Introducing a South African Manufacturing Health Index (SA-MHI): Concept Paper

Justin Barnes

SARChI Industrial Development Working Paper Series

WP 2023-07

May 2023

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

NRF National Research Foundation

SARChI
SARChI Chair:
Industrial Development

UNIVERSITY OF JOHANNESBURG

Introducing a South African Manufacturing Health Index (SA-MHI): Concept Paper

DSI/NRF SOUTH AFRICAN RESEARCH CHAIR IN INDUSTRIAL DEVELOPMENT

Justin Barnes

SARChI Industrial Development Working Paper Series

WP 2023-07

ISBN 978-0-6398363-5-5

May 2023

About the South African Research Chair in Industrial Development (SARChI-ID)

The DSI/NRF South African Research Chair in Industrial Development conducts research, builds capacity and undertakes public and policy engagement in the field of industrial development. Activities focus on research projects; training and supervision of graduate students; hosting postdoctoral fellows and research visitors; and various projects, often in conjunction with partners, such as conferences, workshops, seminars, training courses, and public and policy engagements. SARChI Industrial Development is hosted at the University of Johannesburg, where it operates as a centre located in the College of Business and Economics.

Funding acknowledgement

The South African Research Chairs Initiative (SARChI) was established in 2006 by the then Department of Science and Technology (DST), now known as the Department of Science and Innovation (DSI), and the National Research Foundation (NRF). The Chairs are designed to attract and retain excellence in research and innovation at South African public universities. The funding support of the DSI and the NRF through Grant Number 98627 and Grant Number 110691 for the South African Research Chair in Industrial Development has made this working paper series possible.

Recommended citation

Barnes, J. (2023). Introducing a South African Manufacturing Health Index: Concept Paper. SARChI Industrial Development Working Paper Series WP 2023-07. SARChI Industrial Development, University of Johannesburg.

Disclaimer

The Working Paper series is intended to stimulate policy debate. Working papers express the views of their respective authors and not necessarily those of the South African Research Chair in Industrial Development (SARChI-ID), the University of Johannesburg (UJ), the Department of Science and Innovation (DSI) or the National Research Foundation (NRF).

Working Papers can be downloaded from https://www.uj.ac.za/faculties/college-of-business-and-economics/schools/school-of-management/south-african-research-chair-in-industrial-development/working-paper-series/ in PDF (Adobe Acrobat) format.

Abstract

The South African manufacturing sector has been in decline for an extended period. While the evidence of this decline is clear, the underlying reasons for the negative trend are contested. To shift the discourse away from vested ideological positions and what often is dated information, this concept paper argues for introducing an AI-enabled Manufacturing Health Index for South Africa. Based on a quarterly and annual survey process and the use of AI to objectively analyse performance results, the MHI should accurately project the future performance of the South African manufacturing sector and lay bare the empirical reasons for positive or negative performance over time. The MHI will also identify subsector and regional differences, ensuring it becomes an invaluable tool for successful industrial policy development.

Keywords: South Africa, competitiveness, quarterly performance, annual performance

JEL codes: D21, D24, D81, D92, E32, H32, L25

About the Author

Justin Barnes is presently the Manufacturing Ambassador of the Toyota Wessels Institute for Manufacturing Studies, an Associate Professor at the Gordon Institute of Business Science at the University of Pretoria, and the Chairperson of B&M Analysts. He holds a BA Hons *cum laude* (Geography), MSocSci (Development Studies) *cum laude*, and PhD (Development Studies – Industrial specialisation). Justin has published extensively on a range of industrial development subjects and has extensive benchmarking, firm-level and supply chain management experience, having pioneered firm-level competitiveness assessment and industry clustering methodologies in South Africa. He was also the lead consultant responsible for the development of the South African Automotive and Retail–Clothing, Textile, Footwear and Leather Masterplan. These two experiences have informed the compilation of this concept paper. E-mail: justin.barnes@twimsafrica.com.

Acknowledgements

Support for this research was received under the project 'Community of Practice in Industrialisation and Innovation' (grant number 110691), hosted by the DSI/NRF South African Research Chair in Industrial Development (grant number 98627), University of Johannesburg.

