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CHAPTER 8

INSURANCE IN THE ANTHROPOCENE: EXPOSURE, SOLVENCY AND MANOEUVRABILITY

Nicholas Philip Simpson*

0000-0002-9041-982X

Abstract

This chapter outlines how insurers are responding to emerging harmscapes and the potential role they play in the governance of climate risk. It illustrates a case study of how one short-term insurer is grappling with three general challenges facing the industry and its regulators, those of climate risk exposure, solvency and manoeuvrability. It describes the in-house deliberation of a sub-group of decision makers at South Africa's largest insurer, exploring their consideration of key practical and strategic issues relating to how climate change and climate variability will impact on their business. Workshops and interviews identified the Insurer's anticipation and evolving approach to future risks, which do not match well with the insurer's conventional and existing risk assessment approach. The chapter synthesises empirical observations of workshop discussions and interviews with the emerging literature on insurance and climate risk, the Insurer's performance reports and evolving regulatory developments. Contemporary constraints highlight the potential role of insurance regulators, augmented risk management approaches, client awareness, and carbon disclosure as potential means of facilitating adaptation. These observations highlight both the aspired for potential of the industry and insurer-specific obstacles to the role short-term insurers can play in climate risk governance.

Introduction

Buying insurance ostensibly makes one less vulnerable. It does not technically enhance capacity to endure harm, but it can fiscally compensate for that envisioned harm (Schwartz, 2019). The harm that insurance aims to safeguard against relates to our anticipation of a future and its anticipated risks. In this strict sense of exposure to harms, insurance does not protect or make safe. Yet insurance is an industry that is fundamental to the security that individuals and companies require in order to invest, grow and avoid

adverse disruption (de la Mare, 2013). Consequently, insurers are recognised as potential 'fulcrum institutions' with the ability to ameliorate the impact of environmental harms (Shearing, 2015), such as climate change, and influence public and private actions concerning associated risks (Phelan et al., 2020).

The insurance sector has been recognised as a critical actor in facilitating key mitigation and adaptation actions, and as a leading sector in terms of climate adaptation (Torabi, Dedekorkut-Howes and Howes, 2018; CoastAdapt, 2018). In addition, certain insurance products have been noted for their ability to set norms, for better or for worse (O'Hare, White and Connelly, 2016; Williamson and Nagashima, 2019), and in governing the lifestyles and behaviours of individuals and policyholders (Meyers and Van Hoyweghen, 2018; Beckie et al., 2019). This potentially affords the insurance industry access to influence people inside their home or business, where the power of the state and its potential role or ability to provide a securing function against harms, has conventionally been expected to end (Froestad et al., 2011). Seifert and Lindberg (2012) observe that insurers can promote a more sustainable future through better risk-based modelling and product pricing; through innovative green products; through partnering with businesses for better environmental governance; through alliances with policy-makers and regulators to ensure voluntary market adjustments for risk; and by championing the enforcement of building code efforts. This case study illustrates how one insurer in Africa (hereafter 'the Insurer'), is exploring how it can deal with a subset of these roles, through better risk-based modelling, product pricing and regulatory adjustments.

In light of the uncertainty associated with current environmental and climatic conditions, the insurance sector is, amongst other factors, currently facing technical challenges implementing envisioned proposals, by scholars like that of Seifert and Lindberg (2012) above, into business reality (Froestad et al., 2011; Herbstein, 2015; Phelan, Henderson-Sellers and Taplin, 2010). Further, exposure to more frequent and severe weather events, some of which are attributed to the Anthropocene (Keys et al., 2019; Schiermeier, 2019), give rise to more claims - reducing fiscal margins available for local innovation and research and development (Federation of European Risk Management Associations (FERMA), 2014; California Department of Insurance, 2018) and pose a threat to the ongoing viability of the insurance sector (Dlugolecki, 2008).

Uncertainty is a symptom of, and fundamental to, the current and anticipated future state of the Earth System in the Anthropocene (Mauelshagen, 2018; Steffen et al., 2018). Schwartz (2019: 87) has pointed out that although insurance cannot prevent harms, its conventional role in the governance of harms is securing 'a future by buying out uncertainty'. In Schwartz's (2019) view, insurance is traditionally based on a desire to reduce and control uncertainty. Critical of the apparently self-serving nature of the industry's response to augmented risks anticipated in the Anthropocene, Schwartz (2019: 88) believes insurers are not concerned with Anthropocene indicators, such a loss of biodiversity, starvation, or mass migration, and that rather their concern is 'diminishing predictability'.

