

Mapping the coverage of stimulus measures in response to COVID-19: What risks remain?

OVERVIEW

The R500 billion stimulus package announced by President Cyril Ramaphosa on 21 April 2020 is almost certainly cheaper than not acting. While stimulus packages are complex to manage, the complexities of managing a messy set of rolling closures as a result of a crisis like COVID-19 would be worse. Experiences from previous crises indicate that early implementation of stimulus measures that stop short-term shocks from turning into systematic crises offer the best means to reduce the economic impact of the pandemic and avoid the resulting human suffering. This policy brief aims to assess whether the current stimulus measures are adequately aligned to the expected shocks resulting from COVID-19.

INTRODUCTION

This policy brief proceeds in four parts. First, an overview of existing support measures is presented. Second, the major risk channels for economic impact resulting from the pandemic are identified. Third, a simplified model of the South African economy is presented, and linked to specific risks resulting from COVID-19. With these three elements – stimulus measures, risks, and economic structure – in place, the paper then assesses the coverage of support measures in managing specific risks, and highlights a few notable gaps.

The primary output for this paper is a simplified framework for monitoring the coverage of stimulus measures and risk areas in need of attention. This system, which is dubbed the COVID-19 Economic Risk Accounting Matrix (CERAM), provides a simple means for policymakers to monitor the completeness of economic support measures, and identify areas in need of additional attention. The initial findings of the CERAM can be found in the summary image in Appendix 1.

SUPPORT MEASURES

COVID-19 and the lockdown measures in response to the pandemic pose the most serious economic challenge in decades. While the immediate impact will be felt through a sudden stop in activities by companies affected by the lockdown restrictions, the subsequent disruptions to production processes and supply chains will remain in the medium term, and lasting challenges like firm closures and structural

oversupply in commodity markets will remain in the longer term.

In common with governments around the world, South Africa has announced a series of economic support measures to try to contain the economic impact of the pandemic. While a number of these initiatives were announced in President Ramaphosa's speech on 21 April 2020, the entire package has been developed and iterated on an ongoing basis, with a mix of departmental interventions and overarching policy shifts. A partial mapping of the key interventions announced to date, along with the available understanding of how they will be implemented, is in Table 1 on page 2.

A number of characteristics can be drawn from the identified interventions. First, priority has been given to direct support for vulnerable households and workers. This is likely the best possible support available, for both the human and economic impact of the intervention. Securing the livelihoods of the most vulnerable is a moral necessity, but it similarly assures that underlying consumer demand remains steady, and able to support many of the most employment rich segments of the economy, such as retail. Concerns should be raised about the implementation of some of these measures – most pressing being the issuing of support via child care grants that offers the additional benefit per caregiver, rather than per dependent. But the core principle of these interventions is laudable.

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Table 1. Economic support measures announced in response to COVID-19

INTERVENTIONS	SCALE	INFORMATION	IMPLEMENTER
COVID-19 Social Relief of Distress grant	R50 billion	R350 for six months	DSD SASSA
Increased Child Support grant		Increase by R500 for six months, for each caregiver	DSD SASSA
Increases to other grants		Increase by R250 for 6 months	DSD SASSA
Special Health budget	R20 billion	Special additional funding for COVID-19 response	Department of Health
Support to municipalities	R20 billion	Special additional funding for municipal interventions	CoGTA Municipalities
Loan guarantee scheme for SMMEs	R200 billion	Guarantee scheme to support operational costs for firms with turnover less than R300 million	NT SARB
Tax subsidy	R70 billion	R500 a month for employees earning under R6 500 for the next four months	NT SARS
Employment tax incentive (ETI)		Expansion of ETI from R1 000 to R1 500 in first 12 months, and R500 to R1 000 in the second 12 months. Reimbursements move from twice yearly to monthly	NT SARS
SMME tax relief		Firms with turnover of less than R50 million can delay a portion of employee and company tax liabilities without penalties or interest	NT SARS
Tax payment holidays		Four-month holiday on skills levy, carbon tax and some PAYE tax	NT SARS
UIF Temporary Employer-Employee Relief Scheme	Estimates vary	Partial support to wage payments for firms that cannot afford to pay staff	Department of Labour UIF
IDC Distressed Firms intervention	R3 billion	Emergency finance for firms unable to meet operational costs or debt repayments	the dtic, IDC
IDC Essential Supplies intervention	R500 million	Trade and other finance to import essential medical products	the dtic IDC
IDC MECP intervention	R700 million	Short-term concessional finance for working capital and operational costs	the dtic IDC
Tourism Relief Fund	R200 million	Maximum R50 000 grant per entity towards operational costs. Open to accommodation, restaurants, conference venues and tour operators	Department of Tourism
Debt Relief Finance Scheme	R200 million	For formal small, medium and micro enterprises (SMMEs)	DSBD SEDA
Business Growth & Resilience facility	R300 million	For formal SMMEs able to supply essential goods or shortages resulting from the crisis	DSBD SEDA
Spaza Shop Grant funding	R100 million	Up to R15 000 per shop for purchasing essential goods from participating wholesalers for three months	DSBD SEFA
Job creation and protection	R100 billion	To be set aside for protection of jobs and to create jobs, initiative yet to be determined	Various
Agricultural Disaster Support for Smallholder and Communal farmers	R800 million	Maximum R50 000 grant/voucher towards sourcing of inputs for smallholders with turnover between R20 000 and R1 million per annum	DALRRD
Proactive Land Acquisition Strategy (PLAS) programme	R400 million	Further information not available	DALRRD