This funding is sincerely acknowledged. However, the views expressed in this concept paper and any associated omissions or errors are the author's alone.

Table of Contents

List of Tables

1. Introduction

The South African manufacturing sector has performed poorly over the last decade. This is evident in respect of all key performance indicators relating to the domestic manufacturing sector, including gross value added, investment levels, employment, export levels, and domestic market share. As a result of this decline, the South African economy has become increasingly unbalanced, with consumption driving economic growth at a national level and production lagging. Increasing government expenditure, accompanied by a widening fiscal deficit and rising debt levels, points to an unsustainable national economic growth path that will ultimately need to be corrected if the economy is to regain its lost growth momentum. This will only happen with the rejuvenation of the manufacturing sector, as emphasised in two recent publications exploring the position of the South African economy.[1]

Recognising the weakness of South African manufacturing performance is not a difficult endeavour, given the plethora of data indicating its dire recent performance. However, agreeing on the underlying reasons for the decline in performance over the last decade is much more contentious. The direct role of the country's energy crisis is widely blamed in the media as a key reason, as well as in government and stakeholder reports, but the long-term decline of the manufacturing sector precedes the energy crisis. Rebuilding South Africa's energy capacity may be necessary for rejuvenating the manufacturing sector, but it is unlikely to be a sufficient condition.

There are other significant factors at play, with these made explicit during the development of the South African Automotive and Retail–Clothing, Textile, Footwear and Leather (Retail–CTFL) masterplans. The methodology used to develop both masterplans included several rounds of stakeholder and firm-level engagement that shed light on the underlying vital factors limiting industry growth and development in South Africa. These factors included energy limitations, but also encompassed local government service failures, equity-based Black economic empowerment, the unavailability of critical skills, infrastructure deficiencies (ports, road, rail, etc.), and declining domestic market demand, etc. The relative weighting of these various factors was not established, nor were the factors universally identified.

In essence, stakeholders and firm executives hold extremely strong opinions on the underlying reasons for their industry or firm's inertia, but without any clear grading of the relative or shifting importance of the factors. It is also clear that different factors are more important to certain types of firms and in specific locations, with firms and stakeholders in particular provinces or metropolitan governments appearing to contribute either more

[1] These two publications are Andreoni et al. (2021) and Oqubay et al. (2021).

positive or negative views than the average perspective shared with the masterplan research teams.[2]

With the bad performance of the manufacturing sector being recognised, there subsequently is a major misalignment in South African business, labour, academic and policy circles regarding the underlying reasons for the decline of the manufacturing sector. The reasons cited, which have often driven by vested ideological positions as opposed to empirical observations, range from crude conspiracy theories or sweeping generalisations to the identification of factors that may or may not be at the heart of the decline of the sector. However, another key reason for this misalignment relates to the complexity of interrelated factors affecting the manufacturing sector. These cover the macro-, meso- and micro-levels of economic activity.

Considering each separately:

1. **Macro-level:** This level encompasses the impact of global and national shifts in the South African manufacturers' operating environment. Examples include a depreciating or appreciating currency (including its volatility); changing import tariffs into South Africa and destination markets (for exports); inflation rates (affecting the cost of capital); budgetary expenditure on manufacturing incentives; corporate tax levels; labour market laws and regulations; etc.
2. **Meso-level:** This level encompasses the key activities that occur outside of manufacturing organisations that are essential for their successful daily operations. Key meso-level factors include the quality and safety of the industrial areas in which manufacturers operate; the quality and cost of transport infrastructure (roads, rail, ports and airports); digital connectivity; and the accommodation and living environments of employees (on all levels). It also includes other regionally specific factors, such as industrial clusters (to secure Marshallian external economic benefits); and educational institutions that provide the necessary skills for manufacturing operations.
3. **Micro-level:** This level encompasses the activities that are necessary for the direct, effective functioning of manufacturing operations, including the cost, reliability and quality of energy and water supply; the quality of management, technical staff and operators; the quality and cost of capital (productive assets and buildings); and firm-level labour relations. It also includes the depth of manufacturing organisations' product, process and functional capabilities.