Responding to calls for greater empirical understanding of how insurers are responding to enhanced risk (Paterson, 1999; Phelan et al., 2011; Berz, 1999), Herbstein (2015) identified how the commercial insurance industry responds under conditions of increasing uncertainty, particularly in light of 'debounded' risks. By 'debounded', Herbstein (2015) references Beck's (2010; 1992) notion of risk, which conceptualises augmented risks in a globalised and interconnected world, a notion of risk which fits well with the current understanding of the scale and unpredictability of risks scholars anticipate in the Anthropocene (Keys et al., 2019), where risks and their perception transcend temporal and geographical boundaries, potentially making them uninsurable (Bouwer, 2019). Herbstein's work has further highlighted the need for empirical understanding of how insurers in developing regions of the world are responding to the emerging challenges they face (Herbstein, 2015). Although largely ignored till recently, such areas have become increasingly important to scholars, considering the global reach of insurers for the governance of climate shocks.

Insurers have two sources of revenue: underwriting and investments. There is a longstanding assumption that the most straightforward approach for insurers to respond to Anthropocene risks might be management of investment portfolios (ClimateWise, 2019). However, Herbstein (2015) identified how commercial insurers have mainly responded to climate risk through adaptation of their business - mainly through the use of what he calls 'defensive underwriting' to limit their exposure to financial risk, rather than investment portfolio changes. Herbstein (2015) notes that insurers are finding their existing risk assessment tools progressively out-dated in a world where risk is no longer as predictable as it once was. In effect, Herbstein (2015) found insurers are pursuing

responses focused largely on tweaking their existing ways of engaging risk, including managing their own risks by incentivising others to manage theirs.

Scholars have pointed to the way insurers govern how people (should) act, who qualifies for protection, how to allocate blame and responsibility and help to develop systems of surveillance, monitoring and policing (Ericson et al., 2003; Ericson and Doyle, 2004). Although recent regulatory advances hold potential benefits for the general robustness and solvency of the industry, (such as those recently proposed by the California Department of Insurance (2018)), political pressure on their role and function can result in artificially low insurance premiums in order to please stakeholders such as property developers or local municipalities (Herbstein, 2015). Following Hurricane Katrina, for example, regulators in Florida, under pressure from the local electorate facing sharply higher insurance premiums, forced the industry to maintain rates at well below sustainable levels. This led to many insurers withdrawing from the market, impacting not only their own operations, but also the vulnerability of local homeowners, many whom were left without adequate cover (Grace, Klein and Liu, 2005).

Globally, 2017 and 2018 brought the costliest back-to-back years on record for both economic losses solely due to weather-related events ($653 billion), and for insured losses across all perils ($237 billion) (AON, 2019: 1). Of 349 individual events, AON identified 42 individual billion-dollar natural disaster events that occurred in 2018 (AON, 2019: 1). Climate change has thus become a multi-faceted material risk for the $4.6-trillion global insurance industry (California Department of Insurance, 2018). In less developed parts of the world, victims often have little to no insurance cover. Munich Re have recently highlighted that poorer countries that have experienced disasters often take years to recover (Munich Re, 2019). The loss in Mozambique after Cyclone Idai is equivalent to around one-tenth of the country's GDP (Munich Re, 2019).

Some global insurers have begun partnering with the scientific community to perform basic research and help build forward-looking risk models that take climate change into account. Since 1999, reinsurers have been driving this research agenda through the Resilience Alliance and this has resulted in a number of industry-wide innovations, such as the Carbon Disclosure Project (CDP, 2020), Principles for Sustainable

Investing (PSI) (UNEP-Fi and PSI, 2019), and the Task Force on Climate-related Financial Disclosures (TCFD, 2017). However, these notable examples of progress in the industry can detract from the underwhelming lack of progress called for regarding climate risk attribution. Despite significant endeavours (for some examples, UNEP-Fi and PSI, 2019; Phelan et al., 2011; Phelan, 2011), 20 years later insurers' modelling techniques remain unable to provide usable models that integrate the broad implications of climate risk (Spreng, Sovacool and Spreng, 2016; Thistlethwaite and Wood, 2018).