Note: Department of Social Development (DSD), South African Social Security Agency (SASSA), Department of Cooperative Governance and Traditional Affairs (CoGTA), National Treasury (NT), South African Reserve Bank (SARB), Unemployment Insurance Fund (UIF), Department of Trade and Industry and Competition (the dtic), Industrial Development Corporation (IDC), Department of Small Business Development (DSBD), Small Enterprise Finance Agency (SEFA), Department of Agriculture, Land Reform and Rural Development (DALRRD)

Second, priority has similarly been given to small business relief. With the exception of the Industrial Development Corporation (IDC) facilities, no major sets of financial support have been made available to larger firms. This appears to result from the (correct) identification of small businesses as particularly vulnerable to the impact of the crisis. However, as will be argued, it leaves a number of larger firms vulnerable. Most vulnerable are seasonal industries, large firms with pre-existing strain (notably in metals), and firms participating in global value chains that may see some rationalisation (notably automotives). These vulnerabilities risk undermining efforts to support small businesses, with the majority of smaller firms outside direct consumer activities (like restaurants or shops) being dependent on business from mega-firms that risk closure or reduced activities.

Third, specific characteristics in the implementation of support are notable. One is that policies appear to be developed at individual departmental levels, which leaves some gaps for firms that do not neatly fit the structure of the state. Agricultural exporters, for example, are generally too large for the programmes offered by the Department of Agriculture, Land Reform and Rural Development (DALRRD), and may have to compete against manufacturing firms for access to IDC funding.

Similarly, the use of private sector partnerships to implement key measures of support introduces some complexity – notably in the case of credit guarantees. The guarantee scheme is a positive step that maximises the impact of government’s limited resources. The scheme minimises bank exposure to issued loans by pooling profits from “good” loans issued under the scheme, and backing this with a state guarantee – providing significant risk coverage to incentivise lending to strained firms that would have otherwise been cut off from funding.

However, it remains to be seen how existing private sector processes can adjust to account for the initiative.

Most bank lending decisions, for example, are driven by long-established risk models, which are often inflexible. Policy guidance from the National Treasury instructs banks to “use their normal risk-evaluation and credit-application processes” in issuing loans.¹ Even if banks do adjust their risk assessments, it remains to be seen if costs associated with these loans – such as the need for matching risk-weighted capital adequacy requirements for liabilities on bank balance sheets – will remain a deterrent to assisting firms in distress. On the demand side, each business is limited to accepting a single COVID-19 loan, which may complicate access to funding in cases of multiple shocks happening over different waves of the crisis.

Finally, one of the most significant gaps in current coverage is support for exporter firms. Most exporters do not qualify for any government support to cover operational costs, except IDC distress funding. This is because exporters tend to be larger, and thus do not qualify for most small business support. The lack of support in this area is particularly of concern because shocks from global trade disruptions are likely to be very large, and sustained over a long period. Even larger, well-resourced firms may fail, particularly as they face direct competition from firms benefiting from much larger support packages in other parts of the world. While South Africa cannot and should not try to outspend that support, strategic assistance for exporters is likely to be required.

¹ National Treasury. 2020. COVID-19 Loan Scheme for SMEs. http://www.treasury.gov.za/comm_media/press/2020/20200424%20Loan%20guarantee%20National%20Treasury.pdf

Table 2. Risk channels for South African firms

RICK CHANNEL	DESCRIPTION
1. Commodity prices	Collapse in commodity prices
2. Essential goods	Disruptions in the supply of essential goods (ie. medical supplies, food)
3. Export value chain	Disruptions in the export value chain (ie. logistics, clearance, payment, marketing)
4. Financial shock	Financial crisis triggered by falling capital valuations and rising default risk
5. Foreign exchange	Increasing volatility in foreign exchange markets
6. Foreign travel	Contraction in spending from foreign visitors
7. Global demand	Contraction in demand in export markets
8. Intermediate inputs	Disruptions in the supply of intermediate inputs
9. Local demand	Contraction in demand in local consumer and industrial markets
10. Lockdown impact	Lost value from the direct impact of lockdown regulations, and other efforts to contain the spread of the virus
11. Regional crises	Spillovers from regional economic crises (eg. fiscal crisis in oil-exporting states, strained public services, social instability)
12. Remittances	Declining remittance flows resulting from slowdown in expatriate markets

RISK CHANNELS

The stimulus initiative can only be understood in the context of the various risks associated with COVID-19. While it is widely understood that the pandemic will trigger a global slowdown, the nature of the impact of that slowdown will differ for different sectors and countries.

The economic risks posed by COVID-19 differ substantially from those associated with recent economic crises or shocks. The initial impact of most crises in recent decades has struck through two channels: the financial system, and the price of commodities. Most recently, this was the case in the 2008 global financial crisis (the financial channel) and the subsequent crisis from the end of the commodity super cycle (the commodity channel). The impact on activity like trade or consumer spending was still serious, but came about because of the initial shock to these two core risks. With countries locked down and significant knock-on impacts expected in the real economy, the channels by which this crisis will play out will likely be more numerous, and harder to quantify or predict. Many of the industrial and retail firms that were hit by the after effects of previous shocks will now be directly affected by the first wave of this crisis, and their struggles will be more immediate and potentially more prolonged.

Comprehensively scoping the various channels of impact of the pandemic is difficult at present, because of the high levels of uncertainty that remain on how the crisis and its economic impact will play out. Nevertheless, at least 12 risk channels appear to be particularly pressing. These are listed in Table 2.