A significant challenge when attempting to understand the underlying reasons for the positive or negative trajectory of a manufacturing sector within a country, a province or region, or

[2] These findings are included in the research reports leading to the development of the two masterplans. They are included in the references (Barnes and Hartogh, 2018; Barnes et al., 2016).

even a specific industrial location, is the interplay of these macro-, meso- and micro-factors in either securing or undermining the competitiveness of firms. This represented a significant challenge when doing research to develop the South African Automotive and Retail–CTFL masterplans. Determining which macro-, meso- and micro-factors are catalytic, positive, or harmful for industry development trajectories could not be established with any preciseness. This opened the opportunity for business and labour lobbyists to push specific self-interested factors as being key, and for government to either deflect the factors they were uncomfortable responding to (potentially 'inconvenient truths'), select a lobbied position based on the effectiveness of the lobbying (or the strength of the lobbying organisation), or take up an established ideological position. In doing so, the fundamental factors either impeding or promoting industry development were often lost in the debate.

The consequences of these significant empirical limitations are evident – the continued decline of manufacturing and its associated effect on broader economic performance. This is despite the government launching many masterplans that purportedly target the key issues that need to be addressed to unlock South Africa's manufacturing potential.

Is it possible to remedy the situation and for clear objective evidence to be found for the factors driving the manufacturing sector's performance? We think it is, and that this lies with developing a quarterly-based Manufacturing Health Index for South Africa. This concept paper outlines the objectives, outputs, methodologies, and critical measurements that would underpin the introduction of such a Quarterly (and associated Annual) Manufacturing Health Index (MHI) for the country. We recognise the challenge of introducing the MHI and suggest there is a major opportunity for a corporate sponsor to support its development and implementation.

It is important to emphasise that there presently is no index in South Africa that systematically measures the state of play within the domestic manufacturing sector on a quarterly basis, or that accurately projects future performance and, most importantly, the underlying reasons for performance shifts. The most valuable index presently available is the Absa Manufacturing Purchasing Managers' Index (PMI), which comprises a monthly survey of purchasing managers in South Africa and projects business conditions and confidence in the economy. However, it is focused exclusively on gauging aggregates of volume change from one month to the next (covering business activity, new sales orders, the backlog of sales orders, employment levels, purchasing inventories, purchasing commitments, supplier deliveries, purchasing prices, expected business conditions, and export sales). The PMI does not measure satisfaction levels, nor does it focus on correlating performance areas with shifts in aggregate activity.

Statistics South Africa also produces a monthly Manufacturing Production and Sales report, but the report only monitors production and associated sales levels from one month to the next, and is invariably published two months after the completion of the month being

reviewed. There is no underlying analysis of the reasons for shifting performance, and as such the report is of limited value to industry stakeholders, other than for noting improving or deteriorating performance.

This concept paper comprises six sections to explore the introduction of an MHI for South Africa. After this introduction, Section 2 explores the objectives of the proposed South African Manufacturing Health Index, with Section 3 then considering its methodology and potential outputs. This is a critical section, as it positions the key value add of the MHI. Section 4 focuses on the measurements that could be included in the quarterly and annual surveys, while Section 5 considers the estimated MHI system development and operating costs (and hence the need for a sponsor). Section 6 concludes the concept paper.

2. SA-MHI Objectives

The primary objectives of the MHI would be fourfold. First, the MHI would accurately measure the most recent quarterly performance and operational satisfaction levels of the South African manufacturing sector. This is critical to objectively analyse the present macro-, meso- and micro-factors shaping the performance of the manufacturing sector. Second, the MHI would accurately project the next quarterly South African manufacturing sector performance. This quarterly lead projection would evolve using an artificial intelligence algorithm that measures the accuracy of individual firm projections by pair-matching their historical, most recent, quarter, along with their projected quarterly results, and then adjust the projections accordingly. AI would moderate positive and negative perceptions based on the quarterly relationships between projections and actual performance. This would ensure an accurate, upfront projection of manufacturing performance that presently does not exist in any robust form in the country. Critically, the MHI's quarterly assessment and projection of performance will be sufficiently granular to identify the specific constraints and/or enablers of manufacturing organisation confidence and the underlying macro-, meso- and micro-factors shaping stronger and/or weaker performance within the South African manufacturing sector.