This chapter focusses on an insurer faced with a variety of socio-economic stressors in its base in South Africa, together with operations in 32 African countries and three Asian countries, including India. Its short-term division is currently engaging with understanding, responding to and anticipating the material risks of climate change. The analysis here acknowledges calls by Herbstein (2015) and others (Bougen, 2003; O'Malley, 2003) for clarification of how insurers are responding to enhanced risk. The Insurer's short-term division was chosen in part due to the ongoing research access it provides to our research group at the Global Risk Governance Programme, but also as it allows for analysis of a particular type of risk carrying and risk management - one that responds to claims at a high frequency (monthly and annual terms) - to be more concretely explored. It is hypothesised, in light of an absence of insurers' mitigative actions concerning their investment portfolios (Herbstein, 2015; Phelan et al., 2011; Phelan, Henderson-Sellers and Taplin, 2010), that actions taken by short-term insurers - those ostensibly cognisant of emerging increases in the frequency of climate-related claims - might provide insight into how insurers are adaptively managing risk and therefore illustrate the risk governance role some insurers may be beginning to play in the Anthropocene.

Local Responses: A case study from South Africa

The African insurance market is underdeveloped (KPMG, 2018) and, in total, the African insurance industry accounts for just under 1.2 per cent ($0.06 trillion) of insurance premiums written globally (PWC, 2018: 12). The African market is dominated by South Africa, which accounts for 74 per cent of the total (PWC, 2018: 12). Even so, at only 17 per cent insured, the South African market is under-insured by

global standards (PWC, 2018: 12). This has led to calls to speed up insurance penetration to the un(der)insured across the continent (PWC, 2018).

Compared to the rest of Africa, the South African insurance market is highly competitive and more mature, dominated by a few large players, aided by relatively strong institutions and a sound regulatory environment (PWC, 2018). As such, the South African Insurance Association (2018: 4) claims the industry has an important role to play as a 'safety net and risk adaptation partner' to customers and other stakeholders. The Insurer under investigation here accounts for approximately 25 per cent of the South African insurance market, positioning it as the largest insurer in the largest and most comprehensive insurance market on the continent (Insurer, 2019).

The Insurer was the first in Africa to mobilise the short-term insurance industry in response to increasing climate and weather risk (Insurer, 2017). In 2009, the Insurer embarked on an 'Ecocentric Journey' as growing awareness of environmental concerns matched an increase in climate-related losses (Herbstein, 2015). Hosting an 'Ecocentric Journey' conference for the industry that year, the Insurer positioned itself publicly as a leader in issues relating to climate risk. It sees climate-related catastrophe events, particularly when coupled with developmental concerns such as rapid urban growth, municipality capacity constraints and insufficient infrastructure development, to have a potentially severe impact on its business and the industry at large (Insurer, 2017). In recent years the company had been exposed to a number of environmental perils that have caused significant losses. This included floods and droughts, fires, coastal erosion and increasingly frequently, from lightning strikes and hailstorms. Between 2003 and 2008, more than R 2.5 billion ($ 222 million) worth of total economic losses occurred, of which R 60 million ($ 5.4 million) was paid out, via insurance claims, by the Insurer alone (Herbstein, 2015). Unprecedented losses have also recently been experienced in South Africa with the 'worst catastrophe event in South African insurance history' accounting for R 823 million (approximately $ 60 million) paid out for damage caused by wildfires in Knysna and freak storms in Cape Town in 2017 (Insurer, 2018: 8). A further R1.1bn (approximately $ 80 million) was paid out for floods and hailstorms that year (Insurer, 2018: 8). As a result, South Africa is no longer considered a benign natural catastrophe territory by international reinsurers, who have raised the price of reinsurance (South African Insurance Association (SAIA), 2018). The Insurer's underwriting margin decreased slightly between 2016-2018 as the group was

significantly affected by these catastrophe claims and large commercial claims (KPMG, 2018).

The Insurer understands climate change to be one of the future drivers shaping its business model and a risk that poses an existential threat to the industry (Insurer, 2019). In 2007, the organisation explicitly listed pace of adaptation to climate change as one of the key 'material matters' relevant to the company and stakeholders, demonstrating how the organisation kept pace with emerging global thinking around climate change and insurance at the time (such as that of Mills, 2007), subsequently listing climate change as a significant strategic risk in their *Integrated Reports* from 2017 onwards (Insurer, 2018: 15–16). It is acknowledged that the 'material matter' of climate change and its effects directly affect the 'ability of [The Insurer] to be agile in responding to emerging challenges and opportunities' (Insurer, 2018: 14).