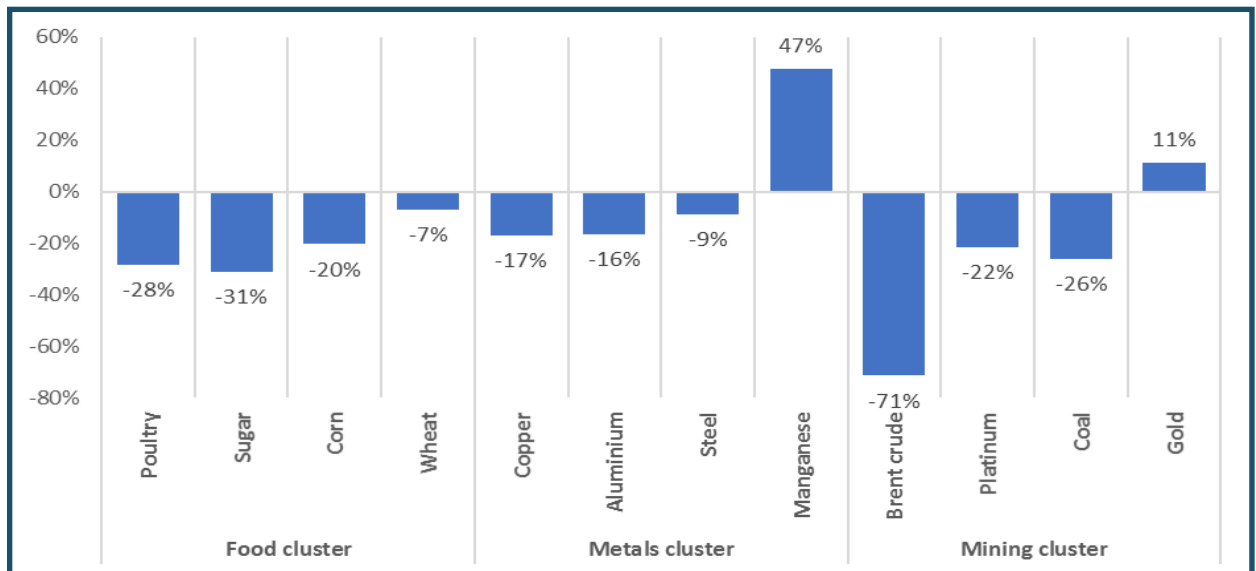
This list is not exhaustive. For example, risks associated with social unrest resulting from a lack of provision for the most vulnerable are not covered, because these risks are so all-encompassing that they cannot be meaningfully mapped. Similarly, some

second-order risks are not mapped. A fiscal crisis, for example, is clearly a risk, but the associated falling revenues and rising debt would result from those indicated in the impact channels list. The same could be said of risks such as firm cash-flow crises (caused by risk channels like the lockdown impact and falling demand), an inflationary or deflationary spiral (caused by surging prices for goods with disrupted supply chains, or collapsing demand), rising protectionism (caused by government interventions attempting to cover the risks identified above), or a second-wave financial shock (caused by failures among large, highly leveraged firms in vulnerable sectors like construction). In other cases, risks are not identified because of pure inability to track the various mechanisms of impact.

In the short term, the most pressing concerns – and the subject of a large portion of government support – is the closure of firms as a direct impact of the lockdown, and disruptions to supply chains for essential goods, in the face of surging global demand. While both clearly have a particularly intense initial impact, as medical capacity is scaled-up and complete lockdown is in place, both will also likely have a sustained impact, through the implementation of risk-based restrictions on activity and the sustained ebb-and-flow of the pandemic.

Other risks are already playing out. The spectacular collapse in petroleum demand is a useful leading indicator for the likely falls in other industrial commodities, some of which have already been placed under significant strain, as can be seen in Figure 1. As will be detailed in the Findings section, falls in metals are particularly worrying, given that global prices for certain industrial metals were already at multi-year lows prior to the crisis, and many steel producing firms saw emergency financial stockpiles eroded by the previous global steel supply glut.

Figure 1. Percentage change in commodity prices, 2 January-27 April 2020



Source: Trading Economics commodity prices

Export markets are likely to be a particularly severe point of vulnerability, particularly since all of South Africa's major trading partners (China, the United States, Germany, the United Kingdom) have been central points of the crisis. Regional trade may cushion some of this impact, but with the World Trade Organization (WTO) predicting that global trade volumes will decline by between 13% and 32% in 2020 and domestic demand similarly impacted, South African exporters will likely face rising competition from other markets unable to dispose of goods. These demand and competition factors may be aggravated by rising costs, as shocks to logistics networks result in reduced ability to share the cost of freight between exporters and importers; and border closures and restrictions result in rising unpredictability of value chains.

Two sets of financial costs – from a financial-crisis like shock and from currency fluctuations – are particularly hard to scope. South African banks are generally robustly capitalised and risk-adverse, but remain vulnerable to failures in other parts of the world. The extent of the risk to global banks is mixed, but potential sources of risks are banks that are heavily exposed to the construction industry (in places like Spain and the UAE), those exposed to commodity industries (such as in Russia or regional banks in the shale-belt in the US), or more widespread exposure to corporate debt in highly leveraged and vulnerable industries. Currency markets are perhaps the most difficult to predict, given the enormous disruptions in trade and financial flows, the spillover impacts from central bank stimulus measures, and the risks associated with fiscal crises in some markets.

