', 'Leather' and 'Food products' factories whereas heavy industry suffered like it did in most other metros. eThekweni's economic structure is similar in some respects to Ekurhuleni, although somewhat more diversified through consumer services.

Nelson Mandela Bay The city of Gqeberha (Port Elizabeth) and its surrounds experienced a serious loss of 'Manufacturing' jobs, which was central to its economy. No other sectors displayed a clear specialisation for the metro apart from 'Construction', which also performed poorly as in the rest of the country. There were very few sectors that created new jobs in the city. Its beleaguered manufacturing base will probably continue to hold back the local economy unless it can diversify into other sectors or industries with better growth prospects.

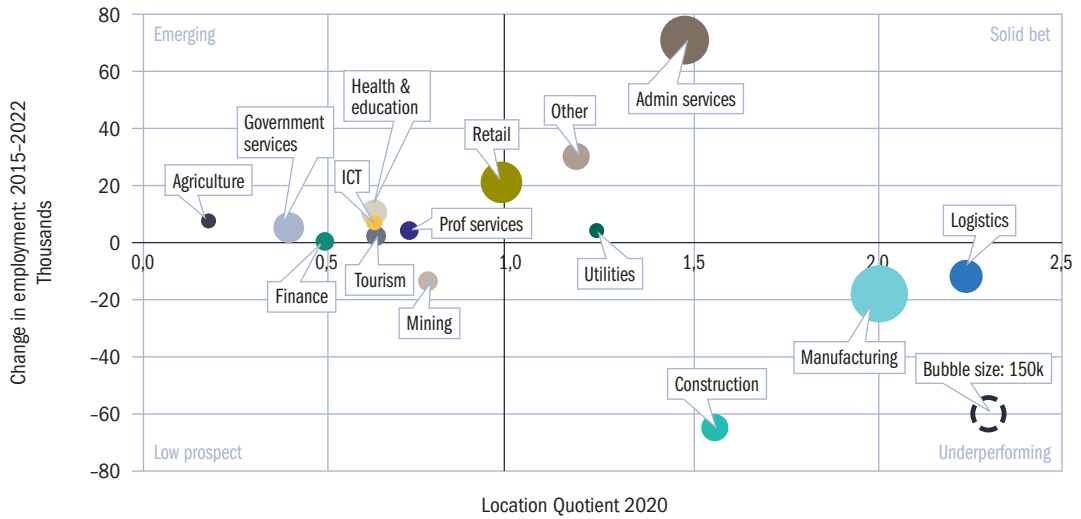
Buffalo City and **Mangaung** These two smaller metros are still emerging in character. They rely heavily on public sector jobs as respective headquarters for provincial government. While both were dependent on the 'Government/Public administration' sector, Mangaung shed a fair number of government jobs, while this was the greatest source of job creation in Buffalo City. Mangaung was also more specialised in 'Health and education' sectors compared with Buffalo City. 'Health and education' was an important source of new jobs in both. Both cities lack strengths in tradable sectors.

FIGURE 3.3 Cities economic outlook: Industry specialisation and jobs performance

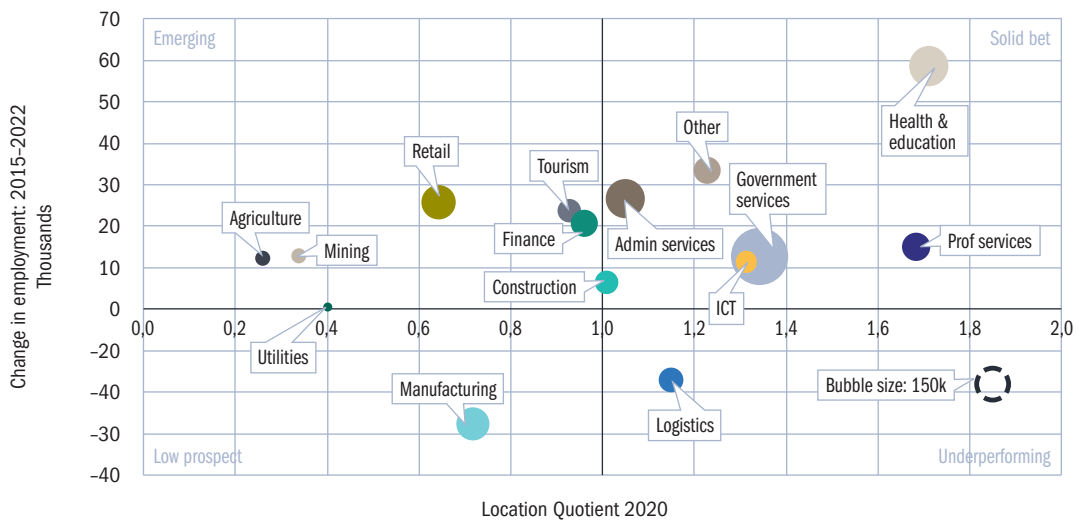
JHB



EKU



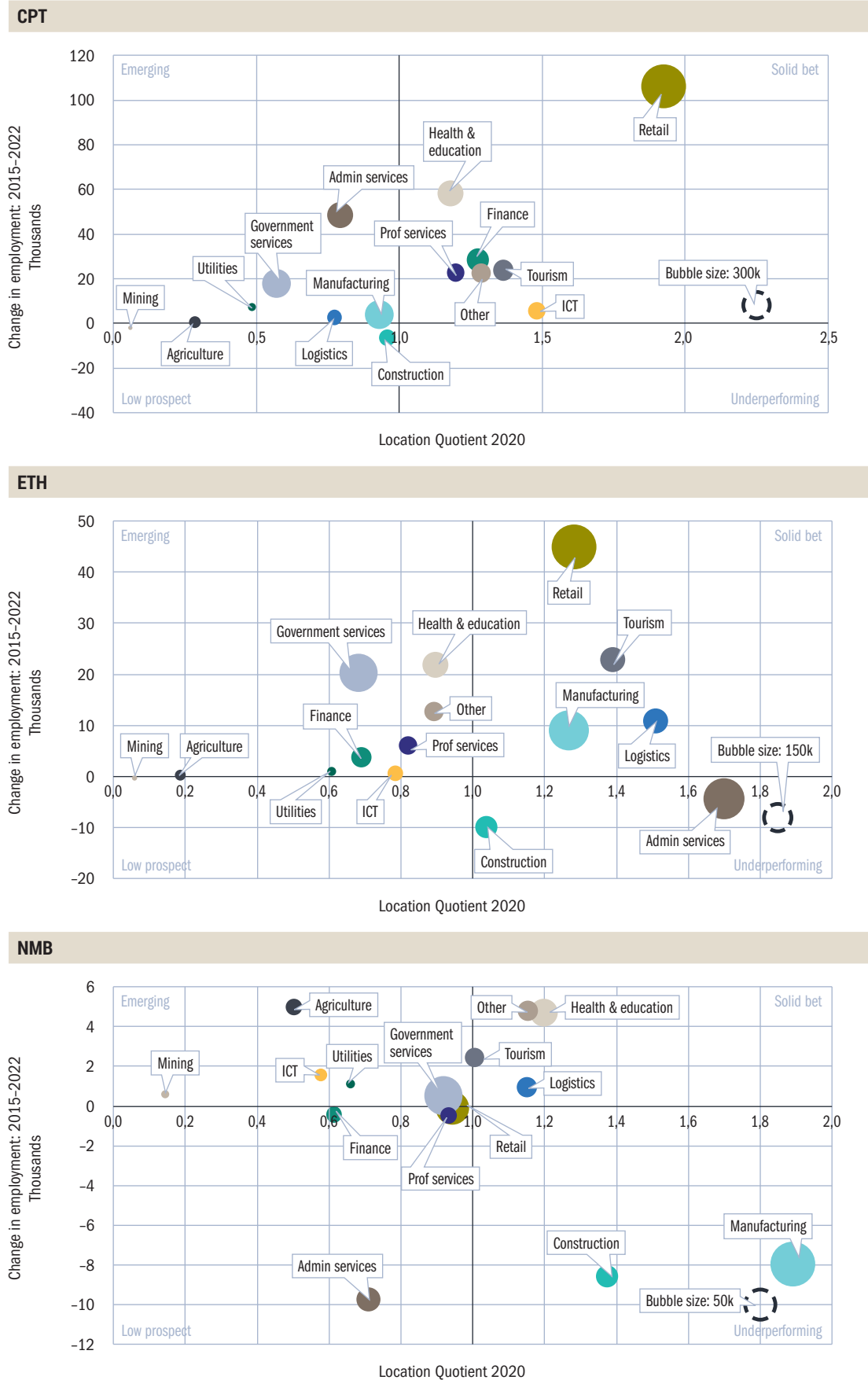
TSH



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

Notes: Change in employment is calculated with a two-year rolling average to reduce volatility in the choice of base and comparison years. The location quotient is a measure of relative industry specialisation.

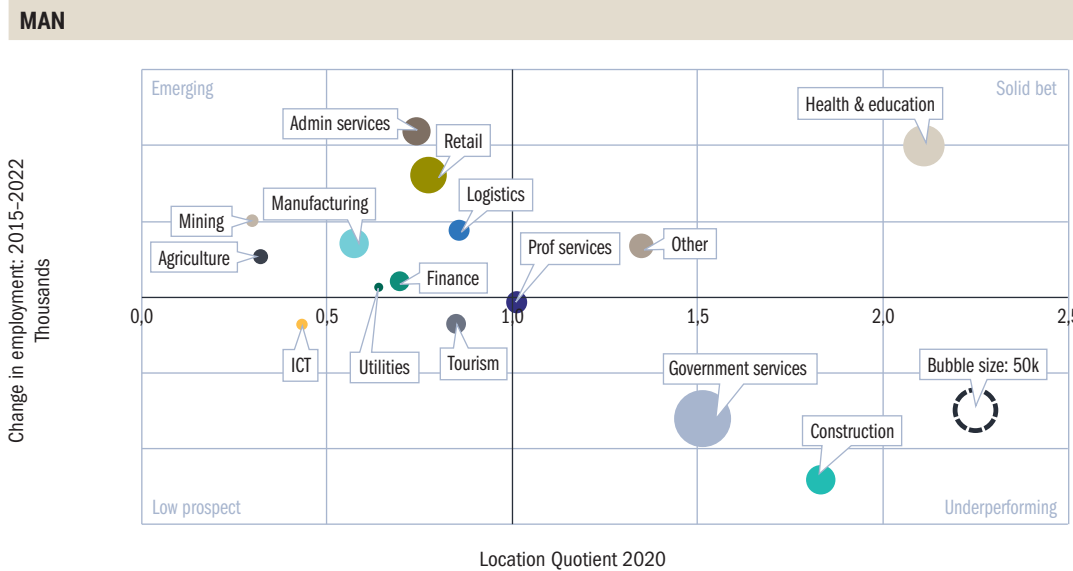
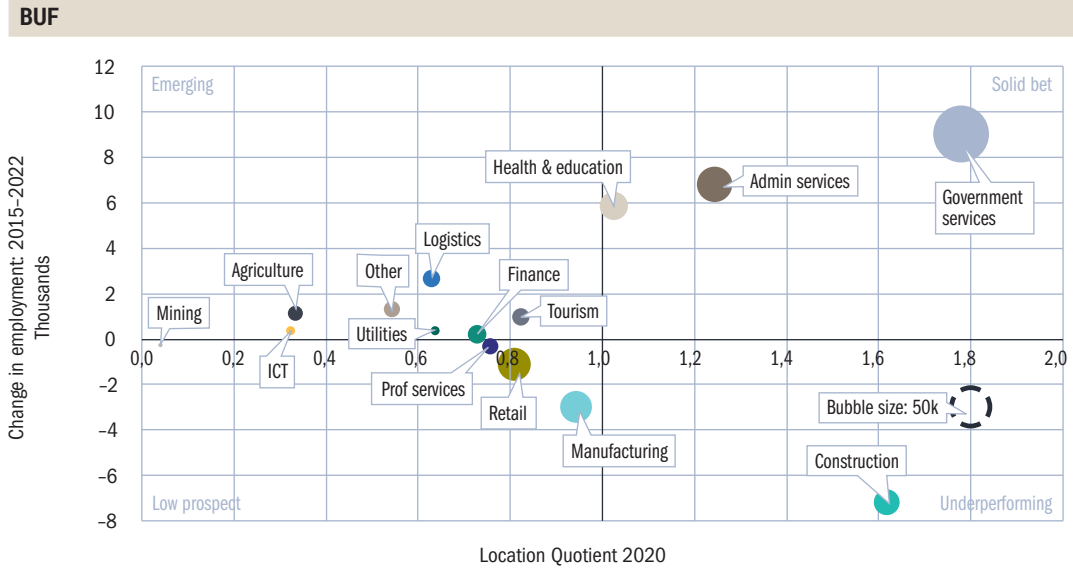
FIGURE 3.3 Cities economic outlook: Industry specialisation and jobs performance (continued)



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

Notes: Change in employment is calculated with a two-year rolling average to reduce volatility in the choice of base and comparison years. The location quotient is a measure of relative industry specialisation.

FIGURE 3.3 Cities economic outlook: Industry specialisation and jobs performance (continued)



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

Notes: Change in employment is calculated with a two-year rolling average to reduce volatility in the choice of base and comparison years. The location quotient is a measure of relative industry specialisation.

3.5 | CONCLUSION

The main contribution of the chapter has been to show the distinctive position and features of each metro economy as part of a wider urban system and national economy. In summary, the metro economies have performed unevenly in terms of jobs growth over the past decade, with a split both above and below the national average. The damaging effects of Covid-19 and the subsequent recovery have also varied across the metros. A deeper exploration of their industry profiles and sectoral performance revealed variations in the main sources of employment as well as where jobs were lost or gained.

It should not be forgotten that the metros operate within a common regulatory environment and face similar global challenges such as inflation, supply chain disruption and rapid technological change. Yet the basic structure and size of city economies affect how their business ecosystems adapt and respond to these shocks. For instance, Ekurhuleni, Nelson Mandela Bay and Tshwane suffered from significant declines in manufacturing jobs, yet eThekweni managed to grow its share of blue-collar work over the same period. The economic character and performance of each city region is explained by all kinds of local features including endowments of natural resources, its weather, position and proximity to other markets, the quality and level of investment in local infrastructure, skills and expertise available from institutions of higher learning, political leadership and civic involvement, among others.

Acknowledging the distinctive features of metro economics has three particular implications for economic planning and policy support.

First, place-blind targeting of growth sectors cannot be the sole preoccupation of industrial policy. A more devolved approach to national industrial and economic policy could build on the strengths of every metro and region. The national economy is hamstrung if only some places manage to grow. It is hard to imagine a prosperous future for the country which is not characterised by vibrant and liveable cities in every province.

IN SUMMARY, THE METRO ECONOMIES HAVE PERFORMED UNEVENLY IN TERMS OF JOBS GROWTH OVER THE PAST DECADE, WITH A SPLIT BOTH ABOVE AND BELOW THE NATIONAL AVERAGE.

Second, the assembly of transparent and robust regional data – such as the Spatial Tax Panel – needs to be prioritised to enable this approach. Detailed city and regional economic intelligence also demand proactive engagement between researchers and academics in local universities and think tanks with local and provincial government officials to develop a sound evidence base.

Third, local actors and institutions need to be coordinated and mobilised around a shared vision of economic priorities for their area. Identifying and tackling a distinct set of local problems as a collective can help to break down silos between different actors and across government departments, and encourage accountability as well as empathy of complex and challenging circumstances, and can go a long way in building up trust and goodwill for deeper collaboration into the future.

References

- Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3
- Robbins, G. [forthcoming] Cities in South Africa’s post-apartheid national economic policy frameworks. HSRC Research Seminar; Gordon Institute of Business Science, University of Pretoria, Pretoria, South Africa.
- Todes, A. and Turok, I. (2017) Spatial inequalities and policies in South Africa: Place-based or people-centred? *Progress in Planning*, 123: 1–31.
<https://doi.org/10.1016/j.progress.2017.03.001>
- Turok, I. (2021) Urbanization, agglomeration and economic development in South Africa. In Oqubay, A.; Tregenna, F. and Valodia, I. (eds) *The Oxford Handbook of the South African Economy*. Oxford: Oxford University Press.
- Visagie, J. and Turok, I. (2022) Firing on all cylinders: Decomposing regional growth dynamics in South Africa. *South African Journal of Economics*, 90(1): 57–74.
<https://doi.org/10.1111/saje.12303>
- World Bank (2023) Open Data Portal. Urban Population Indicator: SP.URB.TOTL.
<https://data.worldbank.org/indicator/SP.URB.TOTL>

4

THE IMPACT OF COVID-19 ON SOUTH AFRICAN CITIES

Authors

Andrew Nell^a and Justin Visagie^b

Highlights

- 1 The Covid-19 pandemic brought about an unprecedented decline in (formal) employment across the country. The bulk of the losses were concentrated in the metros within tradable sectors such as manufacturing, construction, retail, logistics and tourism-related activities. The rest of the country was protected, to some extent, by their dependence on more stable government-related jobs, agriculture and specific mining sectors.
- 2 Only eThekweni and Tshwane had shown signs of recovering to pre-pandemic levels by February 2022. However, this recovery was driven mostly by government-related jobs rather than industries that experienced losses. Public sector employment was the strongest source of new job creation over the period 2019/20 to 2021/22 across all metros.
- 3 The pandemic had disparate economic effects on specific demographic groups. The youth (aged 15–25 years) were severely impacted with total employment contracting by 20% and showing no signs of recovery. Similarly, employment of foreign nationals was heavily impacted by the pandemic without any bounce back. Interestingly, employment levels among males declined much more than among females, probably because of the significant decline in male-dominated manufacturing and construction sectors.
- 4 The internal structure of cities was also affected by the pandemic with losses concentrated in the CBDs as well as other major industrial nodes. The impact on formal employment in townships was relatively muted (with employment actually increasing in several townships), likely because of the role of healthcare and education services and the importance of larger retail chains in these areas.
- 5 We have shown that the Spatial Tax Panel can fill a major gap by providing a detailed evidence-base to better inform responses to the Covid-19 pandemic (and subsequent economic shocks), as well as guide future urban planning, policy and operational decisions.

^a Andrew Nell is an independent consultant, researcher and data scientist.

^b Dr Justin Visagie is a Senior Research Specialist at the Human Sciences Research Council and a Senior Lecturer at the Department of Economics and Finance, University of the Free State.

4.1 | INTRODUCTION

The Covid-19 pandemic was a major shock to an already stagnating South African economy (OECD, 2022; World Bank, 2023). As with any shock, the outcomes (both negative and positive) vary in severity across different groups, whether broken down by geography, industry or demography. This warrants a targeted response from government in order to mitigate against negative impacts that disproportionately affect specific groups, so as to enhance recovery. Yet various spheres of government often lack access to granular data to inform their response. While several programmes and initiatives have been able to either conduct surveys or source specific data ([NIDS-CRAM](#), [Presidential Stimulus](#) etc.), these each have limitations in terms of either specific focuses or the extent of coverage of specific places, industries or socio-economic groups.

A big advantage of the Spatial Tax Panel is the ability to drill down to an unprecedented level of detail in mapping out employment across space, time and demographic characteristics. While tax data has its limitations, such as excluding informal workers and informal enterprises and being prone to administrative error,¹ mapping out trends for formal employment can still provide a good indication of the overall impact and priorities moving forward. These can be used in combination with related measures of economic performance, such as Stats SA's GDP, Quarterly Labour Force Survey and Quarterly Employment Surveys, as well as municipal data and other qualitative information available to build up a credible evidence base.

This chapter enhances our understanding of the impact of the Covid-19 pandemic by providing nuance to the changes in formal employment based on the latest tax data available. We focus on the year proceeding the shock (i.e. the 2019/20 tax year, which conveniently ended in February 2020) up until February 2022 (i.e. 2021/22 tax year). We show that the South African economy – driven mostly by the metro economies – has been severely impacted by the onset of Covid-19 with only limited signs of recovery up until February 2022. The limp recovery in different parts of the country may also be related to a number of subsequent negative economic shocks since the pandemic, including the riots of July 2021, flooding in eThekweni in 2021, and the general global economic downturn, which is forecast to continue (IMF, 2023). The results clearly show how specific sectors, people and places were impacted more severely than others. The implication is that a targeted approach from government could better focus limited resources on vulnerable groups and help build back better.

1 While we can pick up trends associated with specific areas, time periods and several other important aspects, these only provide detail as they are updated by tax filers. As an example, if an employee moved branches within a firm, there is no reason for this to be accurately reflected in the data by a firm filing two separate submissions in a single tax year. However, the changes will likely be reflected in the following tax year. Many trends may present themselves more strongly between tax years rather than months.

4.2 | NATIONAL IMPACT AND RECOVERY

South Africa had been struggling to attract investment, expand production and create new jobs long before the onset of the Covid-19 pandemic (OECD, 2022). The Covid-19 pandemic brought about an unprecedented decline in both the number of full time equivalent (FTE) employees and firms (measured as number of establishments to account for multiple branches) in an already stagnant economy.

Figure 4.1 shows the seasonally adjusted impact of Covid-19 on the total number of employees and establishments in South Africa relative to the 2019/20 tax year. These are overlaid with data related to both Covid-19 waves² and lockdowns³ to provide details related to specific key milestones.

The number of FTE employees saw a slight increase until the onset of the pandemic in March 2020, which prompted the implementation of the first level 5 lockdown, and saw a sudden contraction in employment of about 2%. The fall in jobs numbers began to slow with a move to less severe level 4 lockdown measures in May 2020 but jobs again noticeably declined with the onset of the actual first wave of infections starting in June. The end result was a 3% loss in employment nationally as compared with September and October of the preceding year. The end of the first wave and gradual easing of lockdown restrictions all the way down to level 1 saw some recovery in employment in the final quarter of 2020 even as the country headed into a second wave of infections. Yet this recovery was short lived as infections increased, and lockdown restrictions were once again ramped up to level 3 in January 2021, and employment numbers subsequently declined to a loss of 3% compared with the preceding year. Even after lockdown restrictions were lifted in March 2021, there was little sign of any improvement until October 2021 when employment finally began to increase again. That said, the final February 2022 employment figures were still approximately 2% below the 2019/20 tax year average, suggesting that national employment had still not recovered from the initial shock of the Covid-19 pandemic and subsequent shocks to the economy.

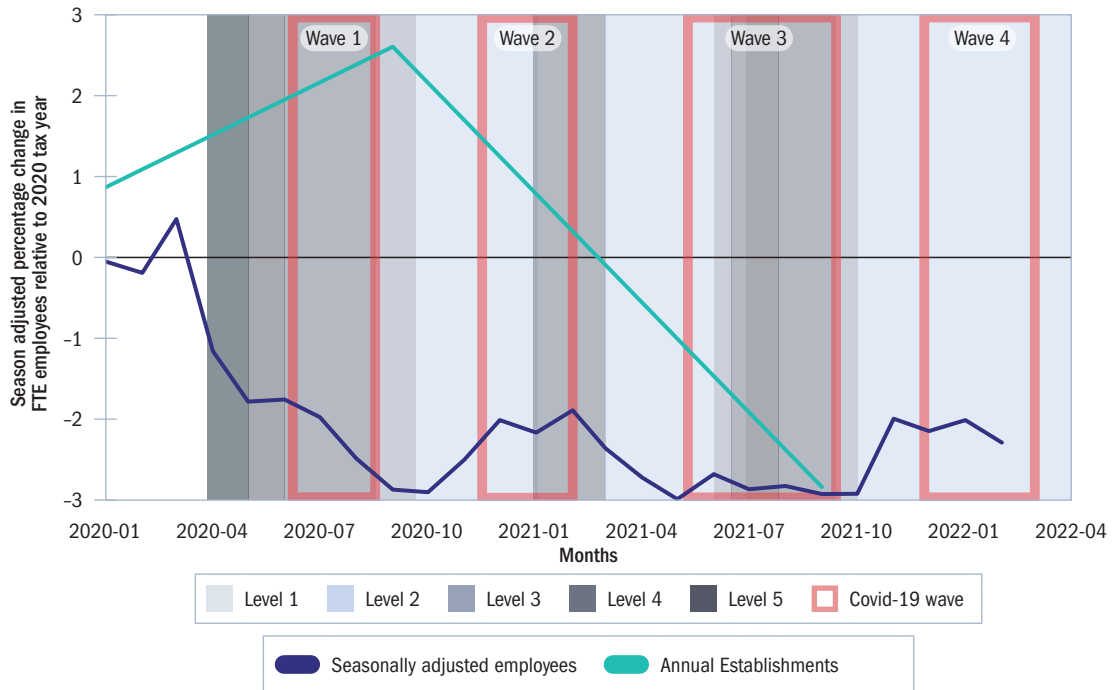
The annual number of establishments was similarly impacted by the onset of Covid-19 and economic lockdowns although with a delayed effect. The number of establishments actually increased up until the 2020/21 tax year by approximately 2.5% compared with 2019/20 levels, but then declined noticeably by the 2021/22 tax year with a contraction in the number of establishments by approximately 3% – roughly matching losses in total employment.⁴ FTE employment is probably more responsive than establishments because companies would retrench employees before closing a branch or shutting down completely.