Finally, the collation of actual and projected quarterly performance data will provide a solid foundation for the completion of a comprehensive annual South African manufacturing sector health analysis. Complemented by an annual survey that secures the annual performance levels of manufacturing firms (including changes in gross value added, employment and investment), the annual survey data will be cross-correlated with the quarterly performance data and used to comprehensively review the state of the South African manufacturing sector, and the key reasons for any shifts in performance.

The MHI's quarterly and annual surveys will give rise to a comprehensive review and predictor of South African manufacturing sector performance, including the key macro-, meso- and micro-reasons for performance movements. The MHI will also allow more disaggregated

analysis, including at a subsector and location-specific level, enabling the accurate capturing of the reasons for different performance levels across the manufacturing sector.

3. SA-MHI Methodology and Outputs

The proposed methodology to be used for the South African MHI would entail the creation of an online perception-based survey platform for a 30-minute quarterly survey (maximum length) targeting the chief executive officers (CEOs), managing directors (MDs), and/or general managers (GMs) of manufacturing operations. The survey would be administered to 300 South African-based manufacturing firms on a quarterly basis, using a stratification methodology that covers six major sectors (autos, CTFL, chemicals, furniture, food processing, light engineering), as well as a spectrum of ownership types (local, foreign), firm size (small, medium, large), and location (provincial, metropolitan). To complement the quarterly surveys, an annual firm-level survey will be administered to the 300 firms on the same survey platform, capturing actual performance data from the participating firms.

The implementation of the methodology should result in four key outputs.

- First, it should result in the compilation of a comprehensive Quarterly South African MHI Report and associated Slide Deck analysing the South African **manufacturing sector's health for the past quarter and projections for the next quarter** – and key strengthening/weakening areas (in aggregate, by subsector, by firm size, by location, and by ownership type).
- Second, it should result in a detailed annual report and associated Slide Deck reviewing performance for the past year and projections for the next year (based on quarterly trends cross-referenced against annual data).
- Third, quarterly and annual press statements should be produced. These press statements should detail key findings, thereby ensuring that accurate and objective information is made available for public consumption and debate.
- Fourth, in further support of this objective, there should be quarterly and annual presentations of the findings generated, with this taking place nationally and per major location and sector.

These outputs will have a positive effect on key stakeholder discussions relating to the performance of the manufacturing sector and the implementation of appropriate remedies and interventions; it will also position the MHI as the authoritative voice monitoring the development of the South African manufacturing sector. This should encourage firm participation, thereby securing sustainable participation in the quarterly and annual survey process.

4. Key SA-MHI Measurements

The quarterly MHI should be structured to capture a set of lag indicators from each surveyed firm. Potential lag indicators are depicted in Table 1. As highlighted, the questions are intended to gain an understanding of the firm-level performance in the preceding quarter in respect of sales (to export and domestic customers); purchases of local and imported materials and components; salaries and wages; utility costs; capacity utilisation; productivity; employment; and fixed asset values.

Table 1: Potential key performance indicators to be captured quarterly in the MHI

Indicators	Rationale for inclusion
a. Export sales	Measurement of international competitiveness; international market health
b. Domestic market sales	Measurement of domestic competitiveness; domestic market health
c. Total sales	Overall company competitiveness; market health; company growth indicator
d. Value of local materials/ component purchases	The capacity of upstream suppliers; competitiveness of upstream domestic supply
e. Value of imports of materials/ component purchases	Import competition; dependence on import purchases
f. Salaries	Cost trends; inflationary pressures
g. Wages	Cost trends; inflationary pressures
h. Utility costs (energy, water)	Cost trends; inflationary pressures
i. Capacity utilisation	Capital utilisation; overhead recovery
j. Productivity (unit output per labour hour)	Competitiveness (versus cost movements)
k. Operating profit	Financial performance/sustainability
l. Employment	Employment contribution
m. Fixed assets	The health of capital base; productive capacity

For each key performance indicator, the MHI will capture a range of performance – from major to minor growth, to no change, and minor to strong decline, using a five-point measurement system, as depicted in Table 2. As indicated, the MHI will measure quarterly performance quite simply, with respondents indicating their organisation's performance regarding strong or moderate growth, no change, or moderate to strong decline.