The primary takeaway from this mapping is that the shocks associated with the crises will likely impact different actors, and will be different enough that one-size-fits-all support likely will not be appropriate. Support that props up domestic demand may not assist companies facing collapsing export demand and prices; while support that secures the ability of firms to purchase inputs may not work if shocks to the logistics value chain undermine their ability to access these inputs. Effective stimulus measures that help one sector of the economy may well be undermined if that sector's clients and suppliers do not receive matching support.

ECONOMIC STRUCTURE

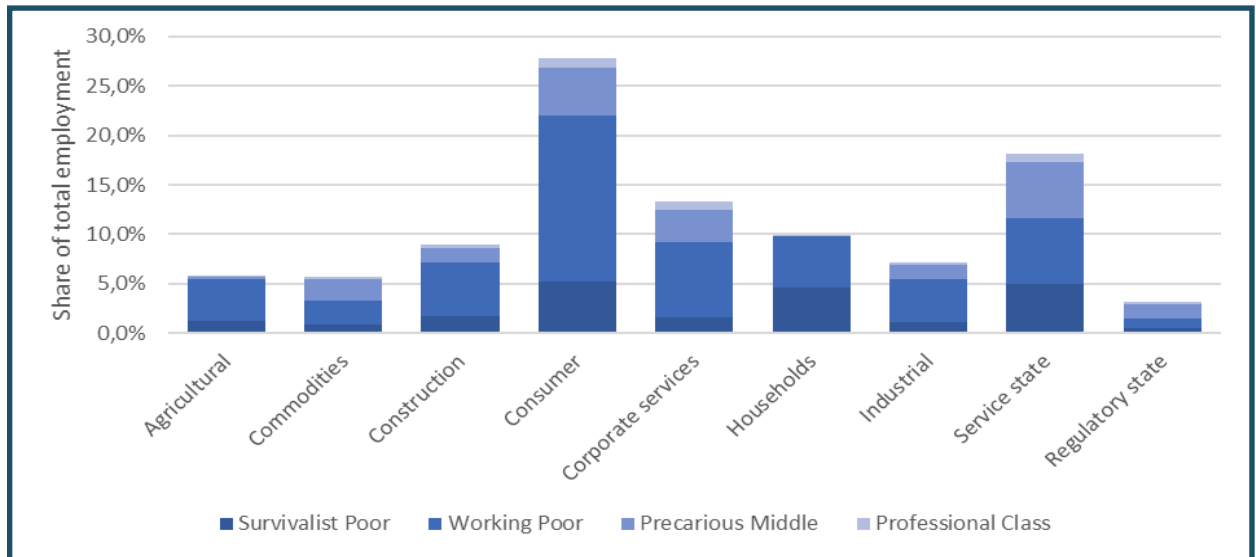
Accounting for the impact on these risks on different parts of the Southern African economy will be essential, both because the scale of impact will be different for different segments, and because different types of firms or individuals qualify for different sets of government support.

To map the impact of stimulus and risk channels on the South African economy, a simplified structure of the economy is constructed. Rather than clustering these various parts by traditional measures, like sector or size, a more illustrative breakdown is used. This typology is to allow for the clustering of firms with similar characteristics, and particularly the clustering of firms and households with similar or linked income channels. Clustering by income channels helps map the impact of the crisis, because it shows where different shocks will play out along different sources of income. The illustrative structure of the South African economy is shown in Table 3.

Table 3. Illustrative structure of the South African economy

CATEGORY	EXAMPLES
1. Large industrial: Large manufacturers, serving the domestic and export market	Automotives, agro-processing
2. SME industrial: SME manufacturers, primarily serving the domestic market	Auto components, consumer goods
3. Large consumer: Large firms directly servicing the consumer market	Retail, telecoms, entertainment
4. SME consumer: Small and medium firms directly servicing the consumer market	Restaurants, specialty retail
5. Informal consumer: Informal firms directly servicing the consumer market	Spaza shops, shebeens
6. Agricultural: Farms, fisheries and similar producers of primary food produce	Fresh fruit, poultry
7. Commodities: Mining companies and basic processing of mined commodities	Platinum, gold, iron ore, steel
8. Corporate services: Finance, and professional services for corporate clients	Banks, insurance companies
9. Construction: Primary construction and supporting engineering services	Construction, engineering
10. Professional class: Workers performing specialist tasks, often requiring advanced education. Well paid and employment secure.	Doctors, lawyers, bankers
11. Precarious middle: Workers performing general tasks, requiring specialist training or substantial experience. Decently paid but with mixed employment security.	Administrators, IT support staff, teachers, nurses
12. Working poor: Workers performing tasks not requiring specialist training or experience. Generally poorly paid and employment insecure.	Retail employees, security guards
13. Survivalist poor: The unemployed, workers in the informal economy, part-time workers, and the working poor with large dependency ratios.	Informal traders, survivalist farmers
14. Service state: Customer-facing state entities, particularly those providing services to consumers and industry	Eskom, Transnet, South African Police Service, local government
15. Governance state: State entities primarily defining regulations or overseeing the service state, even when they provide some customer-facing services	the dtic, National Treasury, National Energy Regulator of South Africa

Figure 2. Share of employment by CERAM economic segment



Source: Author processing of Stats SA, Labour Market Dynamics, 2017

As a rough guideline on the importance of the various economic segments, a breakdown of employment by segment is contained in Figure 2. For this image, breakdowns by size of firm (for industrial and consumer firms) and household earnings are excluded, but are included in calculations used to analyse these various groups.

To understand the progression of risks through the economy, a rough scoping of the interdependencies between these various economic clusters is undertaken, and operates in the backend of the COVID-19 Economic Risk Accounting Matrix or CERAM. This Economic Dependencies Matrix (EDM) is explained in further detail in Appendix 2.

