A Critical View of the South African Construction Sector post-COVID-19 Lockdown: An Opinion Paper on Recovery

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ABSTRACT

The COVID-19 pandemic had numerous detrimental impacts on the construction sector, including but not limited to job losses to construction employees, revenue losses to stakeholders in the industry, as well as supply chain disruptions. Several construction firms had to shut down operations owing to the impact of the financial losses incurred during the lockdown, while the few that are still in operation have had to review their modus operandi to comply with COVID-19 regulations. While the pandemic has negatively impacted the industry, the effect has also necessitated the need for innovations across the construction sector. This opinion paper presents a critical analysis of the pandemic and also analyses the several disruptive technologies that emerged as one of the strategies to retain productivity within the sector while also serving the mitigation purpose of curbing the spread of the virus. Other gains of the pandemic include increased government infrastructural investment, private sector participation, government transparency, and effective policy implementation, which have been established to be key drivers of swift and systemic economic recovery post-COVID-19 and are integral in creating jobs in the construction industry. Lessons from the pandemic can also be harnessed for more efficient project delivery and expenditure planning through cautious incorporation into ongoing and future infrastructural projects.

INTRODUCTION

The COVID-19 pandemic and the subsequent global reactions in the form of lockdowns and movement restrictions have halted the global economy enormously. While the impact was felt worldwide, the intensity of the effect has been regionally specific and varied, with advanced and developing economies recording varying levels of contraction. The construction sector, one of the major players in the global economy, has not been immune to the pandemic's impact, and several construction projects and firms were shut down globally (Adekunle et al., 2023). Mitigative measures in response to the pandemic in the form of social distancing, movement restrictions and regional/country-wide lockdowns have resulted in significant delays and supply chain disruptions leading to devastating economic recession. This has necessitated job cuts, uncertainty in the business environment and significant unrest across several regions globally.

These impacts are felt the world over, though developing countries were observed to have been more severely impacted. To understand the impacts and create a way for the industry to bounce back from the adverse effects., it is necessary to study the developing countries critically and the construction industry's future. Consequently, this paper aims to document the impact of the COVID-19 pandemic on the construction sector organisational processes and supply chains while also investigating the response of firms to the necessitated changes. In addition, the study thoroughly appraised how the pandemic-induced lockdown has shaped the post-lockdown architecture of the industry using the South African construction industry as the case study. The next section provides a balanced and critical review of the South African construction industry. This provides the background to better understand the South African construction industry and provides a basis for this practical opinion paper.

AN OVERVIEW OF THE SOUTH AFRICAN CONSTRUCTION INDUSTRY AND CORONAVIRUS PANDEMIC

The construction sector in South Africa is a significant driver of socio-economic development and an employer of labour, as it is in most other parts of the world. The significance of the sector cannot be over-emphasised as it adds significant value to the end user of construction infrastructure as well as the active players in the sector, such as investors/financiers, clients, workers, regulatory agencies, and suppliers (Rossouw & Naidoo, 2016).

Frequent recessions and negative growth have been recorded within the sector before the pandemic. In 2019, R106 billion of total value added was recorded, a drop in value from the figure of R110 billion reported in 2016 (Stats SA, 2019). External factors such as corruption, legislation, scarcity of resources and rapid evolvement in technology were highlighted by Smallwood and Wentzel (2016) as impacting the construction enterprises, especially SMEs. Windapo and Catell (2013) cited insufficient capital, volatility in material prices, and fluctuating exchange rates as some of the major issues limiting construction firms within the South African construction sector. These challenges have been exacerbated by COVID-19, resulting in a stagnated national economy with low infrastructural spending, leading to massive job losses across the construction sector, which outweigh losses in any other sector within South Africa.

The construction sector suffered the greatest contraction within the South African economy (Stats SA, 2022). This was majorly due to lockdown restrictions that resulted in site shutdowns and consequent project failures. Wood (2022), however, forecasts a rebound of the construction sector between 2023 and 2025 due to the action plan of the South African government on massive infrastructural investment. Promising signs of recovery are already being recorded in the sector, as a 37 per cent increase in completed building projects was reported by Stats SA (2022) in March 2022, and a 17 per cent increase in sectorial value contribution between 2020 and 2021.

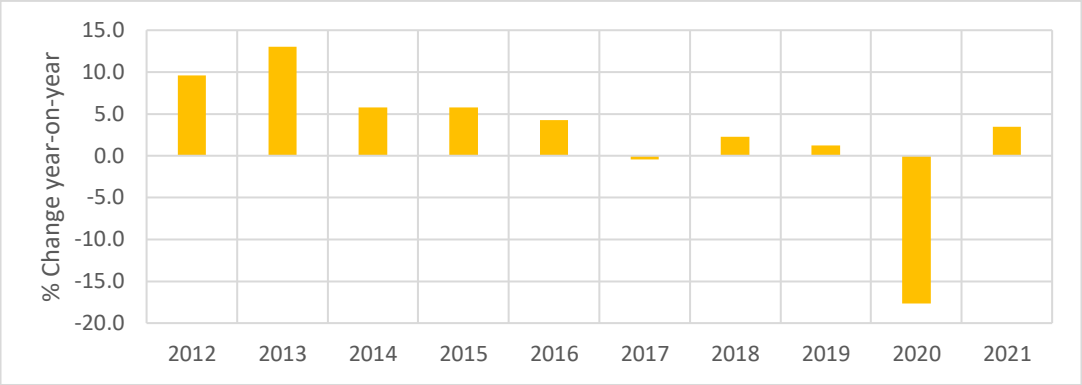

Figure 13: Construction sector value added and GDP for South Africa Stats SA (2022)