2 Defined by the National Institute of Communicable Diseases (NICD) as a period where the incidence of Covid-19 is above 30 cases per 100 000 persons (NICD, 2021).

3 As noted by the South African Government (South African Government, 2023).

4 Differences between employment and establishments are also due to the way the indicators are calculated, with FTE employees tracking the percentage of time an employee works in a year, whereas the establishments indicate the presence of an establishment in a tax year, regardless of how many months they were in operation. Unfortunately, while we can get a sense of establishments overall, most of the other indicators that we could aggregate the data by, such as firm size or whether an establishment is part of a multi-establishment enterprise, have a longer lag in the data, with results only currently available for the 2020 tax year and hence are excluded from subsequent analysis. The rest of the chapter will therefore focus on the FTE employees as a proxy for economic activity.

FIGURE 4.1 National impact of Covid-19 pandemic for FTE employees and establishments



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

4.3 | IMPACT ON METROPOLITAN MUNICIPALITIES

As shown in **Chapters 2 and 3**, cities are the economic engines of the country. However, there are important differences in their industrial profiles and what might drive economic growth in each of these cities. It follows that Covid-19 had varying degrees of impact on each of these places.

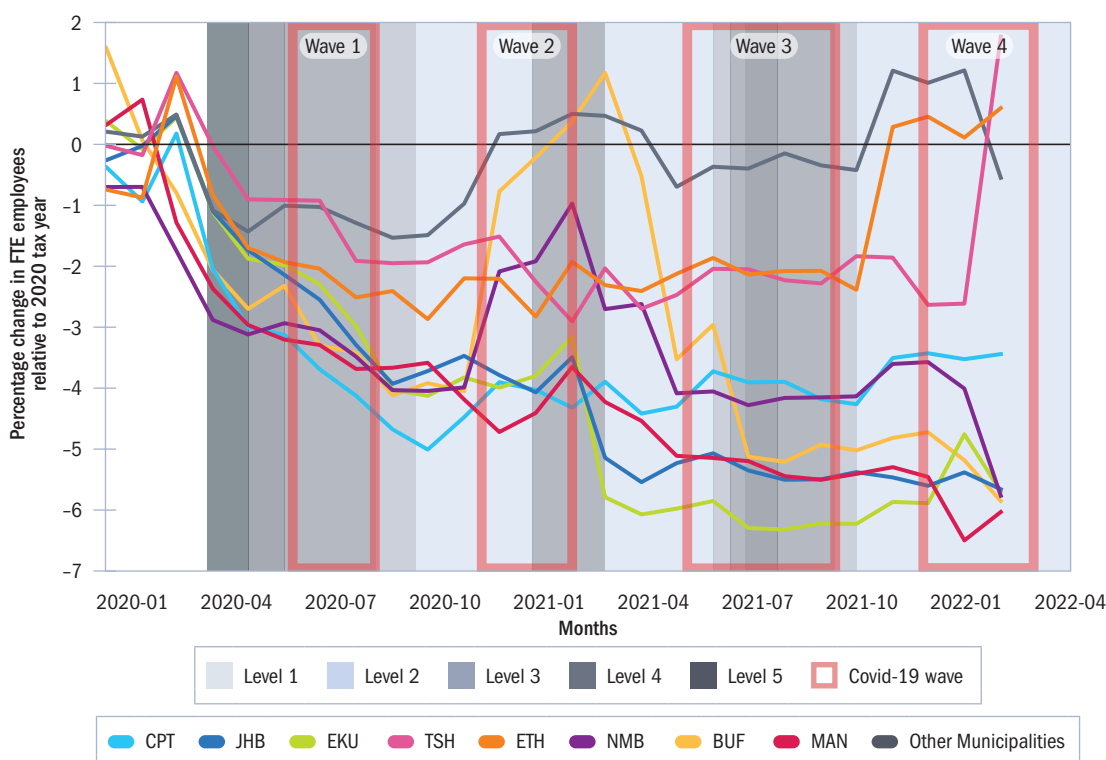
Figure 4.1 shows the seasonally adjusted percentage change in employees in each metropolitan municipality, and all other municipalities, compared with the 2019/20 tax year employment levels. While some cities have shown brief periods of recovery, the overall picture for all metros is a continued decline over the two-year period relative to the pre-Covid-19 baseline. There was generally a slight recovery during and after the second wave with the coastal metros showing the largest improvements. These coastal economies generally perform better over the summer months due to travel and tourism. However, with the onset of the third wave of infections and subsequent lockdowns, most metros experienced further declines in employment.

eThekweni and Tshwane experienced recovery, reaching their 2019/20 levels by October 2021 onwards. Further inspection of the data suggests that this was driven solely by increases in government-sector employment (see **Section 4.4**). These two cities were also the least affected by negative shocks with a maximum decline in employment of approximately 2.5% whereas many other metros experienced more than double this in employment losses. Tshwane was probably shielded due to the high concentration of government workers who enjoy greater job security.

The remaining Gauteng metros (Joburg and Ekurhuleni) were among the worst performers with losses of up to 6.5% in employment relative to the 2019/20 tax year level. Cape Town experienced some recovery from a low point of –5% of employment, but is still sitting low at approximately –3% of 2019/20 levels. The impact on the national economy is amplified by the huge workforce in these cities, which hold almost 50% of employment nationally.

Outside of the metros, combined employment in all other non-metropolitan municipalities appeared to be more resilient. Like Tshwane, this was probably partially due to a high share of protected public sector jobs, but also to more specific growth in some agricultural and mining sectors. In fact, some peripheral areas with little formal economy could have benefited from the expansion in social support such as the Covid-19 relief of distress grant. Employment losses had already recovered to their 2019/20 levels by the end of 2020, but fluctuated around this level over the rest of the period.

FIGURE 4.2 Metro-level impact of Covid-19 pandemic on FTE employees



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

4.4 | IMPACT ON INDUSTRIES

A key question is how the pandemic impacted different sectors within metro economies. **Figure 4.3** and **Figure 4.4** show the absolute changes in FTE employees relative to the 2019/20 tax year average (after data is seasonally adjusted) for 20 sectors that had the highest and lowest growth (10 each) at a 1-digit (broadest industry groups) and 5-digit level⁵ (extremely detailed sub-industry groups).

5 Please refer to [Stats SA's SIC7 classification](#) for detailed descriptions of each of the categories shown.

Focusing on the broadest 1-digit level, **Figure 4.3** shows which specific sectors contributed to the 300 000 lost FTE opportunities observed in the metros. At the same time, there were only a few industries that registered any net new job creation, which added up to approximately 50 000 FTE opportunities.

Some of the big losers included the 'Manufacturing', 'Construction', 'Wholesale and retail trade', 'Administrative and support activities' and 'Accommodation and food service' sectors. Many of these industries were forced to cease, or scale down, their operations due to greater dependence on interpersonal contact, as in the case of retail, restaurants or hotels. Some of these sectors appear to still be in decline ('Manufacturing' and 'Construction'), while others have stabilised or showed some signs of recovery, despite still recording a net decline relative to 2019/20 employment levels.

Both 'Professional, scientific and technical services', and 'Other service activities' experienced small declines with the onset of Covid-19 but have since recovered fully and even recorded positive growth in employment from early 2021. Inversely, the 'Financial and insurance', and 'Mining and quarrying' sectors showed little impact during the first year of Covid-19. However, they have since declined to slightly below 2019/20 levels of employment. This lagging decline may be indicative of greater resilience or perhaps the knock-on effects from an prolonged national and global economic stagnation.

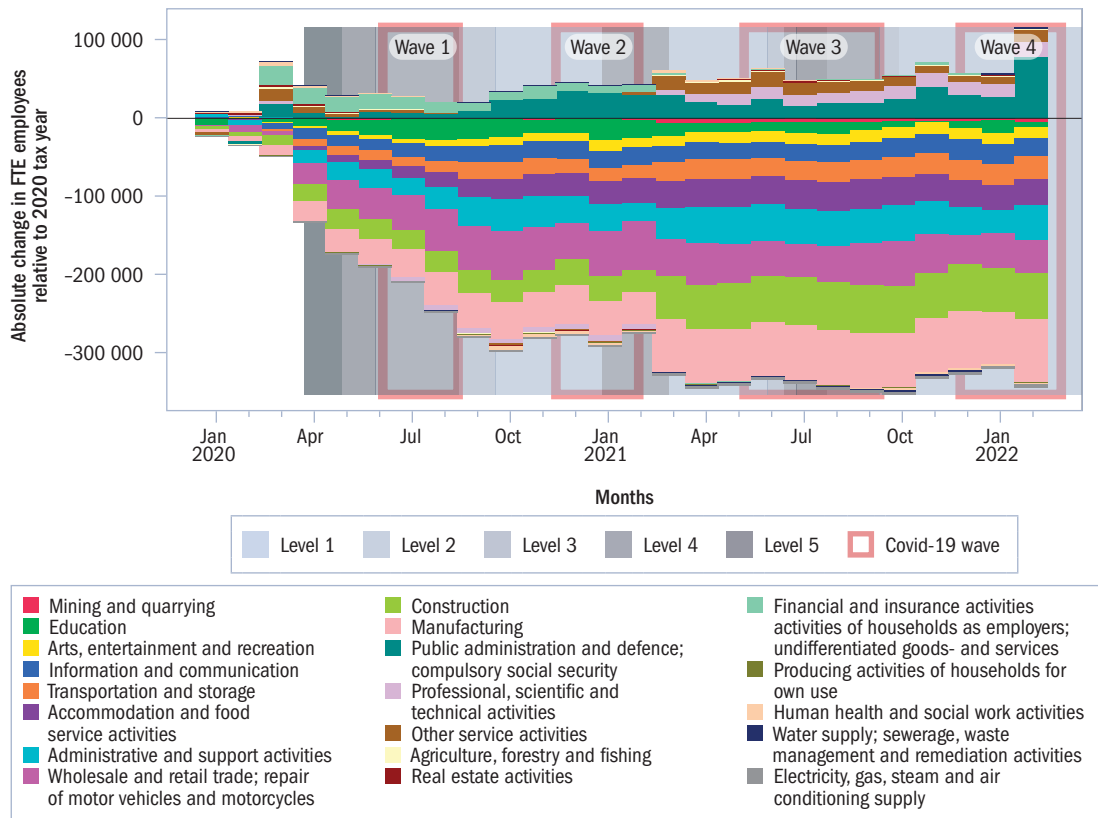
The only industry to consistently show growth over the period relative to 2019/20 levels was 'Public administration', which includes all government agencies and departments. This is indicative of a countercyclical role of government over the period by employing more people. Further research is required to better understand which specific departments contributed to this growth.

Figure 4.4 repeats this exercise with much greater detail by listing the 10 top and 10 bottom sectors at a 5-digit level for net jobs over the period, as well as including 2 other notable industries that were relevant for discussion. This corresponds to Table 4.1, which shows the corresponding absolute and percentage change in FTE employees between the 2020 and 2022 tax years across each of the eight metros and all other municipalities combined. **Figure 4.10** to **Figure 4.18** in Supplementary Figures show the performance in each metro that was used to supplement this analysis. It is important to note that these only highlight changes for 20 of over 500 sub-sectors.⁶

While total FTE employment had grown roughly 2% per annum prior to the 2020 tax year, approximately 76% of all industries grew by less than 2% per annum post-Covid-19 with 68% of all industries actually shrinking and 50% shrinking by more than 6% of 2019/20 employment levels. These widespread losses suggest that most sectors were significantly impacted by Covid-19, with some exceptions such as government services, which performed relatively well over the period.

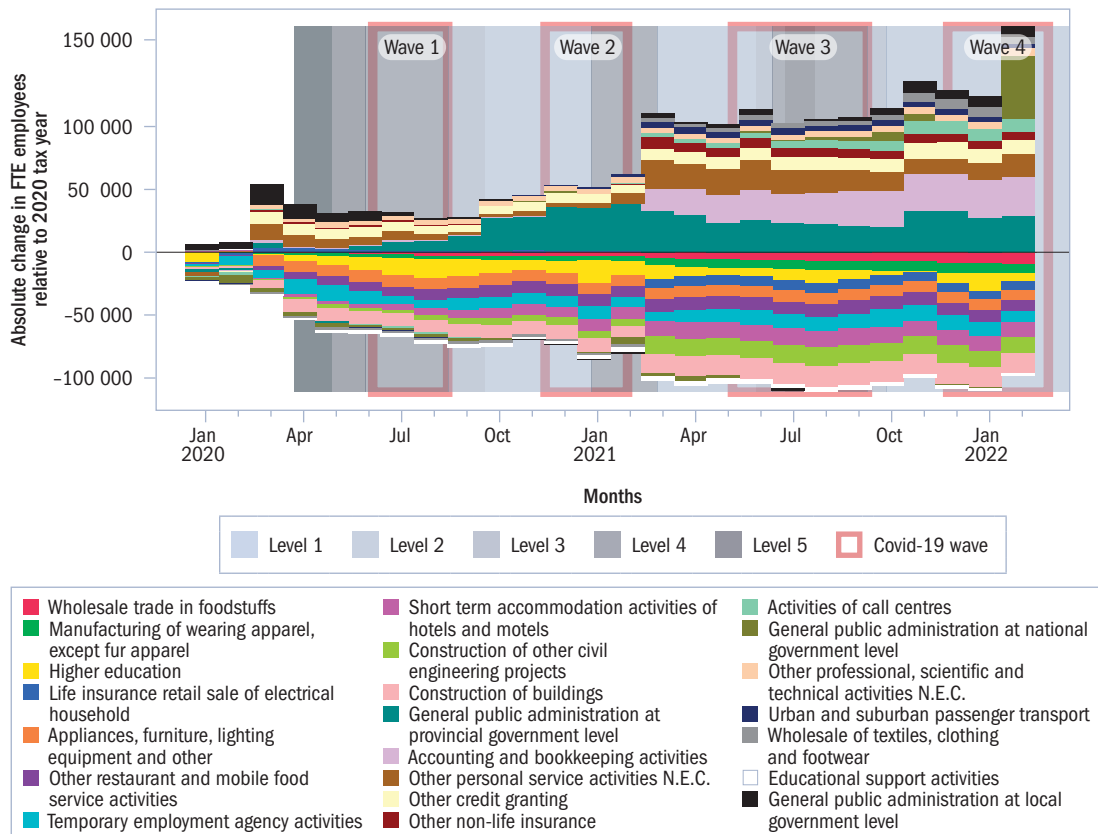
⁶ The absolute numbers do not match with Figure 4.3, because these selected 5-digit industries exclude other 5-digit industries in the same 1-digit category, which lowers the net growth when aggregated together.

FIGURE 4.3 Absolute changes in FTE employees by industry (1-digit level) across all metropolitan municipalities



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

FIGURE 4.4 Absolute changes in FTE employees by industry (5-digit level) across all metropolitan municipalities



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

The results generally align with the trends at a 1-digit level. The biggest losers include 'Construction' (which has both 'Construction of buildings' and 'Construction of other civil engineering projects'), 'Accommodation and food services' (which has both 'Short-term accommodation' and 'Other restaurant and mobile food service activities'), and 'Administrative and support activities' (which includes losses in 'Temporary employment agency services' and, to a lesser extent, 'Private security' (which is not in the bottom 10 sectors, but still significant in the raw data). These all appear to have declined in all metros and non-metropolitan municipalities, except for 'Temporary employment agencies', which showed signs of some growth in Cape Town, Ekurhuleni and Tshwane – with this growth offset by major losses in Johannesburg and eThekweni.⁷ Also included in 'Administrative and support activities' is 'Call centre activities' which grew over the period, with particularly high growth in Cape Town and eThekweni. This makes sense considering the shift to more remote means of doing business.

The 'Wholesale and retail trade' sector includes two of the highest loss sectors ('Retail sale of electrical household appliances' and 'Wholesale trade in foodstuffs'). These losses appear to have been experienced in every municipality except for Ekurhuleni, which showed increases in employment in these two sectors. The only retail sector that experienced some slight growth was 'Wholesale of textiles, clothing and footwear' – with most of this growth happening in Johannesburg, and notable increases in Nelson Mandela Bay and Ekurhuleni.

Looking at 'Manufacturing', the 'Manufacturing of wearing apparel' registered the greatest losses. Johannesburg, Cape Town and eThekweni registered losses of 38%, 30% and 18% of all FTE employees in this sector, respectively. This alludes to a possible shift in the clothing and apparel industry during Covid-19 away from manufacturing locally and more to the importing and wholesaling of other textiles, clothing and apparel. Revisiting the high losses experienced by the 'Manufacturing' sector in [Figure 4.3](#) suggests that several other 5-digit industries within the sector also experienced losses, but were not in the bottom 10 at the 5-digit level.

Considering the complete shutdown and functioning of transport services during Covid-19, it is no surprise that the 'Transport and storage' sector shed roughly 30 000 FTE opportunities relative to 2020 levels. By contrast, the 'Urban and suburban passenger transport' sector showed no changes in 2021 and increases of approximately 4 500 FTE employees in 2022, with the bulk of these being located in Johannesburg. These are likely related to the starting up of key passenger transport services post-Covid-19. The losses can be explained by the 24 other 5-digit industries in this category, with most of them showing slight losses. Notable losses were registered in: 'Bus transport', 'Freight transport by road', 'Passenger air transport', 'Service activities incidental to air transportation', 'Other transportation support activities', and 'Postal activities' of between 2 000 and 8 000 FTE employees.

⁷ It is possible that the 'Temporary employment' sector includes some jobs that may have been erroneously attributed to a head office of the temporary employment service agency as these companies would likely not list the actual work address of all employees, and so the changes would likely be concentrated in major cities.

The 'Finance and insurance' sector grew in 2020 and then retracted in 2021. 'Other credit granting' sector was positive in both years while 'Other non-life insurance' and 'Life insurance' sectors counterbalanced one another. Upon checking the raw data we can identify that 'Other financial services NEC' sector was mainly responsible for the 2021 decline. The growth and decline in these sectors appear to be limited to a couple of cities where a handful of businesses in Cape Town and Tshwane experienced most of the increases for 'Other credit granting' and 'Other non-life insurance' sectors, respectively. A number of metros seemed to experience increases in the 'Life insurance' sector. However, losses in Cape Town, Johannesburg and Tshwane pulled down the overall performance.

The growth in 2021 of the 'Professional services' sector was mostly driven by growth in 'Accounting and bookkeeping activities', which was positive across all metros and, to a lesser extent, by 'Other professional, scientific and technical activities'. The growth in 'Other service activities' in 2021 was driven by an increase in 'Other personal services activities NEC' in almost all cities except for eThekweni and Mangaung.

The growth in employment in 'Public administration' was stronger for provincial government, which was positive across all metros. Local and national government were less consistent, and national government registered a spike of almost 50 000 new FTE employees in February 2022. Most of these jobs benefited Tshwane as the headquarters for national government and related agencies. eThekweni saw the highest increases in local government employees with a $\pm 25\%$ increase. However, Tshwane, Ekurhuleni and Mangaung all lost local government FTE employees over this period.

A sector that has been included in the figure but is not in the top or bottom 10 industries in terms of growth in the metros is the 'Educational support activities'. While there has been a slight reduction in employees in this sector in the metros, we can observe an increase of over 54 000 FTE employees outside of the metropolitan municipalities. This is potential evidence of the impact of the Presidential Employment Stimulus's Basic Education Employment Initiative (BEEI), which, according to the Presidency (The Presidency, 2023), has placed over 600 000 young South African in teaching assistant roles across the country.⁸ It is not clear why these numbers do not show in the metros. Further research is required to better track these individuals in the tax data and to assess the extent of retention in the long run.

8 We would expect a discrepancy in the figures as placements do not necessarily equate to FTE employees (many of the opportunities may have only been for 3–4 months), and not all these schools may file tax correctly and submit IRP5 submissions for all staff (especially if these staff might be placed and paid through a government programme). This can also partially be explained by these new teachers being placed in other basic education 5-digit industries such as 'Primary education' and 'Recreation and sports education', which saw increases of approximately 4 500 and 2 500 FTE employees, respectively. However, the other basic education sectors all lost employees over the period. This poses an important question regarding the programme and whether these new teaching roles may have potentially displaced existing ones.

