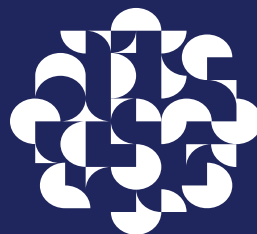


Technological Change in the Insurance Sector in South Africa: Disruption with the Potential for Social Good in a Developing Country Context?

By Zaakhir Asmal, Haroon Bhorat, Lisa-Cheree Martin, and Chris Rooney

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Abstract

Technological change has affected long-term change on countries and sectors across the world. One of the most visible manifestations of these changes is technology's effects on Workplace Innovation (WI). Adopting the case study approach, we examine how technological change has affected the insurance sector in South Africa, with a particular focus on employment and job quality, skills and inequality. We find that technological innovation is likely to lead to job losses, while the effect on job quality is currently indeterminate. In terms of skills, our respondents experienced two challenges: the lack of skills transfer from older employees to younger employees and the recruitment of skilled individuals. Technological innovation is likely to worsen inequality in South Africa, as it advantages those who are highly-skilled, who tend to be from higher socio-economic backgrounds. Overall, these findings suggest that technological innovation in the insurance industry needs to be carefully managed, with appropriate policies implemented so that all can benefit.

JEL codes:

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Keywords:

Insurance sector; labour market; South Africa; technological innovation

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1. Introduction

In South Africa, we are seeing uneven development in terms of the adoption of technological innovations, and correspondingly, in the impacts of these on the workplace. Specifically, in the insurance sector we are seeing the formation of two groups of insurance organisations. On the one hand, we have the well-established, older insurance firms. On the other, we are seeing the emergence of what we call “Insurtech” start-ups. The latter are known for making use of technological innovations, such as big data and AI, as a core part of their operations and product offerings. Furthermore, a significant selling point for these start-ups is the lack of human interaction needed to access their products. The former, however, has shown a mixed response to the use of technological innovations in the workplace, leading to a slow uptake of technology-related innovations within these firms. While some are hesitant, due to the cyber-security risks associated with these types of technologies, others are working through the aforementioned “Insurtech” start-ups via investments and financial backing in order to “test the waters”.

Another factor, important for a developing economy like South Africa, is the uneven distribution of skills and access to technology itself. This makes the approach that firms take to the adoption of technologies in the workplace a difficult balancing act. Firms must balance the need to remain competitive with ensuring that the labour market – current and prospective staff – is on par with skills requirements of the sector. The uneven distribution of skills and access to technology in South Africa means that some individuals may not be equipped to meet the needs of the firm should certain technological innovations be adopted. Thus, it may create a barrier to entry into the labour force.

The aim of this case study¹ is to identify trends related to technological innovation and the workplace in the insurance sector of South Africa within this context and provide insights into how these trends are impacting job quality, employment, skills and inequality in the sector. We also consider whether such innovations have the potential to drive better social outcomes beyond the sector itself.

1.1. The case and its context

Against the backdrop of the 2008 economic crisis and the European Union’s need to remain globally competitive, there has been a growing urgency for innovation and sustainable growth, which has

¹ This paper formed part of a series of case studies for the UNTANGLED interdisciplinary research project (<https://projectuntangled.eu>), that receives funding from the European Union’s Horizon 2020 research and innovation programme. Each case study investigated the interplay of three global megatrends – globalization, digitalization and demographic change – and their impact on employment, skills, job quality and inequality across a number of sectors. These sectors included manufacturing, financial services, and business services.

resulted in a focus on workplace innovation (WI) at the EU policy level (Kesselring et al., 2014). Globalisation and technological change have continued to create competition, and with improvements in technological innovations, a number of WIs have been implemented both in Europe and beyond (McMurray, Muenjohn, & Weerakoon, 2021). Companies are realising a need to shift their focus to technological and business (model) innovation and efficiency (Oeij et al., 2021).

This case study focuses on the role of technology in driving such WIs, as well as the role of technology in product development and access in the insurance sector in South Africa. With respect to the workplace, technology is an important enabler of WI and vice versa, and the Covid-19 pandemic has been a catalyst in the uptake of technologies in the workplace. According to Beblavy et al. (2012), the four main factors at the intersection of WI and technology are fragmentation and disaggregation of work, crowdsourcing, virtualisation of work and cloud computing and equipment.

Fragmentation and disaggregation of tasks can be understood in a number of ways, for example, breaking up work across various geographical spaces, working outside of the normal 9 to 5 timeslot or redistributing tasks across workers, software or machines. Crowdsourcing goes hand-in-hand with fragmentation, allowing for improved access to outsourcing and freelancer services through online platforms. Furthermore, the growth of crowdsourcing cannot be considered without the inclusion of the virtualisation of work, as companies no longer need co-workers to be in the same space, instead using online messaging, teleconferencing and videoconferencing software. Finally, access to improved internet access, cloud computing capabilities and new cloud computing equipment has allowed firms to provide fast and on-demand access to the organisation's network, servers and software.

If effective, these improvements to the way in which an organisation conducts business are intended to directly improve the productivity of the organisation and job quality of employees, but also have the potential to indirectly benefit its customers and the broader society. However, since many of these innovations are relatively new, their long-term impacts on job quality and productivity of employees cannot yet be known for sure. In South Africa and abroad, there is a growing general trend to make use of such innovations. However, the effectiveness of each company's approach to such innovations differs. In many cases, when companies do not fully commit to the changes and rather support change at a superficial level, the result is inefficient. Successful approaches to innovation, especially technologically related innovations, require commitment to organisational renewal and complementary social innovations in the workplace (Kohlgrüber, et al., 2019).

In South Africa, organisational renewal and uptake of innovations in the workplace can have potential positive and negative impacts for the labour market. Many of the abovementioned innovations may

have the potential to improve access to the labour market for people living in remote areas. However, and specific to the South African case, these innovations may also negatively impact marginalised groups who do not have sufficient access to the relevant technologies and lack the skills required to make use of them.

In the South African insurance sector, we have identified two main groups of organisations in the sector with different trajectories of technological change. The first group consists of smaller ‘Insurtech’ start-ups that make use of machine-learning, automation and cloud-based technology to improve their product/service and employee experience, while simultaneously making things more convenient for consumers. Conversely, the second group of established players within the South African insurance industry – such as Old Mutual, Sanlam and Hollard – has limited innovative capacities (Moodley, 2019; Molloy & Ronnie, 2021). We have also identified one relatively established insurer which is still technologically innovative.