According to the CIDB (2020), huge job losses, bankruptcy of construction firms, and labour disruptions are some of the major issues that must be dealt with in the South African construction industry post-COVID-19. The survey by the CIDB investigated both the short- and long-term impacts of COVID-19 within the South African construction industry. The results of the findings are presented in Tables 2 and 3. If the industry is to recover swiftly and adequately from the losses impacted by the pandemic, strategic plans geared towards addressing the short and long-term impacts must be put in place and implemented adequately with the roles and responsibilities of industry players properly spelt out.

Table 1: Short-term impacts

	Grades 2 to 4	Grades 5 and 6	Grades 7 and 8	Grade 9	Overall
Short-Term Impacts	Ranking	Ranking	Ranking	Ranking	Ranking
Job losses for construction workers	1	1	1	2	1
Loss of income/revenue for organisations	2	2	4	5	2
Retrenchment of construction workers by firms	3	3	1	1	3
Non-payment of preliminaries and general during the lockdown	4	6	3	4	4
Significant increase in the cost of materials	4	7	6	9	5
Lack of payment for certified work	6	4	5	2	6

(CIDB, 2020))

Table 2: Long-term impacts

Long-Term Impacts	Grades 2 to 4 Ranking	Grades 5 and 6 Ranking	Grades 7 and 8 Ranking	Grade 9 Ranking	Overall Ranking
Massive job losses for construction workers	1	1	6	2	1
Bankruptcy of construction firms	2	2	2	1	2
Business interruption	3	4	3	5	3
Labour disruptions	4	5	4	7	4
Interruptions in the delivery of critical infrastructure projects	5	3	4	10	5
Suspension of projects/potential site closure	6	6	7	2	6
Increase in the number of claims related to contractual scheduling along with scheduling along with mediations, arbitrations, and litigation over construction delays	9	6	1	8	7

(CIDB, 2020)

MICRO, MESO AND MACRO LEVEL IMPACTS OF THE CORONAVIRUS ON THE SOUTH AFRICAN CONSTRUCTION INDUSTRY

Job Impact on the Construction Industry

Over the years, the construction industry has been characterised by a relatively high employment share to its gross domestic product (GDP) contribution. Since the sector utilises inputs from other sectors of the economy, it indirectly has a job creation impact in sectors beyond its confines. The COVID-19 pandemic has, however, heavily impacted the construction sector in terms of job losses. In fact, the most notable impact of the pandemic has been devastating job losses to all categories of workers within the sector as well as large-scale retrenchment. Before the pandemic, job cuts were fairly prevalent in the South African construction industry, as stated by Stats SA (2022) (Figure 2).

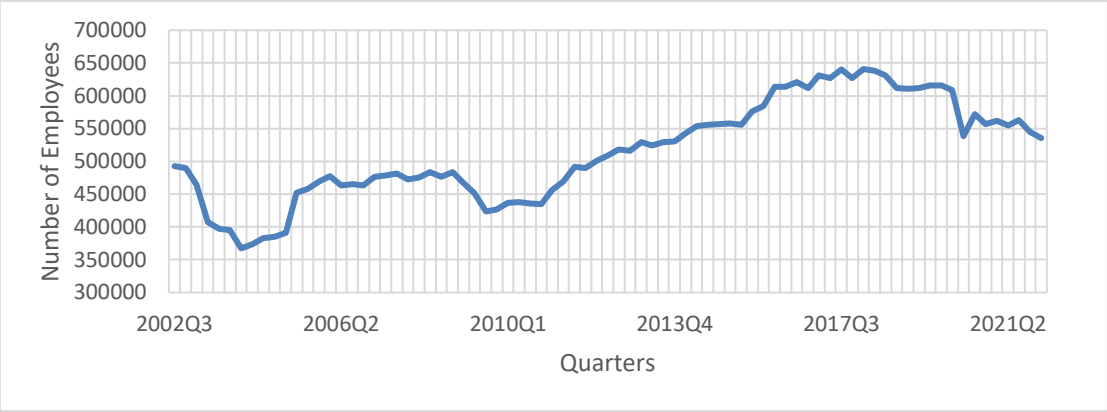

Figure 2: Number of employees in the construction sector in South Africa (Stats SA, 2022)

It can be seen that since the third quarter of 2017, a downward trend in the number of employees is evident, as depicted in Figure 2, with a steep plummet in the year 2020 when the pandemic struck. According to the CCMA 2018/2019 report, the construction sector had the highest retrenchment occurrence and organisation liquidation viz-a-viz other sectors of the economy owing to the financial constraints imposed on many construction firms due to the pandemic (CCMA, 2019). Owing to these job losses, the construction sector is liable to experience a major skill shortage in the coming decade due to the volatile nature of job retention, which was further exposed by the pandemic. A chunk of the workforce in the sector are highly skilled workers. There is a high possibility of losing them to other regions of the world if they remain unemployed for too long, while the younger generation is becoming somewhat sceptical about studying construction-related courses owing to the high volatility and lack of job security in the sector. Another important consideration worthy of attention is the issue of skills transfer from the veterans and highly skilled older generation to the younger ones. For the construction sector to readily have the required skills needed in the near future without importing those skills from neighbouring countries, adequate measures must be implemented to enhance a systemic transfer of skill and knowledge within the South African construction industry (Mashego, 2021).