Table 2: Potential scoring system for quarterly MHI

Quarterly performance	**Score**
Growth of > 5%	+2
Growth of < 5%	+1

Essentially no change	0
Decline of > 5%	-1
Decline of < 5%	-2

To complement the quarterly lag indicators that are captured, the MHI should also measure firm-level satisfaction ratings relating to the operating environment in which the firms find themselves. The quarterly survey will therefore interrogate the extent to which firms are satisfied with various internal and external performance areas. These are depicted in Table 3, which also includes an overview of the importance of each potential performance area in the MHI.

Table 3: Quarterly performance areas to be assessed in the MHI

Performance area	Economic level	Rationale for inclusion
a. Domestic market health	Macro	Perception of domestic market health
b. International market health	Macro	Perception of international market health
c. Company operations	Micro	Perception of the company's quality, cost and reliability performance
d. Domestic materials/ component suppliers	Micro	Perception of quality, cost and reliability of domestic suppliers
e. Imported materials/ component suppliers	Micro	Perception of quality, cost and reliability of international suppliers
f. Road logistics	Meso	Perception of quality, cost and reliability of road logistics
g. Rail logistics	Meso	Perception of quality, cost and reliability of rail logistics
h. Port logistics	Meso	Perception of quality, cost and reliability of port logistics
i. Air logistics	Meso	Perception of quality, cost and reliability of air logistics
j. Municipal services	Meso	Perception of quality, cost and reliability of municipal services
k. Company safety and security	Meso	Perception of the company's safety and security
l. Firm-level industrial relations	Micro	Perception of the health of firm-level industrial relations
m. Industry-level industrial relations	Macro	Perception of the health of broader, industry-level industrial relations
n. National government support	Macro	Perception of quality of national government support given to firm and/or sector within which firm operates
o. Provincial government support	Meso	Perception of quality of provincial government support given to firm and/or sector within which firm operates
p. Municipal government support	Meso	Perception of quality of municipal government support given to firm and/or sector within which firm operates

In addition to measuring the satisfaction of each firm across each performance area on a percentage-based score, where 0% equals complete dissatisfaction, 50% a neutral perspective, and 100% complete satisfaction, firms will also be asked to provide the primary reason for either a very positive or very negative satisfaction level (above 75% or below 25%). Only the primary factors strongly affecting performance should be made explicit through this form of issue identification.

The approach proposed is summarised in Table 4.

Table 4: Measurement system to be used for assessment of each MHI performance area

Satisfaction rating	Range: 0% to 100%
The primary reason for rating	Reason request if very poor or strong satisfaction rating (below 25%/above 75%)

Capturing the lag indicators and the performance assessment for the last quarter will establish a base profile of firm-level performance and environmental satisfaction levels, which can then be linked to leading indicators of performance. The latter will also be captured quarterly. These leading indicators will mirror the lagging indicators presented in Table 1, and provide a clear projection of likely performance over the next quarter. Critically, and uniquely, the MHI will use an AI algorithm to understand the relationships between actual quarterly performance (lagging performance) and performance satisfaction levels, and the accuracy of lead performance projections by individual firm responses.

Where firms are consistently too conservative in their projections of future quarterly performance (where quarterly lagging performance is consistently superior to quarterly projected performance), or too optimistic (quarterly lagging performance is more negative than quarterly projected performance), the use of AI will enable the MHI to project South African quarterly manufacturing performance more accurately. This will enable a corrected quarterly projection of South African manufacturing performance that incorporates potential biases in firm-level forecasts. Given that the MHI will accurately capture firm-level satisfaction across multiple performance areas on a quarterly basis, the AI should also assist in objectively identifying the key macro-, meso- and micro-reasons for shifts in quarterly trends (positive or negative).