Collins, Hannah and Giuliani (2022) note that one of the key reasons for a lack of innovation amongst established insurance companies is that across Africa, the insurance industry only targets a small proportion of the population due to the complexity and higher costs associated with providing more insurance products to a wider segment of the population. According to the Financial Conduct of South Africa’s *Financial Sector Outlook Study 2022* (FCSA, 2022), although three-fifths of South Africans report having one insurance product, this is somewhat misleading since 42% of South Africans report having funeral cover only in 2021. If this product is excluded from insurance coverage calculations, the proportion of South Africans who have any other type of insurance product falls to 19.0%, mostly comprising life insurance (10.0%), physical asset insurance (11.0%) and health insurance (9.0%). The FCSA (2022: 39) also report that “*Life insurance is strongly correlated with earnings and income, where the poorest 20% of the population have only 3% of the coverage they need.*” Due to this correlation between income and having an insurance product, South African insurance companies tend to target their insurance products solely at big businesses and wealthy individuals who tend to value stability over innovation. As a result, there is little incentive to innovate, because there is no demand from their current clients.

Molloy and Ronnie (2021) examine the use of Fourth Industrial Revolution (FIR) technologies – a proxy for innovation – in the South African life insurance sector and find that there are several reasons why the impact of the FIR on the sector has, at present, been minimal. Their findings were based on interviews with twelve senior executives at life insurance companies across South Africa.

The first reason provided by several insurance industry participants was that the lack of innovation was intentional because the market was not yet ready for products that were radically different from the previous products on offer. Related to this, the South African insurance market needed to innovate at a slower pace than other countries due to the broad unfamiliarity of workers and customers with new technologies. In addition, while some insurance companies were happy to embrace aspects of the digital revolution – such as using iPads and computer to reduce paper use – some insurance brokers insisted on still using paper.

A second reason provided by some participants was that their firms were unable to respond to opportunities and challenges presented by the FIR due to inter-related structural and cultural issues. Firstly, a number of participants identified structural inertia in their company, which relates to how things are done in a company. Structural inertia was reinforced by companies using outdated legacy systems and industry protection mechanisms (such as complex regulation, high capital solvency requirements) that limit the number of new entrants into a market and therefore, the need for established players to change. The second issue was cultural inertia. In any business environment, there are individuals who are doing well at present and thus do not see a need to change anything. As a result, anything that threatens their current standing will face fierce opposition, resulting in many new initiatives being shut down, again limiting innovation. The third issue related to the inherent risk aversion present amongst the established insurance companies. This was ascribed to the dominance of actuaries in the insurance profession who heavily rely on data and other evidence to make strategic decisions. With innovations where data are by definition not available, they emphasise the risk that it might not work out.

Overall, established insurance firms in South Africa are not at the forefront of innovation in the sector. Five factors – the small market size, consumers' unwillingness to try radically different products, structural and cultural inertia and excessive risk aversion were offered as reasons for the current state of affairs. However, it is possible that senior executives within established insurance firms have recognised this lack of innovation and have looked outwards to understand new developments in the sector. Indeed, a number of established insurance firms have acted as underwriters for the new wave of insurance firms dubbed "Insurtech". These firms use technological innovations to make insurance products more accessible and affordable.

The lack of innovation amongst established insurance firms in South Africa meant that the market was ripe for disruption by new entrants. Indeed, a whole wave of Insurtech firms have entered the South

African insurance market and have since become well-known brands amongst the South African public. These include Naked Insurance, Pineapple Insurance, Simply, Lumkani and JaSure.²

At a first glance, it might appear that Insurtech firms are fiercely competing with the established insurance firms. However, this is not the case. The South African Insurtech sector is currently simply not big enough to make a significant difference to the profit of the established insurance firms. Instead, established insurance companies act as under-writers for these Insurtech firms. Hollard, for example, acts as underwriters for Naked Insurance and Lumkani, while Old Mutual play the same role for Pineapple Insurance and Simply.

According to a senior executive at an Insurtech firm, there are multiple reasons why established firms underwrite Insurtech firms. Firstly, the insurance sector is a capital-intensive business and the Insurtech firms do not have access to large cash reserves. To access capital, one option is to negotiate with an established firm to underwrite their business so that they can assure their clients that they will be paid out if necessary.

Moreover, underwriters are responsible for the compliance, legal and regulatory operations of the Insurtech firm. As a result, the established firm carries these expenses on their income statement, rather than the Insurtech, who do not want to be burdened with significant expenses at an early stage of their development. An additional benefit to this arrangement is that the Insurtech firm can focus on its core functions of customer acquisition and customer service. Underwriters also help Insurtech firms understand the importance of risk management. With the design of a new product, risks and opportunities need to be identified to decide whether it is worth bringing the product to the market. Underwriters typically have access to a large team of actuaries who can undertake sophisticated modelling of these new products, providing useful data on whether to launch the product.

In return, established companies obtain access to innovations in the insurance sector. Essentially, the innovation function is “outsourced” to these Insurtech firms, while the established firms use their financial muscle and reputation as a trusted corporate to “purchase” the innovation. We can expect this trend to continue in the future because it is a mutually beneficial arrangement: Insurtech firms require capital and established insurance firms are consistently on the lookout for innovations to enhance their own business.

² More detail on the way these firms use technology and offer innovative insurance solutions can be found in the Technology Use section in the report: Ursula Holtgrewe, Martina Lindorfer, Šalamon, Nela (Eds.). (2023). Globalising, digitising and changing companies and sectors: Case studies from the UNTANGLED project. (Deliverable 4.5) Leuven: UNTANGLED project 1001004776 – H2020.

An interesting player in the South African insurance sector that somewhat bucks the alternative of either being a large established insurer that fails to make use of technological innovations at a wide level or a smaller Insurtech start-up which focuses on such innovations is Discovery Insure. Discovery applies a principle they have named “Shared-value insurance” to its insurance product offerings, meaning that all stakeholders, clients, the insurer, and society as a whole should benefit in some way – and they use technological innovations driven by incentivisation towards achieving this goal. This was first used in the company’s older and more established medical aid scheme, which started the Vitality Health and Wellness programme. This programme is an add-on to the medical aid products that incentivises a healthy lifestyle through rewarding healthy behaviour. In turn, this is better for medical aid profits, which creates the funds to further incentivise clients to live healthier lives, which is better for clients’ overall health. And this continues in a virtuous cycle.