TABLE 4.1 Changes in FTE employees for top 10 and bottom 10 sectors at a 5-digit level across all metros⁹

	BCM	CPT	EKU	ETH	JHB	MNG	NMB	TSH	Other Municipalities	
Top Performing Sectors	General public administration at provincial government level	584 (2.1)	1 959 (2.5)	2 935 (12.6)	7 510 (11.9)	9 987 (9.5)	961 (3.4)	1 057 (5.8)	1 930 (5)	3 856 (0.6)
	Accounting and bookkeeping activities	-79 (-17.4)	1 385 (33.5)	1 405 (51.3)	894 (36.5)	19 112 (321)	40 (4.4)	80 (9.8)	2 721 (55.9)	3 846 (37.7)
	Other personal service activities NEC	798 (113.7)	2 893 (10.2)	1 628 (7)	-1 850 (-10.7)	6 048 (15.5)	-574 (-16.6)	329 (6.2)	8 460 (47.1)	2 796 (6.6)
	Other credit granting	-22 (-7.8)	11 695 (78)	-82 (-18.6)	-201 (-12.3)	-772 (-14.5)	88 (29.1)	-64 (-18.1)	-52 (-5.4)	230 (5.1)
	Other non-life insurance	-47 (-38.8)	835 (16.6)	-154 (-8.9)	-116 (-13.3)	-3 473 (-27.3)	-46 (-17.1)	-8 (-1.9)	10 165 (142.6)	-834 (-23.4)
	Activities of call centres	-19 (-100)	4 299 (33.6)	174 (28.4)	2 298 (35.9)	-180 (-2.3)	12 (12)	-16 (-3.5)	24 (3.7)	-122 (-24.3)
	General public administration at national government level	-7 (-0.2)	-694 (-7.6)	-174 (-3.7)	86 (1.7)	151 (1.9)	5 (0.2)	28 (1)	5 406 (7.3)	-791 (-1.6)
	Other professional, scientific and technical activities NEC	29 (40.6)	384 (12.1)	94 (5.1)	172 (20.1)	3 702 (69.7)	204 (88.5)	-464 (-73.6)	609 (13.5)	478 (12.7)
	urban and suburban passenger transport	0 (0)	64 (13.7)	-112 (-54.6)	-57 (-100)	4 494 (34.3)	0 (0)	275 (2 453.3)	-75 (-24.9)	-106 (-45.9)
	Wholesale of textiles, clothing and footwear	-113 (-8.4)	-285 (-1.1)	444 (27.1)	-660 (-11.4)	4 810 (79.3)	11 (22.7)	382 (66.7)	-97 (-10.5)	-29 (-1.7)
	General public administration at local government level	561 (5.5)	1 715 (4.6)	-2 149 (-9.4)	7 462 (24.8)	2 168 (6.2)	-684 (-12.1)	59 (0.7)	-4 801 (-18.1)	1 408 (0.8)
	Educational support activities	-1 052 (-40.6)	-508 (-8)	-246 (-11.1)	-222 (-7.1)	-164 (-1.3)	-933 (-63.8)	-95 (-16.7)	39 (1)	54 288 (462)
	Bottom Performing Sectors	Wholesale trade in foodstuffs	4 (0.6)	-1 019 (-10.1)	244 (3.3)	-3 943 (-22.1)	-1 748 (-8.7)	52 (3.8)	19 (0.8)	-646 (-14.3)
Manufacturing of wearing apparel, except fur apparel		-174 (-18.9)	-3 132 (-29.9)	-292 (-71.1)	-1 520 (-16.7)	-1 636 (-38)	0 (0)	-23 (-9)	-411 (-27.1)	-544 (-8.3)
Higher education		-80 (-2.7)	-268 (-1.1)	179 (10.5)	148 (1)	-1 172 (-4.4)	-1 066 (-10.7)	-152 (-2.6)	-4 853 (-8.6)	-2 625 (-5.9)
Life insurance		84 (6.8)	-3 712 (-17.7)	430 (36.1)	-68 (-2.4)	-1 880 (-8.4)	94 (15.4)	198 (22.1)	-2 805 (-29.6)	325 (4.3)
Retail sale of electrical household appliances, furniture, lighting equipment and other		4 (2.3)	-8 204 (-63)	33 (1.7)	-148 (-8.2)	-656 (-6)	-21 (-16.7)	-84 (-18.5)	133 (4.8)	-206 (-4.8)
Other restaurant and mobile food service activities		-190 (-27.2)	-4 230 (-22.2)	52 (1.3)	-1 287 (-17.3)	-2 582 (-20.5)	-234 (-17.2)	-306 (-18.7)	-1 242 (-14.5)	-2 244 (-10.1)
Temporary employment agency activities		-459 (-24.6)	1 958 (21.4)	4 022 (11.6)	-11 673 (-16.1)	-6 566 (-8.8)	-373 (-88.1)	-171 (-9.6)	2 347 (24.6)	-3 974 (-19.7)
Short-term accommodation activities of hotels and motels		-144 (-18.8)	-5 146 (-41.7)	-1 085 (-33.7)	-1 908 (-38.4)	-2 362 (-23.1)	-131 (-21.4)	-338 (-37.2)	-1 415 (-40.3)	-7 726 (-26.1)
Construction of other civil engineering projects		-1 119 (-40)	-1 169 (-13.9)	-4 483 (-28.1)	-753 (-7.9)	-3 259 (-18.9)	-1 816 (-38.3)	-589 (-16.8)	-697 (-7)	-1 972 (-5.3)
Construction of buildings		-213 (-7.7)	-4 272 (-26.9)	-3 541 (-35.4)	-1 428 (-14.5)	-4 544 (-27.2)	-284 (-15.1)	-422 (-13.7)	-1 866 (-15.1)	-3 946 (-11.4)

■ Net Growth - Increased year-on-year	■ Net Growth - Increased in 2020, decreased in 2021	■ Net Growth - Decreased 2020, Increased 2021	■ Net Decline - Increased 2020, Decreased 2021	■ Net Decline - Decreased 2020, increased 2021	■ Net Decline - Decreased year-on-year
--------------------------------------------------------------------------	---------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------	-------------------------------------------------------------------------

Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

⁹ Including 'Education support activities' and 'Local government' as additional high-performing sectors for discussion.

4.5 | IMPACT ON INCOME GROUPS

We have shown that Covid-19 had an uneven impact on employment outcomes for different sectors and sub-sectors in different parts of the country. It follows that this also had an impact across different income groups of workers. This section focuses on earnings outcomes for workers at different income levels.

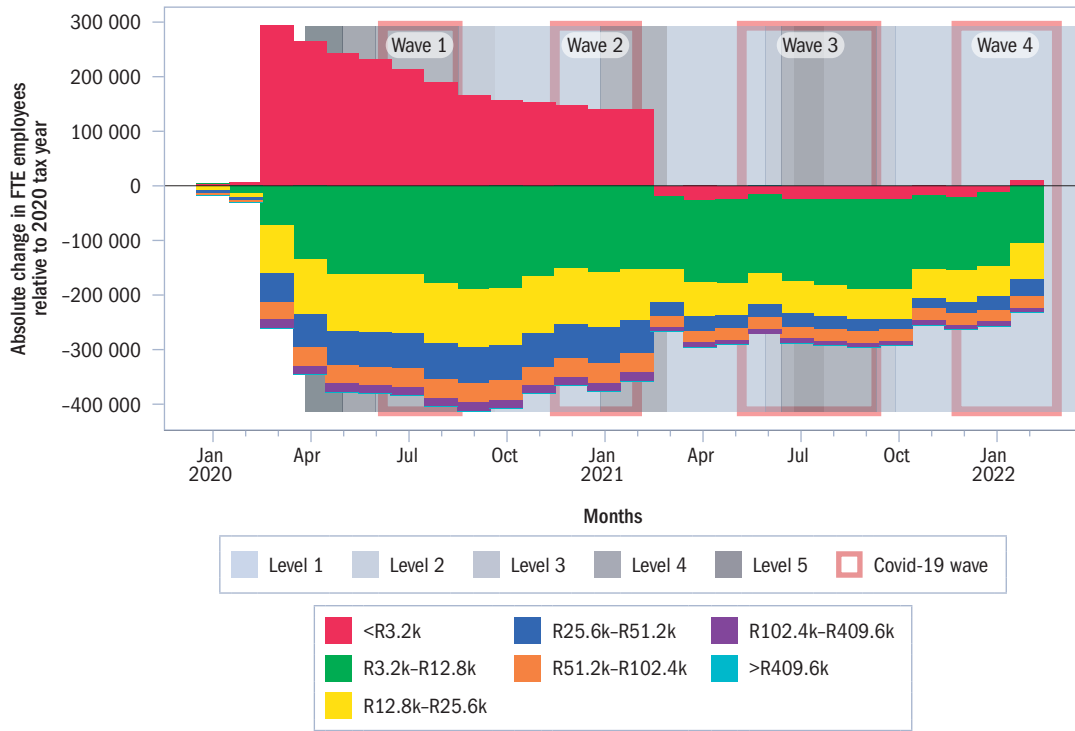
Figure 4.5 and **Figure 4.6** show the seasonally adjusted absolute and percentage changes in FTE employees per wage band relative to the 2019/20 tax year, respectively. There was a massive spike in opportunities for employees at the very bottom of the earnings ladder who earned less than R3 200 a month (which is below the national minimum wage). This slightly offsets the losses across all other income bands in the 2020/21 tax year. However, this drops to below 2019/20 levels in the 2021/22 tax year. The spike could be attributable to a shift in the economy with less certainty in the market and more companies relying on shorter-term, lower-income work or pay cuts that employees may have taken to retain their jobs.¹⁰ Further analysis is required to follow individual taxpayers to monitor how income may have changed and to identify any retrenchments.

There were losses in opportunities for all other wage bands above R3 200 per month, starting in March 2020 and reaching a maximum just after the first wave in September 2020, with losses of roughly 400 000 opportunities. The losses varied between 5% and 10% of 2019/20 FTE employees in the 2021 tax year for each income group, although higher income groups did tend to lose more employees proportionally. It is possible that proportionally higher losses in higher income bands could be a result of pay cuts where individuals were pushed down into a lower income band. However, further work is required to track individuals and opportunities over the period. Each wage band showed signs of recovery in 2022 but employment was still between -2% and -5% of 2019/20 levels.

Approximately 150 000 opportunities were lost in the R3 200–R12 800 wage band, which is particularly concerning as these individuals likely have less of a savings buffer to cope with the sudden loss of income. Further work should focus on understanding trends associated within this income group, such as whether or not individuals often have multiple jobs, the extent of job churn and the odds of finding new employment. Further work could also focus on identifying specific industries which might support job creation for lower income workers.

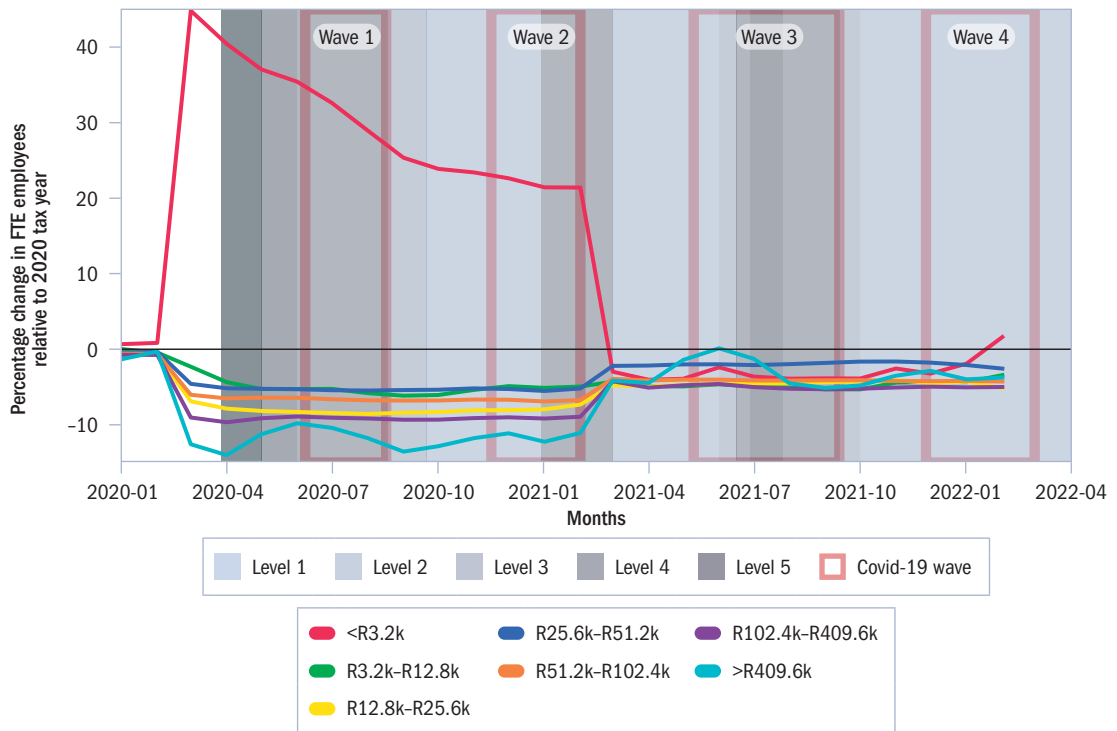
¹⁰ It is also possible that some employees who were retrenched at some stage in the year were incorrectly listed as working for the full tax year, which would deflate monthly earnings.

FIGURE 4.5 Absolute changes in FTE employee by wage band across all metropolitan municipalities



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

FIGURE 4.6 Percentage changes in FTE employee by wage band across all metropolitan municipalities



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

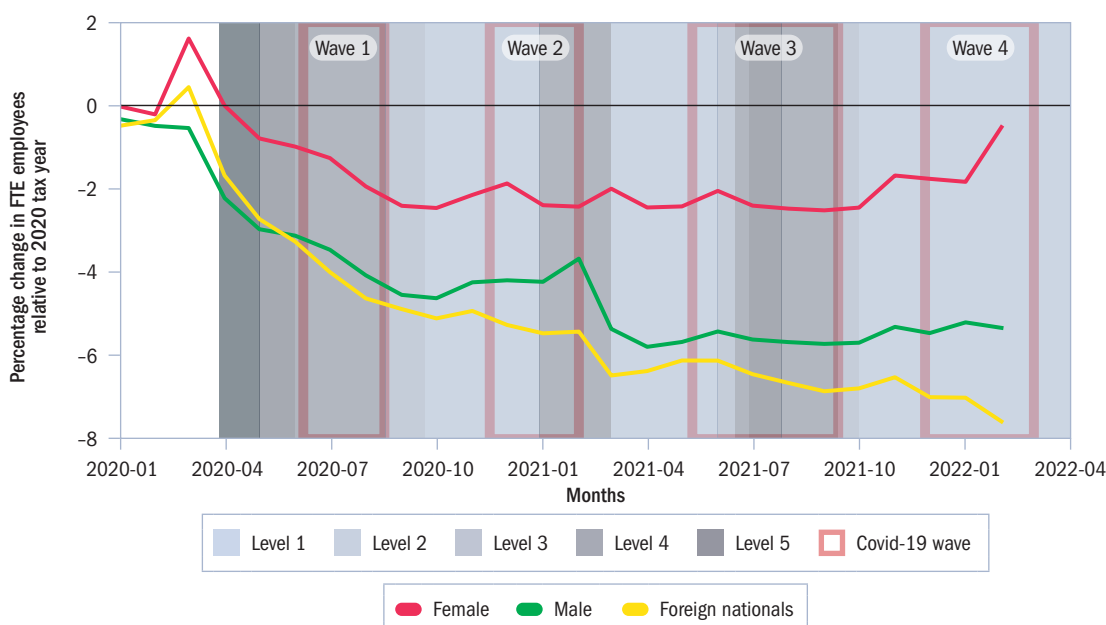
Generally, changes in earnings in each of the metros followed similar trends, apart from a few notable exceptions:

- Job opportunities where employees earned between R12 800 and R51 200 recovered to above 2019/20 levels in Tshwane and Mangaung in 2022. This resurgence is probably related to the increase in provincial and national government jobs, as well as the prominence of health care and education sectors.
- The recovery in eThekweni from October 2021 is dominated by opportunities for workers earning below R12 800 per month, while higher wage bands experienced fairly consistent losses. New employment appears to be driven by opportunities in provincial and local government, which had replaced workers in other sectors.
- The spike in employment in the summer of 2020/21 in Nelson Mandela Bay and Buffalo City is almost exclusively driven by employment in wage bands below R12 800 per month. Upon further inspection of the raw data, this is again attributable to both local and provincial government activities.

4.6 | IMPACT BY SEX INCLUDING NATIONALITY

The data identifies individual employees' sex (as assigned at birth) based on their ID number. This provides information on losses in employment experienced by male and female employees, as well as foreign nationals, who do not have South African ID numbers (and therefore do not have their sex classified in the data). The seasonally adjusted percentage changes in FTE employees by sex relative to the 2019/20 tax year are shown in Figure 4.7.

FIGURE 4.7 Percentage change in FTE employee by sex across all metropolitan municipalities



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

Female employees were the least impacted by the economic shock of Covid-19 with a maximum loss of 2% in FTE opportunities as well as stronger signs of recovery from October 2021 onwards. Male employees lost a maximum 6% of FTE opportunities, with a stable trend from February 2021 onwards. Heavier losses for male employees intersected with distress of male-dominated industries such as construction and manufacturing. Yet compared with both South African workers (positioned between male and female losses), foreign nationals were the most heavily impacted demographic group. Employment of foreign nationals declined over the entire period reaching a maximum loss of 8% of FTE employment opportunities by February 2022. Further analysis is needed to better understand these dynamics as well as unpack the implications for vulnerable groups such as single-income, female-headed households.

These trends are relatively consistent across each of the metros with slight differences in the gap between losses between male and female employees and with foreign nationals generally losing a high percentage of employment. However, there are some deviations with female employees initially taking a bigger hit in Buffalo City in the 2021 tax year.

However, this flipped back to males being harder hit in the 2022 tax year. These both start to provide a clearer picture of who has been most severely impacted and can help to inform how government (and other stakeholders) can better target recovery-focused interventions to prioritise those most severely impacted, but also to address structural inequalities. This data can be used both to target more specific issues in the workplace and to regularly monitor interventions to provide often missing, critical feedback to policymakers.

4.7 | IMPACT BY AGE GROUP

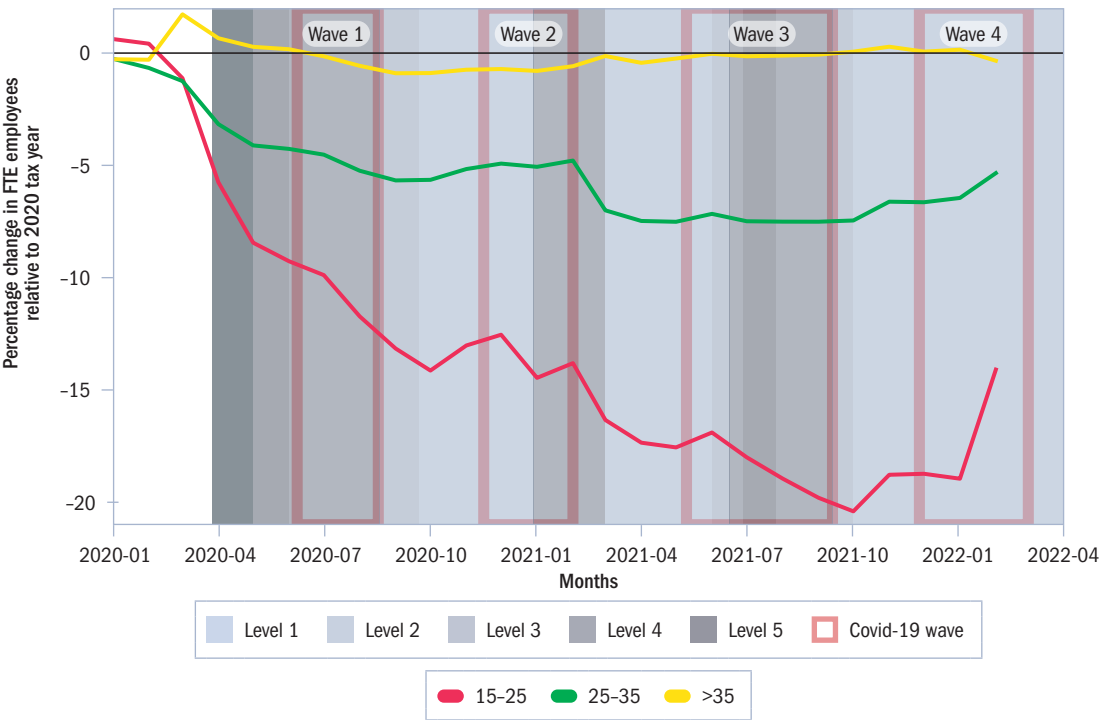
South Africa has among the highest levels of youth unemployment in the world and, as a consequence, many youth are discouraged from actively seeking employment (Stats SA, 2022). **Figure 4.8** shows the seasonally adjusted percentage change in employment relative to the 2019/20 tax year for different age groups in all eight metros.

A major concern is the disproportionate impact of Covid-19 on youth employment with a drop in FTE employment of 20% for individuals aged 15–25 years. There was some sign of a recovery starting in October 2021, but youth employment still ended the period approximately 15% lower than in 2019/20. This compares with a maximum loss of 7% for individuals aged 25–35 years. Interestingly, employees aged over 35 years experienced only marginal losses in employment relative to the 2019/20 tax year between the first and second waves, with this almost fully recovering to 2019/20 levels by the end of the 2021/22 tax year.

These trends are mirrored when looking at trends by age group in each of the metros. The notable exception is in Nelson Mandela Bay and Buffalo City where younger 15–25 and 25–35 age groups had returned to 2019/20 levels during the recovery in employment in the summer of 2020/21. However, after the summer spike, trends continued to mirror other metros. Further research is needed to understand exactly why this is the case, although it appears to be related to new job opportunities in local and provincial government that were mainly filled by youth.

Job losses among younger workers exacerbate an already pressing crisis of exclusion of younger people in the economy. Covid-19 is a worrying setback in breaking cycles of exclusion that prevent younger workers from entering employment and gaining invaluable experience. An avenue for further research would be to use tax data to identify the types of companies and sectors that have created the greatest number of opportunities for younger workers.

FIGURE 4.8 Percentage change in FTE employee by age group across all metropolitan municipalities



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

4.8 | IMPACT ON THE NEIGHBOURHOODS WITHIN CITIES

A big advantage of the Spatial Tax Panel is the ability to track spatial patterns in employment within metros at the neighbourhood (hexagon) level. The tax panel identifies changes in employment based on where people work rather than where they live. We make use of a ‘hotspot’¹¹ analysis to help identify changes in both absolute and relative (percentage) levels of employment in any hexagon in each of the metros between the 2019/20 and 2021/22 tax years.¹² Further analysis could identify trends associated with some of the metrics discussed above spatially to further inform responses.

Figure 4.9 shows which areas displayed a significant change in employment (based on the location of the firm/branch in which people work). Further detail is provided in Figure 4.19 in Supplementary Figures, which shows the absolute change in employment spatially. Not surprisingly, approximately 60% of all hexagons registered job losses over the period due to the pandemic, with \pm 80% of these recording losses greater than 1 000 FTE employees. Yet there were some important exceptions that managed to record growth in localised pockets. However, the maximum growth experienced in these areas was generally much lower than losses incurred elsewhere. Key themes from this analysis are discussed below:

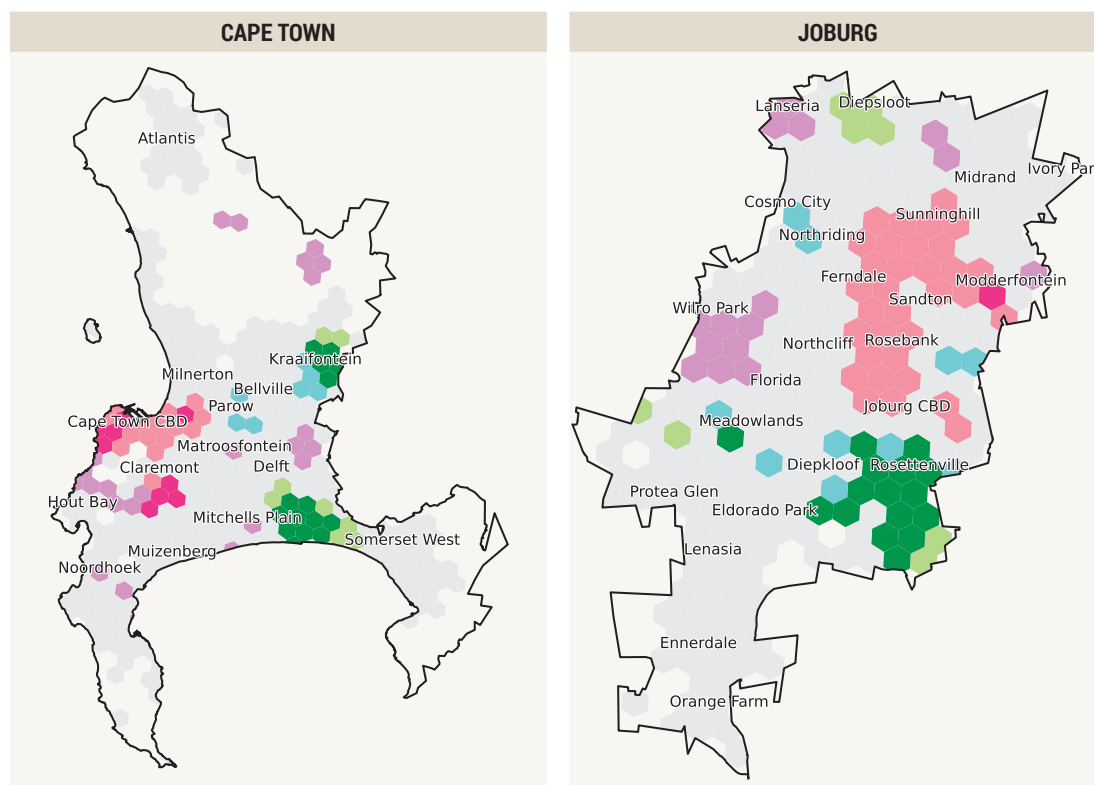
- CBDs along with other established economic hubs generally experienced significant declines in employment in both absolute and percentage terms. Areas of employment decline included: *Cape Town*: Cape Town CBD, Claremont and Paarden Eiland; *Johannesburg*: Joburg CBD, Rosebank, Sandton and Sunninghill; *eThekweni*: Central Durban stretching down to Jacobs industrial; *Ekurhuleni*: Bedfordview, Edenvale, Isando, Boksburg CBD, Germiston CBD and Wadeville; *Tshwane*: Pretoria CBD and Pretoria East; *Buffalo City*: East London CBD and *Nelson Mandela Bay*: Gqeberha CBD.
- Yet there were still several notable exceptions in other economic hubs where net job creation was positive. Areas of employment growth included: *eThekweni*: Umhlanga, and parts of Westville; *Tshwane*: Centurion; *Ekurhuleni*: Midstream; *Cape Town*: Parow and Bellville in Cape Town. There was also evidence of growth in some industrial nodes including the South of Johannesburg, parts of Somerset West and Kraaifontein in Cape Town, Coega and Markman industrial in Nelson Mandela Bay, Rosslyn in Tshwane, and parts of Alberton in Ekurhuleni. These were likely driven by a handful of businesses or specific programmes in these areas. Further research is required to understand which factors influenced the resilience of different places.

