

## **BLACK SWAN EVENTS, COVID-19 AND ITS STRUCTURAL IMPACT**

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### **ABSTRACT**

*Black Swan Events (BSEs) are those unplanned events that significantly and negatively impact various aspects of human life over a short period. The COVID-19 pandemic and the Global Financial Crisis in 2008 (GFC) have been considered by many as Black Swan Events. This study set out to investigate these events as either BSEs or non-BSEs by interviewing senior level officials and professionals to identify various structural changes that these events impacted. From the study, it was identified that many of the professionals identified these events as BSEs. However, a few suggested they are non-BSEs, and this study further evaluated the dissenting views and considered the changes these events have had on the economy of Australia. Some of the changes from these events can be identified in climate change, changes in social interactions, changes in market and commerce and changes in various government policies.*

Keywords: Black Swan Events, COVID-19, GFC, Structural Changes, Australian Economy

### **1.0 INTRODUCTION**

Events, either planned or unplanned that happens in economies have various impacts and effects on different sectors and human life. Events that are unplanned and mainly impossible to premeditate tend to have harsh and negative repercussions due to their volatility. Such events can be either described as Black Swan Events (BSEs) or not.

The recent occurrence of various events that could be classified as BSEs has heightened the interest of researchers and policymakers in understanding BSEs. There have been studies on BSEs by various scholars, most in defining BSEs (Aven, 2013; Taleb, 2008) and types of BSEs (Higgins and Perera, 2016; Aven and Krohn, 2014). Studies seeking to classify experienced events as either BSEs or otherwise are limited. Various events classified as Black Swan Events have happened in history, with more recent ones being the Global Financial Crisis (GFC) in 2008 and the COVID-19 pandemic.

The recent happenings with COVID-19 and GFC have prickled the interest of the authors of this study to understand whether these events could be classified as BSEs from the perspective of senior level property industry personnel. This study aims to identify whether COVID-19 and GFC are BSEs and consider their impact structurally on the economy in Australia. This study will contribute empirically to existing literature and augment literature on the understanding of black swan events and structure change.

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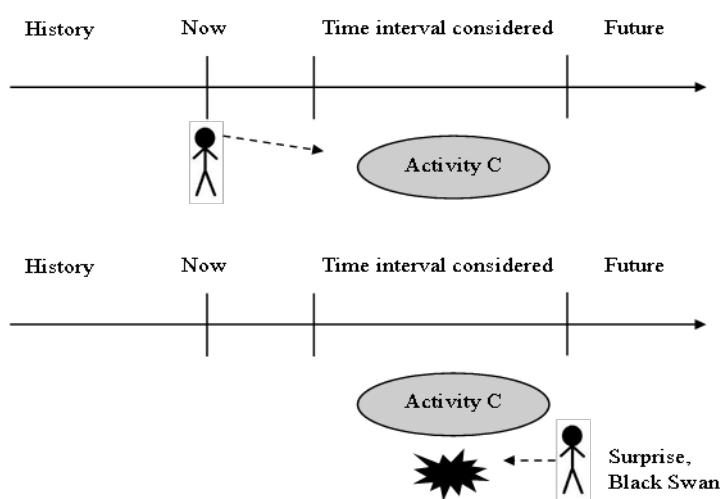
The paper first presents an overview of the extant literature on the topic. Then progresses to describe the methodology used in the research. The findings are discussed, and the paper concludes with some recommendations.

## 2.0 LITERATURE REVIEW: BLACK SWAN EVENTS

### 2.1 Definition

The sighting of the first black swan in Australia illustrates the fragility of knowledge, as everywhere else in the world believed all swans were white. The black swan metaphor has gained increased attention in the risk management field following the publication of ‘The Black Swan – the Impact of the Highly Improbable’ by Nassim Nicholas Taleb. Black Swan describes random events with three key characteristics: “First, it is an outlier, as it lies outside the realm of regular expectations because nothing in the past can convincingly point to its possibility. Second, it carries an extreme impact. Third, despite its outlier status, human nature makes us concoct explanations for its occurrence after the fact, making it explainable and predictable” (Taleb, 2008 p. xvii). These characteristics of BSEs can be summarised as rarity, extreme impact, and retrospective predictability. Similarly, Aven (2013) defines a Black Swan as a surprisingly extreme event relative to one’s belief and knowledge. Figure 1 illustrates this surprising aspect from a micro perspective.

**Figure 1. The Black Swan’s Surprising Aspect: Micro Perspective**



Source: Aven (2015)

Let Activity C denote the consequences of the activity concerning values such as life, health, environmental care, assets and the like. Risk assessment of the activity is conducted at present, and as time goes by, C may be realised. If the consequence deviates from the risk assessment, it becomes a surprise as illustrated in Figure 1. Such a surprising accident is a Black Swan event that the risk analyst had not predicted a priori.