This business model then spilled over to the short-term insurance market, specifically car insurance and the introduction of the Vitality Drive programme. Much like the Vitality Health programme, vitality drive *“uses behavioural economics together with technology and data power to nudge clients”* to drive more safely and creates benefits at an individual and societal level.

1.2. How does it fit into the triangle of technological change / globalisation / demographic change?

With increasing globalisation and integration of South Africa into the world economy, technological changes within the country are quick to follow global trends or be influenced by those seen elsewhere, and this again accelerates globalisation. Demographic change is also influenced by the global economy via migration. South African youth and skilled workers are more easily able to leave the country, and the skill and age distributions in the country and the sector are changing. Finally, technological and demographic changes will impact inclusion in the sector. The changing skill requirements that result from changing demographics and adoption of technological innovations will make the reskilling of employees necessary. This entails ensuring that continuous learning is taking place.

1.3. Key impacts and ways these are being addressed or shaped

In order to ensure the successful adoption of technological workplace innovations, organisations either need access to a workforce with the necessary skills or need to reskill current employees. This is especially true in the insurance sector, as there are two skills gaps observed within the industry. The first is due to older employees with technical knowledge and experience exiting the labour market without passing on knowledge to younger graduates. The second is related to the technology changes

taking place in the sector. In order for reskilling to be successful, older generations and those in leadership positions will need to be willing to adopt newer technology, and essentially to drive the adoption of these technologies. The reskilling of staff must also be aligned with the strategy and vision of the organisation.

The onset of the Covid-19 pandemic has changed the way in which we work and has impacted job quality positively. The pandemic has forced employers to make changes to work organisation, and although these changes were rushed and forced by lockdown measures, many employees have benefited from improved job quality as a result. Furthermore, technological improvements have the potential to positively impact the insurance sector in other ways, typically in the form of improved product offerings, improved consumer experience and by reaching consumers that previously were not able to benefit from insurance. However, technological innovation may also increase inequality in the sector's own workforce.

Our respondents agreed that discussions about employment and potential job losses as a result of technological innovations in the workplace are important and unavoidable. Our interviews indicate that there will be two potential outcomes along the lines of technological substitution or complementarity of tasks. There will be some jobs that can be successfully and efficiently done by technology and AI, and although this is still a distant future for South Africa, it will result in job losses. However, there will always be consumers in the industry that prefer dealing with a human being and meeting or talking face-to-face. This highlights the importance of continuous learning, upskilling and reskilling employees.

2. Methodology

An analysis of the insurance sector labour force data was conducted. These data provide information about the number of jobs in the sector and the gender, age, and racial breakdown of the workforce. In addition, a literature review was performed to gather information on the global outlook on workplace innovations, and the current state of the insurance sector in both a general sense and with a specific focus on workplace innovation.

Table 1. Interview details

Respondent	Organisation type	Position of interviewee	In-person / Online Interview
1	ASISA (Association for Savings and Investment South Africa)	Policy Advisor	In-person
2	SAIA (South African Insurance Association)	Executive	Online
3	IISA (Insurance Institute of South Africa)	Executive Manager	Online
4	An established insurance company – Discovery Insure	Head of Telematics	In-person
5	An established insurance company – Discovery Insure	Deputy CEO	In-person
6	An established insurance company – Discovery Insure	Marketing	In-person
7	An established insurance company – Discovery Insure	Head of Operations	In-person
8	An established insurance company – Discovery Insure	International Operations	In-person
9	An “Insurtech” firm – JaSure	Co-founder	Online

The background data and literature were used as guides to structure interview questions, the focus of which was understanding technological innovation and workplace innovation in the South African insurance sector. A number of interviews were scheduled with members of various organisations within the insurance sector. Table 1 provides more detailed information on each of the individuals that were interviewed, as well as their organisation. These interviews and background information provided insight that was used to complete the case study.

2.1. Case study findings: The “megatrends”

2.1.1. The Sector

The South African insurance sector forms part of the Finance, Insurance, Real Estate and Business Services industry. In 2021, the insurance sector had a total of 3603 active employers (Oosthuizen et al., 2021), and the sector had gross earnings of an estimated R33.2 billion in 2020 Q4 (Table 6). This makes up 4.5% of the earnings of the formal non-agricultural economy. The total relative growth of the insurance sector gross earnings over the 5-year period from 2015 to 2020 (46.6%) was larger than the

finance industry, tertiary sector, and the total non-agricultural economy. Similar results are seen for average annual growth of the insurance sector.

Relative growth in mean monthly earnings of the non-agricultural economy, tertiary sector and finance industry is closer in size when compared to the insurance sector. This is mirrored by the average annual growth of the mean monthly earnings in Table 2. However, the growth experienced by the insurance sector is still the largest. The converging growth rates can be explained by the differences in employment growth rates between the categorisations.

Table 2. Employment and Earnings in the Insurance Sector, 2015-2020

	2010	2015	2020	Change (2015-2020)		
				Total	Relative (%)	Ave. Ann. Growth (% p.a.)
Employees ('000s)						
TOTAL NON-AGRIC. ECONOMY	8 481	9 600	9 640	40	0.4	0.1
TERTIARY SECTOR	6 802	7 957	8 084	127	1.6	0.3
Finance	1 879	2 181	2 172	-9	-0.4	-0.1
... Insurance Sector	147	195	211	16	8.2	1.6
Gross earnings (R billion, nominal)						
TOTAL NON-AGRIC. ECONOMY	353.4	569.5	740.9	171.4	30.1	5.4
TERTIARY SECTOR	288.6	476.2	626.7	150.4	31.6	5.6
Finance	87.3	145.3	192.6	47.3	32.5	5.8
... Insurance Sector	11.1	22.6	33.2	10.5	46.6	7.9
Mean monthly earnings (R '000s, nominal)						
TOTAL NON-AGRIC. ECONOMY	13.9	19.8	25.6	5.8	29.6	5.3
TERTIARY SECTOR	14.1	20.0	25.8	5.9	29.5	5.3
Finance	15.5	22.2	29.6	7.4	33.1	5.9
... Insurance Sector	25.3	38.6	52.3	13.7	35.4	6.3

Source: Oosthuizen et al., 2021

According to Table 2, the insurance sector employed an estimated 211 000 people at the end of 2020, up 8.2% from 2015. Conversely, the finance industry experienced a declining number of jobs (-0.4%), and the tertiary sector and total non-agricultural economy experienced significantly slower job growth over the same period.