11 ‘Hotspot’ analysis makes reference to an approach that spatially weights adjacent areas and clusters specific trends and tests for statistical significance to identify both ‘hotspots’ and ‘coldspots’ as areas with strong positive and negative performance.

12 Mangaung was excluded as currently spatial data is disaggregated to hexagons from postal codes, and there are several postal codes that cover large areas of Mangaung that prevent any meaningful analysis from being conducted. The data is currently being geocoded at SARS, which will allow this analysis to be undertaken in the future.

- Smaller economic nodes also experienced significant losses but off a lower employment base. Whilst these numbers might not have been as large as in major economic hubs such as CBDs, they were still significant in relative terms. Notable areas of decline include: *Cape Town*: parts of the Atlantic Seaboard and Blue Downs; *Johannesburg*: parts of Roodepoort, Lanseria, Modderfontein and Midrand; *eThekweni*: Dube Trade Port and Tongaat; *Tshwane*: Roodeplaat, Cullinan and Ekangala; *Buffalo City*: Gonubie and parts of Berlin/Ntabozuko.
- While townships have low absolute numbers of formal employees, a surprising number actually experienced employment gains, at least in relative terms. This is likely attributable to the types of formal businesses that are registered with SARS in these areas including healthcare services, education and large retail chains. Expansion of various social relief programmes could even have boosted disposable income in very marginalised communities.¹³ Notable areas of increase include: *Johannesburg*: Diepsloot; *eThekweni*: Mpumalanga; *Nelson Mandela Bay*: parts of New Brighton and Bethelsdorp; *Ekurhuleni*: Tsakane; *Tshwane*: Ga-Rankuwa, Soshanguve and Mabopane.
- Yet there were many large townships that experienced high relative employment losses including: *Ekurhuleni*: Tembisa and Vosloorus; *Cape Town*: parts of Mitchells Plain and Delft; *eThekweni*: Umlazi; *Tshwane*: Atteridgeville; *Buffalo City*: Kwetyana and Isixekweni.

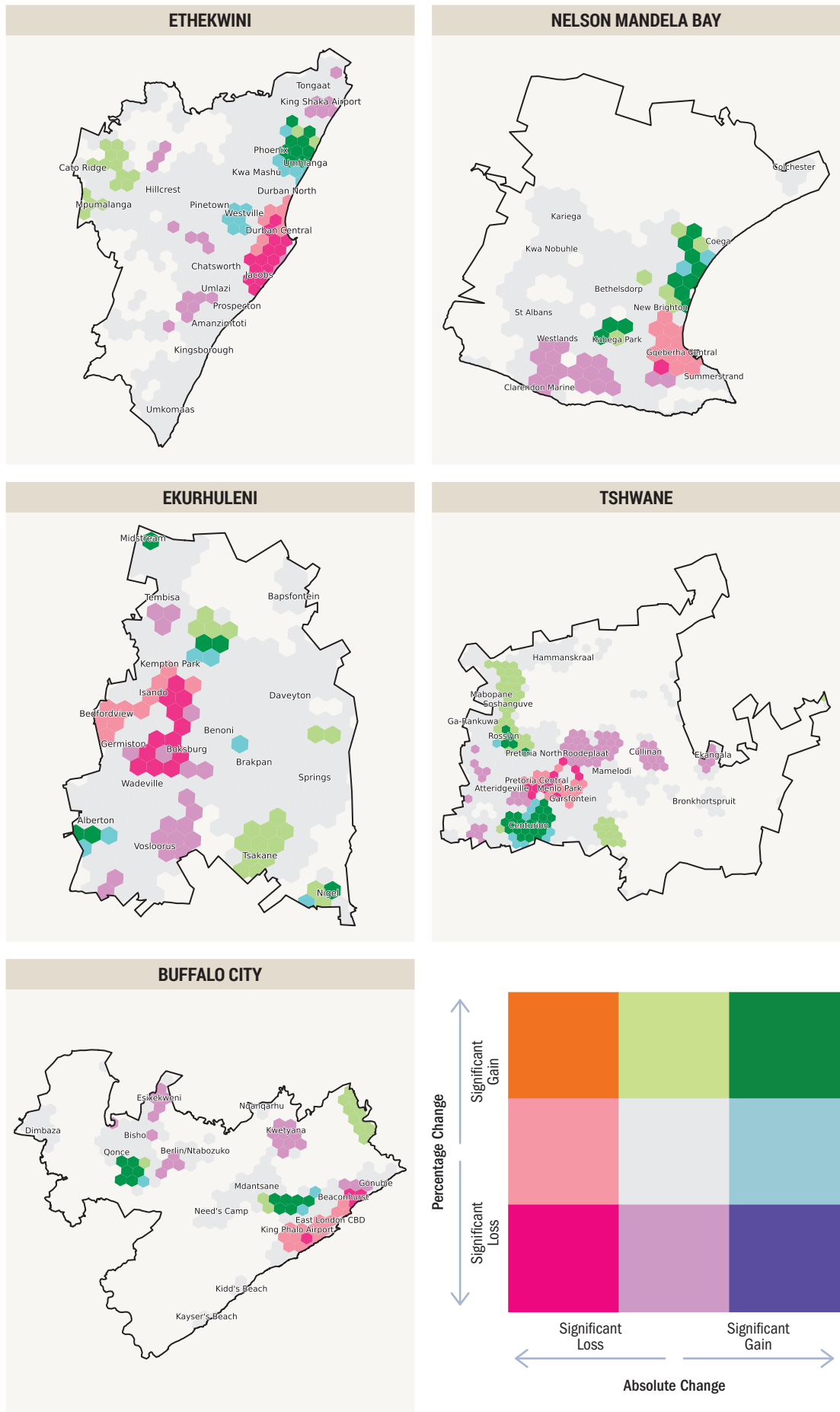
FIGURE 4.9 'Hotspot' and 'coldspot' analysis of change in FTE employees in seven metropolitan municipalities between 2019/20 and 2021/22



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

13 It is important to reiterate that this analysis does not include informal economic activities, many of which were severely impacted by the pandemic and lockdowns. This is problematic in assessing trends for townships and other areas with higher numbers of informal workers.

FIGURE 4.9 'Hotspot' and 'coldspot' analysis of change in FTE employees in seven metropolitan municipalities between 2019/20 and 2022 (continued)



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

4.9 | CONCLUSION

This chapter investigated the severity of the economic impact of Covid-19 on employment in South African metros. The results suggest that national employment losses (in formal jobs) were driven by losses in metropolitan municipalities. While the rest of the country also struggled with the economic consequences of the pandemic, the workforce outside of the metros was propped up by a greater dependence on recession-proof government services, as well as specific agricultural and mining sectors. Interestingly, even within the metros, economic recovery was often attributed to increases in government-related activities rather than a recovery in industries that suffered losses.

A few key facts are worth repeating:

- The crisis in youth unemployment was compounded by the pandemic. The number of employment opportunities for youth was 20% less compared to pre-pandemic levels and showed no signs of recovery. The impact on youth was far greater than other age groups.
- There was a major increase in employees within the lowest earnings bracket of less than R3 200 per month, which was also less than the minimum wage. This spike might suggest a shift to lower-paying temporary work in some cases. Across the board, there was evidence of employment losses and erosion in wages but in particular a loss of 150 000 employees earning between R3 200 and R12 800 per month.
- There were heavier losses among male employees compared with female employees, probably because of the shrinkage in male-dominated construction and manufacturing sectors.
- Foreign nationals were the most severely affected of all demographic groups and experienced employment losses across the entire period.

This analysis offers a useful starting point in building up a more detailed understanding of the economic impact of Covid-19 and subsequent recovery strategies. More detailed localized analysis could help identify more specific trends and issues that are applicable to each municipality.

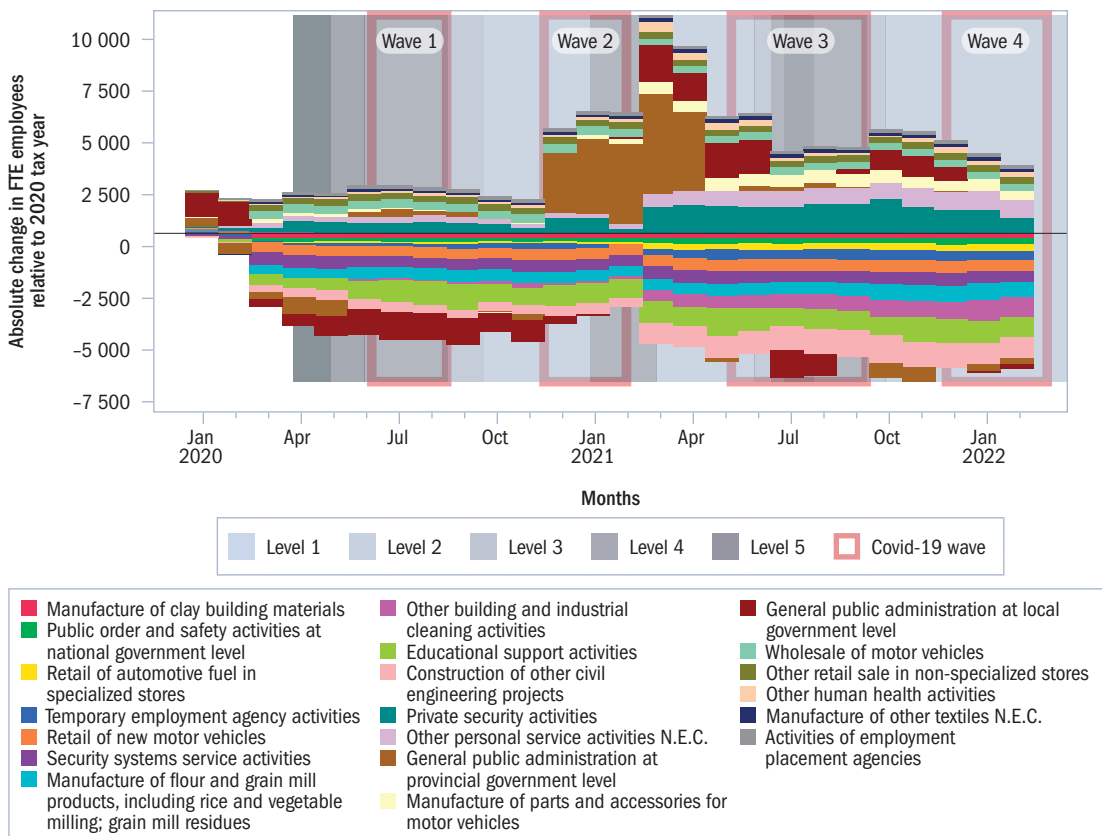
The geographic consequences of the pandemic are especially important to consider given South Africa's history of spatial inequalities. This is made clearer by the distinct spatial trends that are identifiable in the data and reiterate how detrimental the spatial legacy of apartheid is to our cities and why space should almost always be included as a dimension when developing policies or plans, especially in order to build back better. Municipalities can use the spatial dimension of the data to identify and engage directly with business communities to identify qualitative constraints and issues that are affecting their recovery. This information can be combined with other supplementary data to start identifying specific communities of people that may be more severely impacted and require other types of assistance.

In summary, this chapter has demonstrated how the Spatial Tax Panel is a useful tool for evidence-based decision-making. The fine-grained spatial data provide much-needed insights about the economic impact and continued recovery from the Covid-19 pandemic. More detailed analysis is required to uncover specific trends across different local municipalities and regions. We would strongly encourage municipalities to leverage this new resource to enable data-driven decision-making to support planning, policy and operations. Lastly, this exercise also highlights the value of making administrative data, which is often locked away and lying dormant within government agencies, freely available.

SUPPLEMENTARY FIGURES

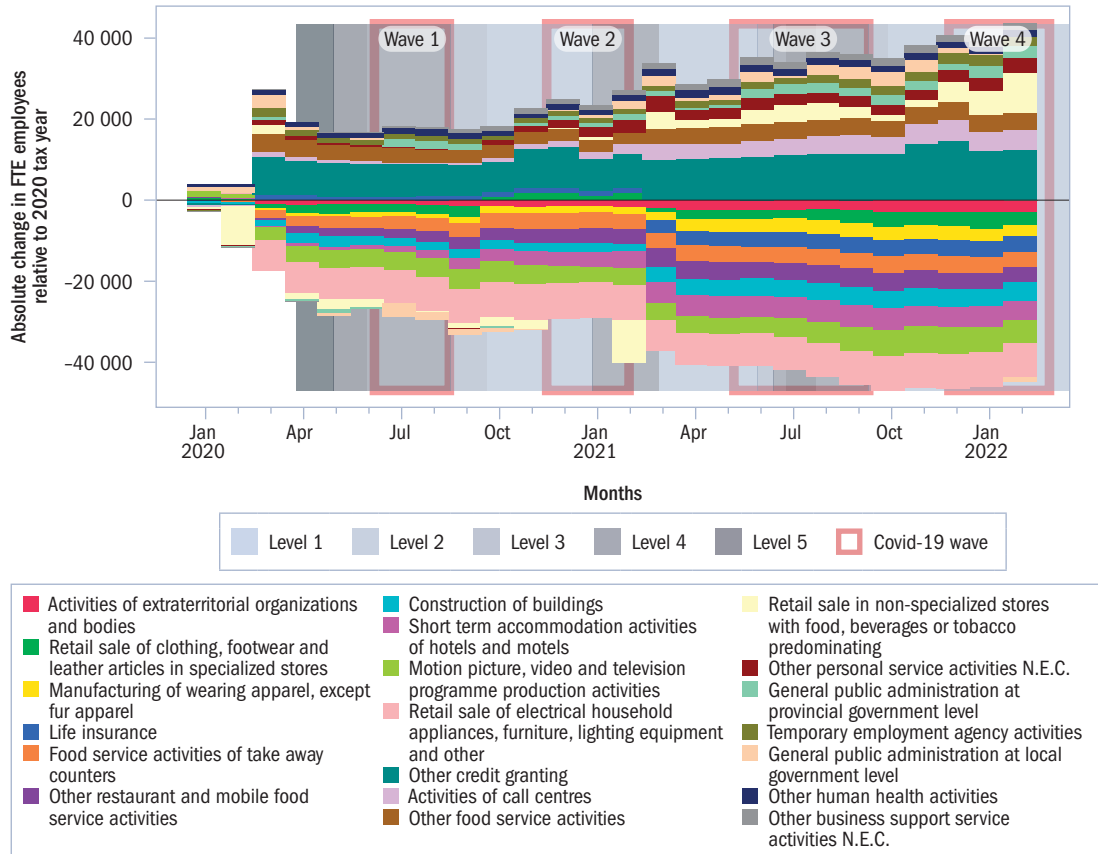
Metro-specific industry trends

FIGURE 4.10 Absolute changes in FTE employees by industry (5-digit level) in Buffalo City



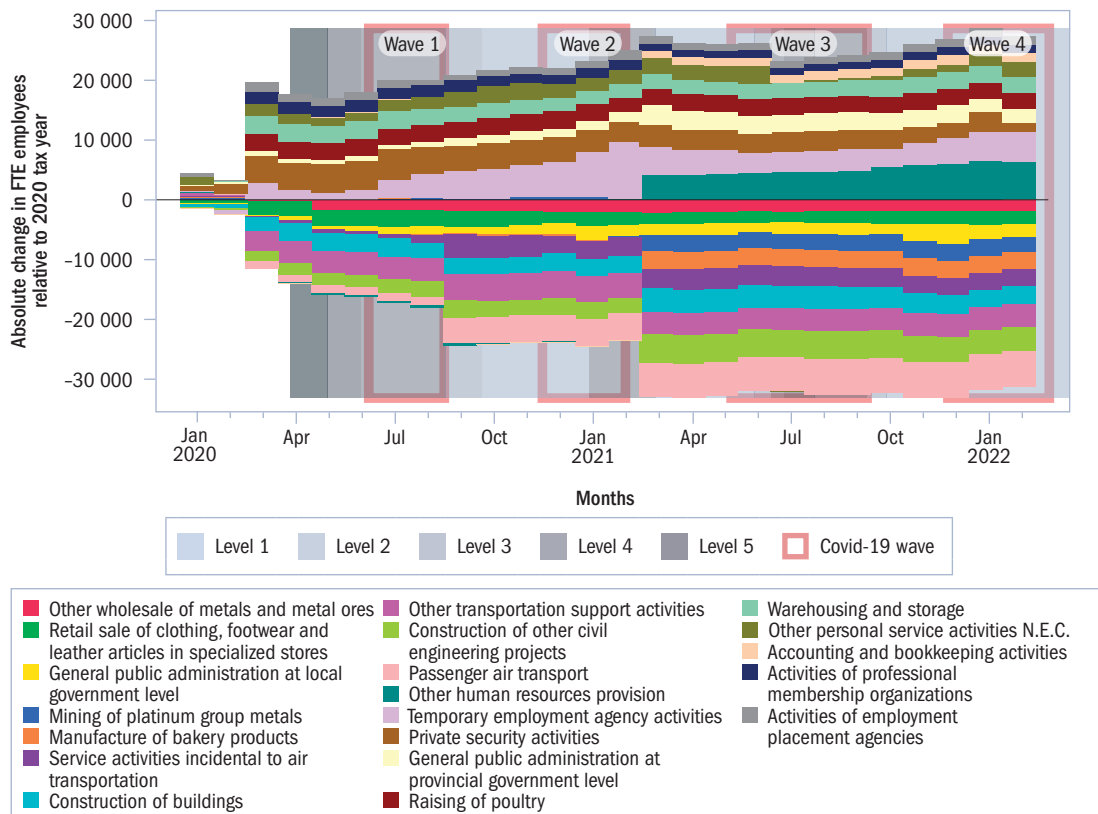
Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

FIGURE 4.11 Absolute changes in FTE employees by industry (5-digit level) in Cape Town



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

FIGURE 4.12 Absolute changes in FTE employees by industry (5-digit level) in Ekurhuleni



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

FIGURE 4.13 Absolute changes in FTE employees by industry (5-digit level) in eThekweni

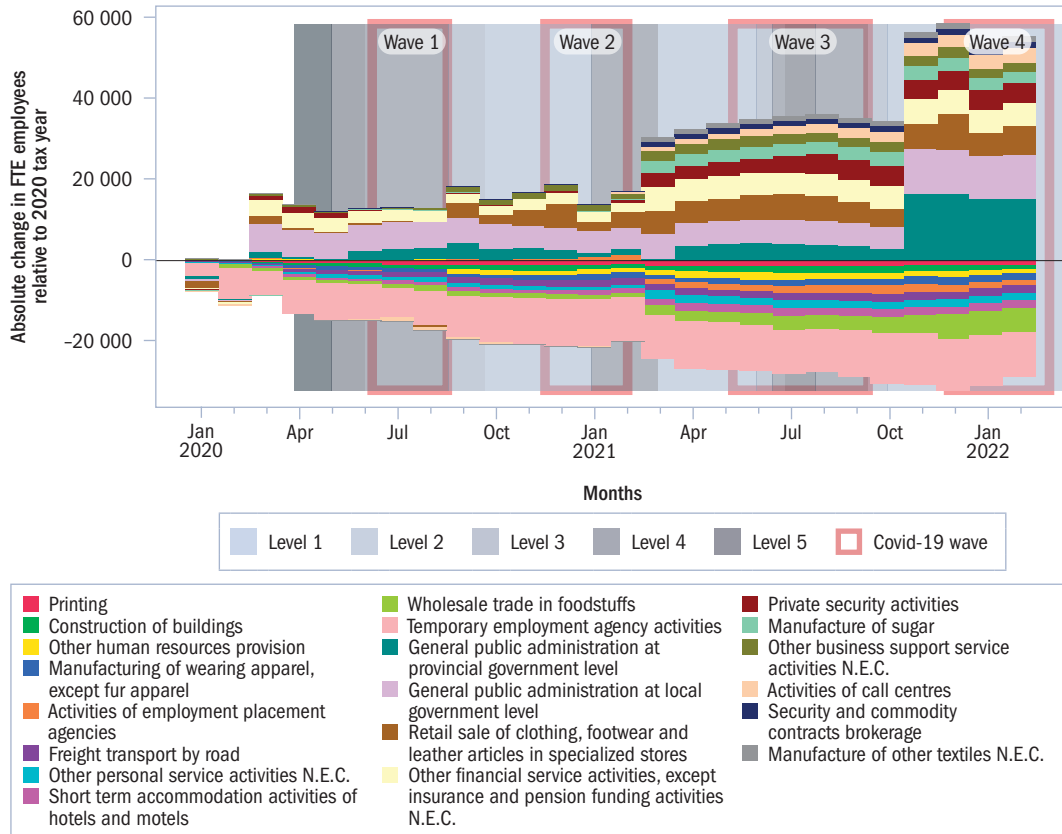


FIGURE 4.14 Absolute changes in FTE employees by industry (5-digit level) in Johannesburg