In order to illustrate the decision-making tests the Insurer faces, the following section sets out three challenges: (i) climate risk exposure, (ii) solvency, and (iii) manoeuvrability. These challenges were observed during discussions at the Insurer's climate risk workshops and interviews with risk managers carried out in the first half of 2019. These themes are relevant beyond the Insurer's own deliberations: climate risk exposure (ClimateWise, 2019; Insurance Business, 2018; AON, 2019), solvency (Steffen, 2008; Turnbull, 2018) and manoeuvrability (Glaas, Keskitalo and Hjerpe, 2017), have been identified as key challenges to the industry the world over. In addition, the Insurer has a globally recognised leadership role related to climate risk. This positions its decision making and actions at the forefront of what African insurers are doing.

In January 2019, in an externally facilitated two-day workshop, the Insurer explored material risks relating to their commitments to the Task Force on Climate-related Financial Disclosures (TCFD). In March 2019 a group of scientists from the University of Cape Town's Climate Systems Analysis Group (CSAG), Africa Climate Development Initiative (ACDI), and Global Risk Governance Programme deliberated with the Insurer's risk professionals over a further two-day workshop, exploring the available climate science data and models, as well as the Insurer's approaches to risk and modelling. The workshop explored how the respective risk data and models can be used to understand the current and future climate risk impacts on the Insurer's business

and its stakeholders, and to develop future scenarios to assist in the determination of the appropriate governance, strategy, risk management and targets, and responses for the Insurer. In addition to engaged participant observation of the presentations, risk identification activities, discussions and feedback sessions at the two workshops, one-on-one interviews were conducted with four senior risk managers during and after the second workshop with those risk managers who expressed day-to-day engagement with innovating the Insurer's risk assessment and management of flood risk. Interviews concentrated on themes of climate risk exposure and what actions the Insurer is taking in response to enhanced climate risk.

Exposure

The Insurer has made a number of responses to climate risk exposure, most of which relate to taking a leadership role in the industry on climate risk (UNEP-Fi, 2019; TCFD, 2017), as well as managing proximate risks in the municipalities where they are exposed (Insurer, 2017; 2019). Workshop discussions confirmed that despite progress in climate modelling (Dosio et al., 2019), current climate models can only provide high-level probabilities at temporal scales of decades, covering vast regional geographies, while short-term insurers require information to make decisions commonly within an annual timeframe and require that information to be as locally specific as possible as they insure buildings, cars, ports and farms. Current models (such as the CORDEX model, Dosio and Panitz, 2016), are currently insufficient as an information base for short-term insurer's decision making at property scale (Mechler, et al. 2019).

In line with TCFD expectations, the Insurer is supposed to 'demonstrate responsibility and foresight in their consideration of climate issues' (TCFD, 2017: 2). Risk identification therefore holds potential to signal the kinds of harmscapes insurers are anticipating. Fleshing out the physical and broader indirect physical impacts, the Insurer has identified and categorised how risks are or will likely manifest with direct impact on their insurance business as well as on their clients. Herbstein (2015) had previously found that the Insurer had been forced to redefine flood lines from 1-in-50 to 1-in-10 year events, in order to accommodate shifts in flood frequencies. Herbstein (2015) observed that, from an underwriting perspective, Geographic Information System (GIS) models were quickly identified as an ideal response to the inherent weakness of the actuarial models to the challenges the Insurer was facing. However,

one of the shortfalls of the GIS models they applied was that, although they started to identify the properties likely to be most impacted by specific Anthropocene perils, such as flooding, they failed to account for how or why the floods occurred in the first place, how the risks were likely to change over time, as the variables shifted, and how the perils could be better managed (Herbstein, 2015).

Interviews with flood risk managers demonstrated that the endeavour for more fine grain and adaptive GIS-based modelling is evolving within the organization through their approach to geocoding risk and development of a vast flood lines data set. Hydrologists and risk managers developing this programme revealed that this programme is still in its infancy, as insurance premiums are still generally calculated according to more coarsely-grained proxy indicators, such postal code or suburb, rather than directly on geophysical risks at such spatial scales. However, as Figure 8.1 below shows, the Insurer is exploring how flood lines and other physical characteristics can be spatially integrated to risk assessment and management.