2.1.2. Globalisation

South Africa is a developing economy that is relatively well-integrated into the global economy. Globalisation impacts the labour market in two ways (Fang, Gozgor, & Nolt, 2022). Firstly, it greatly impacts global value chains, as production processes are divided among various countries and locations. Although the insurance sector does not have a physical product to offer, knowledge and innovations can still be shared across countries.

Global innovations in the insurance sector filter through to South Africa. The established companies in particular learn from large players in other countries and adapt to make use of new global best practices in the industry. In some ways, South Africa influences other countries as well due to the unique circumstances and solutions required for the South African market. An example of this is South African insurers' readiness to work together despite it being such a competitive industry. According to a respondent from SAIA, with fraud and crime being such a huge problem in South Africa, insurers were co-operating to work towards a solution, unlike elsewhere. *"So we [South Africa] were actually quite advanced in terms of that"*.

Second, globalisation impacts the movement of human capital between countries. On one hand it encourages governments to deregulate labour markets in an attempt to attract investors, which can negatively impact workers' employment conditions. However, this appears to be an issue that is more prevalent in lower-skilled segments of the labour market, whereas the South African insurance sector has a relatively high proportion of high skilled workers. On the other hand, globalising labour markets make it easier for workers with sought-after skills and knowledge to migrate, especially if skill demands converge globally. However, improved opportunities for individuals result in a problem in South Africa, as the country struggles with skills gaps as many skilled workers leave for better deals abroad, and the education system has not been able to produce skills at the rate that is required by the national labour market. In addition, the Covid-19 pandemic has acted as a catalyst to decouple work from physical presence and create more flexibility for workers. This adds to the ways in which labour can be attracted out of the country.

According to our respondent from JaSure, in the post-Covid world, all companies appear to be looking for digital skillsets, and it seems that many companies are approaching the same people. In addition,

"the international tech companies are really getting far more aggressive with their sourcing of talent in South Africa, both to work remotely and for them. Also, there's a lot more of the sort of

complete deal immigration type recruitment happening, so the employer will sponsor you and your spouse and your children's immigration to wherever and cover all costs" (JaSure).

This is something that is also common among European employers.

In terms of operations in other countries, one of the firms we interviewed, Discovery Insure, is involved in a number of markets globally, not least due to the scalability and repeatability of the Vitality Drive programme. Outside of South Africa, the company offers a version of the Vitality programme in the UK, as well as various Asian markets. There, Discovery partners with regional insurers that offer the Vitality programme. The programme has also been applied to rental cars, for example with Avis SafeDrive, which was later expanded into the Netherlands, the UK – and recently – Saudi Arabia.

In addition to technological improvements in remote work, which assists in these global partnerships, Covid-19 has also been a catalyst in the uptake of Discovery's business model by international clients. According to our interviewees at Discovery, the company has become an early and expansive innovator due to the *"South African adaptability"* and the unique country circumstances. The underserved market and divided business models apparently left the company the space to innovate its products.

2.1.3. Technology use

The South African insurance sector is dominated by large and well-established insurers. These organisations in the sector currently make limited use of technological innovations, but have been taking steps towards learning more about technological innovation, such as using "big data" or "artificial intelligence" in the design and development of product offerings, and updating and streamlining their business processes. Only recently have they started to release mobile phone applications that assist customers and make dealings between consumers and the organisation easier. However, these applications are limited, and some individuals have reservations about adopting technology in their dealings with insurance companies.

However, the onset of the Covid-19 pandemic has been a catalyst in the adoption of technological innovations in the insurance industry both in the workplace and in the offerings of companies to their consumers. In terms of the shift out of the office and into work-from-home (WFH) setups, the industry was *"well-equipped to move people to their individual homes and not disrupt productivity or any functionality"*. Still, now that lockdowns have been lifted there are "strong calls" for people to return to their offices. It appears that productivity has started to drop since the initial move to WFH, and some of our interviewees believe that employees working from home lack team connectedness and that face-

to-face contact is essential in the insurance sector, where relationships and building trust with clients is very important.

Nonetheless, there are benefits to WFH. One respondent discussed the time-saving and convenience benefits of online work, for example when scheduling meetings. Furthermore, companies are acknowledging that digital innovation has been positive for business and operations. Some companies have already experimented and put measures in place to take a hybrid approach to the workplace. For example, some redesign the office environment, using unassigned office cubicles or communal workspaces where anybody at any level of the company hierarchy can work.

Molloy and Ronnie (2020) identified a range of factors that either enable or inhibit digital transformation and innovation in the South African life insurance industry. Overall, these findings show a disparity between what insurers know is necessary to implement change and digital innovation, and what is being done. Enablers include a continuous learning mind-set within the organisation, partnerships within the broader ecosystem, and the role and attitudes of senior management towards shaping the organisation's culture and structures.

Molloy and Ronnie identified a connection between the optimal functioning of an organisation and individuals' skills and abilities to act as enablers of innovation and drive or inspire action across the business. Continuous learning is relevant to technology use, as employees will need necessary skills to be able to adapt with the changing organisation. This requires either reskilling of employees or potential employees that already have the necessary skills.

The role of senior leaders in shaping cultural attitudes and structures is also discussed by Molloy and Ronnie (2020). Leaders appear to have substantial influence to guide transformations but so far have failed to recognise the need for these transformations. However, our respondents indicated that the leaders of the insurance sector are aware of the need for changes and have started to take the necessary, albeit slower, steps towards these changes.

The majority of respondents have emphasised cyber-security as a concern when discussing the slow adoption of technological innovations in the workplace. This is especially important within the financial services and insurance sphere, as customers provide insurers with very personal financial information. This makes insurers and their customers more likely targets of scam artists, which is one further reason for financial services' slow and incremental approach to technological innovation. This is also a strength that established insurers have over new start-ups. Thus, Insurtech start-ups can benefit from partnerships with more established insurers that have more experience with cybersecurity and with

“accessing the types of resources that you need to properly manage that risk, and it also links back to the talent. The talent point is the ability to find and retain cybersecurity talent. They’re exceptionally rare and they’re among the first to get headhunted by overseas employers, so they’re a pretty scarce skillset in this country”.