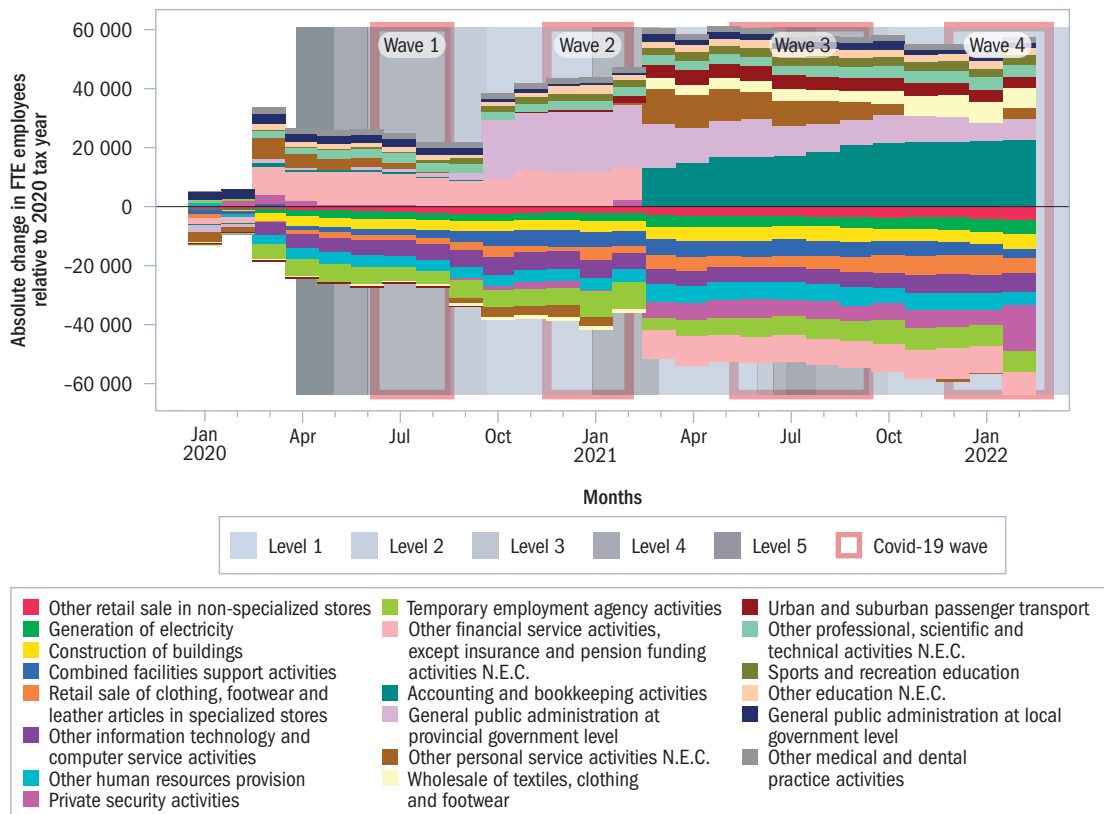
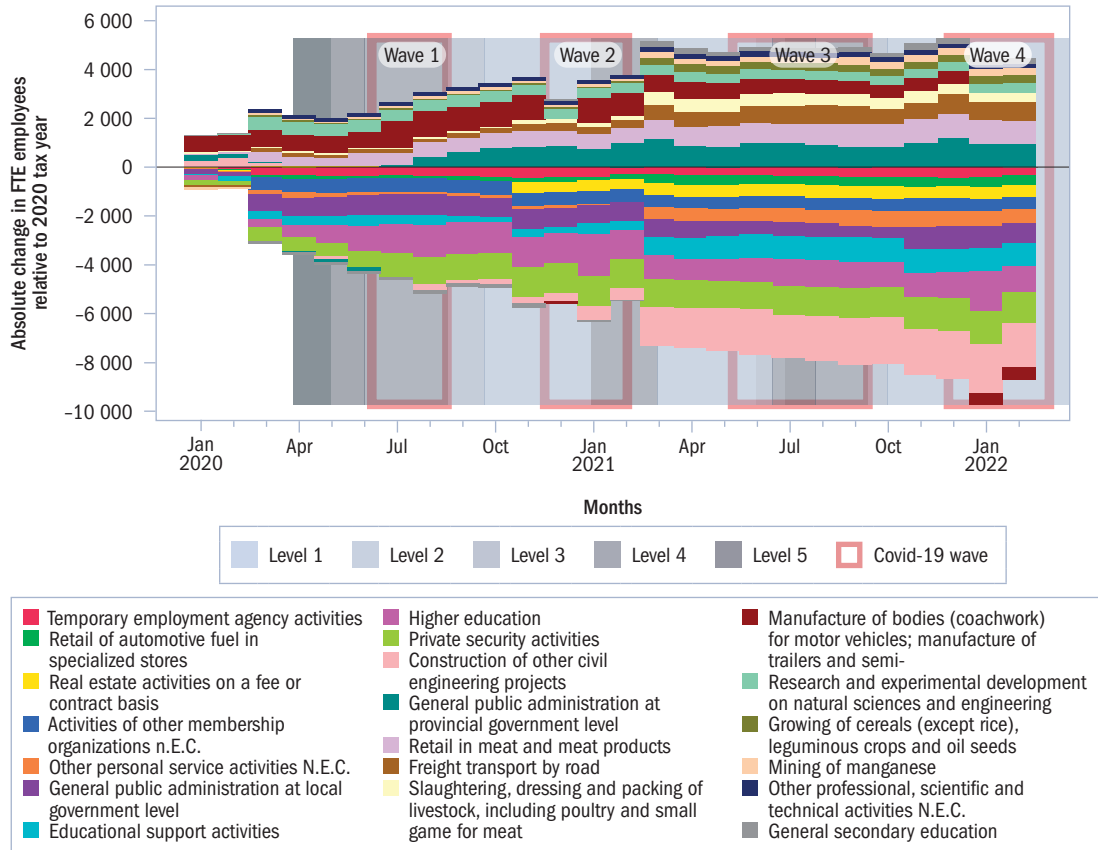
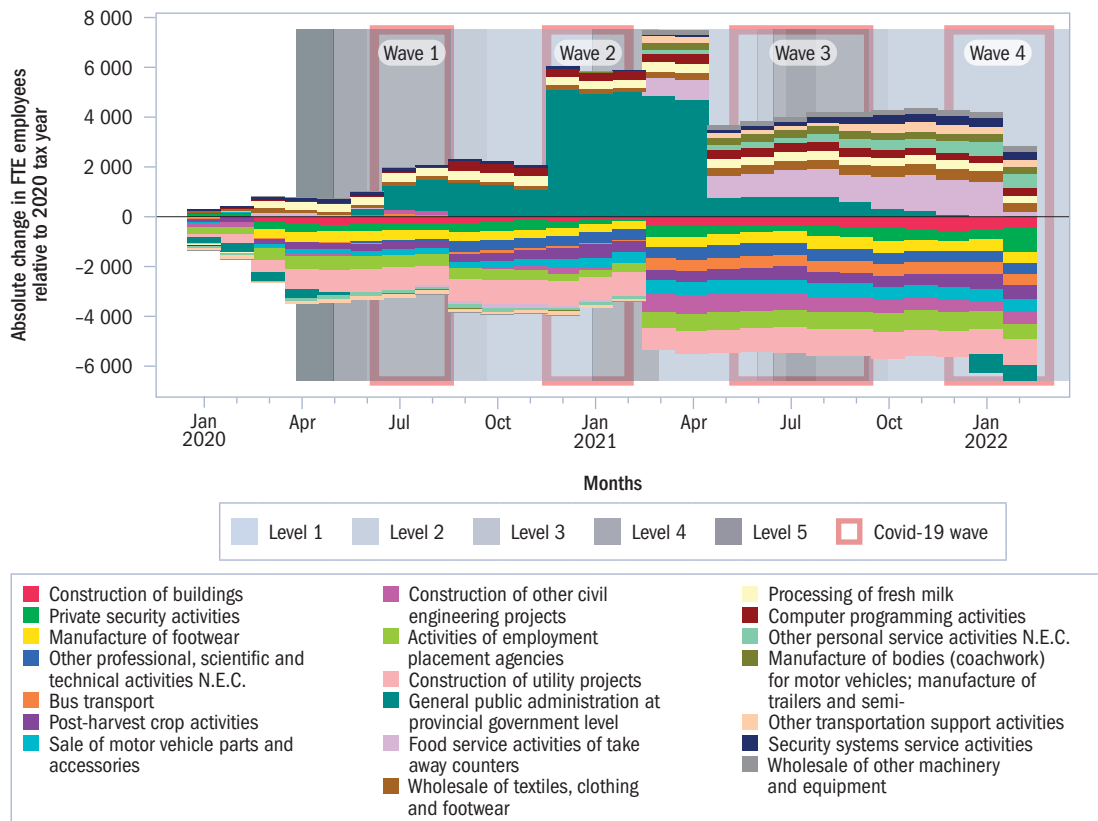


FIGURE 4.15 Absolute changes in FTE employees by industry (5-digit level) in Mangaung



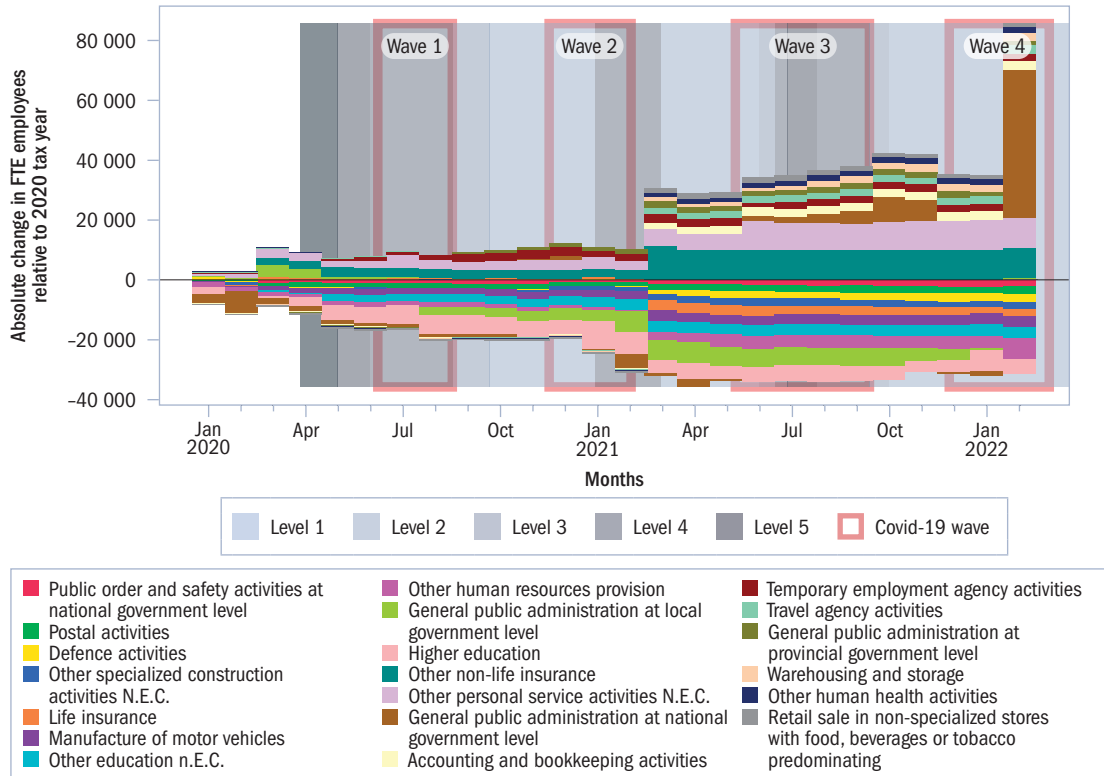
Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

FIGURE 4.16 Absolute changes in FTE employees by industry (5-digit level) in Nelson Mandela Bay



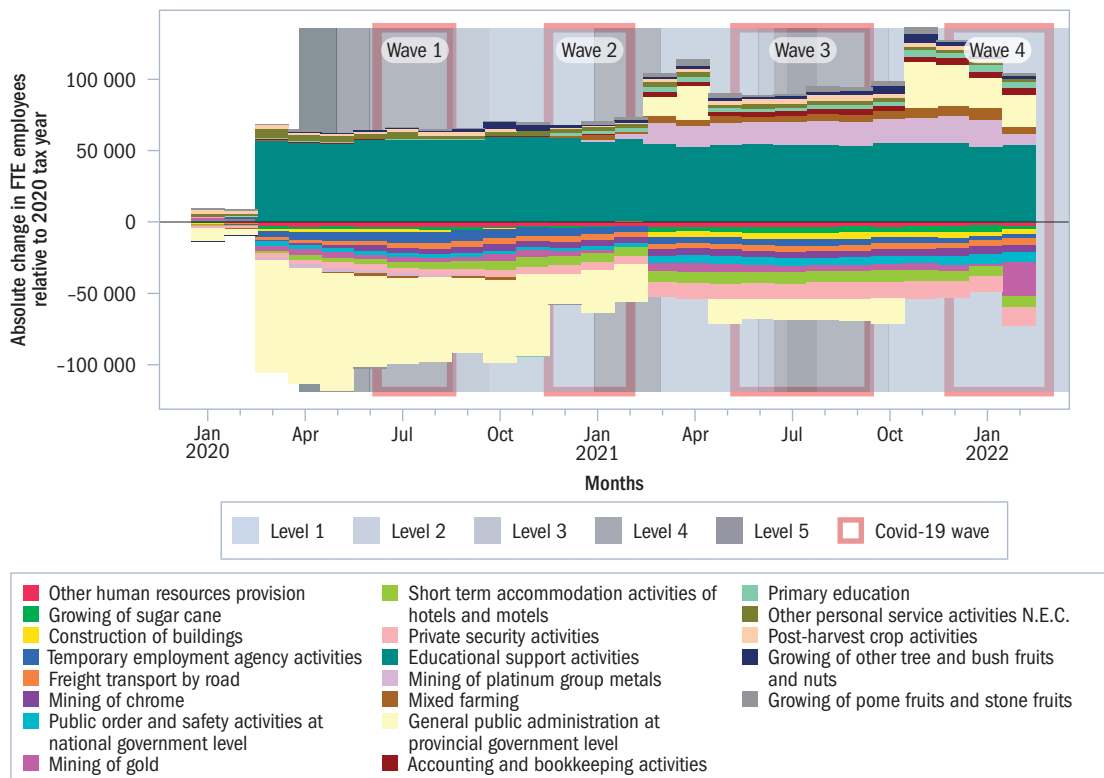
Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

FIGURE 4.17 Absolute changes in FTE employees by industry (5-digit level) in Tshwane



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

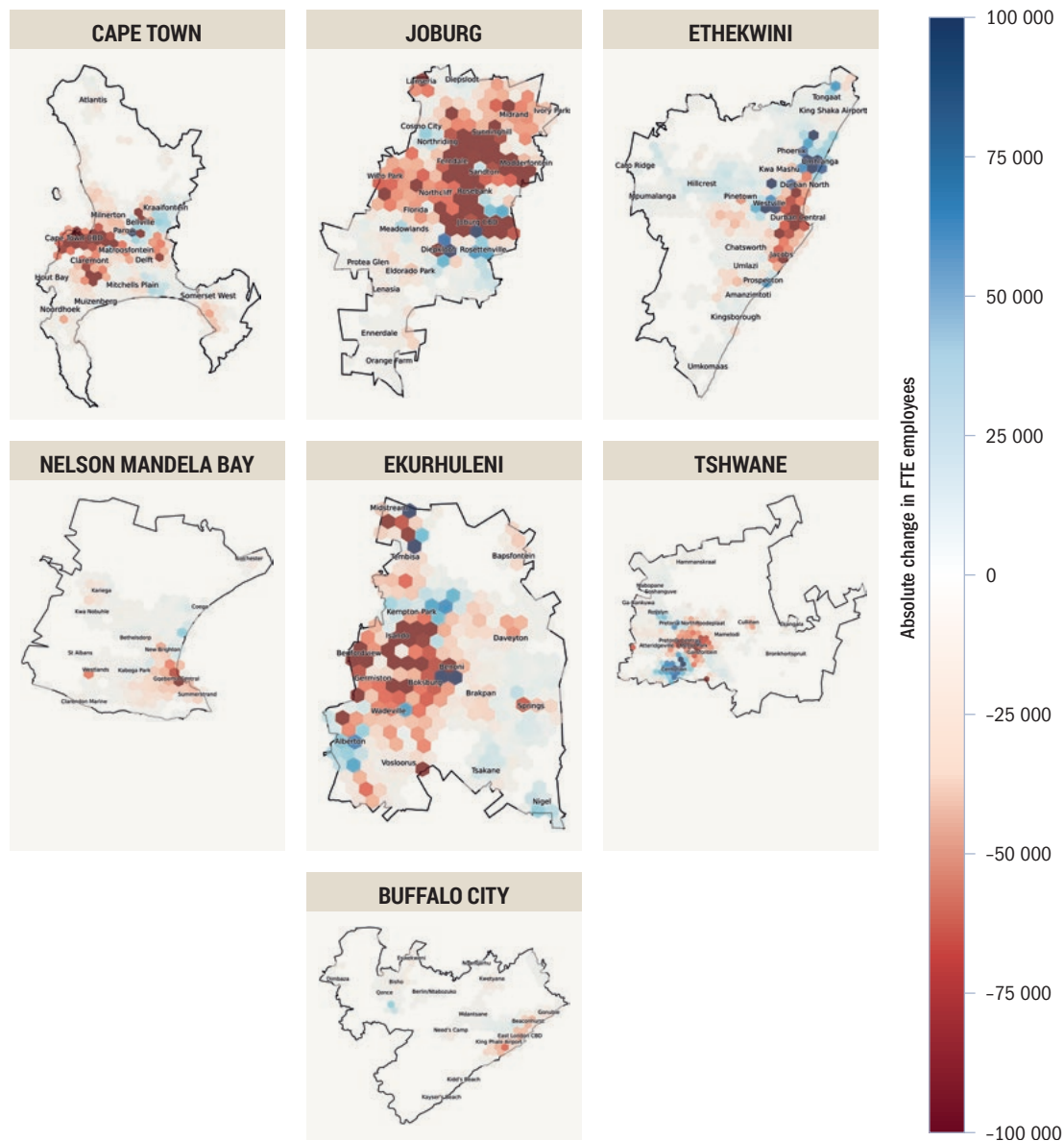
FIGURE 4.18 Absolute changes in FTE employees by industry (5-digit level) across all non-metropolitan municipalities



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

IMPACT ON THE NEIGHBOURHOODS WITHIN CITIES

FIGURE 4.19 Absolute changes in FTE employees in seven metropolitan municipalities between 2019/20 and 2021/22



Source: Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3

References

- International Monetary Fund (IMF). (2023) World Economic Outlook Update – Inflation Peaking Amid Low Growth.
- National Institute for Communicable Diseases (NICD). (2021) *Proposed definition of COVID-19 wave in South-Africa* <https://www.nicd.ac.za/wp-content/uploads/2021/11/Proposed-definition-of-COVID-19-wave-in-South-Africa.pdf>
- Nell, A. and Visagie, J. 2023. Spatial Tax Panel 2014–2022: version 3
- Organisation for Economic Co-operation and Development (OECD). (2022) *OECD Economic Surveys: South Africa 2022*. <https://www.oecd-ilibrary.org/content/publication/d6a7301d-en>
- South African Government. (2023) *COVID-19/Coronavirus*. <https://www.gov.za/Coronavirus>
- Stats SA (Statistics South Africa). (2022, June 1) *South Africa's youth continues to bear the burden of unemployment*. <https://www.statssa.gov.za/?p=15407>
- The Presidency. (2023) *Presidential Employment Stimulus Update February 2023*. <https://pres-employment.openup.org.za/img/Presidential%20Employment%20Stimulus%20Update%20February%202023.pdf>
- World Bank. (2023) *South Africa Overview* <https://www.worldbank.org/en/country/southafrica/overview>

5

CITIES AND PRODUCTIVITY IN SOUTH AFRICA

Authors

Justin Visagie^a and Ivan Turok^b

Highlights

- 1 Productivity is widely recognised as the key to long-term economic success and explains how a firm, city or country can produce more and better output with its inputs of raw materials, labour, plant and machinery and other resources.
- 2 Cities play a crucial role in providing a supportive environment for firms to do business and offer a number of special advantages from concentration known as ‘agglomeration’ economies. Yet density can also become a drag on productivity if there is insufficient investment in infrastructure, urban amenities and creating a functional built environment.
- 3 We find that there is no simple relationship between the size of South African cities or settlement types with aggregated firm-level productivity. This is partly because of the importance of industry specialisation between metros and across settlement types, which complicates any comparison of their aggregate productivity.
- 4 The rankings depend on which sector is being compared. In general, the metros tend to have higher productivity in service-based and knowledge-intensive industries. By contrast, outlying settlements often compete in sectors where they have a natural advantage, such as in mining and agriculture.
- 5 A clear message for government is to prioritise the economic development potential of cities more than it does at present. This necessitates stronger support from national and provincial authorities to fix the fundamentals. But it will also require comprehending and building on the unique industry specialisations that exist within each city.

^a Dr Justin Visagie is a Senior Research Specialist at the Human Sciences Research Council and a Senior Lecturer at the Department of Economics and Finance, University of the Free State.

^b Professor Ivan Turok is DSI/NRF Research Chair in City-Region Economies at the University of the Free State and Distinguished Research Fellow at the Human Sciences Research Council

5.1 | INTRODUCTION

Nobel prize-winner Paul Krugman once famously argued that: “Productivity isn’t everything, but in the long run it is almost everything” (1997: 11). This is because, over the long term, sustained increases in productivity are found to be the primary driver of economic growth, as they enable a country to produce more output with the same resources or to free up resources to be used in other areas of the economy (Easterly & Levine, 2001; Kim et al., 2016). Although other factors, such as natural resources and population size, are also important, productivity is undoubtedly the key to long-term economic prosperity and sustained increases in living standards.

Productivity is not just about firms, because location or ‘place’ also plays an important role in business performance. It was again Paul Krugman who demonstrated how cities and regions can continue to prosper indefinitely because of the special advantages of economic concentration (Krugman, 1991). These positive external effects are often called ‘agglomeration economies’ or urban ‘externalities’. Cities benefit from various advantages such as better access to shared infrastructure, including transportation networks, energy systems, and public utilities, as well as from having access to deep pools of labour, talent, and other resources. In addition, they often have strategic institutions such as universities, research centres, and major cultural amenities, which contribute to the creation of efficient flows of information and knowledge among firms and workers. The process of urbanisation (i.e. the movement of people to cities) can further enhance these benefits by continually refreshing the supply of labour and entrepreneurs, thus amplifying these advantages over time (Turok & McGranahan, 2013).

In recent years, considerable intellectual effort has been devoted to understanding the relationship between cities and productivity (Ahlfeldt et al., 2018). There is an ongoing debate in urban economics about the importance of the sheer size of the city compared with its other attributes. An important distinction is made between the general externalities that apply to firms in different sectors (urbanisation economies) and the particular externalities relevant to firms in the same sector (localisation economies). The former favour the largest and most diverse city economies, whereas the latter favour cities with certain specialisations. In some countries city size and industrial diversity seem to be decisive, while in others specialisation seems to be all important (Storper, 1997; Sarkar et al., 2020).

The relationship between cities and productivity is further complicated by inherent pressures in managing urban growth in such a way that rising population densities also translate into prosperity. An efficient urban form is vital for the circulation of people, goods, materials and information (Collier & Venables, 2017; Turok, 2017). This means frequent human and business interactions and seamless input-output linkages between firms. It is also essential for the city to function well as an integrated labour market, with abundant choices available to firms and workers, and efficient matching of labour demand and supply. Yet cities in most developing countries struggle to raise the funding required to ensure adequate investment in infrastructure, including transportation systems, energy

networks, and water and sanitation services. This often leads to congestion, freight delays and higher transport and energy costs, thereby reducing firms' competitiveness and hindering economic growth.

The purpose of this chapter is to explore the relationship between cities and productivity in South Africa. To date, almost nothing is known about agglomeration and productivity in the country's cities. An absence of suitable data has also inhibited efforts to assess cities against each other, and to compare them with towns and rural areas. Inadequate prior research means that little is known too about the relative importance of industrial specialisation and diversity in South African cities. This is symptomatic of a wider neglect of the distinct economic problems and potential of metropolitan areas.

5.2 | METHODS: MODELLING PRODUCTIVITY

The measurement and modelling of productivity is referred to by economists as estimating 'total factor productivity' (TFP) (also 'factor productivity' or 'multi-factor productivity'). The basic idea is to understand the "efficiency with which firms turn inputs into outputs" (Saliola & Seker, 2011). Firms produce their goods or services by combining 'factors of production', which include raw materials, physical plant and equipment (also known as capital), and labour from their workforce. The fact that some firms will produce more than others – even when controlling for the inputs listed above – is because of differences in their 'technical efficiency' or TFP (i.e. their productivity).

Any attempt at modelling productivity warrants scrutiny because TFP is not directly measurable (like when examining total revenue or cost of sales). However, such efforts are vital because productivity is a crucial driver of economic growth and often accounts for the bulk of variation in output per worker both between and within countries (see Easterly & Levine, 2001). A more technical description of our approach to modelling TFP is outlined in **Box A**.

Whilst firm-level productivity has been explored in recent research using the SARS data, most studies to date have been limited to manufacturing firms (manufacturing made up less than 12% of GDP in 2019) with little analysis of geography (Kreuser & Newman, 2018; Matthee et al., 2018; Kreuser & Brink, 2021). The exception is the preliminary work of Amusa et al. (2019), who provide a tentative spatial estimation of TFP in an analysis of agglomeration economies. However, the emphasis of their work is on modelling the returns to agglomeration rather than spatial estimates of TFP. Their findings are somewhat contradictory because, while they report that "productivity is relatively higher in firms located in regions/municipalities outside key economic clusters", they also present evidence in favour of agglomeration (Amusa et al., 2019: 24). There is clearly scope for much more research on the spatial economy.

BOX A Technical description of modelling total factor productivity

Total factor productivity is represented by a Cobb-Douglas production function which takes the form:

$$Y = A \times K^\alpha \times L^\beta \dots (1)$$

where Y is total output or revenue, A is TFP, K is capital inputs, L is labour inputs.

In this log-based estimation, α and β are *output elasticities* of capital and labour, respectively. This means that the elasticities capture the extent to which a '1%' change in an input results in a 'x%' change in output. Therefore, increasing returns to scale would mean that a doubling of inputs (K and L) would lead to a more than doubling of output ($\alpha + \beta > 1$).