Expenditure on Construction Projects

A steady decline in the expenditure on infrastructural projects has also been noticed since 2016, with the pandemic inducing a steep plummet in the first two quarters of 2020. Although the investment in public infrastructure has been steadily lower than the targets set by the National Development Plan (NDP), which stipulates a value of 10 per cent GDP from 2010, the advent of COVID-19 dropped investment levels to 7.1 per cent in the 4th quarter of 2020 (Industry Insight, 2021).

National Treasury (2021), however, posits that contractions in the construction sector are attributable to restrictions due to COVID-19, which has resulted in extensive project delays and a downgrade in credit ratings. This has caused a significant reduction in capital expenditure programmes. Significant declines in completion were recorded in all sub-segments of the building construction industry, with flats and townhouses being the most impacted, alongside luxury and low-cost housing.

Contrastingly, the wholesale market of construction building materials experienced an upward trend of activities by 14 per cent in the second quarter of 2020. This has been attributed to the boom in the renovations sector and the Do-It-Yourself (DIY) market, which has been positively impacted by the pandemic and the desire for various degrees of home renovation and refurbishments and the availability of lower interest rates to fund such improvements. The non-residential construction sector also suffered from the impact of the pandemic, as was evident in the all-time low demand for office spaces and shopping centres. The pandemic engendered the wide acceptance of remote working, and the demand for office spaces might likely be compromised for a very long time (Alsharef et al., 2021).

The civil construction industry has also been reported to be underperforming, with an 18 per cent reduction in investment recorded (Stats SA, 2021). The poor performance of the civil engineering sector since 2016 has been majorly anchored to the underperformance of the South African economy as a whole, resulting in declined infrastructural spending and poorly performing state-owned entities, which have, over the years, been responsible for the most significant investments in the sector. Generally, confidence and profitability levels in the sector are still extremely frail, which was evident in most civil contractors recording an extremely low level of patronage (SAFCEC, 2021). Although a subsequent increase in the expenditure on construction has since been recorded towards the end of the third quarter of the year 2020, it will still take a conscious effort by the government (being the major driver of infrastructural projects) as well as other industry stakeholders to come up with ways of necessitating increased investor confidence in the construction sector as well as justifying the investments in the form of commensurate value for every penny spent if the expenditure ratings are to reach the highs of the year 2017 or even beyond.

Delay on Commencement of Prospective Projects

The COVID-19-imposed delays experienced by the construction industry have not just been limited to the execution of ongoing projects but also extended to the award of already-priced tenders. The CIDB (2020), for instance, reported the labour and financial impacts resulting from the pandemic and how the entire construction supply chain interruption has affected the timely delivery of projects. Owing to the costly nature of the tendering process, contractors are forced to retain resources for promised pipeline projects. These idle resources could have been invested elsewhere, and the cost of retaining these resources is quite significant to the contractors' cost of doing business. A 6 per cent increment was recorded in construction project postponement in the 2nd quarter of 2020 and was majorly attributed to improper planning and liquidity concerns due to the pandemic (Industry Insight, 2020). A glance at Figure 3 shows that the number of completed building projects was at its all-time lowest in the pandemic-induced year 2020. While the number of completed buildings has been gradually decreasing since 2007, with some slight comparative increase in 2012 and 2017, the percentage decrease in the subsequent year was highest during the pandemic-ravaged year of 2020.

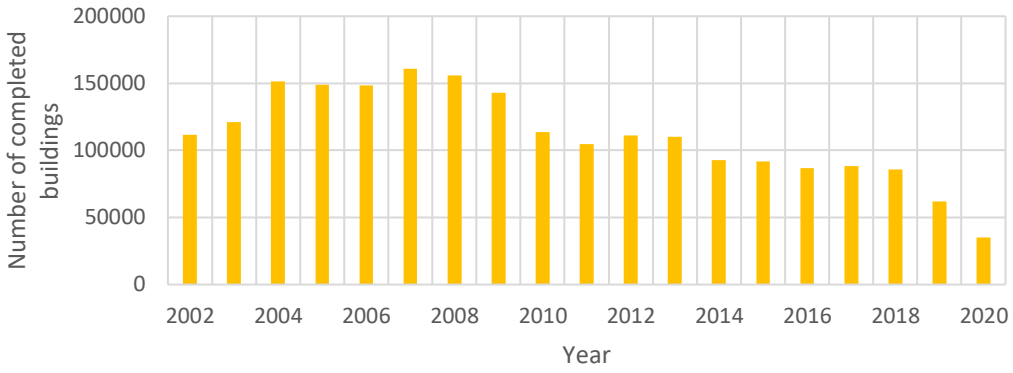

Figure 3: Buildings completed (Stats SA, 2021)

Health Infrastructure

While the pandemic brought the health sector to its knees and exposed lacunas in both the quality and capacity of the global health infrastructure, it served the purpose of awakening almost all governments globally to the need for massive investment in health infrastructure. In South Africa, for instance, the 2020/2021 health budget increased substantially owing to intended spending on issues relating to the COVID-19 pandemic through the allocation of approximately R20 billion to the health sector to aid the expansion of various medical facilities as well as the acquisition of equipment needed for swift response required for keeping the virus under control. An additional amount of R8 billion was also allocated to health departments at the provincial level (National Treasury, 2021).