Furthermore, many large firms in the insurance sector in South Africa already make use of a database – the Insurance Data System (IDS), which was developed in 2001 *“to combat fraud and crime”*. The data used is mostly insurance claims data and the system aids in identifying patterns of fraud within these claims data. In addition to this, the South African Crime Bureau was created in 2008, and there are future plans in place to expand the scope of the system to include underwriting data as well. However, there are also some remaining issues within the sector, with regards to the IDS. Mainly, there is a need to improve the collection of data from insurance organisations by standardising the data format as well as ensuring that all contributing companies provide complete and correct data. According to a respondent from SAIA, a solution to the former problem will be in effect during the second half of 2022, by enforcing the use of a standardised data template. Another issue is that not all companies provide data to the system. Contribution to the database itself is not compulsory, and some companies likely choose not to share their data as a means of remaining competitive and not wanting to share information with their competitors.

The lack or slow pace of innovation amongst established insurance firms in South Africa meant that the market was ripe for technological disruption by new entrants. Several Insurtech firms have entered the South African insurance market and have since become well-known brands amongst the South African public.

One of the more prominent Insurtech examples is Naked Insurance. The main focus of Naked Insurance is motor insurance, which reportedly is one of the least profitable lines of insurance due to market saturation (Littlejohns, 2019). However, according to the Automobile Association, around 60.0 – 70.0% of the 11 million vehicles on South Africa’s roads are uninsured (Automobile Association, 2020), presenting an opportunity for a firm, such as Naked Insurance, to capture a large share of this market. The fundamental value proposition of Naked Insurance is that they can offer lower motor vehicle premiums than established insurance firms through technological innovations such as an AI chatbot and computer vision technology. In addition, the process of signing up is very quick. Naked Insurance boasts that they can provide a quote within 90 seconds and the individual or company is covered three minutes after acceptance of the quote (Littlejohns, 2019).

Pineapple Insurance provides insurance for a far wider range of products than Naked Insurance. They provide insurance for any material object, provided it is not a house, vehicle or drone (Littlejohns, 2019). To do this, they require the client to upload a picture of the product they want covered, and using sophisticated machine-learning and AI algorithms, a quote will be provided within minutes. By removing bottlenecks in the signing up process, Pineapple Insurance can offer competitive quotes. In addition, Pineapple Insurance's policy involves returning unspent premia to their clients, resulting in lower profit margins than would typically be expected at a traditional insurance firm.

Lumkani targets an under-serviced part of the insurance market: those who live in informal settlements, who tend to be amongst the poorest people in South Africa. One of the greatest risks there is the threat of fire damage. This is mainly due to two reasons: firstly, paraffin is used extensively as an energy source as many of these informal settlements do not have access to electricity (Kimemia & Van Niekerk, 2018). Secondly, informal settlements are usually built with highly flammable materials (Littlejohns, 2019). To address this major issue, Lumkani provides a fire detection device that is distinct from a smoke detector and triggered through a rise in temperature. In addition to providing this low-cost product to impoverished communities, an insurance product is offered to these communities to rebuild after a fire has occurred (Littlejohns, 2019).

In contrast to the other three Insurtech firms described above, Simply focuses on life insurance. Typically, obtaining life insurance is a tedious process, requiring a lot of information and possibly a medical check-up in order for the insurance company to obtain an accurate picture of the customer's health profile. Simply, however, removes the arduousness of the process by only asking a potential client a few select health questions on a mobile application, and processing the application expeditiously. The company also offers group cover for all employees to corporate clients through a digital application process obviating the requirement for a broker to meet the business to discuss terms and conditions (Littlejohns, 2019).

JaSure is a new insurance company that offers unbundled insurance – meaning that the client chooses specific items to insure, not an umbrella such as 'home contents insurance' – on a range of items that includes cars, home insurance and other technological items and camera gear. Furthermore, all interactions with the client are done via the company's smartphone application. This includes signing up and adding items to be insured by uploading pictures and information regarding the item, in a similar manner to Naked insurance. The company's key innovation is that it provides clients additional flexibility by allowing them to turn cover on or off during the month, so that the cover paid for is only for the days on which the client had cover turned on.

Discovery is an exception in that it is not an Insurtech firm but is quite established in the South African market. It makes technological as well as workplace innovations a core component of its operating model. Discovery uses various technological innovations in their product offerings, such as telematics and smartphone application technologies. The data collected from these technologies are used to identify trends in client behaviour and to develop and refine the vitality drive programme to create incentives that will successfully change driver behaviour for the better.

According to Discovery's own research, *"driving behaviour is shown to be more predictive than claims history for risk"*. The telematics and cell phone data collected by Discovery provide detailed information on driving behaviour, and result in a better assessment of client risk. For example, telematics data can be linked to the frequency and distance driven by clients, which has drastically changed since Covid-19 altered the lifestyles of many individuals through increased uptake of work-from-home systems. Therefore, more accurate premiums can be charged to clients. Telematics is also useful for reducing claims fraud, since it can be used to confirm incident time and date, speed of car etc.

Discovery places a great emphasis not only on the technology but on the big database that it generates the many uses for this data. The data that Discovery has access to is very granular, which makes it easy to identify patterns or incidents that are relevant to clients. One use case was the activation of car alarms if driving data show that a client needs assistance without the need for a phone call. In the event of hijacking of cars, the recorded driving behaviour will likely change as well as the location, which will allow Discovery to automatically respond. In addition, the telematics data can be used to detect road conditions and find potholes to repair, which is a Discovery programme that is aimed at improving driving conditions for clients. Other uses of the data can assist insurance brokers by leveraging the data to give insight into client needs and offer improved or more specific rates.

2.1.4. Demographic change

According to the Quarterly Labour Force Survey, there were 197,000 individuals employed in the insurance sector in 2020. This is a considerable decline from 242,000 in 2019. Table 3 provides an overview of the distribution of those employed in the insurance sector across a number of factors. In 2020, there were more women (55.5%) employed in the insurance sector than men (44.5%). This is worth noting, as men accounted for more than half of all those formally employed (56.2%) in South Africa in 2020, and this pattern is generally mirrored in both the tertiary sector and the finance industry.