FINDINGS

These three factors – the government stimulus measures, risk channels, and the structure of the economy – must all align in order for economic support to be effective. Stimulus measures that miss certain risks, or that don't help the right segment of the economy impacted by a risk, will not be successful. In order to evaluate the adequacy of the various support measures, these three key factors are mapped in a simple visual representation, dubbed the COVID-19 Economic Risk Accounting Matrix, or CERAM.

The initial mapping can be found in the summary figure IN Appemdox 1. The horizontal plane lists potential risk channels. The vertical plane lists segments of the South African economy impacted by the corresponding risk channel. The size of the bubble estimates the scope of the risk, based on a 10-point scale where 1 is lowest risk and 10 is highest risk. The number in the bubble provides an estimate of available government support for the corresponding risk channel and impacted party, in ZAR billions. The colour of the bubble provides an at-a-glance illustration of high-risk areas. Further information on

all these factors can be found in Appendix 2.

The results of this initial CERAM roughly align with analysis provided above. For example, risks are high for small firms, but these categories of firms also have access to the most substantial government support. However, four key areas have notably high risks without adequate government support, namely: exports by mid-sized manufacturers and agri-firms, commodities impacted by price swings, the informal consumer sector, and the construction industry.

Exports are a risk both because of the very large disruptions expected in export markets and the operation of supply chains, but also because of the scale of firms that tend to export. Globally, exporter firms tend to be larger than those that operate in the domestic economy, and the firms that make up the bulk of South African exports will likely exceed the R300 million turnover threshold that qualifies them for loan guarantee support. For firms that exceed this threshold, available funding is in the range R4.2 billion from IDC and DALRRD facilities. By comparison, the -4% growth estimated by the WTO in 2020 would be equivalent to R52 billion, and this does not account for challenges such as currency fluctuations or rising freight costs.

Perhaps the core challenge with designing support for mid-sized exporters is the heterogeneity of the group, in which some will have considerable financial reserves and be cushioned by the rapid declines in the Rand, while others are emergent exporters that may retreat from exports to focus on the domestic market, and still others may be too vulnerable to absorb a large global shock. The underlying problem is the need to set upfront restrictions on qualifying criteria for available funding, based on factors like turnover or sector. While such restrictions are necessary to properly target government support, they will always be an imperfect approach in cases where flexible, case-by-case judgement is needed.

Perhaps the most serious risk is the one a selection of vulnerable commodities exporters are facing. Sectors such as platinum, steel, and ferrochrome have faced multiple years of strain following the end of the commodities super cycle in the aftermath of the global financial crisis, as can be seen in Figure 3. The strain from this slowdown, and the impact of rising energy costs in South Africa, have already resulted in significant reductions in production by Arcelor Mittal, and ongoing concerns among larger ferroalloy producers such as Glencore-Merafe and Samancor. While these firms are large multinationals with significant financial resources, the concern is that this pre-existing strain may result in South Africa being on the losing end of global consolidation in the metals industry.

Closures in metals pose some of the most significant spillover impacts, because of the government's exposure to metals via Eskom. Eskom remains reliant on large metals smelters for a significant portion of their baseload demand, and given the utility's extremely precarious financial position, a shock from the closure of only a handful of large smelters could trigger a further crisis. This crisis could well trigger contingent liabilities at the National Treasury, or risk the need to put together a costly bailout at exactly the moment that government needs to direct its resources towards pressing economic support measures.

Finally, two vulnerable sectors lack coverage in the current basket of financing: the informal consumer sector (such as spaza shops) and the construction sector. Both face high risks, albeit for very different reasons. The informal sector is extremely vulnerable to shocks, with few financial reserves or access to formal financial services. Both the informal retail sector and the wholesalers that supply them operate on thin margins, and a shock to food supply or through consumer demand could pose an existential

threat to their operations. For construction, while the sector has considerable access to finance, the crisis has hit during a period of declining construction activity which is now likely to collapse in the medium term, as companies redirect resources towards managing the crisis. Mooted infrastructure spending initiatives may help offset these risks, but this remains to be seen.

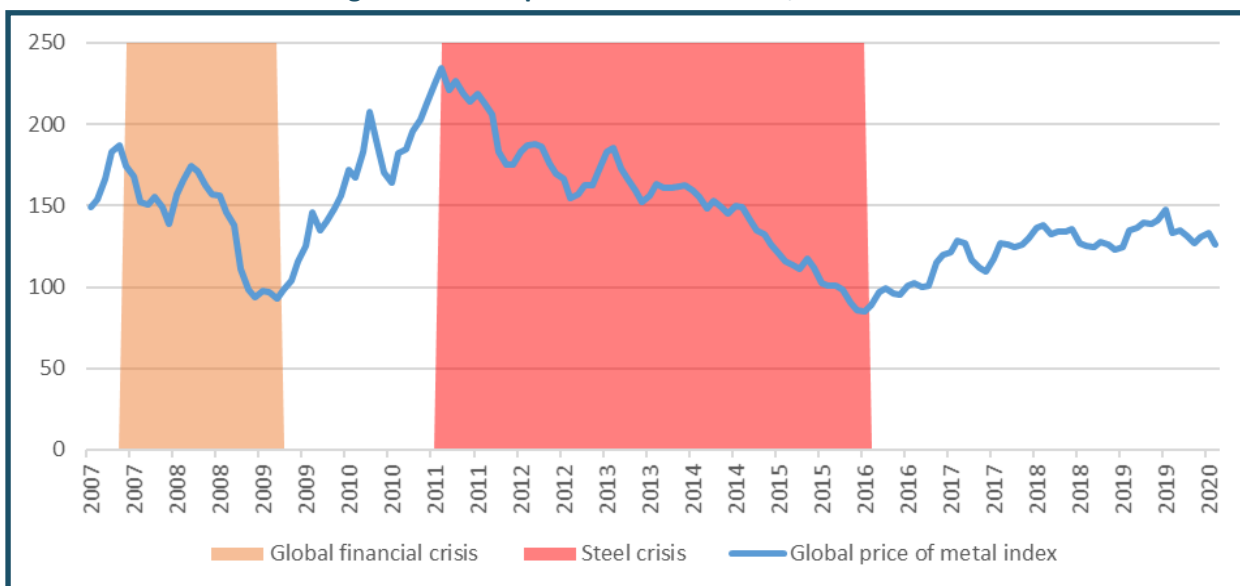
Given the fluid and rapidly developing nature of the COVID-19 crisis, policymakers will have to commit to constantly reviewing and updating stimulus measures. While a very large package of upfront support may seem appealing, it may leave policymakers without the flexibility to respond to new emerging challenges or to adapt support as the crisis develops.