<**Insert Figure 8. 1 in here**>

(**Figure 8.1:** Geocoding risk)

Figure 8.1 indicates a hypothetical 20km cross-section of a suburb that includes an estuary. Previously there was no way for insurers to systematically nor proactively differentiate between degrees of risk across this profile, apart from on a claim-by-claim basis. However, being able to map slope and flood lines are critical for flooding and land subsidence calculations. This is achieved through a two-step process, as indicated in Figure 8.1.

Step 1 suggests that analysis of historical loss data can be mapped onto such a transect, or along selected topographies, affording risk managers the opportunity to identify high- and low-risk areas and make more informed calculations of risk. Step 2 is a scenario-building exercise that can be used to anticipate shifts in risk across a topographical profile. Of great interest to risk managers is (a) identifying areas of stability and low risk, such as those hypothetically indicated on the right side of Step 2, (b) understanding areas of transitional risk, and (c) identifying high-risk areas, which either need to be priced accordingly or managed off their books. This endeavour aims

to calculate risk and cost of premiums with greater accuracy. It potentially allows the Insurer to avoid exposure to the riskiest assets, make use of deductibles and excesses, diversify its risk exposure or simply withdraw from the highest risk markets altogether (Herbstein, 2015). An example of this was displayed in an interview, which revealed that the municipality of Cape Town had called in one of the Insurer's senior flood risk managers to informally request the Insurer to stop 'managing' risk (withdrawing cover from particular zones), as their actions were affecting property prices and the municipality's rates base in the Strand region of Cape Town. Although anecdotal, there is good reason to expect such moves by a local government. Generally, flooding in coastal areas lowers property values (Belanger and Bourdeau-Brien, 2018; McGregor and Spicer, 2016). If flood risks were directly related to costs, there should be a reduction in land and housing values in such floodplains (Lamond and Proverbs, 2008). However, Armbruster, Zischg, and Andreas (2018) found that when insurance is available for such areas, on the contrary occurs. When flood hazard maps are introduced into legally binding municipal landuse planning in multiple jurisdictions across the world, municipality assessed property prices increase (Armbruster, Zischg and Andreas, 2018). There is likely many reasons for this increase (land buyers imperfectly foresee the construction process of houses and relevant flood risks, when they buy land and people commonly underestimate flood risk) (Armbruster, Zischg and Andreas, 2018), but it is likely that revenue collection for the municipality plays an important role. Such actions, however, by local governments can induce moral hazard, increasing the eventual cost of flooding to the wider community (Lamond and Proverbs, 2008).

This approach highlights the role of GIS in the Insurer's move towards a more centralised approach to risk assessment and management, as it aims to both improve the quality of data collected and automate as many parts of the underwriting process as possible. Herbstein (2015: 75) observed the Insurer's initial transition away from a large network of semi-autonomous regional offices and brokerages (conventionally decentralised), to one of more central 'control', where they might be 'more consistent underwriting results and to gain access to all the data it needed to fully understand the changing risk landscape it was being exposed to.'

In mature insurance markets, regulators will generally attempt to prevent a scarcity of available insurance, and one way they do so is by disallowing an insurer to leave a particular market on the threat that if the insurer does so, the commissioner may

penalise or discontinue the insurer's license to write any line of insurance (de la Mare, 2013). However, market penetration in Africa is so low, insurers and their regulators face a unique arrangement. For example, South Africa has the highest rate of short-term insurance in Africa, and yet only 17 per cent of South Africans are insured (KPMG, 2018). In light of the regulator's conventional role to facilitate available insurance, it will be interesting to see how insurers manage their exposure while attempting to expand insurance markets and to what extent regulators will allow insurers to manage out 'bad' climate risk. In their current formulation, it is unlikely that such actions by insurers would have a positive effect for distributive justice (Bouwer, 2019; Grace, Klein and Liu, 2005).

Solvency

Climate risk and its harmscapes present a solvency challenge to insurers, challenging the amount and sources of capital in the business, as well as potential future regulatory capital requirements in response to climate perturbations of the insurance market. During workshop discussions, the Insurer's Head of Strategy flagged climate risk to be a question of solvency and one serious enough to threaten the existence of the organisation within a decade. Price (the premium that should be charged to a policyholder), reserves (the amount set aside in order to pay claims) and capital coverage ratio (or solvency amount: the capital requirement for regulatory solvency purposes considering both the liability and assets of insurers) are all monitored through the Insurer's quarterly Group risk appetite, which is drawn up by the Enterprise Risk Management (ERM) and Financial Risk Management (FRM) teams, then approved quarterly by the Insurer's Board (Insurer, 2017). In general terms, the Insurer acknowledges that climate change will impact their operating environment. However, deliberations in the workshops revealed that active risk management, like its geocoding exercises discussed above, although cognisant of experienced variations in historical loss data, was not calculated in accordance with specific climatic scenarios and rather based on loss ratios and price of premiums of the previous year and in light of general historical loss data.