In terms of race, the proportions of those employed in the insurance sector are 39.4% African, 35.3% White, 13.6% Coloured and 11.7% Asian. This is unlike the distribution seen in the rest of the employed

population. In both the total economy and the tertiary sector, around three quarters of employees are African, followed by just over one-tenth White, one-tenth Coloured and less than 5% Asian. Within the finance industry and even more so in the insurance sector, the White proportion is thus disproportionately high whereas Africans are underrepresented compared with their share in the population at large and among the formally employed population.

Three-fifths (58.9%) of those employed in the insurance sector are between 35 and 54 years of age. Over one-third (34.4%) of those employed in the insurance sector are between the ages of 15 and 34 years. There is a similar distribution of ages across the total economy, tertiary sector and finance industry. Among young people, the 25-34-year age cohort make up 90% of employment in the insurance sector. Due to the comparatively high skill level, young people in the sector are older than in other parts of the economy. Finally, the remaining 6.8% of those employed in the sector are over the age of 55 years.

Table 3. Overview of Employment in the Insurance Sector, 2020

	Insurance Sector	Finance Industry	Tertiary Sector	Total Economy
Total Employment ('000s)	197	2401	11163	15253
Distribution of employment (%)				
GENDER				
Male	44.5	58.5	49.6	56.2
Female	55.5	41.5	50.4	43.8
RACE				
African	39.4	64.8	75.1	74.6
Coloured	13.6	9.4	9.3	10.0
Indian/Asian	11.7	4.6	3.5	3.3
White	35.3	21.2	12.0	12.1
Other	0.0	0.0	0.0	0.0
AGE GROUP				
15-24 years	3.3	5.1	5.5	5.7
25-34 years	31.0	30.5	28.6	28.6
... 15-34 years	34.3	35.6	34.1	34.3
35-44 years	36.0	34.4	30.7	31.2
45-54 years	22.9	21.2	23.9	23.4
... 35-54 years	58.9	55.5	54.6	54.5
55-64 years	5.5	7.8	10.1	9.9
65+ years	1.3	1.1	1.2	1.3
EDUCATIONAL ATTAINMENT				
Up to NQF Level 1	0.7	6.3	11.8	13.9
NQF Levels 2 and 3	3.7	24.2	25.7	27.6
NQF Level 4 (Grade 12 Equivalent)	41.7	39.3	35.5	34.4
NQF Levels 5 and 6	22.4	12.7	12.8	11.8
NQF Level 7	20.1	9.8	7.7	6.5
NQF Levels 8-10	11.3	7.1	5.6	4.8
Unknown NQF Level	0.0	0.5	0.9	0.9

Source: Oosthuizen et al., 2021

The insurance sector is relatively well-educated, with 95.6% of those employed in the sector having an education level of Grade 12 or higher, compared to only 57.5% in the total economy and 68.9% in the finance industry. Furthermore, more than half (53.8%) have an educational attainment higher than Grade 12 (NQF Levels 5-10), and nearly one-third (31.4%) have degrees. This is in contrast to only 11.3% of graduates in the total economy and 16.9% in the finance industry. This suggests that the insurance sector has a higher concentration of skilled employees when compared to the rest of South Africa.

Despite this, the insurance industry suffers skills gaps on two fronts. Firstly, with regards to skills that are specific to the insurance sector, such as underwriting and modelling. According to an interviewee from SAIA, these are skills that are gained through experience over and above a university degree.

Furthermore, many of these experts in the industry are older and exiting the sector without a proper transfer of this technical knowledge to recently hired graduates.

Secondly, with the technological advancements taking place in recent years, there is a growing technological skills gap. Technology allows companies both to offer more customised services and to reach more consumers. Employees need to keep up with these technological changes and insurance companies require new types of employees to take on emerging tasks relating to technological change. However, as the uptake of technological and workplace innovations by firms is slow-moving, there has not been a sufficient push to upgrade the skills of staff. In addition to the typical insurance occupations, there is now a need for more ICT-specifically skilled workers, such as data specialists, software and web developers.

2.1.5. Interrelated changes

Increasing globalisation and integration of South Africa into the world economy accelerates the diffusion of technological changes in the country's economy, and also that of South African innovations in other countries. For example, in the insurance sector, one of our respondents was invited to speak at an international workshop about the advancements surrounding the insurance data system. Discovery Insure, in particular, is making inroads in international markets through marketing its innovative incentive-based shared-value approach and entering into partnerships with global insurers to adapt this approach to localized conditions in other countries.

Demographic change is also influenced by the global economy through migration. South African youth and skilled workers are more easily able to leave the country, so skill and age distributions of the country and sector are changing in accordance with this. At the same time, technological innovations in the sector will require employers in the sector to have access to the pool of skills required to drive these innovations and their implementation. Both labour supply and demand are thus globalising actually or potentially. As an example of one response to this, our respondent from SAIA has noted that the sector has worked to include specific skills on South Africa's Critical Skills List via INSETA, the sector's training and education authority.

Furthermore, technological and demographic changes will impact inclusion in the sector. The changing skills requirements that result from changing demographics and adoption of technological innovations will make the reskilling of employees necessary. This entails ensuring that continuous learning is taking place. It is also important to keep in mind the potential impacts of these changes for inequality since the distribution of skills and access to technology is uneven and South Africa's history has created a tie

between racial background and access to education. As the insurance sector has a lower proportion of Black workers and a higher proportion of White/Asian/Coloured workers compared to the racial distribution in the general labour force in South Africa, it is important to ensure that skill-related changes do not exacerbate these inequalities.

3. Impacts

3.1. Skills

To ensure the successful adoption of technological innovations, organisations will either need access to a workforce with the necessary skills or will need to reskill current employees. There are two key skills gaps within the industry: The first relates to older employees with technical knowledge and experience exiting the labour market without passing on knowledge to younger graduates, while the second is related to the technological changes taking place in the sector.

Modise (2019) conducted semi-structured Interviews with 13 leaders in senior roles within the insurance industry (heads of business units and senior managers in human capital management and development areas), in order to provide an in-depth understanding of factors that are considered important in the success of reskilling insurance sector employees, especially for technological adoption and innovation during the 4IR. The report indicates that reskilling employees is influenced by both organisational culture and organisational structure.