While recommendations for each specific risk is beyond the scope of this paper, two recommendations are made.

First, ongoing monitoring of emerging economic conditions is essential. A constant flow of communication will be needed between government, households and the private sector; to understand the evolving needs of these various parties. Formalising this communication, in the form of a single channel to report on the impact of the crisis, may offer the best means to manage this conversation.

Second, in the special emergency budget that will define the governments stimulus package, a significant portion of funding needs to remain unassigned to specific initiatives. Funding from this special set-aside should be accessible on a bid-like basis, in which departments and agencies submit proposals for specific initiatives to manage emerging risks. Failure to prepare now for the risks that we cannot immediately identify will result in the need for another costly round of stimulus fundraising, at exactly the moment the state is least equipped to handle it.

Figure 3. Global price trends in metals, 2007-2020



Source: FRED processing of IMF global metals price index

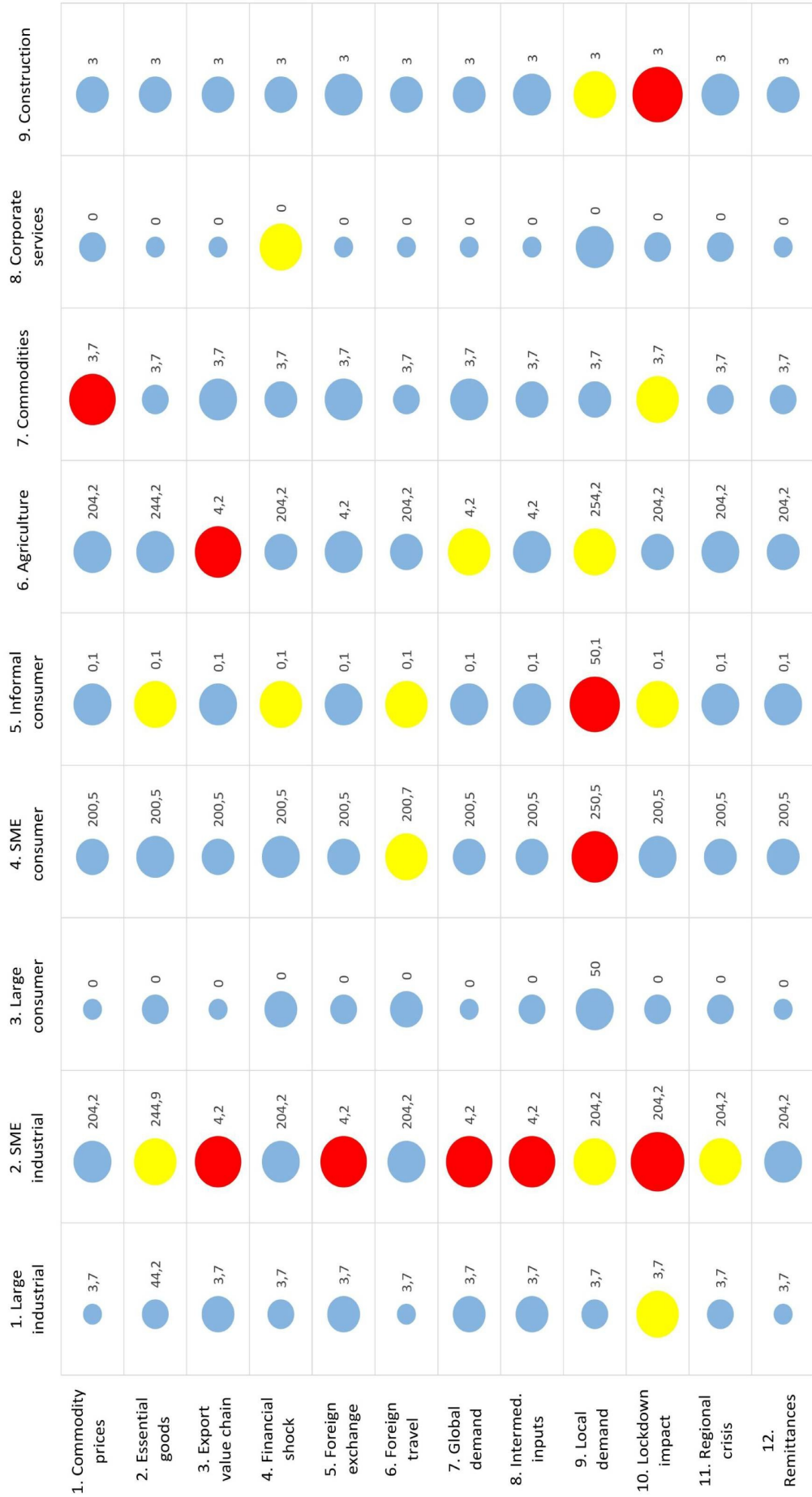
APPENDIX 1: CERAM SUMMARY IMAGE

COVID-19 Economic Risk Assessment Matrix (CERAM)