In practice, a challenge of the econometric modelling is to ensure that bias is not introduced in the estimates of TFP because of the interdependent relationship between outputs and inputs. There is bound to be simultaneity (i.e. causality can run both ways) in a standard OLS regression because the level of output might influence decisions about inputs (such as where a firm delays capital investments during a recession or where a firm responds to a positive productivity shock by expanding inputs and total production).

A popular approach to dealing with this is the two step-procedure suggested by Olley and Pakes (1996) and Levinsohn and Petrin (2003) which uses investment or intermediate inputs as a control for productivity shocks. We implement the approach by Wooldridge (2009), which is found to be a more efficient than the OP and LP methodologies because the two stages are jointly estimated using a general methods of moments approach. Lags of capital and labour are shown to be potentially valid instruments in the estimation. (For a technical description of the model, see Rovigatti & Mollisi, 2018.)

We are careful to model the production function for each industry separately because of fundamentally different operating and technological constraints facing firms across different product markets. The large samples available in the SARS data mean that we can take advantage of running our estimations at a granular 2-digit¹ industry classification level (which includes 73 sub-sectors in total).

In most instances we aggregate firm-level estimates of TFP up to a 1-digit level (or for all sectors combined), to make reporting our results more manageable. We also aggregate firm-level TFP when reporting by a particular geography. Simply adding together establishments ignores the vastly different market share held by firms. Therefore, we weight all of the results by local branch-level employment:

$$Weight = \frac{Empl_{it}}{\sum_{i=1}^n Empl}$$

where $Empl$ is total employment (i.e. branch level), t is the tax year and i is the establishment.

A final issue of importance is dealing with the limitation that balance sheet information for firms is only available at an enterprise level (i.e. reported nationally rather than in each branch). This means making some assumptions about how productivity is distributed across establishments within each enterprise. We make the assumption that each branch of an enterprise faces an identical productivity function and hence generates an identical TFP. This is an obvious simplification but is not so unrealistic considering that large firms are able to deploy their technology, capital and labour between branches and often adopt a standardised set of operational practices and procedures. Enterprises in different locations might also perform different roles as distinct pieces within an integrated value chain. Each enterprise is weighted by their local employment share.

As a robustness check, we run a separate model which only includes single-establishment firms. While this has a large impact on the sample size, and generally excludes larger firms, it allows for a tighter controlled measurement of the potential returns to location.

1 Based on Statistics South Africa's Standard Industrial Classification of all Economic Activities (SIC) Seventh Edition

5.3 | PRODUCTIVITY AND SOUTH AFRICAN CITIES

A vital question is whether operating in a metro offers firms any measurable advantage compared with being located elsewhere in the country? The results of our modelling of productivity are displayed in [Table 5.1](#).

At first sight there appears to be a fairly weak relationship between cities and productivity. Firms located in Cape Town and Johannesburg had the highest average productivity but the advantage was only slight. Only firms located in rural areas lag behind the rest of the country to a noticeable extent.

An important part of the reason for the lack of variation by location is the strong influence of multi-location firms in the sample. This is because productivity is assumed in the model to be the same across all branches in multi-establishment firms. This is an obvious simplification, but it is not completely unrealistic considering that large firms can deploy their various assets between branches and often adopt standard operational practices and procedures. Enterprises in different locations might also perform different functions within an integrated value chain.

When these large multi-location firms are omitted from the sample, there is an important change in the results (see [Table 5.1](#) – “Sub-sample: Single-location firms”). A clearer relationship emerges between agglomeration and productivity, with a stronger premium for firms locating in Cape Town and Johannesburg, and weaker scores for large towns, small towns and mostly rural municipalities. Interestingly, the aggregate level of productivity also declines in all locations when multi-location firms are omitted. This indicates that these large firms are relatively productive. Reviewing the correlates of productivity as part of a regression model for different samples leads to the same conclusions.

5.4 | THE ROLE OF SPECIALISATION

Analysing productivity at a more granular, industry level shows even clearer patterns of productivity by location. The results support the proposition that productivity is generally higher in cities, especially in tradable sectors. It is also noteworthy that productivity of service-based industries in metros consistently surpasses the average, while it is frequently lower than the average in secondary cities, towns, and rural locations. This supports previous research which indicates that agglomeration economies are generally stronger in the service industries than in manufacturing. Less dense settlements and regions areas clearly specialize in areas such as mining or agriculture, where they have a competitive advantage due to their natural resources.

TABLE 5.1 Detailed breakdown of total factor productivity, average score (2013/14–2019/20)*

	JHB	EKU	TSH	CPT	ETH	NMA	
All Firms	15.81	15.41	15.21	16.02	15.52	15.40	
Sub-sample: Single-location Firms	14.77	14.39	14.36	15.32	14.13	14.13	
All Firms by Sector	Agriculture	14.93	14.46	14.68	15.09	14.06	15.94
	Mining	18.00	17.76	15.33	16.51	17.30	15.20
	Manufacturing	16.12	16.14	16.17	15.23	15.81	17.03
	Construction	15.65	16.06	14.53	14.47	14.67	14.53
	Retail and wholesale	16.61	15.39	15.39	18.35	16.83	15.32
	Transport and storage	18.29	14.65	17.14	15.00	16.12	14.92
	Accommodation and food	14.67	14.34	14.03	13.87	15.22	13.57
	ICT	15.83	14.88	15.87	14.59	14.89	15.05
	Finance and insurance	15.34	13.25	14.82	15.26	14.64	14.26
	Real estate	13.53	12.45	12.98	12.80	12.82	12.37
	Professional services	13.85	12.84	13.28	13.43	12.95	12.67
	Administrative services	15.46	15.00	14.88	14.41	15.06	14.36
	For profit education	12.63	11.91	12.71	12.29	12.98	11.99
	For profit health	17.06	16.58	16.49	16.18	16.46	16.50
	For profit arts and entertainment	10.77	9.24	11.10	13.53	9.74	8.50

Source: Nell, A. and Visagie, J. 2022. *Spatial Tax Panel 2014–2021: version 2*

Notes: *Yellow fill represents above average TFP score; Green border is the top ranked TFP score; BCM and MAN are included as secondary cities. The scores are in the format log (TFP).

TABLE 5.1 Detailed breakdown of total factor productivity, average score (2013/14–2019/20)* (continued)

	SECONDARY CITIES	LARGE TOWNS	SMALL TOWNS	MOSTLY RURAL	
All Firms	15.76	15.78	15.61	15.32	
Sub-sample: Single-location Firms	14.29	13.96	14.03	14.27	
All Firms by Sector	Agriculture	14.48	14.69	14.68	14.82
	Mining	20.29	20.08	20.90	19.61
	Manufacturing	16.37	15.69	15.69	15.81
	Construction	14.60	14.01	14.26	14.28
	Retail and wholesale	14.82	14.78	14.95	15.43
	Transport and storage	15.21	14.98	14.42	14.99
	Accommodation and food	13.54	13.27	13.18	13.64
	ICT	14.70	14.26	15.10	15.67
	Finance and insurance	14.51	13.64	13.36	14.40
	Real estate	12.34	12.08	11.87	11.86
	Professional services	12.67	12.17	12.07	12.00
	Administrative services	14.67	14.47	13.78	14.17
	For profit education	12.05	12.13	11.46	11.76
	For profit health	16.63	16.07	14.12	14.93
	For profit arts and entertainment	9.41	8.76	9.19	8.15

Source: Nell, A. and Visagie, J. 2022. *Spatial Tax Panel 2014–2021: version 2*

Notes: *Yellow fill represents above average TFP score; Green border is the top ranked TFP score; BCM and MAN are included as secondary cities. The scores are in the format log (TFP).

It is also interesting how average productivity varies by sub-sector between the different metros, depending on their particular specialisations. For instance, Cape Town demonstrates prominence in retail and wholesale trade, as well as in arts and entertainment. Johannesburg is the leader in most of its business service sectors, including finance and banking, suggesting strength in depth. Nelson Mandela Bay boasts the highest average productivity in manufacturing, likely attributable to its advanced automotive assembly plants. Most other metros are not particularly competitive in manufacturing, which is actually higher in secondary cities. Yet this is likely dependent on specific sub-sectors within the manufacturing sector.

The point is that there doesn't appear to be a linear relationship between city size and productivity because the sectoral strengths of each city differ. These differences in industry composition tend to obscure or iron out any simple correlation between city size and productivity because there is a lot more going on beneath the overall pattern. The results confirm the importance of agglomeration economies in increasing productivity, but suggest that the distinctive clusters available to firms within the same industry (localisation economies) are ultimately more important than the generic externalities available to all firms (urbanisation economies). Specialisation really does seem to matter.

5.5 | CONCLUSION

There is widespread agreement that productivity is fundamental to long-term economic success. Differences in productivity are a primary factor in explaining income per person in different parts of the world. Cities play a key role in supporting firms to upgrade their capabilities and in raising productivity. The dense concentration of activity ensures proximity between firms and people, which stimulates demand in local markets, fosters specialisation, allows for sharing of infrastructure and resources and spurs learning and innovation. Yet density can also become a drag on productivity if it leads to overloaded infrastructure, service delivery failure, congested transportation networks and overcrowding of public amenities; in other words, where physical proximity no longer facilitates connectivity.

The core question explored in this chapter is whether South African cities succeed in offering firms a competitive base from which to operate by comparing firm-level productivity. According to our evidence, there isn't a simple relationship between the size of cities or settlement types with firm productivity. To be sure, Johannesburg and Cape Town do offer a slight premium over the rest of the country (particularly if excluding larger multi-establishment firms) but the relationship is weak so bigger is not necessarily better.

At least part of the reason behind a lack of geographical variation in aggregate productivity is the role of economic specialisation between places. Indeed, we find a much stronger relationship between cities and productivity when applying a sectoral lens. Each metro has a different sectoral makeup and distinct industry strengths and specialisations. Some are more efficient and competitive than their rivals in certain industries, but less efficient

and competitive in other sectors. This complicates any comparison of their aggregate productivity because it really depends on which sector is being compared. That said, in general, the metros tend to have higher productivity in service-based industries. By contrast, peripheral settlements often compete in sectors where they have a natural advantage like in mining and agriculture.

There are two clear implications for policy which arise from our results:

First, greater effort needs to be devoted to comprehending and addressing the unique industry specialisations that exist within each city. This necessitates conducting further research and engaging with key stakeholders to gain insights into the drivers and dynamics of various sectors. Subsequently, tailored responses are necessary, contingent on the challenges and opportunities presented by each industry. In certain instances, establishing dedicated industry associations or reinforcing existing organisations that advocate for sector interests and collaborate with local businesses may be necessary. Specific actions and initiatives, such as enhancing specialised skills, gathering current information on technological or market trends, or facilitating joint projects on product development, could be incorporated in this approach.

Second, it is crucial to get the basics right in dealing with the bottlenecks and barriers to economic growth in each of the metros. Fixing the foundations is fundamental to attracting and retaining productive investment and supporting enterprise. Metro decision-making must prioritise economic development more than it does at present. This necessitates stronger support from national and provincial authorities to address the obstacles and constraints faced. This process should begin with a strategic evaluation of the primary growth impediments. In some instances, this may entail simplifying or streamlining cumbersome regulatory processes. In other cases, it may be necessary to coordinate certain systems, such as transport and logistics networks, to enable more integrated decision-making and a stronger focus on the local context. In certain instances, policy or operational responsibilities should be delegated to the metros to foster greater responsiveness and synergy with other functions.

References

- Ahlfeldt, G., Pietrostefani, E., Schumann, A. and Matsumoto, T. (2018) Demystifying compact urban growth: Evidence from 300 studies from across the world. OECD Regional Development Working Papers 2018/03. <https://doi.org/10.1787/bbea8b78-en>
- Amusa, H., Wabiri, N. and Fadiran, D. (2019) Agglomeration and productivity in South Africa: Evidence from firm-level data. WIDER Working Paper 2019/93: 1–30. <https://doi.org/10.35188/unu-wider/2019/729-3>
- Collier, P. and Venables, A. (2017) Urbanisation in developing countries: The assessment. *Oxford Review of Economic Policy*, 33(3): 355–372.
- Easterly, W. and Levine, R. (2001) It's not factor accumulation: Stylized facts and growth models. *The World Bank Economic Review*, 15(2): 177–219. <http://www.jstor.org/stable/3990260>

- Kim, Y. E., Loayza, N. and Meza Cuadra Balcazar, C. M. (2016) Productivity as the key to economic growth and development (August 1, 2016). World Bank Research and Policy Briefs No. 108092. <https://ssrn.com/abstract=3249552>
- Kreuser, C. F. and Brink, D. (2021) Total factor productivity in South African manufacturing firms 2010–17: CIT-IRP5 panel v4.0. WIDER Technical Note 20/2021. <https://doi.org/10.35188/unu-wider/wtn/2021-20>
- Kreuser, C. F. and Newman, C. (2018) Total factor productivity in South African manufacturing firms. *South African Journal of Economics*, 86(S1): 40–78.
- Krugman, P. (1991) Increasing returns and economic geography. *Journal of Political Economy*, 99(3): 483–499. <https://doi.org/10.1086/261763>
- Krugman, P. (1997) *The Age of Diminished Expectations*. Cambridge, MA: The MIT Press.
- Levinsohn, J. and Petrin, A. (2003) Estimating production functions using inputs to control for unobservables. *Review of Economic Studies*, 70(2): 317–342.
- Matthee, M., Rankin, N., Webb, T. and Bezuidenhout, C. (2018) Understanding manufactured exporters at the firm-level: New insights from using SARS administrative data. *South African Journal of Economics*, 86(S1): 96–119. <https://doi.org/10.1111/saje.12158>
- Nell, A. and Visagie, J. (2022) Spatial Tax Panel 2014–2021: version 2
- Olley, G. S. and Pakes, A. (1996) The dynamics of productivity in the telecommunications equipment industry. *Econometrica* 64(6): 1263–1297.
- Rovigatti, G. and Mollisi, V. (2018) Theory and practice of total-factor productivity estimation: The control function approach using stata. *The Stata Journal*, 18(3): 618–662.
- Saliola, F. and Seker, M. (2011) Total factor productivity across the developing world. Enterprise Survey: Enterprise Surveys Country Notes No. 23. Washington DC: World Bank Group.
- Sarkar, S., Arcaute, E., Hatna, E., Alizadeh, T., Searle, G. and Batty, M. (2020). Evidence for localization and urbanization economies in urban scaling. *Royal Society Open Science*, 7(3): 191638. <https://doi.org/10.1098/rsos.191638>
- Storper, M. (1997). *The Regional World: Territorial Development in a Global Economy*. New York: Guilford Press.
- Turok, I. (2017) Urbanisation and development: Reinforcing the foundations. In Bhan, G., Srinivas, S. and Watson, V. (eds) *The Routledge Companion to Planning in the Global South*. Oxford: Routledge.
- Turok, I. and McGranahan, G. (2013). Urbanization and economic growth: The arguments and evidence for Africa and Asia. *Environment and Urbanization*, 25(2): 465–482. <https://doi.org/10.1177/0956247813490908>
- Wooldridge, J. M. (2009) On estimating firm-level production functions using proxy variables to control for unobservables. *Economics Letters* 104(3): 112–114. <https://doi.org/10.1016/j.econlet.2009.04.026>

6

CITIES ARE AT THE CENTRE OF SOUTH AFRICA'S WAGE INEQUALITIES

Authors

Msawenkosi Dlamini^a and Justin Visagie^b

Highlights

- 1 Cities are at the centre of South Africa's wage inequalities. This is because of the sheer concentration of total employment in cities, with two-thirds of formal jobs in metros, but also because of higher wage inequalities in cities compared with the rest of the country.
- 2 There are important differences in the earnings profiles between cities, characterised in general by higher wage inequalities in larger cities. Examining median wages and wage bands also reveals important distinctions between places.
- 3 Median wages (in constant prices) were falling across all metros because wages failed to keep up with inflation. There were also no signs of earnings inequality decreasing in any of the metros.
- 4 The structure of industry is important, but insufficient, as an explanation of wage differences between metros. While some sectors paid better than others, it is also true that some cities paid better than others, even when comparing differences within sectors.
- 5 A key implication for policymaking is that applying a generic formulae to labour market reforms across all cities and regions is unlikely to have the intended outcomes in light of their distinctive characteristics.

^a Msawenkosi Dlamini is a Ph.D. trainee at the Human Social Science Council and a second-year Ph.D. student at the University of KwaZulu-Natal

^b Dr Justin Visagie is a Senior Research Specialist at the Human Sciences Research Council and a Senior Lecturer at the Department of Economics and Finance, University of the Free State.

6.1 | INTRODUCTION

The dynamics of the South African labour market are central to the country's most intractable problems. The 'triple challenge' of inequality, poverty, and unemployment all have their roots in a slack labour market which features unprecedented levels of unemployment, among the highest levels of wage inequality in the world and a legacy of race-based exclusion which is still characterised by chronic levels of unemployment for the unskilled black majority.

The government's primary response to these challenges has been to influence post-market outcomes through taxation and fiscal redistribution. Since transition to democracy, the country has made steady progress in increasing levels of coverage of free basic services and has seen a huge expansion in direct cash transfers to the poor. Yet the labour market has continued to deteriorate in the post-apartheid period, which has undermined many of the pro-poor gains from expanded social welfare (Mosomi & Wittenberg, 2020; Borat et al., 2021). In recent years, the official rate of unemployment has soared to record heights reaching above 30% since 2020. The result has been a lack of progress in reducing poverty and inequality over the past two decades with poverty rates fluctuating at around half of the total population (Stats SA, 2017; Francis & Webster, 2019). In addition, the prospects for further pro-poor redistribution are severely limited as public debt has accelerated in the wake of more than a decade of low economic growth. Transformation of the South African labour market is imperative for building a more equitable and prosperous future.

To date, the overwhelming majority of scholarly work on this topic has focused on micro supply-side issues, or in other words, on the barriers that exist in the lives of young workers. Demand-side macro factors, by contrast, such as the impact of technological change, globalisation and urbanisation, have been mostly neglected (De Lannoy et al., 2020). Yet the evolving structure and geography of industry can have important implications for the types of jobs on offer.

The labour market of large cities is where the majority of demand for work finds expression. In addition, the geography of jobs is a critical factor in explaining demand-side patterns in light of South Africa's history of spatial inequality. A lack of spatial transformation within cities plays a critical role in effectively blocking access to job opportunities for many younger work seekers.

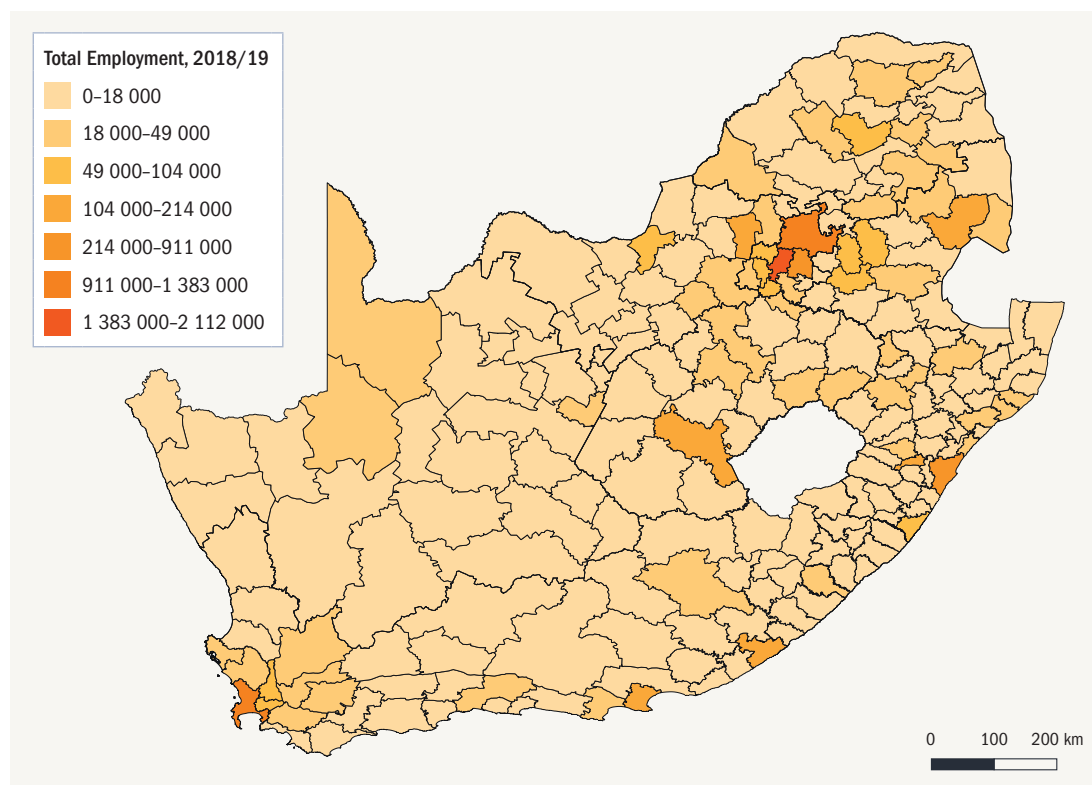
To the best of the authors' knowledge, no studies have examined wage inequalities among South African cities. This is surprising given that approximately 65% of all formal jobs in the country are concentrated in the metropolitan areas, with 38% in the Gauteng metros alone. Focusing on cities when measuring labour market outcomes is crucial, as they are central drivers of labour demand. Their earnings potential is intertwined with a range of local factors, including the structure of industry, urban infrastructure, spatial form, among others, all of which have been neglected in studies of the South African labour market.

The goal of this chapter is to better understand the position of cities in contributing to wage inequalities in South Africa. A key question is whether wage inequalities are particularly high in the metropolitan municipalities in comparison to the rest of the country. A follow-up question is whether the earnings distribution differs between cities and if there are any signs of improvement. A key message is that wage inequalities are related to the structure of industry in cities, but place-based factors also play an important role. The analysis is based on an exciting source of new spatial data based on tax records, the Spatial Tax Panel.

6.2 THE GEOGRAPHY OF EMPLOYMENT AND WAGE INEQUALITY IN SOUTH AFRICA

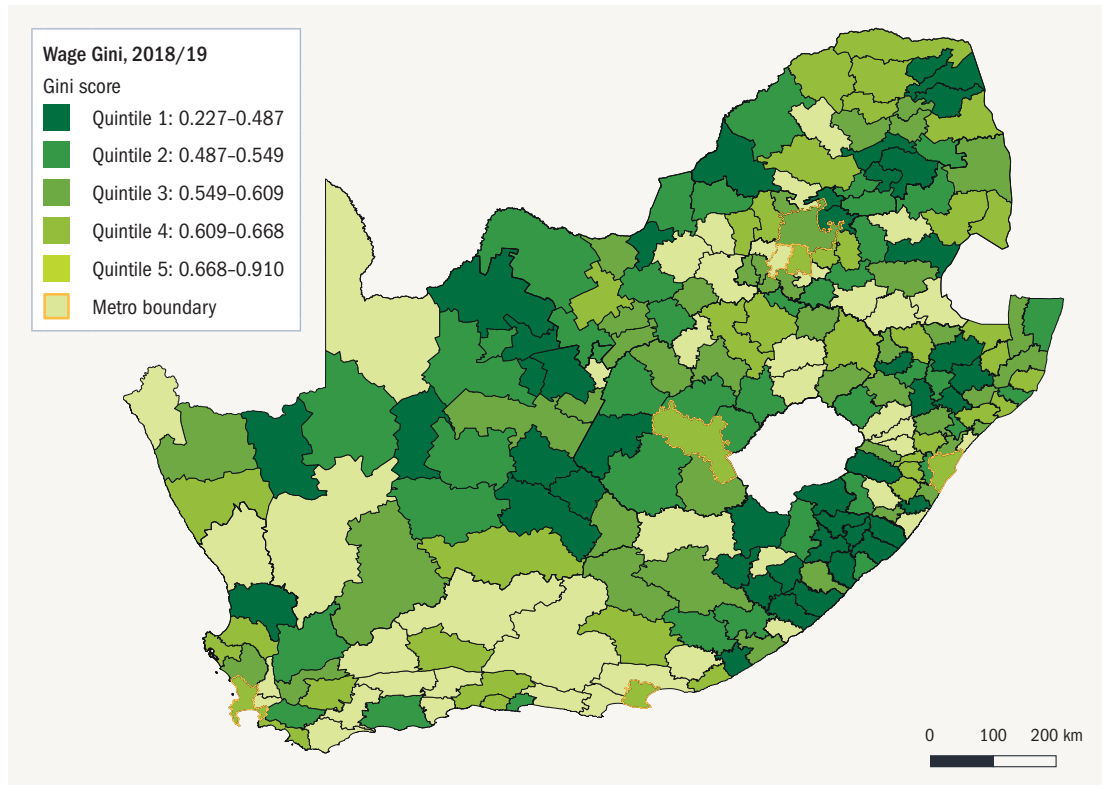
A central rationale for cities is that they function as labour pools which facilitate a more exact match between labour supply and demand across workers and firms. Figure 6.1 shows the spread of total (formal) employment across the country based on tax data. The concentration of labour is heavily skewed towards employment in the eight metros. In fact, the four largest job centres – Johannesburg (JHB), Tshwane (TSH), Cape Town (CPT) and eThekweni (ETH) – account for 52% of total employment. It follows that what happens in each of these labour markets has a large impact on national outcomes.