Supply Chain Management and Financial Standing of Contractors

The construction industry is heavily reliant on the steady availability of various materials. Lockdown restrictions have hugely disrupted the construction supply chain, not just within South Africa but globally as well. The ecosystem of materials movement from within local and global sources has been seriously hampered and several projects have been delayed owing to this issue. The trend is expected to continue way beyond COVID-19 restrictions as it will take time to meet up with some of the existing backlogs of supplies. Manufacturing facilities have also been negatively impacted by the pandemic in terms of their workforce and facility management challenges (Chivilo et al., 2020). Even if production were increased in the various factories and industries supplying these materials, logistic demand would still create a bottleneck in trying to deliver the resources to the desired locations.

The pandemic has also impaired the liquidity challenges of various construction firms and has accelerated job losses in the process. Figure 6 shows how gross earnings in the sector experienced a downturn in 2020 as a result of lockdown restrictions. These losses were not limited to construction firms but extended to various material

suppliers, resulting in the temporary shutdown of some and the complete exit of others from the industry, thereby disrupting the supply chain.

One of the foremost concerns of construction firms across all categories is the issue of bankruptcy. It ranks high (among the top three) of the issues troubling construction firms and often stems from the temporary suspension of projects or site closures that result in job cuts for site workers or sometimes in pay cuts when the firm tries to retain the workforce. These project suspensions often result in the contractor laying claims, which often result in mediations and arbitrations and even occasionally stretching to litigative actions, which impose huge financial strains on construction firms.

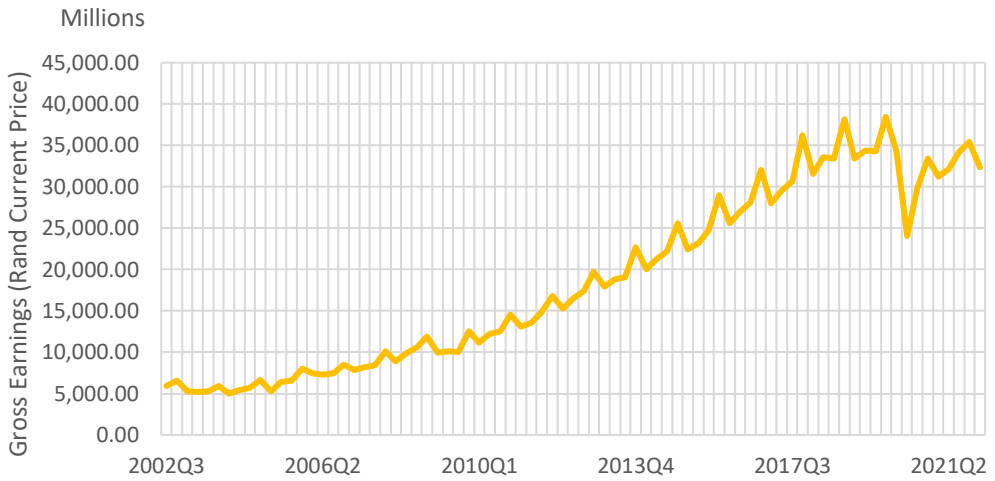

Figure 4: South African gross earnings in the construction sector (Stats SA, 2022)

Construction Site Invasion by Syndicates

According to Master Builders South Africa (MBSA, 2021), criminal gangs have usurped the majority of building sites across the country. Site invasions by the syndicates have negatively affected the timely delivery of infrastructural projects (Irish-Qhobosheane, 2022). These criminal groups, which sometimes appear under the guise of local business forums, mostly target large-scale construction sites, requesting a certain percentage of project earnings in order to allow the smooth running of operations on site or sometimes compel project contractors to sub-contract certain aspects of project work to nominated individuals who are members of their criminal gang. These syndicates normally adopt a method of intimidation, assault, and sometimes threaten murder and commit arson in the presence of state security officials.

Imports in the Construction Sector

Lockdown restrictions due to the pandemic significantly affected general imports into the South African space. In 2020, the South African import value dropped by US$1.2 billion between January and March (Viljoen, 2020). A drastic reduction in cement

import is evident from Figure 5 between April and May during the lockdown. A major rebound was, however, recorded in September 2020, with a somewhat steady flow of imports into the country ever since.