Version 1, updated 27 April 2020

HOW TO READ THE MATRIX

- The horizontal plane lists potential risk channels.
- The vertical plane lists segments of the economy impacted by the corresponding risk channel.
- The size of the bubble estimates the scope of the risk, where larger bubbles mean higher risk.
- The number in the bubble provides an estimate of available government support for the corresponding risk channel and economic segment, in ZAR billions.
- Red indicates a high risk area, yellow indicates an emerging risk area.



Source: Wood, C. 2020. "Mapping the coverage of stimulus measures in response to COVID-19: What risks remain?"

APPENDIX 2: TECHNICAL NOTES ON CONSTRUCTING THE CERAM

The COVID-19 Economic Risk Assessment Matrix is a simple tool meant to assist policymakers and other interested parties in assessing (1) the scale of risks posed by the COVID-19 crisis and (2) the adequacy of government stimulus measures meant to address those risks.

While the CERAM is data- and research-based, it should not be considered a formal analytical tool of the likes of an economic model, mainly because a significant element of user judgement is required in constructing the matrix. This is a necessary concession to allow for completeness of the matrix, and because of the need to assure usability – in both being understandable and being a matrix that can be updated as economic debates around the crisis progress. The CERAM is, in particular, designed to be used by those with economic knowledge, but without formal technical modelling skills.

The core insight of the CERAM is provided by the score given to specific risks for specific economic segments, which is represented as the size of the bubble in the matrix. The risk score ranges between 0 (no risk) and 10 (severe risk), and is derived from four elements: first-order risk, second-order risk, vulnerability, and tilt – as can be seen in Table 4. This technical note provides further information on how each element is constructed.

Table 4. Elements in the composition of the CERAM risk score

ELEMENT	RANGE
Exposure: The extent to which the identified economic segment is directly exposed to the identified risk.	0 - 3
Second-order exposure: The extent to which the identified economic segment is exposed to the identified risk via linkages to other parts of the domestic economy.	0 - 3
Vulnerability: The capacity of the identified economic segment to absorb shocks.	0 - 3
Tilt: A user-based assessment of the overall validity of the score.	0 - 1

Exposure

Exposure is measured on a scale from 0 to 3, in which 0 indicates no direct exposure to the identified risk, and 3 represents very significant exposure to the identified risk. Scores are not assigned based on a set numerical threshold, but are rather evaluated relative to an appropriate evaluation measure. For this reason, an element of judgement remains, albeit one backed by the available evidence. The evaluation measure used changes for each risk, with each measure detailed in Table 5.

Table 5. Evaluation methods used to identify exposure risk

RISK CHANNEL	EXPOSURE MEASURE
1. Commodity prices	Measured by the change in select commodity prices between 2 January 2020 and 27 April 2020, and their applicability to the economic segment in question.
2. Essential goods	Relevant to suppliers and purchasers of essential goods, limited in this definition to medical supplies and food
3. Export value chain	Measured by the share of income from exports for the selected economic segment, and/or the reliance on imports for the sourcing of key inputs
4. Financial shock	Applicable to firms in the financial services space or with large exposure to financial markets
5. Foreign exchange	Measured by the share of income from exports for the selected economic segment, and/or the reliance on imports for the sourcing of key inputs. Does not account for financial shocks resulting from forex shocks (this is captured in risk channel 4)
6. Foreign travel	Measured by the extent to which firms are recipients of income from inbound foreign travel. Does not account for sourcing of skills or partnerships from abroad.
7. Global demand	Measured by the share of income from exports for the selected economic segment
8. Intermediate inputs	Measured by reliance on imports for the sourcing of key inputs
9. Local demand	Measured by the share of income from direct consumer spending by households
10. Lockdown impact	Measured by the extent to which firms can operate during lockdown and the higher stages of the risk-based strategy
11. Regional crises	Measured by the extent of exposure by firms to regional operations in Southern Africa
12. Remittances	Measured by the share of income derived from foreign remittances

Second-order exposure

Second-order exposure is measured on a scale from 0 to 3, in which 0 indicates no indirect exposure to the identified risk, and 3 represents significant indirect exposure to the identified risk. Second-order exposure is calculated based on linkages between economic segments, derived from the share of income each segment derives from another. This is calculated through an Economic Dependencies Matrix (EDM) (see Table 8 page 10).

The EDM is roughly analogous to a social accounting matrix or input-output table, in that it maps the flow of income from one segment of the economy to another. Unlike a traditional social accounting matrix, the EDM should not be considered quite so complex or robust, and should not be used to, for example, develop economic models. Instead, it should be considered a data-based illustration of the interdependencies of the economy. Its role is not to produce rigorous economic outcomes, but to add rigour to the less rigid processes of abstract logic that by necessity drive policymaker's thought processes in the quick decision timelines of a crisis; and to identify clear interdependencies through which risks can travel.