This solvency imperative brings sharply into focus that climate variability and climate change will likely pose an existential threat to those insurers not making provision for such enhanced risk. Further it opens up a challenging new praxis of establishing and

justifying what this solvency amount could or should be, what a commensurate risk appetite should be, and how capital coverage ratios relate to or are informed by climate prediction probabilities and uncertainties.

de la Mare (2013: 235) has cautioned that

> [a]s the pressures of climate change increase, if the global insurance system does not develop the necessary internal structures to spread risk as efficiently as possible, two possible outcomes will emerge: insurers will become insolvent due to not being allowed to charge adequate premiums, or they will have to leave markets due to the markets being unable to afford the actuarially-true premiums.

The Insurer group's economic capital requirement, at 31 December 2017, amounted to R 6 billion ($430 million), an economic capital coverage ratio of 158 per cent (Insurer, 2018). The Insurer's board of directors generally targets an economic capital coverage ratio of between 130 per cent and 170 per cent (Insurer, 2018). An amount determined to be 'excess capital' is maintained (i) to make an allowance for risk based on the complexity of the underlying business, (ii) to maintain a margin over the current regulatory capital requirements, (iii) to maintain the Insurer's insurer financial strength credit ratings, and (iv) to fund business growth and allow for any corporate actions (Insurer, 2018). These four stated capital allocations are imperative for the sustainability of a conventional insurer business model, yet each is subject to unpredictable climate risks. The organization's commitment to 'efficient capital management' may need to be revised to allow for an enhanced margin. Philosophically and pragmatically, imperatives of 'capital efficiency', allocating capital to its most productive ends (Reuss, Russ and Wieland, 2015), run contrary to and rarely tolerate holding large reserve capacities that risk-based solvency frameworks such as Solvency II now require (Reuss, Russ and Wieland, 2015). Yet, in the face of uncertainty, climate risks are increasingly alerting risk managers, from a diverse range of fields with responsibility for the sustainable finance of an entity, to consider revising their approach and assumptions of how much and what type of reserves are needed (Simpson et al., 2019). Although the identification of solvency challenges was a noted outcome of the workshops, how the Insurer will make such provision calculations remains to be determined.

There have been global calls for the development of comprehensive legal structures to address climate change risks, together with warnings that a failure to enact such a

structure may leave the insurance industry unable to deal with catastrophic loss from climate change-related risk (de la Mare, 2013). Recent regulatory developments in South Africa have demanded insurers' solvency and capital requirements correspond to international standards (Insurer, 2018; KPMG, 2018). At time of writing, the Insurer is still undergoing the regulatory accommodations of Solvency II (such as a revision of the Insurer's solvency capital requirement) and the organisation recognises that the global industry faces tighter regulatory regimes (Insurer, 2019). While the South African regulator imposes new standards on the domestic industry (not necessarily specific to climate risk), regulators across the world are setting new precedents for insurers to quantify their climate risk.

One noteworthy example internationally has been in response to wild fires in California, where the Californian Insurance Commissioner led as the first United States financial regulator to undertake climate-related scenario stress testing of insurers' reserves (California Department of Insurance, 2018). This came out of the regulator's recognised 'responsibility for monitoring the financial condition of insurers, including both their assets and their liabilities and risks thereto, and helping maintain the availability, affordability, and adequacy of insurance for consumers' (California Department of Insurance, 2018: 5). It remains to be seen whether these kinds of strength tests and climate-related scenario testing will become the norm and expected by regulators and prudential authorities more widely.