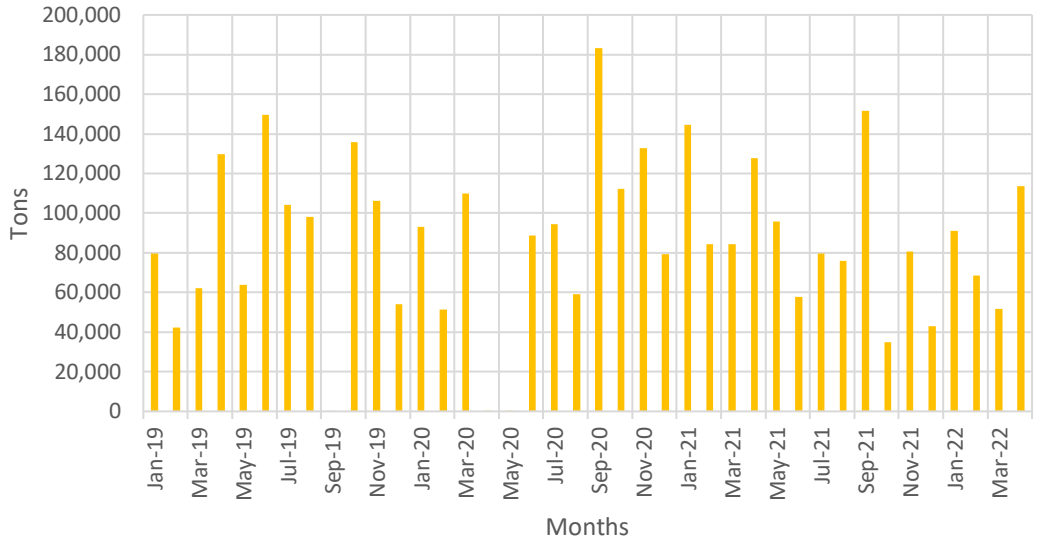

Figure 5: Cement imports statistics in the construction sector (South African Revenue Services, 2022)

The majority of the cement imports coming into South Africa emanate from Vietnam, Pakistan, and Mozambique. In an effort to improve local production and increase the GDP, the South African government has recently banned the utilisation of imported cement in state-funded contracts (Erasmus, 2021). This embargo is believed to protect the local cement manufacturing companies from foreign ones with larger production capacity and competitive advantage. The government recently extended the anti-dumping duties imposed on Pakistani imported cement by five years. This has stirred a great deal of mixed reactions amongst construction firms, with the major concern being that the limitation of the cement import would increase the cost of cement in the market and would have inflationary effects on the rates of cement-related tasks (such as concreting and masonry) and consequently increase their cost of doing business. The effect of COVID-19 spans beyond just cement but also on other major construction materials such as stone, plaster, asbestos, glass, and ceramic products.

RESPONSE OF THE CONSTRUCTION SECTOR TO THE COVID-19 PANDEMIC

Managing Project Risks

With the pandemic strike came new challenges such as social distancing on sites, travel restrictions, on-site safety and security, labour shortages due to movement restrictions and the health impact of the pandemic on site workers, supply chain

issues, unanticipated delays, and reduced productivity. Remote working was adopted globally in almost all sectors as a risk mitigative measure to the pandemic. Unfortunately for the construction sector, the majority of the activities cannot be executed remotely. Project meetings, documentation, designs, planning, and budgeting were the major activities that mostly benefited from remote working. In a bid to incorporate innovation and mitigate the risk of COVID-19, contractors have embraced an alternate duties approach to prevent overcrowding of the site by the simultaneous presence of the entire workforce. Activities are planned so that workers visit the site on different days and sometimes different periods. This practice enables site managers to control the number of personnel on site and aids the easy attainment of social distancing. Other safety measures by several construction contractors during the pandemic include establishing risk-mitigating programmes for employees needed on site, compelling sick employees to isolate themselves from site, adequate record keeping of employee movement during the pandemic, and introducing mandatory sanitation rules on the construction site.

Safety Measures to Prevent the Spread of COVID-19

The pandemic has brought the issue of health and safety on construction sites to the forefront. Construction firms now prioritise the health and safety of their workers more than ever as it has become an integral part of most contract conditions and carries heavy fines in cases of non-compliance. Thorough cleaning now occurs at construction sites along with isolated disinfection of construction vehicles, mobile plants, eating facilities, security access control rooms and hand-washing facilities, which are properly disinfected and deep cleaned. Regular cleaning and disinfection of contact points such as taps, door handles, communication equipment, handheld tools and other construction machinery are widespread in construction sites nationwide. To ensure construction sites are COVID-19 free, site employees are adequately screened through no-contact thermometers and have to wear full personal protective equipment (PPE) before being granted site access.

Post-Lockdown Architecture of the Construction Sector

Construction project costs have increased post-lockdown owing to the impact of hindered labour productivity due to lockdown and movement restrictions, elongated project durations, additional project requirements such as deep cleaning and sanitising of certain site areas, job trailers and the need for additional PPE. The price indices of construction materials have also increased significantly since the pandemic. A 14 per cent increase in price has been recorded since the start of the pandemic (Figure 6), largely due to inflationary pressures from the economic rebound of the construction sector.

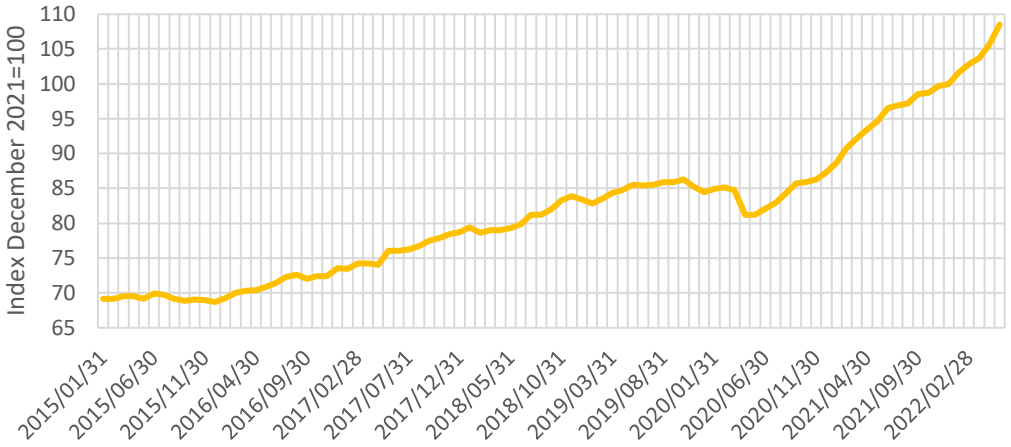

Figure 6: Construction materials price indices (Stats SA, 2022)