To enrich the quarterly MHI, and to provide the MHI with actual firm-level data to strengthen the quarterly measurement process, a more detailed annual survey will need to be administered via the MHI online platform. The annual survey will capture 12 actual key performance indicators that align with the quarterly survey questions. The 12 KPIs relate to:

1. Total sales (local, African, distant exports)
2. Total material/component purchases (local, African, distant exports)
3. Total other purchases (local, African, distant exports)
4. Total capital employed in the business
5. Total stock holding at year end (raw materials, WIP, finished goods)
6. Total employment

7. Total remuneration bill (salaries, wages)
8. Total capital investment
9. Total R&D spend
10. Total training spend
11. BBBEE score
12. Operating profit

The KPIs collected annually will serve two purposes. First, combined with the four quarterly MHI surveys of the year in review, they will provide a comprehensive annual status quo perspective on actual manufacturing sector performance levels from one year to the next. Second, the annual data will build on the quarterly survey perception data and will be used to train the AI projection algorithm, thereby improving the accuracy of the projection model developed as the unique value proposition of the MHI.

5. Estimated MHI Costs and the Need for Sponsorship Support

The quarterly MHI and annual manufacturing sector performance review will provide major branding and other client-facing benefits to any sponsor willing to invest in its development and deployment. The results of the MHI will be released quarterly and should be widely reported via a range of media channels (digital and print media, radio and television). Individual participating firms will also receive high-quality PDF-based quarterly reports that they will benefit from and clearly show the survey's sponsorship. The dissection of the data into sectoral, regional and firm-type results will also permit the distribution of the quarterly and annual results to specific private and public-sector audiences, and at key industry events. Each of these distribution opportunities should add substantial value to the sectors and/or regions involved and will permit sponsorship-marketing benefits. Finally, any sponsor of the MHI should have the right to use the MHI survey findings for its own marketing and advertising purposes.

The importance of securing sponsorship for the MHI is underpinned by its substantial development and operating costs. Estimated development costs are presented in Table 5 and, as indicated, amount to R3.1 million, with R300 000 projected for the full scoping of the MHI quarterly and annual platform, R300 000 to scope all functionality requirements (including AI algorithm functionality), and then R2.5 million for the development and associated testing of the actual MHI platform.

Table 5: Estimated costs of MHI system development

System cost	Estimated cost
MHI model development	R300 000
Functional system development	R300 000
System coding and testing	R2 500 000

TOTAL	**R3 100 000**

Once established, the MHI is projected to require three full-time team members to work exclusively on its quarterly and annual sets of deliverables. This would encompass a senior researcher (and MHI manager), a project administrator, and a data scientist. Ideally, the team should be based at an academic institution, drawing on the expertise of senior academics for the analysis, interpretation and compilation of the results, as well as the associated dissemination of the quarterly and annual findings. An estimation of costs is presented in Table 6. Importantly, the costs are all estimated based on direct cost recoveries, with no margins built in. As highlighted, the total annual budget (in 2023 rand terms) is estimated at R3 045 000.

Table 6: Estimated annual cost of MHI operations

Cost element	Annual
MHI researcher and manager	R 910 000
MHI administrator	R 325 000
Data scientist (database optimisation, extraction, AI)	R 650 000
Participation of senior academics	R 480 000
MHI platform maintenance	R 120 000
MHI website maintenance	R 120 000
Publication dissemination (quarterly)	R 40 000
Marketing events (quarterly)	R 80 000
Stationery and office costs	R 120 000
Travel (flights, car hire, accommodation, travel claims)	R 200 000
Annual estimated cost	R 3 045 000

It is difficult to identify how an academic institution will be able to fund the development and running of the MHI, hence the importance of securing a sponsor to cover its development and operational costs. Key to the proposed cost breakdown presented in Table 6 is a range of public dissemination activities that should be attractive to a corporate sponsor. The benefit to any academic institution hosting the MHI should also be immense. The quarterly and annual survey findings should provide a consistent stream of data and manufacturing-sector intelligence to support academic activities relating to the manufacturing sector in South Africa.