Since senior management is often part of the older age cohort, with regard to organisational culture it is important for leadership to encourage continuous learning and development, so that employees can learn and effectively benefit from technology adoption. Our respondents agreed that the senior staff are typically much older and possess skills mostly gained through experience, but that these experienced individuals are *“exiting the insurance industry at the moment and have been for a while”* and *“there is hardly any transfer of knowledge into those technical skills and there is a lot of graduates coming in”*. Thus, a gap in the transfer of these technical skills is a problem in the sector. As a response to this, SAIA currently runs a mentor/mentee programme as a pilot solution where older, more experienced individuals transfer their technical knowledge and leadership skills to graduates.

With regard to reskilling and organisational structure, participants of Modise’s 2019 study highlighted the impact of technology within their business and how it has changed their product offerings, customer service and back-office operations. Participants agreed that reskilling of staff must be aligned with the strategy and vision of the organisation. As mentioned earlier in this report, according to our

interviewees, leaders within the insurance industry are aware of and share the belief that technological changes need to be taken advantage of and that the sector must adapt, despite the reluctance and slowness of some actors to adopt technological and workplace innovations.

While the focus in our interviews was predominantly on addressing technology-related skills gaps, the challenges in the sector appear to be twofold: Acquiring new skills requires training and/or recruitment of skilled individuals, and retaining existing knowledge and skills requires such skills to be continually filtered through to younger staff from those retiring or exiting the sector. Both requires continuous learning and re-skilling supported by appropriate training and learning interventions – and working conditions supporting the exercise of these skills.

Currently, a number of courses are offered to employees by insurance sector associations. A general sense from our interviews is that companies are making use of these course opportunities for their staff, in addition to company-specific courses. Apart from encouraging employers to upskill their employees, ISSA has offered courses that include a focus on digital transformation, critical thinking and problem-solving skills, and in September 2022 ran a course titled “Certificate Digital Insurer”. ASISA also operate an academy that aids in the education of current and prospective insurance sector employees. However, these courses are aimed at insurance-related skills and not information technology.

3.2. Employment and Job Quality

With regard to job quality, the onset of the Covid-19 pandemic has changed the way in which we work. These changes have also taken place in the insurance sector, and many of these changes will remain as part of a hybrid work environment and style in many companies. The pandemic has forced employers to make changes to work organisation, and although these changes were rushed and forced by lockdown measures, employees have experienced changes in job quality as a result.

Specifically, employees now typically have more flexibility of work hours and location of work, which is typically split between working from home or working in an office. Companies are also testing out new, more open office layouts that allow employees to collaborate in a more casual, less hierarchical way. This includes unassigned workspaces and shared areas for working together as a team. These physical changes are closely tied with changes in work organisation, which is usually less strictly supervised and controlled and affords employees more autonomy. However, as one of our interviewees mentioned, this places more responsibility on employees to meet work demands and deadlines.

Whether some of these changes are beneficial or not is hard to say, since many of these innovations and adoptions are relatively new to most companies. Although many of these changes are seen as positive, more time and research will be required to understand the full, long-term impacts of these changes on employee job quality. For example, flexible working hours may be considered positive, but may result in employees working more or less than they typically would, given that they do not have a set schedule. Similarly, working from home has many benefits, but one drawback is that it may be difficult for some employees to separate home and work. Previously, it may have been easier for employees to ensure work-life balance by having a separate work location. Even if commuting time can be saved, it may require time and adjustment for workers and companies to develop a healthy work-life balance with the new modes of working.

With regard to employment, our respondents agreed that discussions about potential job losses as a result of technological innovations in the workplace are important and unavoidable. They agreed on two potential outcomes in this regard. First, there will be some jobs that can be successfully and efficiently substituted by technology and AI, and although this is still in the distant future for South Africa, it will result in job losses. Second, there will always be consumers in the industry that prefer dealing with a human being and meeting or talking face-to-face. These preferences will be met, but typically remaining or newly developing customer-facing jobs will require the insurance-specific technical skills discussed earlier. As such, the proportion of employees that will remain employed within the sector will have to possess these skills and be able to adapt to technological change and a more technological workplace. This highlights the importance of continuous learning, upskilling and reskilling employees.

Discovery Insure offers an interesting case in its approach to employee engagement and organizational culture to incentivize innovation across the firm. Discovery's culture is similar to that of a tech-focused firm (like those investigated in this volume in Italian or Austrian manufacturing or Polish business services), which encourages constant innovation and generation of ideas among employees. Incentives for employees to innovate are part of the company's business model and mission statement. Staff are rewarded in a number of ways for participating and contributing to innovation in the firm. In this sense, innovation is driven through a culture which permeates the firm and is embedded within the jobs done by employees. This is positive for employee engagement and job quality on the one hand, and beneficial to the company on the other.

3.3. Inequality

Technological improvements have the potential to positively impact the insurance sector, typically in the form of improved product offerings and customer experience. These changes can be beneficial not only for the sector itself, but also broader society in terms of financial inclusion and risk mitigation. However, technological innovation may also increase inequality in its own workforce.

With regards to improvements in firms' offerings to consumers, technology has allowed for insurance firms to reach consumers that previously were not able to be served. Our respondents agree that, in general, technology has improved the coverage and penetration of insurance services across a wider range of customers and aided in reducing cost and improving affordability. Specifically, with regard to Insurtechs, *"consumption of the insurance actually matches the usage of the asset"*. Instead of a one-size-fits-all insurance product that typically has little variation from one customer to the next, these start-ups are able to offer *"episodic insurance"*, which allows for *"personalisation and customisation and this ability to construct your insurance solution around your needs"*. This has meant that there is now better access to insurance and financial inclusion for poorer households and individuals, which will have positive outcomes for inequality in the broader society.

With regard to employees and the impact of technological change, there is more to consider to ensure that inequality is reduced. In terms of employee demographics, the insurance sector has a majority female workforce, which is above average for the South African labour market. In terms of age, the distribution of employees in the sector aligns with the South African economy. However, there are two aspects that distinguish the sector from the South African economy at large, which appear to be linked. The first is that the racial distribution has a higher proportion of White and Indian individuals and a lower proportion of African individuals employed in the insurance sector. Second, the insurance sector has a high proportion of well-educated employees. In South Africa, education outcomes and race are closely related as a result of the country's past. The impacts of the apartheid education systems have persisted and are yet to be reversed. Thus, a large proportion of the country's population with lower educational attainment are from the Black and Coloured ethnic groups.