Increased crude oil prices have also affected the cost of materials manufactured from crude oil derivatives such as bitumen used for road construction. Preliminaries and site operations costs have also been impacted by increased global fuel prices (Reaper, 2022). The Russia-Ukraine conflict has also affected the global prices of steel (Figure 7) as both nations rank amongst the top producers of steel globally. In contrast, several other steel plants in other regions of the world have had to shut down owing to rising global energy costs.

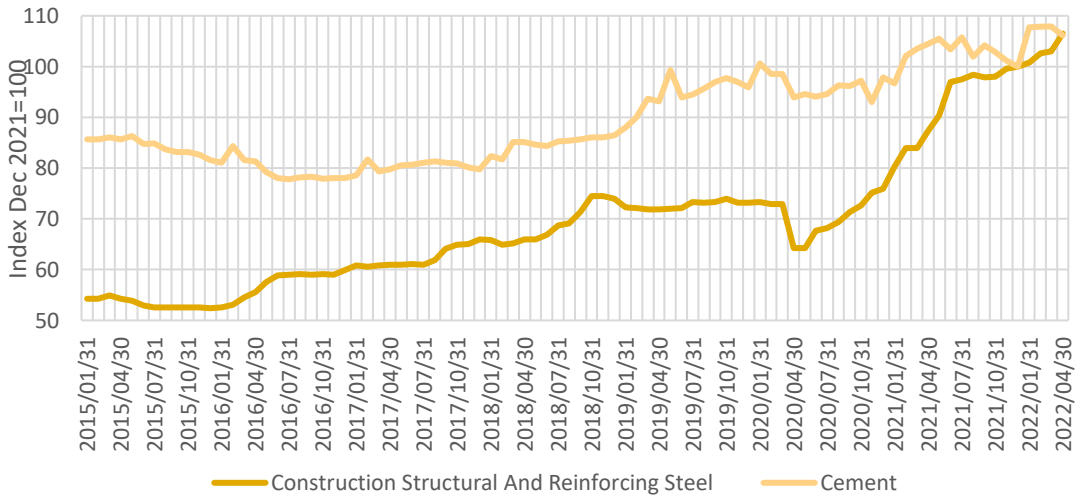

Figure 7: Construction input price index (Stats SA, 2022))

Development of a Resilient Local Supply Chain

The criticality of business resilience in the construction industry has been further accentuated by the COVID-19 pandemic in that planning should not be majorly

prioritised for the interim but designed around a more stable and long-term basis. A sustainable supply chain is the fulcrum on which the industry's resilience is pivoted. Local industries have been highly prioritised in the delivery of infrastructural projects according to the South African government's economic reconstruction and recovery plan. This was done with the belief that adequate engagement of the local industry would help improve their capacity and provide a robust supply chain adequately in local control over time and easily sustainable and devoid of unpredictable external influences. It is further stressed that women empowerment, youthful engagement, and the involvement of military veterans and the physically challenged will give a sense of societal inclusivity and a spirit that fosters competitiveness and resilience. This engagement will go alongside formulating a local supplier industry for infrastructural projects (The Presidency, 2020). Further actions that can be used in strengthening the construction supply chain, according to Das et al. (2021), include outsourcing business operations, geographical partnering of supply chain agents, and contingency planning. Adequate implementation of these strategies would likely engender a sufficiently resilient supply chain adequately equipped against future pandemics.

Utilisation of Disruptive Technologies

The construction industry's labour-intensive nature and its heavy reliance on manual labour, coupled with the reluctance to change, has been responsible for the limited technological innovation in the construction sector over the years. The COVID-19 pandemic has, however, necessitated the embracing of technological innovations throughout the entire life cycle of construction projects. The utilisation of disruptive technologies such as drones, pre-fabricated components, radio frequency identification, smart wearables, immersive solutions, 3D printing, modular construction, big data, artificial intelligence, and the Internet of Things has been on the increase since the pandemic struck.

While COVID-19 has negatively impacted the work supply to the sector, it has also aided the integration of several technologies in the pipeline before COVID-19. One such technology is modular construction, a process by which building components are manufactured off site in a plant under controlled conditions with the same materials that would have been used had construction been in situ. Designs are based on the same standards as conventionally constructed facilities. Modular construction has been noted to aid speedy construction of facilities with an average of 50 per cent cut in construction duration (Modular Building Institute, 2021). The Chinese government adequately demonstrated the utilisation of modular construction during the peak of the pandemic through the construction of a 1000-bed space capacity medical facility within two weeks.

Owing to the majority of the modular construction work being carried out in a controlled environment, the risk of spreading COVID-19 was significantly reduced. Social distancing was more easily achieved on site owing to fewer workforce requirements in the integration of components, thereby facilitating on-site personnel management and making it safer. The construction cost is also reduced with modular construction, and the risk in schedule is minimal as site weather conditions have minimal impact during the installation of modular components (Villegas, 2021).