Key to the successful implementation of the MHI is securing a minimum of three and a half years of funding. This relates to six months of funding to develop the system, and three years of funding for the initial three years of operation. This is the estimated period for the AI to "learn", and hence the minimum period required to successfully implement the concept.

Table 7: Three-and-a-half-year funding requirement to establish the MHI

Cost element	Costs
Development costs (six months)	R 3 100 000
Operating costs: Year 1	R 3 045 000
Operating costs: Year 1 (5% escalation)	R 3 197 250
Operating costs: Year 1 (5% escalation)	R 3 357 113
Total estimated funding requirement (3.5 years)	R 12 699 363

6. Conclusion

This concept paper has outlined the potential value of establishing a Manufacturing Health Index (MHI) for South Africa. Based on experience from the development of two masterplans, it argues for the establishment of an evidence-based quarterly assessment of the state of health of the South African manufacturing sector, with an annual survey further deepening and building its value. At the heart of the proposed quarterly MHI is a firm-based, AI-moderated capability that (a) predicts the likely subsequent quarterly performance of the South African manufacturing sector (in aggregate, by key manufacturing subsector, and by location), and (b) identifies the primary reasons for the expected strong or weak performance. The singular focus of the MHI on the manufacturing sector, combined with its quarterly predictive capability, will provide it with a unique value proposition for key South African manufacturing stakeholders, including investors, national, provincial and national government, firm management, sector and regional associations, and unions.

As argued by Andreoni et al. (2021:356) in the concluding chapter of their book on structural transformation in South Africa:

> Experience from other countries shows that successful industrial policy needs to be led politically from the apex of government and that lessons learnt along the way need to be incorporated in an ***iterative process of continuous improvement*** (emphasis added) of policy design and implementation.

While we are in full agreement with this powerful statement, a key outstanding question relates to the quality and objectivity of the evidence that drives this successful iterative process and that ultimately triggers the continuous learning process. This is where the potential value of the MHI sits: It should positively contribute to 'best practice' industrial policy development.

The cost of developing and then running the survey through an online platform over a three-year period (a time frame deemed critical for building the machine-learning algorithm that lies at the heart of the system's predictive capability) is estimated and, as indicated, the likelihood of establishing the MHI independently of a corporate sponsor is unlikely. Given the potential benefits of brand association with the MHI, and the extensive likely distribution (and

associated publicity) of its findings, there appears to be a solid base for attracting such a sponsor. This concept paper hopefully represents an important step in that direction.

References

Andreoni, A., Mondliwa, P., Roberts, S., & Tregenna, F. (eds). (2021). *Structural transformation in South Africa: The challenges of inclusive industrial development in a middle-income country*. Oxford: Oxford University Press.

Barnes, J., & Hartogh, T. (2018). Status quo analysis of the South African Retail–CTFL value chain: Report 1 of 4 of the South African Retail–CTFL Masterplan Project. Compiled for the South African national government's Department of Trade and Industry, 14 February.

Barnes, J., Black, A., Comrie, D., & Hartogh, T. (2016). Phase 1 report – An analysis of the South African automotive industry status quo. Compiled for the South African national government's Department of Trade and Industry, 22 September 2016.

Oqubay, A., Tregenna, F., & Valodia, I. (eds). (2021). *The Oxford handbook of the South African economy*. Oxford: Oxford University Press.

DSI/NRF South African Research Chair in
Industrial Development (SARChI-ID)
31 Henley Road, Auckland Park,
Johannesburg, South Africa

General enquiries:
Koketso Manyane-Dlangamandla
E-mail: koketsom@uj.ac.za
Tel: +27 011 559 7454

SARChI
SARChI Chair:
Industrial Development

UNIVERSITY
OF
JOHANNESBURG