With the increased incorporation of technological innovations in the high-skills insurance sector, barriers to employment will remain and likely worsen for those from a disadvantaged background. Without a focused effort from the parties involved in the sector to improve the education and training of the workforce, racial inequality in the industry may worsen. The sector already suffers from gap in insurance-related skills gap which requires changes in South Africa's education system. However, a new information technology skills gap has now developed as well.

Discovery Insure's shared value approach offers an interesting case to consider in terms of broader societal benefits of innovation within the insurance sector. A key factor in the case of Discovery is that "data permeates" through all processes and products. The analysis of big data on customers and their behaviour that is able to be collected via telematics devices and smartphone applications feeds into the creation of incentives to pursue less risky behaviours in health or driving. Behavioural economics is combined with technology in the successful gamification of the insurance product. Discovery's "Vitality" programme is able to be applied to a variety of settings and is currently being implemented in a number of other countries. There as well, the telematics technology and the big data produced from its use make a difference in incentivising safe driving behaviour. This has created "better" clients for the insurer, enabled more savings and profits for the company due to fewer claims being made as a result of fewer and less severe accidents.

Beyond driving behaviour, Discovery places an emphasis on improving driving conditions. This is not only beneficial for clients, as improved road conditions will result in lower claims, less accidents and lower risk for clients, but simultaneously creates overall safer roads for non-clients and society. Discovery runs various initiatives with societal impacts. For example, in the Western Cape province, where bus accidents have been a significant problem, the company has applied the Vitality Drive programme to the school bus industry, which has improved bus driver behaviour and reduced such accidents (through an initiative called "Childsafe").

4. Conclusions

This case study has considered technological change and its effects on the workplace in the insurance sector of a developing economy, namely South Africa. With increasing globalisation and integration of South Africa into the world economy, technological changes within the country are quick to follow global trends or be influenced by those seen elsewhere, and vice versa, South African innovations can be scaled to other countries. However, demographic change and available skills are also influenced by the global economy through migration. South African youth and skilled workers are more easily able to leave the country, so skill and age distributions of the country and sector are changing in accordance with this.

We identified two key groups of firms in the insurance sector in the country, and adaptation of new technologies in the sector appears to be somewhat dualised. On the one hand, we have the well-established, older insurance firms that have been slow to adopt new technologies. On the other, we are seeing the emergence of what we call "Insurtech" start-ups. The latter group is known for making use of technological innovations, such as big data and AI, as a core part of their operations and product

offerings. While some incumbent companies are hesitant, not least due to the cyber-security risks associated with these types of technologies and the sector's traditional risk aversion, others are working through the aforementioned "Insurtech" start-ups via investments and financial backing to test and possibly incorporate new technologies into their operations.

For both of these types of firms, skill gaps are a major concern. In order to ensure the successful adoption of technological innovations, organisations either need access to a workforce with the necessary skills or to reskill current employees. There are two key skills gaps within the industry: The first relates to older employees with technical knowledge and experience exiting the labour market without passing on knowledge to younger graduates, while the second is related to the technological changes taking place in the sector. To address these gaps within the industry, changes in both organisational culture and organisational structure may be required to enable effective reskilling and skill upgrading of employees.

With regard to skills, another factor to consider for a developing economy like South Africa is the uneven distribution of skills and access to technology itself among potential employees. This makes the adoption of technologies in the workplace a difficult balancing act. Firms must balance the need to remain competitive with ensuring that the labour market – current and prospective staff – is on par with skills requirements of the sector. The uneven distribution of skills and access to technology in South Africa means that some disadvantaged groups may not be equipped to meet the needs of firms adopting advanced technological innovations. Then, these changes may increase barriers to entry to comparably skilled emerging jobs.

The pandemic has forced employers to make changes to work organisation, and employees are impacted by changes in job quality as a result. Whether these changes are positive or negative is not yet certain. However, technological improvements have the potential to positively impact the insurance sector in the form of improved product offerings, overall customer experience, and access to consumers that previously were not able to be served.

Ultimately, it is important for insurers to understand that technological innovations are inevitable and they will need to make use of them. For example, smart cars and homes incorporate a number of technological advancements and provide a number of data points that insurers can use to improve and target their own product offerings. Such innovations merge technological and workplace innovations. In the event that they choose not to keep up with such innovations within the sector, they risk becoming less competitive. Our interviewees have stated clearly that they do believe that these innovations are significant for the future of the sector's productivity. Notably, they and other studies (such as Modise,

2019) emphasise that complementary changes in organisational culture from the top down will be necessary to reap these gains.

Discovery Insure provides an interesting case of how innovation and technology can be used to both drive performance of an insurance company and encourage positive behavioural changes among customers (and also employees) which drive positive social outcomes. Discovery uses technological innovations, in particular big data analytics, to incentivize behavioural changes among the insured that lead to positive outcomes for individuals and the insurer – and broader society as well by reducing overall societal risk. The idea was first used in the company's older and more established medical aid scheme, which started the Vitality Health and Wellness programme. This programme is an add-on to the medical aid products, and it incentivises a healthy lifestyle through rewarding healthy behaviour.

This business model has now been transferred to the short-term insurance market, specifically car insurance and the introduction of the Vitality Drive programme. Much like the Vitality Health programme, Vitality Drive *“uses behavioural economics together with technology and data power to nudge clients”* and create benefits on an individual as well as societal level by improving overall driving conditions. Discovery has taken this model to the global market by partnering with insurers in other countries to design incentivisation solutions that are appropriate for local conditions in those countries.

Other insurers have not been as explicit about the social outcomes that have resulted from their technological innovations. Yet, the Discovery example makes a case for the potential of such innovations to drive positive change in societies that go beyond just the sector itself. However, it also highlights that for such positive outcomes to be achieved, a model of operation which links these outcomes to the operations of the insurer is essential. For Discovery, this has been made explicit in what the company calls the principle of *“shared-value insurance”*. The company actively seeks to innovate to provide solutions and products that generate benefits for multiple stakeholders which include clients, the insurer, and society as a whole. This ultimately benefits the insurer – but it is through the benefits to multiple stakeholders that this ultimate benefit to the insurer is realized.

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