The construction sector has also embraced artificial intelligence and machine learning to aid efficiency improvement across the entire construction value chain. These technologies have been adopted from the material manufacture stage up to the construction facilities' management. Robots are being deployed for real-time monitoring of construction activities as well as the execution of works that are repetitive to improve productivity. Drones and rovers are also being engaged on construction sites for material transportation, photograph taking and quick and comprehensive scanning of the job site.

Furthermore, 3D printing, which is the computer-controlled sequential layering of materials to create three-dimensional shapes, has also gained prominence in the construction sector since the outbreak of COVID-19. It is extremely useful in the manufacture of construction components or in the printing of an entire building in construction. Apart from the swift and accurate execution of tasks or the manufacture of materials, AI and 3D printing utilisation can also aid the reduction in labour costs, consequently reducing the construction cost (SAICE, 2021). While software packages were widely embraced prior to the pandemic, remote working requirements due to lockdown increased the use of online software packages in project packaging and administration.

It is expected that the adoption of several new technologies in the construction sector will have some sort of impact on employment in the construction sector. According to Agenbag and Amoah (2021), utilisation of new technology equipment is expected to impact the workforce negatively as tasks that are normally expected to be executed by personnel are now being done by machines. The upside to this is the increased productivity achievable in the South African construction industry through adopting these technological devices. As shown in Table 3, if drone technology is adequately adopted for site monitoring, 100 per cent of the workforce in that section of the site could be replaced. Similarly, for the inspection of work, it is believed that one robot machine has the capacity to replace at least five workers, and one excavating plant can replace 15 workers for the same task, while paving machines and self-driven roller compactors can replace as many as five workers with a more certain amount of quality. Agenbag and Amoah (2021) conclude that the construction sector had to prepare for massive job cuts resulting from using technology to carry out traditional human functions and the resulting unemployment.

However, it appears a daunting task to harness the use of technology fully in construction operations, not just because of the reluctant nature of the industry to change, but mainly because of the sector's sensitivity to job creation for the semi-skilled and general workers in the labour market. Although lack of expertise hinders the adequate use of technological equipment on construction sites, the biggest challenge that would have to be surmounted by the government would be the identification of an alternative sector that can absorb the massive unemployment that will permeate the South African economy if technology is allowed to take the place of humans on job sites.

THE FUTURE OF THE SOUTH AFRICAN CONSTRUCTION INDUSTRY

There is a strong consensus among construction professionals that the rollout of vaccine is one of the major steps to drastic recovery from the pandemic (SAICE,

2021). It is believed that a swift vaccine rollout to construction site workers is an integral step towards ensuring a safe work place devoid of the possibility of COVID-19 transmission. The CIDB (2020) further suggests that for full recovery from the pandemic to be achieved in the construction sector, substantial support will be required from the government to cushion the effects of job and revenue losses among construction workers and contractors, respectively. These support measures can come in the medium term in the form of tax benefits, swift approval of tenders and post-lockdown reimbursements of outstanding invoices from stalled projects. Also, ensuring the payment of unemployment insurance funds and increased government spending on infrastructural projects will go a long way to ensure stability and sustained recovery of the construction sector post COVID-19.

The COVID-19 pandemic and mass riots in 2021 have placed the business confidence in the South African construction industry at an all-time low. Business conditions in the construction industry are not looking good for South Africa's planned infrastructural rollout programme which is an essential part of the nation's economic recovery plan. The low business confidence is not new to the construction sector as it was reported prior to the occurrence of COVID-19 that the lack of sufficient infrasatructural projects, low return on investment, slow transformation pace, and lack of innovation had been prevalent (Engineering News, 2021). COVID-19 merely acted as an exacerbating factor that dipped the confidence level of a sector that had already been struggling, as was evident in the reluctance of clients to award tenders and the frequent cancellation of already awarded tenders.

Suppose the South African investment plan is to achieve its goals. In that case, it must prioritise proffering solutions to the issues of underspending that have characterised all speheres of government down to state-owned enterprises. Although the government agrees that there is an exigent need for purposive infrastructural investment and has taken the right step to addressing this through the newly formulated infrastructural development system (SIDS) aimed at creating a framework for the attainment of the South African development agenda, adequate implementation of this framework should be ensured by the government departments saddled with its actualisation. The Department of Public Works and Infrastructure (DPWI) also produced the National Infrastructure Plan (2050) with the intent of diversifying the South African economy from a monolithic one which relies on mineral resources to a more robust one which is regionally integrated and globally inclusive to promote dynamic investments for future industries (NIP, 2021). The NIP 2050 provides a base for the NDP's vision which creates a nexus between NDP objectives to actionable steps and achievable intermediate outcomes. In order to attain the goals of the NDP, an amount in excess of R6 trillion will have to be invested in infrastructure between 2016 and 2040.

Concerns have, however, been raised regarding the NIP 2050 by the Development Bank of Southern Africa (DBSA) as to whether the NDP is a vision document similar to the NDP or an actionable plan addressing infrastructural development. It has been learnt over time that the lack of specificity hinders the implementation of such plans/documents as was the case with past national economic policies. Lucidity is also one of the issues to be addressed on the NIP 2050 as it fails to stipulate explicitly the responsibilities of the players in the plan, from the government at various levels to the private sector participants. According to the National Planning Commission, for

instance, for the first time since record keeping, the private sector emerged as the biggest investor in civil construction projects, exceeding the values obtained by the government and public entities (NPC, 2020).