FIGURE 6.1 Total jobs by municipality, 2018/19



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

FIGURE 6.2 Wage Gini coefficient by municipality, 2018/19



Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

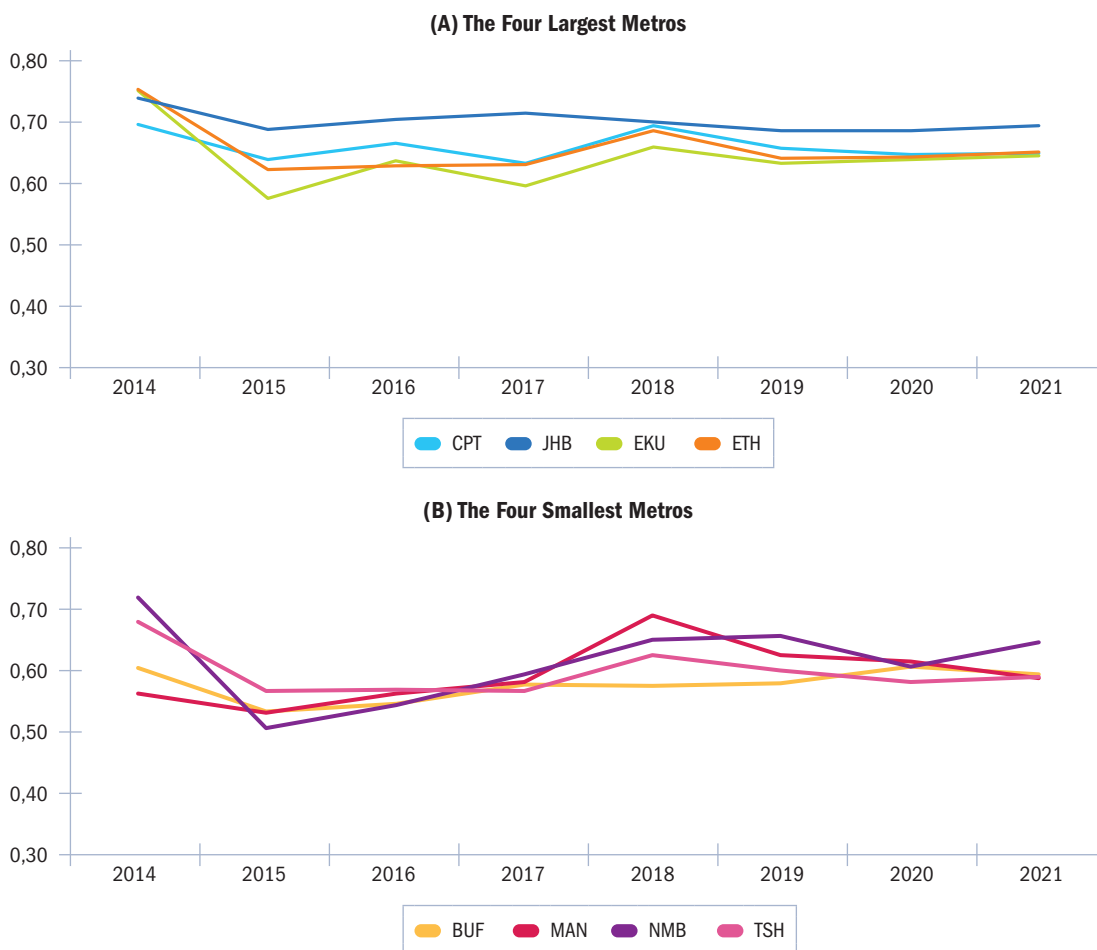
Is there a noticeable disparity in wages inequalities between metropolitan municipalities and the rest of the country? **Figure 6.2** displays the level of earnings inequality among formal wage workers for each municipality in the country, as measured by the Gini coefficient. The Gini coefficient is a statistical measure, ranging from 0 to 1, used to quantify income inequality within a population, with 0 representing perfect equality and 1 indicating extreme inequality.

While the wage Gini is high across the whole country, metropolitan municipalities fall into the 4th or 5th quintiles, or, in other words, the top two tiers in wage inequality rankings among municipalities. The exception is Tshwane and Buffalo City (BUF), which both fall into the middle (3rd) quintile, probably because of their relative concentration of unionised and protected government jobs. The ultimate reasons behind variations in income inequalities across South Africa require further investigation. However the tax data confirm that cities are generally associated with higher levels of earnings inequality.

6.3 WAGE INEQUALITY AND WAGE LEVELS BETWEEN SOUTH AFRICAN CITIES

Looking more closely at wage inequalities between metros, we find a general separation in levels of earnings inequality across the four largest and four smallest metros (by population size) (Figure 6.3). Higher wage inequalities in larger cities might be attributed to their mature industrial profiles, which attract workers with a wide range of skills sets and experience. In contrast, the government is typically the primary employer in smaller metropolitan areas, offering more consistent wages. Among the metros, Johannesburg consistently displayed the highest levels of income inequality. This is not surprising as it is the country's prominent financial and business service centre, and a common headquarters for big business.

FIGURE 6.3 Wage Gini coefficient by metro, 2014/15–2020/21

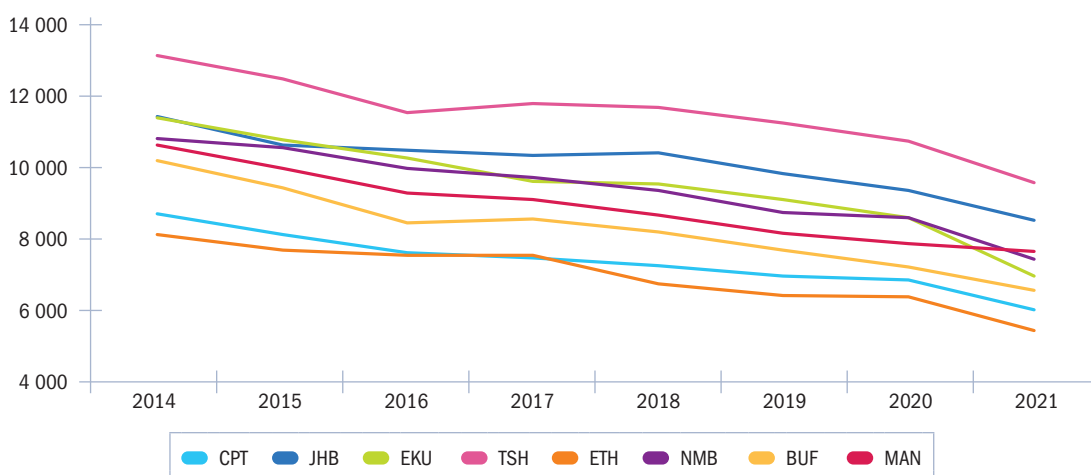


Source: Nell, A. and Visagie, J. 2022. *Spatial Tax Panel 2014–2021: version 2; Metros ranked by population size*

In addition to levels of earnings inequality, Figure 6.3 also shows trends in time for wage inequality between 2014 and 2021. Data for the four smaller metros is noticeably more volatile than in the larger metros, but none of the metros display any discernible pattern over time. We find no clear evidence that wage inequalities have been decreasing in any of the eight metros.

Median wages are another useful way of comparing labour market returns between regions. Median income is a calculation of the midpoint in the earnings distribution where half of all workers earn more, and half earn less, than the median wage. A main advantage of the median is that it is not influenced by extreme values because a small number of exceptional income earners can inflate average (mean) wages. **Figure 6.4** shows the trends in real median wages by metropolitan municipality over time. Prices have been adjusted for inflation in order to take into account that costs of living were rising over time.

FIGURE 6.4 Median wage by metro (constant 2015 prices), 2013/14–2020/21



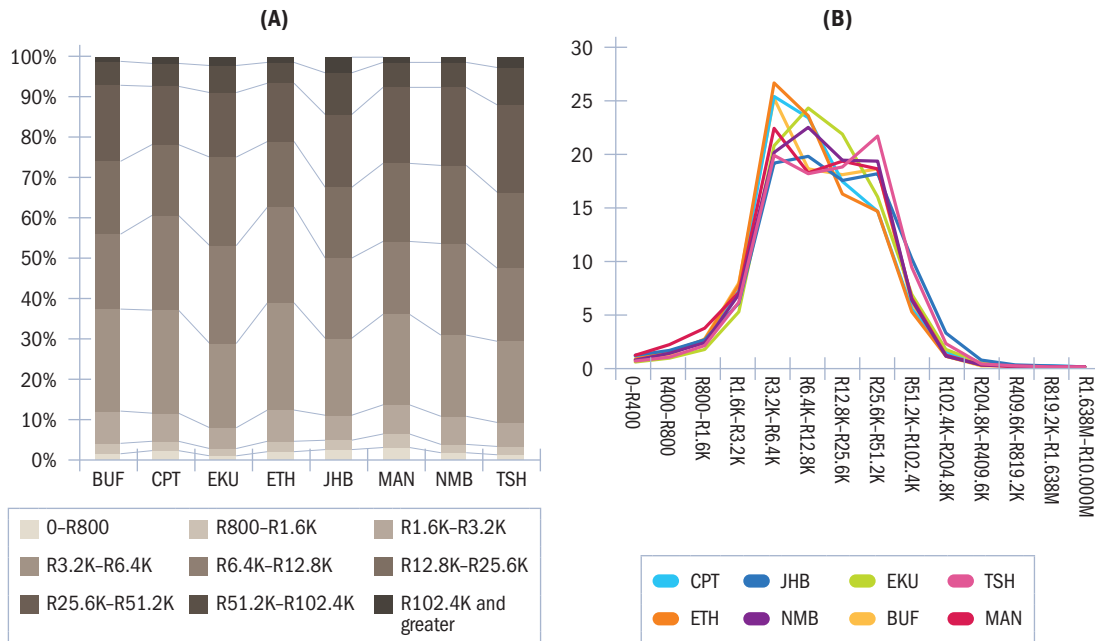
Source: Nell, A. and Visagie, J. 2022. *Spatial Tax Panel 2014–2021: version 2; adjusted to 2015 prices according to the Consumer Price Index*

A striking feature of the figure is the alarming scale of erosion in median wages for all metros over time. This suggests that the ‘average’ wage worker in South African cities has been getting poorer because earnings at the median has not kept pace with inflation. Further research is necessary to confirm the trend and its applicability across the distribution. Yet there is some emerging evidence of a hollowing out, or bifurcation, in the South African earnings distribution (Finn & Leibbrandt, 2018; Mosomi & Wittenberg, 2020; Bhorat et al., 2021).

Figure 6.4 also reveals a fairly consistent hierarchy in the levels of median income over the period. TSH offers the most favourable median wage level, second is JHB, followed by a cluster in the middle comprising of Ekurhuleni (EKU), Nelson Mandela Bay (NMB) and Mangaung (MAN). The bottom three are Buffalo City, Cape Town and finally, eThekweni municipality. The difference between median wages for the top (TSH: R9 593) and bottom (ETH: R5 457) ranked metros in 2021 is surprisingly large at more than R4 000 per month. This once again reinforces the reality of significant spatial earnings differences.

Gini coefficients and median wages are summary measures to understand the evolution of wages. A fuller picture of labour market earnings is offered by wage bands as contained in **Figure 6.5**. The results are understandably more nuanced but generally reinforce the point that there are important differences between metros.

FIGURE 6.5 Employment by wage bands and by metro, 2018/19



Source: Nell, A. and Visagie, J. 2022. *Spatial Tax Panel 2014–2021: version 2*

A few important subtleties in the wage distribution are worth mentioning.

First, Johannesburg has double the percentage of earners in the highest earnings bracket when compared to other metros with approximately 4% of employees earning more than R100 000 per month. This corresponds with Johannesburg’s higher Gini score when compared to other metros, which is evidently driven by a concentration of top paid executives.

Second, Mangaung (14%), Buffalo City (13%), eThekweni (12%), and Cape Town (11%) have the highest shares of people earning less than R3 200 per month. The high concentration of low-wage earners in these cities might be attributed to the greater prevalence of manufacturing, retail and tourism industries. These sectors generally offer lower wages due to factors such as lower skills requirements, higher levels of competition, and the seasonal nature of some jobs (Bhorat et al., 2015).

Last, the metro wage distributions appear to lack a consistent peak with the heaviest concentration of earners in some cases falling in a low R3 200–R6 400 monthly wage band such as in eThekweni, Buffalo City and Cape Town, and sometimes falling in a high monthly wage band of R25 600–R51 200 such as in Tshwane. Ekurhuleni had the highest concentration of workers in the middle wage bands with 46% of workers earning between R6 400 and R25 600. The same middle tier made up less than 37% of all workers in Buffalo City, Mangaung and Tshwane. A stronger middle wage tier in Ekurhuleni is consistent with the larger share of manufacturing or ‘blue collar’ workers in Ekurhuleni. Notwithstanding the fact that wage bands offer a fairly crude representation of the earnings distribution, the evidence does suggest that too few individuals fall into the middle, which is symptomatic of high levels of wage inequality.

6.4 THE ROLE OF INDUSTRY SPECIALISATION IN EXPLAINING WAGE INEQUALITIES BETWEEN CITIES

There are obvious differences in the structure of earnings between South African cities upon closer inspection of tax data. A key question is the extent to which earnings outcomes can be explained by differences in the industrial profile of cities (see also [Chapter 3](#)) or otherwise a range of local factors. [Table 6.1](#) combines information on average wage levels with a breakdown of industry to allow for a direct comparison of wages by industry between metros.

Evidently, industry plays an important role in driving wage differences between cities with large variation in average wages by sector. In general, the highest paying sectors include 'Utilities', 'Finance' and 'Mining' with average wages in excess of R40 000 per month in some places. The lowest paying sectors include 'Administrative services', 'Tourism', 'Retail' and 'Agriculture', which frequently pay less than R15 000 per month on average.

TABLE 6.1 Mean monthly wages by sector and by metro (in rands), 2018/19

SECTOR	ALL METROS	JHB	EKU	TSH	CPT	ETH	NMB	BUF	MAN
ALL	22 187	29 198	23 274	26 664	20 190	18 852	21 957	20 850	21 550
Agriculture	16 091	19 033	13 431	18 709	14 133	18 161	14 639	8 397	11 751
Mining	41 377	52 019	35 689	30 227	51 314	33 763	14 402	14 043	24 701
Manufacturing	25 223	31 976	27 480	24 912	18 026	22 026	26 340	15 801	15 446
Utilities	46 804	59 317	23 670	19 871	31 466	11 479	14 583	21 178	41 643
Construction	18 240	23 353	22 868	15 582	14 911	13 532	15 018	12 810	13 814
Retail	15 880	19 115	19 670	16 157	13 340	13 496	14 305	13 370	14 529
Logistics	27 773	34 138	28 343	25 752	22 066	25 317	18 109	17 526	17 284
ICT	39 578	45 061	36 534	45 330	27 982	28 172	31 714	30 920	26 072
Tourism	12 416	14 511	12 548	11 059	11 770	11 904	9 361	9 364	10 660
Finance	43 558	51 147	28 469	40 100	38 577	25 686	28 454	21 413	29 549
Professional services	34 469	40 941	28 369	34 755	31 768	24 651	24 670	25 748	23 502
Administrative services	10 742	10 495	11 244	12 493	12 976	8 768	9 835	7 000	9 177
Government services	37 143	36 018	35 519	39 315	36 750	36 260	37 258	35 337	35 889
Health and education	21 131	21 804	18 942	22 967	19 866	21 179	19 800	18 955	17 788
Other	17 484	21 974	17 896	15 939	15 919	12 930	13 142	13 714	12 035

Source: Nell, A. and Visagie, J. 2022. *Spatial Tax Panel 2014–2021: version 2*

Note: mean wages are calculated by imputing the mid-point of each wage band. This is a rough approximation of the mean wage.

Yet the table also reveals the insufficiency of industry as the sole explanation for earnings inequalities. When comparing average wages between cities in the same sector, the differences can be striking. For instance, the average monthly wage levels in 'Utilities' are as high as R59 312 in Johannesburg but as low as R11 479 in eThekweni. This has to do with the influence of Eskom, which has its head office in Sandton. The same is true of 'Financial services', which pay, on average, R51 147 in Johannesburg but only R21 413 in Buffalo City. Again, Johannesburg is headquarters to most of the big banks in South Africa.

In summary, while some sectors pay better than others, it is also true that some cities pay better than others, even when comparing differences within sectors. The descriptive evidence shows that, in general, workers from Johannesburg receive higher average wages in any sector, while workers in the smallest metros (Buffalo City and Mangaung) seem to experience some wage penalty. Further research is needed to unravel the role of place-based factors from a range of important demographic and demand-side features, including industry, occupation, education, age and experience.

TABLE 6.2 Workers earning R51 200+ per month by sector and by metro, 2018/19

	RANK	SECTOR	TOTAL	INTENSITY (%)
JHB	1	Finance	62 330	27.2
	2	ICT	33 561	27.5
	3	Manufacturing	32 846	16.8
EKU	1	Manufacturing	26 084	12.4
	2	Retail	8 933	7.7
	3	Logistics	7 299	9.7
TSH	1	Government services	40 622	16.0
	2	Health and education	12 255	9.3
	3	Professional services	12 180	19.5
CPT	1	Government services	15 911	11.4
	2	Finance	15 197	18.1
	3	Retail	14 841	4.0
ETH	1	Manufacturing	12 349	8.8
	2	Government services	11 876	10.9
	3	Retail	6 152	3.9
NMB	1	Manufacturing	5 335	10.6
	2	Government services	4 166	11.8
	3	Retail	1 274	4.5
BUF	1	Government services	5 794	13.1
	2	Manufacturing	897	5.1
	3	Retail	657	4.0
MAN	1	Government services	5 078	12.5
	2	Health and education	1 582	7.0
	3	Retail	813	4.9

Source: Nell, A. and Visagie, J. 2023. *Spatial Tax Panel 2014–2022: version 3*

Notes: Intensity represents the percentage of all workers within the sector earning R51 200 or more per month

A final approach to evaluating the role of the industrial profile in reproducing wage inequalities is a focus on top earners. **Table 6.2** shows the industries with the greatest number of highly paid workers, earning more than R51 200 per month, in each metro.

A striking feature of the table is how the rankings of the top three sectors for highly paid workers change across the metros. This correlates neatly with our characterisation of the specialisation of each metro economy set out in **Chapter 3**. For instance, Johannesburg is characterised as a 'Financial centre' (Finance is ranked 1st), Ekurhuleni as 'Manufacturing-logistics' (Manufacturing is ranked 1st and Logistics 3rd), Tshwane as 'Mational government and professional services' (Government services is ranked 1st and Professional services 3rd), etc. Each city's strength is rewarded in the labour market.

Yet the intensity of high-income earners by sector also fluctuates across the metros and can differ significantly when making comparisons between the metros. For instance, within 'Manufacturing', 17% of workers earn above R51 200 per month in Johannesburg compared with just 5% of manufacturing workers in Buffalo City. The same is true of 'Finance', where 27% of workers in Johannesburg fell into the top-paying bracket compared with 18% in Cape Town. The possible exception is 'Government services', which consistently features in the top three sectors offering the greatest number of high-paying jobs and with a similar share of well-paid workers between metro municipalities. That said, there are still obvious differences in both number and intensity of high-wage workers by sector per city.

6.1 | CONCLUSION

The labour market is central to the country's preeminent challenges, and cities sit at the centre of the South African labour market. It follows that getting to grips with the dynamics of local urban labour markets, particularly in the metros, is critical for building a more equitable and prosperous future. A preliminary examination of earnings and employment trends from tax data reinforces this message and offers some novel insights.

First, wage inequalities tend to be higher in cities compared with the rest of the county. The central role of cities in driving wage inequalities is further amplified by the sheer concentration of employment in South Africa's bigger urban centres. In addition, wage inequalities were persistently high over the period 2013/14 to 2020/21, with no sign of improvement. In fact, median wages (in constant 2015 prices) declined significantly over the period because wages did not keep pace with inflation. Further research is needed to establish whether this was an issue for earners at the middle of the earnings distribution or more widespread.

Second, there is evidence of a hierarchy in levels of inequality and average wages between cities. For instance, earnings inequalities were highest in Johannesburg, which also paid better median wages and had double the percentage of top earners (above R100 000 per month) compared to other metros. On the other hand, earnings inequalities were lowest in Tshwane, which also had the highest median wage, probably because of the concentration of unionised and protected government jobs.

Third, the structure of industry explains some of the wage variation between metros but was insufficient as the only reason behind earnings differences. While certain industries offered higher salaries than others, it is equally true that specific cities offered higher wages than others, even when considering variations within industries. The same message is repeated when looking at the concentration and intensity of top-income earners by sector, which showed significant variation both within, and between, cities and sectors.

The implications for policymaking is that it makes sense to bear in mind the unique characteristics of local labour markets when tackling labour market reforms, particularly in the metros. This could start with an evaluation of the goals of local industry plans and its knock-on effects for wages and labour absorption in the local economy. Education and training programmes could also be designed in close collaboration with local business in order to better align with workplace demand. Another opportunity is for deeper exploration of wage profiles by sector (and sub-sector) as a way of identifying potential hotspots of non-compliance with regulatory protections. Any of the above interventions would depend on further investment in research and experimentation in order to design and test a more targeted approach. A key take home is that applying generic formulae to labour market reforms across all cities and regions is unlikely to have the intended outcomes in light of their distinctive characteristics.

THE IMPLICATIONS FOR POLICYMAKING IS THAT IT MAKES SENSE TO BEAR IN MIND THE UNIQUE CHARACTERISTICS OF LOCAL LABOUR MARKETS WHEN TACKLING LABOUR MARKET REFORMS, PARTICULARLY IN THE METROS.

References

- Bhorat, H., Naidoo, K., Oosthuizen, M. and Pillay, K. (2015) Demographic, employment, and wage trends in South Africa. WIDER Working Paper 2015/141.
- Bhorat, H., Stanwix, B. and Thornton, A. (2021) Changing dynamics in the South African labour market. In Oqubay, A., Tregenna, F. and Valodia, I. (eds) *The Oxford Handbook of the South African Economy*. Oxford: Oxford University Press: Oxford. <https://doi.org/10.1093/oxfordhb/9780192894199.013.29>
- De Lannoy, A., Graham, L., Patel, L. and Leibbrandt, M. (2020). Why Is youth unemployment so intractable in South Africa? A synthesis of evidence at the micro-level. *Journal of Applied Youth Studies*, 3(2): 115–131. <https://doi.org/10.1007/s43151-020-00012-6>
- Finn, A. and Leibbrandt, M. (2018) The evolution and determination of earnings inequality in post-apartheid South Africa. WIDER Working Paper 2018/83.
- Francis, D. and Webster, E. (2019) Poverty and inequality in South Africa: Critical reflections. *Development Southern Africa*, 36(6): 788–802. <https://doi.org/10.1080/0376835x.2019.1666703>
- Mosomi, J. and Wittenberg, M. (2020) *The labor market in South Africa, 2000–2017*. IZA World of Labor. 2020(475): 1–11. <https://doi.org/10.15185/izawol.475>
- Nell, A. and Visagie, J. (2022) Spatial Tax Panel 2014–2021: version 2
- Nell, A. and Visagie, J. (2023) Spatial Tax Panel 2014–2022: version 3
- Stats SA (Statistics South Africa). (2017) Poverty Trends in South Africa: An Examination of Absolute Poverty between 2006 and 2015. Report No. 03-10–06. Pretoria: Stats SA.