### 2.2 Types of Black Swan Events

There is a growing significance of BSEs around the world. The first step is to peel back the elements, explain the types of BSEs, and construct a framework around the categories. These BSEs can be grouped into three

types: (i) natural, (ii) artificial, and (iii) hybrid disasters. Natural disasters are catastrophic events resulting from natural forces, unplanned and socially disruptive events with sudden and severe effects. This is often termed ‘Acts of God’ where there is no human control – Hurricane Katrina, Ebola outbreak, and Nepal earthquake.

In contrast, unnatural disasters are those catastrophic events that result from human decisions (Ibrahim, 2007; Turner & Pidgeon, 1997). These can be sudden or over a more extended period and include socio-technical disasters due to accumulated unnoticed facts generated from the interaction between internal and external factors – Chernobyl, Long Term Capital Management (LTCM) Fund collapse, GFC (Higgins & Perera, 2020).

While hybrid disasters result from both human error and natural forces, these could include deforestation resulting in soil erosion and subsequent heavy rain causing landslides; floods ravaging communities built on a known floodplain; locating residential premises and factories at the foot of an active volcano, or in an avalanche area (Ibrahim, 2007). Therefore, BSEs lead to risks for all sectors, including the residential property markets in different countries. These risks are downside risks because they cause significant adverse impacts to an economy and by extension, the housing market of a specific country.

### **2.3 Structural Changes**

A structural change implies a change in the economy’s structure in one or more dimensions primarily concerned with the distribution of output across sectors, industries, states, or regions. Since these segments of the economy are mutually interdependent, drivers of structural change that directly impact a particular sector/industry may have significant repercussions on another. In conjunction with compositional change across sectors, transformations of the economy related to the geographic distribution of activities, the workforce, and the population may also exhibit structural changes (Connolly & Lewis, 2010; Downes & Stoeckel, 2006; Productivity Commission, 2013).

According to Prescott (2006), there must be a change in one or more of three key variables: endowment, technology, and preferences. Endowment refers to the factors of production available to the production process at a point in time. Technology includes the knowledge embodied in the hardware and intangible factors such as management practices and know-how. The preferences refer to the consumer’s utility level for different goods and services in different quantities and combinations. The fourth, ‘institutions’, is often added to the above three economic fundamentals, which refers to the set of laws, rules, regulations, governance frameworks, and policies that constrain or encourage the acts of production and consumption (Productivity Commission, 2013).

Generally, structural changes are measured over the medium to long-term, even though short-term shocks are common, such as changes in capacity utilisation, lumpy investment, market bubbles, cyclical crises, natural disasters, and other irregularities. As a result, there is a risk that measuring structural change over a short run could provide an inaccurate picture of economic transformations. Medium to long-term structural changes can happen with varying intensity. Some occur gradually over time, such as population ageing, rising educational

attainment, or resource depletion. Another set of structural changes may occur rapidly, such as innovations, policy decisions, or international developments such as a financial crisis (Productivity Commission, 2013).

### **3.0 METHODOLOGY**

In achieving the objectives of this research, the study employed qualitative research methods and concepts (Creswell, 2014; Johnson & Onwuegbuzie, 2004). The research is exploratory and aimed at understanding BSEs. It is argued that interviews are the optimal method for obtaining information from industry experts. When attempting to comprehend a phenomenon from the perspective of those who have experienced it, interviews are a rich source of knowledge. Interviewing is a strategy for obtaining qualitative data by eliciting information from interviewees on multiple topics, themes, and questions through open-ended questions (O’Leary, 2014). An interview is a principal method for obtaining primary data for this study. The interview method was fluid to ensure interviewees felt involved and contributed information freely. It was beneficial to have an interview guide outlining the questions that must be asked and how to establish a conversational interview. According to Yin (2003), a researcher in an interviewing process must stay in the line of study and simultaneously ask conversational-style questions impartially. The interview was accompanied by an interview guide with a pre-set list of questions that served as a reference point for the data collection. Robson (2002) indicates three types of research interviews: fully structured, semi-structured, and unstructured, and this research utilised a face-to-face semi-structured interviews approach. However, some respondents preferred using a digital platform for face-to-face semi-structured interviews. Consequently, some interviews were conducted using MS Teams as the digital platform. Thus, researchers were able to conduct face-to-face interviews at respondents’ places of employment, where possible, and used digital channels where face-to-face was not possible.

Despite the availability of an interview guide, this form of interviewing enabled us to ask respondents more in-depth questions depending on their earlier responses. Face-to-face semi-structured interviews allowed for a comprehensive examination of the drivers of house prices, BSEs, their impacts, and the deployment of strategic measures to deal with the effects of BSEs.