Manoeuvrability

In short-term or retail insurance contexts, customers generally do not understand climate risk as a contibuting component of the premium they pay (Hudson et al., 2016; Li et al., 2017; Botzen and Van Den Bergh, 2008). This militates against one insurer increasing premium costs in order to price climate risk into short-term insurance products, when competitors do not also do so. The Insurer explained that the insurance market, particularly in under-insured markets like South Africa, is often a 'race to the bottom', where competitor insurers aim to marginally undercut each other and convince clients of the value of their product offering. Clients will often switch between insurers based on price without full consideration of the comprehensiveness of the cover offered nor the risk factors behind that pricing of premiums. It therefore makes it very challenging for one insurer to act alone, based on their internal understanding of climate

risk and increase premiums in accord with their calculation of the full risk. Further, if these calculations are based on climate scenarios and people are notoriously unaware of their present, let alone future risk, such costs would likely be seen as exhorbitant by the consumer. The Insurer expressed therefore that they could not risk pricing their products outside the status quo of the non-climate priced insurance market.

During workshop discussions it was identified that this is further hampered through regulatory controls designed to prevent collusion; these same regulations prevent insurers from acting in concert, for example, to include a percentage of premiums for climate risk, which could be passed on to the consumer. This is thought to present proactive and climate risk-aware insurers with a first mover disadvantage. In addition to a threat of losing clients, it can also create a market niche for predatory insurers with higher risk appetites prepared to consider climate risk without the same degree of caution in their risk management approach. It is conceivable that such insurers could simply declare bankruptcy rather than honour claims when major insured climate losses manifest. Workshop participants were quick to point out how two insurers in South Africa did not survive the 2017 claims season for this very reason (see CFO South Africa, 2018). In light of these developments, the degree to which consumer choice may change with greater climate risk awareness will be an increasingly important research agenda for insurers with lower risk appetites.

One potential way that has been proposed to overcome this lack of manoeuvrability and pricing flexibility for insurers, acting alone or in collusion, is for the regulator to place a range of climate risk governance demands on all insurers within their jurisdiction, such as those proposed by the Californian Insurance Regulator (California Department of Insurance, 2018). In such a case, premiums may not explicitly have climate risk priced into them but premiums will likely rise in cost, reflecting increases in due diligence burdens common to all in the market. Climate risk can then be indirectly priced into the business model with costs past onto the market.

Conclusion

This chapter illustrated the challenges of climate exposure, solvency and manoeuvrability for a short-term insurer as it grapples to accommodate and implement current climate knowledge into their business. These challenges have been presented

as they emerged out of the Insurer's deliberations on climate risk, together with consideration of associated regulatory developments. Although regulation is the number 'one factor influencing underwriting, and the number one factor in terms of risk severity' (de la Mare, 2013: 247), and one of the most notable challenges currently facing insurers, particularly South African insurers (KPMG, 2018), this case exemplifies what has been noted elsewhere: that climate risks globally and their governing responses by short-term insurers have generally outpaced the development of prudential regulatory or legal frameworks in most regimes (de la Mare, 2013).

The enhanced unknowns of climate variability and change of the Anthropocene present augmented challenges to the insurance sector as a whole as it contemplates the implications of evolving climate risk. This case has illustrated how historic data is still used in risk assessment and management, yet becomes increasingly less helpful for insurers (Bouwer, 2019; Nel, Shearing and Reyers, 2011). This elevates the importance of cautions that the insurance industry may find itself unable to effectively analyse the risks it faces, undermining both the profitability of industry and the role it plays in society (de la Mare, 2013). In the workshop and interviews participants identified how climate change presents novel and future risks, with a range of associated harmscapes, which do not match well with the insurer's conventional and existing risk assessment calculation practices. Although highly desired, the interpretability and translatability of current climate science into the insurer's business is demonstrated in this case to be a far more complex and problematic task than previously assumed. The Insurer demonstrates that this potentially requires a multitude of risk-specific recalibrations to find where 'good risk' is in the Anthropocene, and dynamic modelling of where it might emerge or change. The case demonstrates entrenchment and elaboration of what Herbstein (2015), in a thesis with the instructive sub-title, *Like a Frog in Hot Water*, identified as 'defensive underwriting' in the Insurer's response to climate risk through adaptation of their business.

The potential manoeuvrability of one insurance company, acting alone and proactively is displayed in this case to be significantly constrained by market competition as well as global insurance pricing trends. Such constraints highlight the potential role of insurance regulators, client awareness, carbon disclosures and cooperation with other market players in order to accommodate such pricing shifts or flexibility. A shift in insurance coverage may have larger societal risk management implications, particularly

for African countries with low insurance penetration rates. At a time when society requires greater insurance penetration, likely at higher premiums, the potential vulnerability of currently uninsured entities militates against their future coverage and protection against climate harms.

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