APPENDIX

Explore South African Tax Data: An introduction to the Spatial Tax Portal

Highlights

- 1 A user-friendly web interface is available which makes it simple and easy to explore and download spatial tax data: www.spatialtaxdata.org.za
- 2 Discover what is distinctive about each municipality through a series of curated interactive charts by exploring the 'Dashboards' feature.
- 3 Visualize spatial tax data according to your area of interest using the 'Map Explorer' feature. Take advantage of visual toggles to further customise your map.
- 4 Get access to the raw data, metadata and methodology user guide through the 'Download Data' feature.

7.1 | INTRODUCTION

The Spatial Tax Portal (www.spatialtaxdata.org.za) is a flexible diagnostic web interface which makes it simple and easy to explore and download spatial tax data. The user-friendly web portal enables anyone to find the information they need as well as offering analytical tools in exploring particular themes.

Tax data is both comprehensive and detailed with far too many individual pieces to adequately describe or synthesis in a research or statistical report. In addition, the demand for spatial information depends on the geographical frame of reference – whether neighbourhood, metro, local municipality, district, province or national– which compounds the variety in how the data can be packaged. The intention behind the web portal is to support a wide variety of user needs by enabling a flexible approach to exploring the data.

MAIN FEATURES OF THE PORTAL

There are three main features of the web portal:

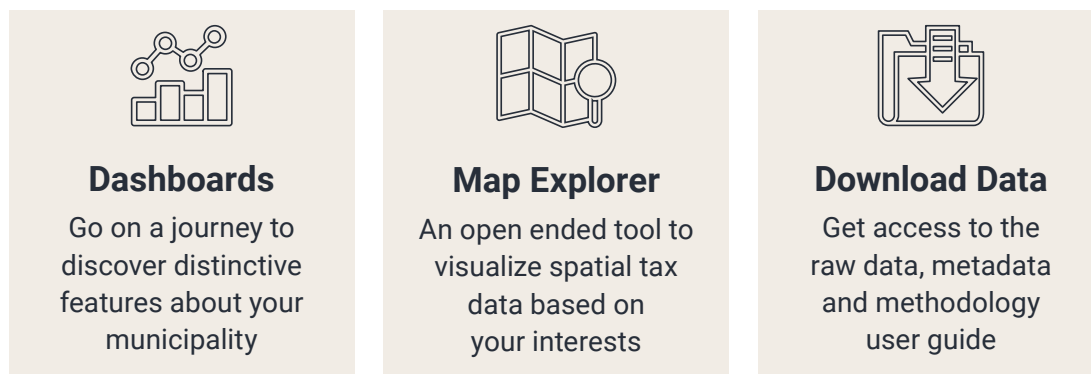


FIGURE A1 Web portal landing page: visit www.spatialtaxdata.org.za



Dashboards feature

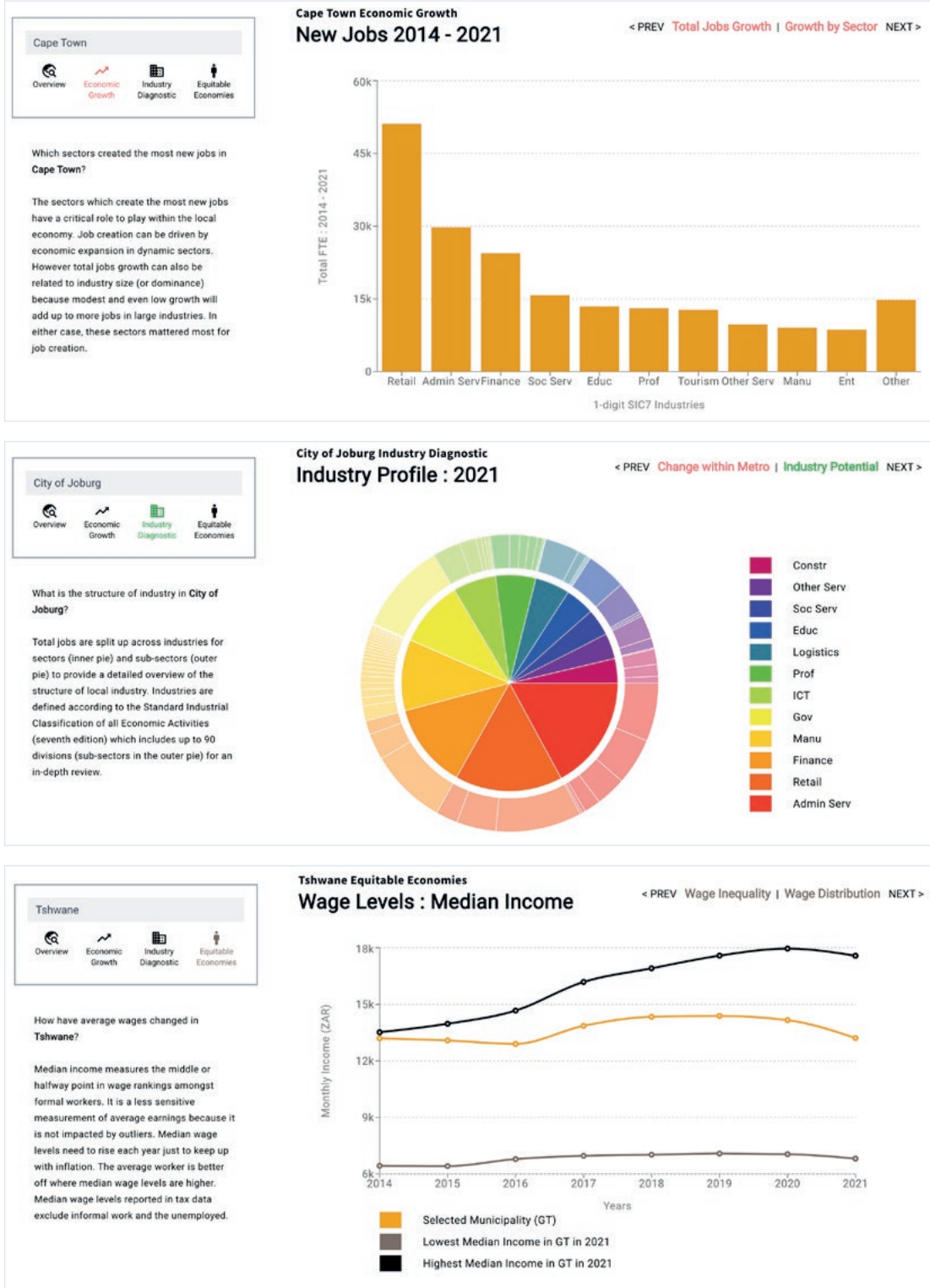
The dashboards are a series of carefully curated charts or figures organised by theme which help the user discover what is distinctive about their municipality. The dashboards are organised by a municipal perspective and begin with the user choosing their municipality. They are an excellent starting point in summarising the key features and trends for each of the 205 local municipalities and 8 metropolitan municipalities in South Africa.

The charts are organised into four themes: 'overview', 'economic growth', 'industry diagnostic' and 'equitable economies'. Each of the charts includes a range of interactive toggles which allow for custom manipulation and deeper exploration of the data.

TABLE A1 List of dashboard charts

	CHART	QUESTION
Overview	Jobs growth	How many jobs are available in 'your municipality'?
	Industry structure	Which sectors are the biggest employers in 'your municipality'?
	Wage distribution	What do jobs pay for people working in 'your municipality'?
Economic growth	Total growth comparison	How does total jobs growth compare in 'your municipality'?
	New jobs	Which sectors created the most new jobs in 'your municipality'?
	Growth by sector	How does jobs growth compare between and within sectors in 'your municipality'?
	Change within metro (only available for metros)	Where are jobs and firms being created or lost within 'your municipality'?
Industry diagnostic	Industry profile	What is the structure of industry in 'your municipality'?
	Industry Potential	Which sectors show the most potential in 'your municipality'?
	Exporters	How do the level of exports compare in 'your municipality'?
	Multi-establishment firms	What types of firms are located in 'your municipality'?
	Job density (only available for metros)	Where are jobs concentrated within 'your municipality'?
Equitable economies	Wage inequality	What is the level of wage inequality in 'your municipality'?
	Wage levels	How have average wages changed in 'your municipality'?
	Wage distribution	How do earnings compare in 'your municipality'?
	Jobs for youth	Which industries offer the most jobs for youth in 'your municipality'?

FIGURE A2 Selected examples of municipal dashboards



Map Explorer feature

The map explorer is an open-ended query tool which visualises spatial tax data in maps. Tax data can be explored either by comparing municipalities (i.e. map of South Africa) or by comparing hexagons at the suburb level (i.e. map of metro).

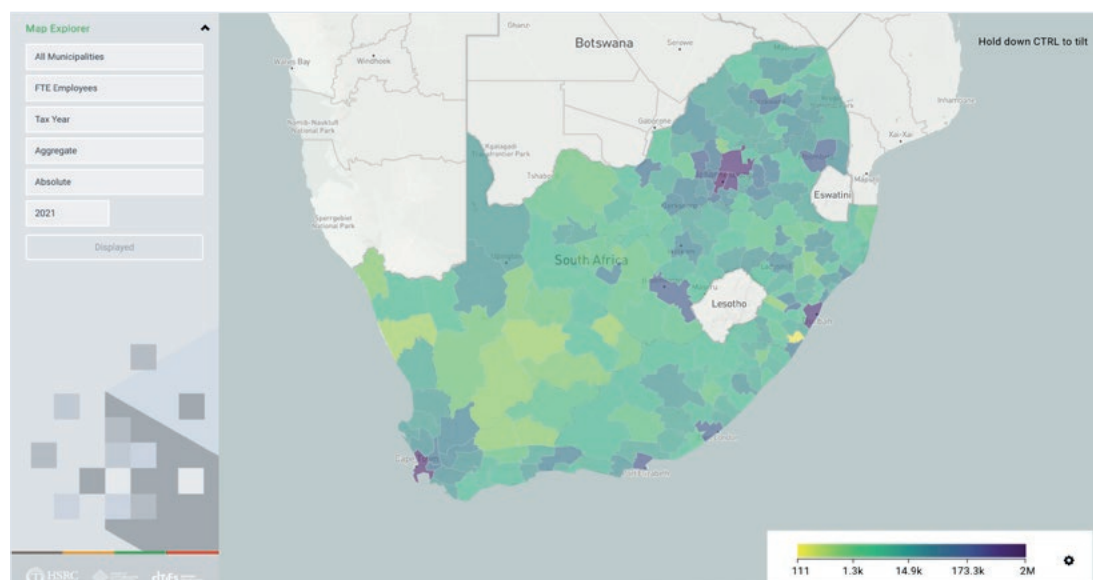
The map explorer is not pre-packaged into specific charts (in contrast to the dashboards) but instead allows the user to specify their particular area of interest. This offers maximum flexibility in exploring the spatial tax databases.

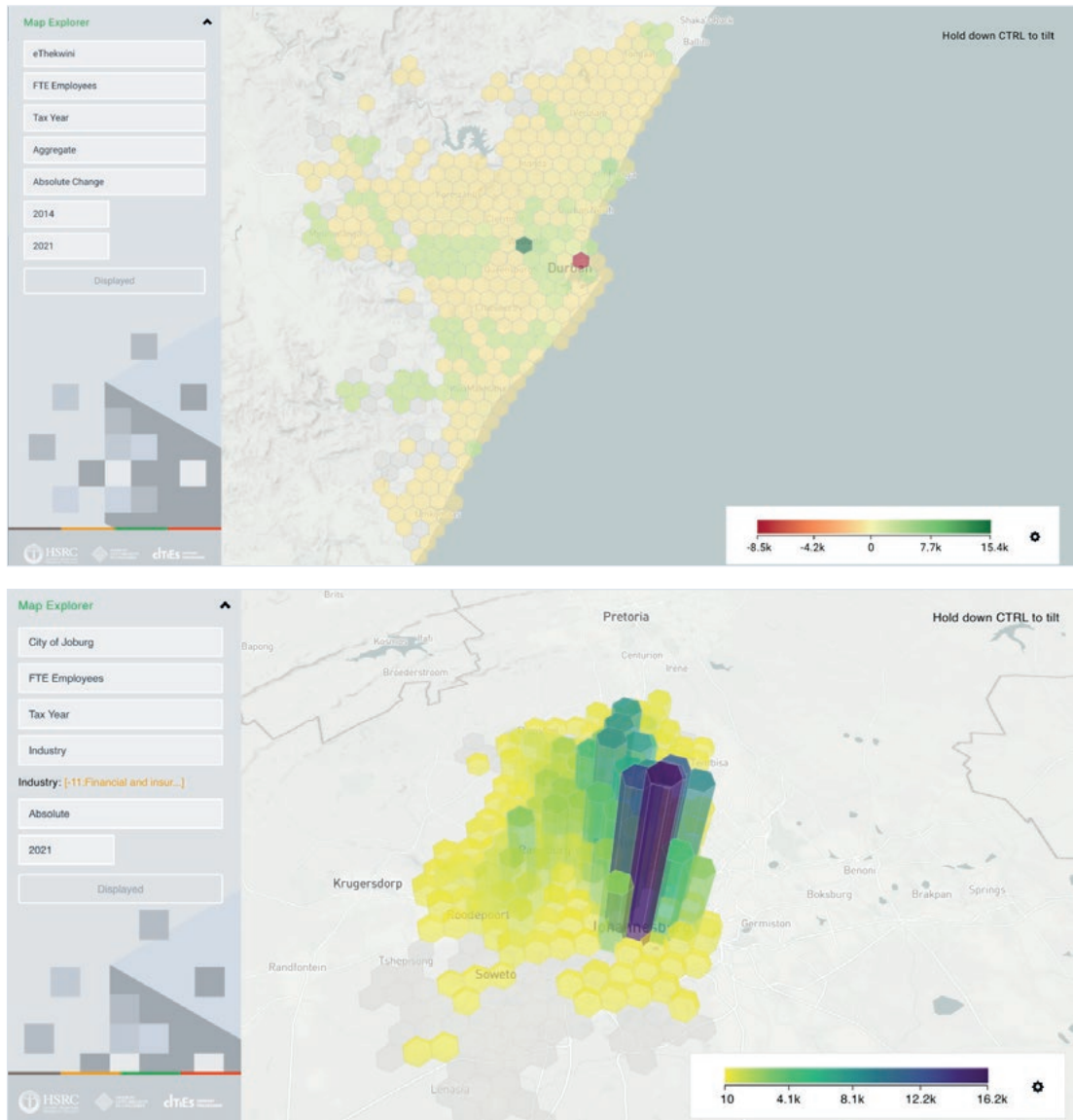
There are five simple steps in specifying a map:

- Step 1** Select your metro (or “all municipalities” for nationwide comparisons)
- Step 2** Select your output (such as employees, establishments or median income)
- Step 3** Select your aggregation (such as by industry or gender) or otherwise skip
- Step 4** Select your view (such as absolute totals or percentages or change over time)
- Step 5** Select your year

Any of these parameters can be modified easily to allow the user to adjust or ‘tweak’ their results.

FIGURE A3 Selected examples of Map Explorer

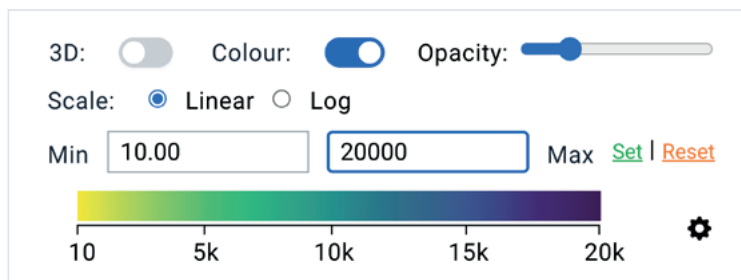




The map explorer also supports a number of visual toggles which impacts how the data is displayed. These functions include:

- i. adjusting the 'max' and 'min',
- ii. using a 'log' or 'linear' scale,
- iii. switching between 'colour' or 'monotone',
- iv. changing the 'opacity', and
- v. choosing a '3D' tower view.

FIGURE A4 Visual toggles for map explorer



Download data feature

The tax portal also allows users to download the raw tax data which is stored as ‘.csv’ files. The user first needs to register an account but access to the data is free and instant. There is a choice between downloading selected databases or otherwise a compressed version of all of the data.

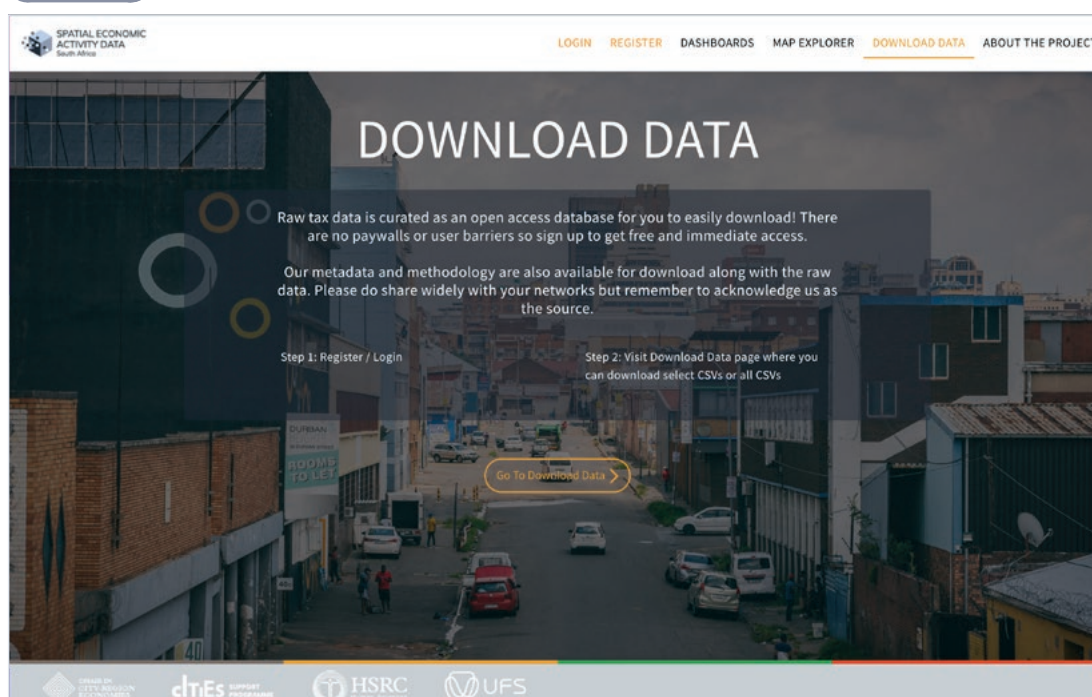
The raw data is also accompanied by a range of support materials. These include:

- a metadata document and release notes which summarise the attributes of the Spatial Tax Panel databases.
- Shapefiles for Uber’s H3 equal area hexagon framework with an aperture of 7 (edge lengths of approximately 1.2km) for the entire country. Hexagons are used as the
- unit of analysis when exploring spatial data within metros.
- Shapefiles for local municipalities. These are also available publicly through the Demarcation Board’s website. Municipalities are used as the spatial unit of analysis when exploring spatial data across municipalities.
- Statistics South Africa’s industry classification tables (SIC7 version) which contain the industrial codes used in sector-related databases.
- A methodology report and user guide which provides detailed technical information about how the spatial tax databases were created.

Access to raw data is important for advanced users who wish to undertake deeper analysis. The raw data is ‘open-access’ but users should still be mindful to acknowledge the original source as follows:

- Nell, A. Visagie, J. Spatial Tax Panel 2014-2022 [dataset]. Version 3. National Treasury – Cities Support Programme and Human Sciences Research Council [producer and distributor], 2023.

FIGURE A5 Download data web page



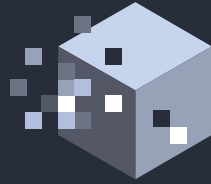
List of Figures

Figure 2.1: Population and employment size, 2019/20	12
Figure 2.2: Trends in employment, 2013/14–2021/22	13
Figure 2.3: Composition of industry, 2019/20	14
Figure 2.4: Net job creation by sector, 2013/14–2021/22	15
Figure 2.5: Employment share by size of establishment, 2019/20	17
Figure 3.1: Trends in employment, 2013/14–2021/22	21
Figure 3.2: Composition of industry, 2019/20	23
Figure 3.3: Cities economic outlook: Industry specialisation and jobs performance.....	28
Figure 4.1: National impact of Covid-19 pandemic for FTE employees and establishments	36
Figure 4.2: Metro-level impact of Covid-19 pandemic on FTE employees	37
Figure 4.3: Absolute changes in FTE employees by industry (1-digit level) across all metropolitan municipalities	39
Figure 4.4: Absolute changes in FTE employees by industry (5-digit level) across all metropolitan municipalities	39
Figure 4.5: Absolute changes in FTE employee by wage band across all metropolitan municipalities	44
Figure 4.6: Percentage changes in FTE employee by wage band across all metropolitan municipalities	44
Figure 4.7: Percentage change in FTE employee by sex across all metropolitan municipalities.....	45
Figure 4.8: Percentage change in FTE employee by age group across all metropolitan municipalities	47
Figure 4.9: ‘Hotspot’ and ‘coldspot’ analysis of change in FTE employees in seven metropolitan municipalities between 2019/20 and 2021/22.....	49
Figure 4.10: Absolute changes in FTE employees by industry (5-digit level) in Buffalo City	52
Figure 4.11: Absolute changes in FTE employees by industry (5-digit level) in Cape Town	53
Figure 4.12: Absolute changes in FTE employees by industry (5-digit level) in Ekurhuleni.....	53
Figure 4.13: Absolute changes in FTE employees by industry (5-digit level) in eThekweni	54

Figure 4.14: Absolute changes in FTE employees by industry (5-digit level) in Johannesburg	54
Figure 4.15: Absolute changes in FTE employees by industry (5-digit level) in Mangaung	55
Figure 4.16: Absolute changes in FTE employees by industry (5-digit level) in Nelson Mandela Bay	55
Figure 4.17: Absolute changes in FTE employees by industry (5-digit level) in Tshwane	56
Figure 4.18: Absolute changes in FTE employees by industry (5-digit level) across all non-metropolitan municipalities	56
Figure 4.19: Absolute changes in FTE employees in seven metropolitan municipalities between 2019/20 and 2021/22.....	57
Figure 6.1: Total jobs by municipality, 2018/19	71
Figure 6.2: Wage Gini coefficient by municipality, 2018/19	72
Figure 6.3: Wage Gini coefficient by metro, 2014/15–2020/21	73
Figure 6.4: Median wage by metro (constant 2015 prices), 2013/14–2020/21	74
Figure 6.5: Employment by wage bands and by metro, 2018/19	75
Figure A1: Web portal landing page.....	82
Figure A2: Selected examples of municipal dashboards	84
Figure A3: Selected examples of Map Explorer.....	85
Figure A4: Visual toggles for map explorer	86
Figure A5: Download data web page.....	87

List of Tables

Table 4.1: Changes in FTE employees for top 10 and bottom 10 sectors at a 5-digit level across all metros.....	42
Table 5.1: Detailed breakdown of total factor productivity, average score (2013/14–2019/20)*	64
Table 6.1: Mean monthly wages by sector and by metro (in rands), 2018/19.....	76
Table 6.2: Workers earning R51 200+ per month by sector and by metro, 2018/19.....	77
Table A1: List of dashboard charts	83



SEAD_{SA}
SPATIAL ECONOMIC
ACTIVITY DATA
South Africa

CITIES ECONOMIC OUTLOOK 2023

Insights into South Africa's
spatial economy from
tax data



T: +27 (0)12 302 2000



JPVisagie@hsrc.ac.za



www.spatialtaxdata.org.za