This emphasises the emerging role of the private sector in infrastructural project investment and as such, assuming a traditional role for a player taking up a more important role in a somewhat conservative industry would be inappropriate. It therefore becomes important to create an enabling environment that adequately caters to the private sector's needs to encourage more private sector participation, which would foster a more broad-based public-private partnership (PPP).The economic reconstruction and recovery plan also captures the network industry and the freight and public transport sector. Private sector skills and expertise are targeted for fast tracking the infrastructural project delivery through improving state technical ability and project administrative capacities.

Social compacting, which is the implicit agreement between the government and the citizens, is also stressed as a key success factor in the actualisation of the economic reconstruction and recovery plan. Professionals of various fields are the forces driving the private sector which emanates from the citizenry, and a high level of trust between them and the government is expected to foster a cordial relationship capable of mitigating the risk that might be imposed on the industry by a future pandemic. The government's response to the COVID-19 pandemic shows an obvious mistrust between the government and the governed as several accusations are still left unattended to regarding graft issues in several government agencies in respect of palliative resources. It is generally believed that establishing amicable relationships among parties in the spirit of social compacts will positively impact conflicts and crises. If private sector investment is to be fully encouraged, issues of transparency and nepotism in the government's decision-making and accountability in resource utilisation should be adequately addressed.

CONCLUSION

Similar to many other industries, the construction sector was obviously not equiped for a pandemic of the COVID-19 magnitude. The effects of the pandemic are still very evident within the South African construction industry and the world at large. Risk mitigation strategies within the construction industry must be adequately anchored to the government's conscious effort alongside various recovery plans if the construction sector is to recover fully from the impact of the pandemic. Positives from the pandemic such as disruptive technologies should continue to be harnessed and improved upon to ensure a more productive and innovative industry. Unemployement issues that may result from the proper integration of the necessitated disruptive technologies should be further investigated with a view to engaging the manual labour that will be shed from the construction industry properly into other sectors within the national economy that might be more in need of it.

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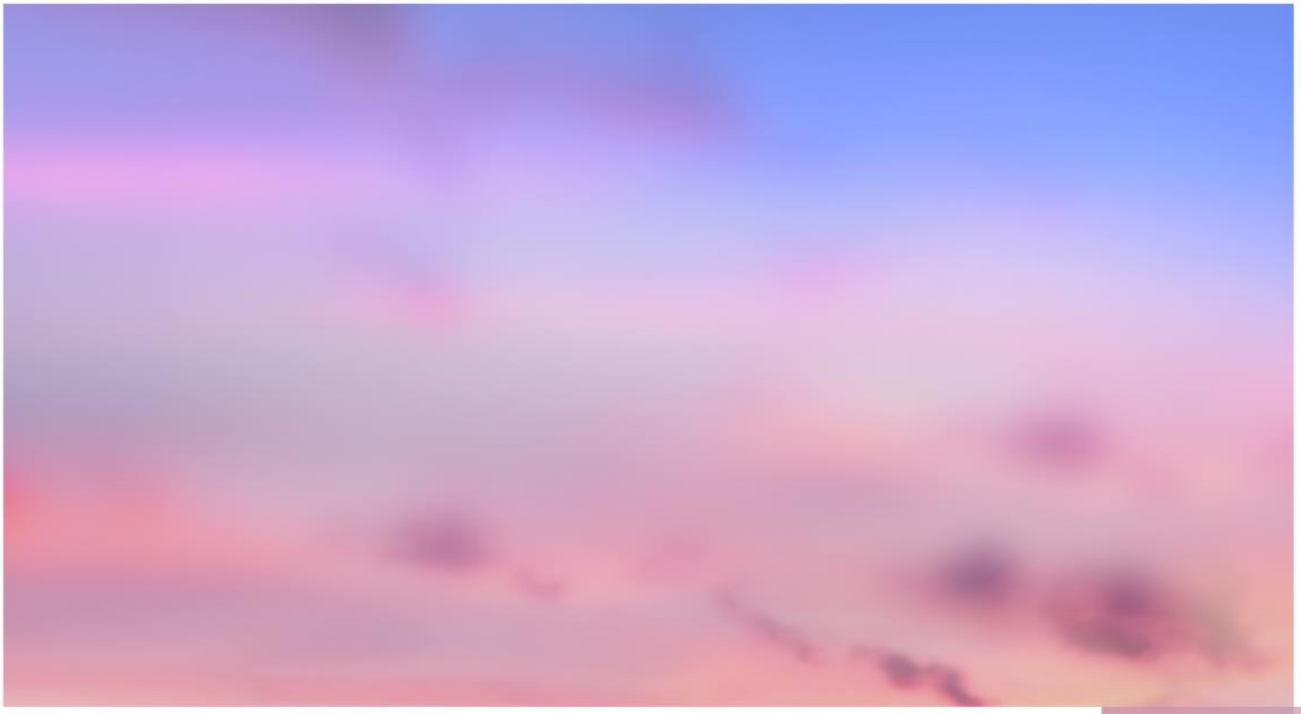

A REVIEW OF HOW MUNICIPAL INFRASTRUCTURE DELIVERY MANAGEMENT FLAWS HAMSTRING GROWTH AND DEVELOPMENT IN SOUTH AFRICA

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