Linkages between sectors in the EDM are derived from the South African Social Accounting Matrix (2015), while linkages between households and sectors are derived from StatsSA's Labour Market Dynamics (2017) and Living Conditions Survey (2014-2015). Export exposure is derived from the SAM and cross-checked against evidence from trade data and StatsSA's sales and production surveys for manufacturing and mining. Estimates are included for the state, but removed in the version on display because of challenges with data accuracy.

Vulnerability

Vulnerability refers to the capacity of firms to absorb shocks. This capacity differs substantially within the various economic segments defined in the CERAM, and between individual firms within other economic categories, such as sector and firm size. Vulnerability is measured on a scale from 0 to 3, in which 0 indicates a high capacity of firms to absorb or manage shocks, and 3 represents very weak capacity to do so, and a high likelihood of closure in the face of a large economic shock.

Vulnerability is the area with the weakest availability of data. While some proxies are available, such as the number of liquidations in a given segment, these are imperfect measures for a crisis situation. Instead, a scorecard methodology is used. This assigns vulnerability points based on more abstract facts about the segment in question, as described in Table 6.

Table 6. Scorecard method for assessing the vulnerability of economic segments

FACTOR	DESCRIPTION	SCORE
1. Negative trends	Experiencing notable contraction or losses	1
2. Positive trends	Experiencing notable growth or profitability	-1
3. Cash-flow vulnerable	Limited liquidity, cash-flow dependent	1
4. Cash-flow resilient	Substantial cash deposits or financing	-1
5. Informal	Largely informal	1
6. Sector crisis	Recent crisis impacting sector or anchor firms	1
7. Global crisis	Negative experience in past crises	1
8. Multinational	Backing from large multinational group	-1
9. Competitiveness	Unique competitive advantages	-1
10. Subsidies	Substantial government support	-1

For households, the risk score is applied in a linear fashion to the four groups, with a vulnerability of 0 for households in the professional class, and a risk score of 4 for those in the survivalist poor. The state is given a standard score of 1, but this would need to be reassessed if ongoing fiscal concerns deepen. Draft vulnerability scores can be found in Table 9 (see page 10).

Tilt

Tilt refers to risks that are not adequately covered in other factors, and result in a total risk score that is judged to be too low. It is therefore purely a judgement call, albeit one that should be based on available knowledge of the economy. Tilt is measured on a scale from 0 to 1, in which 0 indicates no apparent challenge with the final risk score, and 1 indicates a score that appears to underestimate the associated risks. Only two tilt scores are used in the initial build of the CERAM, as described in Table 7.

Table 7. Tilt scores applied in the construction of the CERAM

RISK	SEGMENT	RATIONALE
Export value chain	Agriculture	Perishable goods are particularly vulnerable to disruptions, meaning higher risks for the same degree of exposure to export markets.
Commodity prices	Commodities	Exposure of Eskom to commodities disruptions raises overall risks

Table 8. Draft Economic Dependencies Matrix, showing source of income for categories on the horizontal plane

	Agricultural	Commodities	Construction	Consumer	Corporate services	Governance state	Industrial	Service state	Survivalist	Working poor	Precarious middle	Professional class	Export
Agricultural	3%	0%	0%	1%	0%	0%	28%	2%	9%	14%	15%	17%	11%
Commodities	2%	22%	7%	6%	2%	1%	10%	5%	0%	1%	2%	4%	38%
Construction	0%	8%	17%	14%	15%	2%	3%	3%	1%	2%	6%	19%	9%
Consumer services	0%	1%	1%	15%	12%	7%	4%	4%	3%	9%	14%	19%	10%
Corporate services	1%	3%	3%	17%	24%	4%	5%	8%	1%	2%	6%	22%	3%
Industrial	2%	7%	4%	11%	3%	3%	20%	5%	2%	5%	8%	13%	16%
Survivalist poor	8%	3%	8%	26%	8%	2%	6%	17%	0%	1%	4%	16%	0%
Working poor	6%	6%	11%	32%	16%	2%	9%	12%	0%	0%	1%	3%	0%
Precarious middle	2%	9%	6%	23%	16%	7%	6%	30%	0%	0%	0%	0%	0%
Professional class	2%	7%	8%	26%	21%	7%	8%	20%	0%	0%	0%	1%	0%

Sources: Labour Market Dynamics (2017), General Household Survey (2018), Living Conditions Survey (2014-15), South African Social Accounting Matrix (2015)

Notes: Does not include transfer payments, including social grants, remittances and company incentives – although these are accounted for in the updated version used for findings above. Work of community organisations and NGOs captured under service state. Firm classification by size and formality not included in this version of the EDM

Table 9. Vulnerability scorecard, as of 27 April 2020

Segment	Composite score	Positives					Negative				
		Positive trends	Cash-flow resilient	Multinational	Competitiveness	Subsidies	Negative trends	Cash-flow vulnerable	Informal	Sector crisis	Global crisis
1. Large industrial	-1	0	-1	-1	0	-1	1	0	0	0	1
2. SME industrial	3	0	0	0	0	0	1	1	0	0	1
3. Large consumer	-3	-1	-1	-1	0	0	0	0	0	0	0
4. SME consumer	2	0	0	0	0	0	0	1	0	0	1
5. Informal consumer	3	0	0	0	0	0	0	1	1	0	1
6. Agricultural	2	0	0	0	0	0	0	1	0	1	0
7. Commodities	1	0	0	-1	-1	0	1	0	0	1	1
8. Corporate services	-3	-1	-1	-1	0	0	0	0	0	0	0
9. Construction	2	0	0	-1	0	0	1	0	0	1	1

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