Interviews with 14 senior government official, senior industry professional and industry experts were conducted for the research. In qualitative research, there are no specific sample size criteria (O’Leary, 2014). However, it is common to encounter small sample sizes when employing purposive sampling (Teddlie and Tashakkori, 2009). Due to this, the sample size of 14 is enough for this investigation, and comparable sample sizes have been used in other studies. Furthermore, the saturation strategy was used to decide the suitability of the number of interviews conducted. The respondents were chosen based on their expertise, experience, and knowledge. The semi-structured interviews occurred between 4th May 2022 and 30th June 2022. They were recorded and transcribed into Microsoft Word files, and the responses were coded for analysis. The procedure for coding involved assigning codes such as R1, F1, I1, and A1 representing regulators, financial institutions, industry experts, and academics, respectively.

## 4.0 FINDINGS AND DISCUSSION

The views of senior level property professionals were considered crucial in this study, and their understanding of BSEs and classification of COVID-19 and GFC as BSEs were sourced in this research. The industry experts shared their views on what BSEs are and what type of events they classify as BSEs and what events they classify as suitable for structural changes. From the findings, it was identified that most of the experts clearly understood what black swan events entail. Additionally, most experts classified COVID-19 and GFC as black swan events. However, a few suggested otherwise, and these views and comments of the experts are discussed further in this section.

### 4.1 Understanding Black Swan Events

Interviewees were asked about their understanding of BSEs. This was to assess the respondents' awareness and appreciation of BSEs. The data shows that words consistently used to describe Black Swan events were 'unexpected', 'not experienced', 'unknown', 'disruptive' and 'unique'. Those interviewed also suggested that BSEs are primarily negative and impactful. The quotes below are some definitions of BSE given by the interviewees.

*".. my understanding as an economist of a Black Swan event, though, is something that has a very small likelihood of happening but happens. Yeah. OK. So, I guess my rule of thumb for a Black Swan in terms of the course of my work is something that we know that there is a possibility of happening, but we don't actually think is all that likely that it's going to happen" (R3)*

*"My understanding would be a once in a lifetime event that would be something that's tragic and horrible, but then there is an opportunity to grow and come out of that. It's a rare thing to find the Black Swan" (I2)*

From the above quotes, the participants overwhelmingly suggested BSEs as those events that are unexpected, unknown and unplanned. Some of the respondents referred to BSEs as once in a lifetime events, and others also noted them as less probable events. The experts' views align with definitions propounded by various scholars in the literature (see Aven, 2013; Taleb, 2008). Additionally, we note that BSEs are typically impactful adverse events that cause disruptions in various aspects of human life, namely, economic, social, financial and health. The negative impact and magnitude of BSEs prompt immediate action through policies and changes from the government and market forces. However, if the impact of the BSE drags over a long period, it may take more than immediate and ad hoc action but require structural changes.

### 4.2 Black Swan Events Classification

After identifying what BSEs were, interviewees were asked if the COVID-19 pandemic and Global Financial Crisis (GFC) in 2008 could be classified as Black Swan Events.

From the interview data, eight out of thirteen representing only 62% of the participants suggested that COVID-19 and GFC are BSEs. The quotes below of respondents suggest that both events qualify as BSEs.

*“You know they should qualify because there were unknown, unexpected and negative.” (R1)*

*“I think they both satisfy that. I mean, there were both significant corrections in markets, right? I mean, in Australia, we didn't have a recession in 2008. Yeah, but we did. We certainly went into a new macroeconomic environment, so much lower wages growth, inflation, stagnant growth, and stagnant productivity came out of that. So, it was a big shift in the macroeconomic environment” (R4)*

*“So COVID-19, our clear latest example, that was, uh, no one had predicted. We're going to be in that state of the economy. Umm yes, I think the GFC is also a Black Swan event. Again, from the year 2001 after 9-11 there hasn't been any sort of changes in the global economy. Umm, things were flowing fine. People who are earning good money I can't. Governments are doing well, and then the GFC hits, and yes, I would say that that was again unexpected and unprecedented again.” (F2)*

Four out of thirteen respondents representing 31% suggested one of the events as a Black Swan Event. Notably two of the interview participants suggested either event as a non-Black Swan Event. The quotes below indicate this assertion.

*“I think the GFC is perhaps got more claim to be a Black Swan event than the pandemic just because we have had it before. People predicted it and said it's likely to happen again. And I think our increased knowledge of what's happened through this time says, yeah, it'll probably happen again” (R2)*

*“Umm GFC was what 2008, 2009. Yeah. OK, I think you'd agree Australia wasn't necessarily overly impacted by it. And it was kind of interesting. Business went on, and I think from that point, actually, now that you mentioned it. And you know, I just tend to think that we're pretty resilient and we came through it. Is it a Black Swan event, the GFC, I would say perhaps not. COVID-19, is it a Black Swan event? Yeah, perhaps. Perhaps you could say it is.” (I2)*

One of the interviewed respondents, R3, classified both COVID-19 and the GFC as non-BSEs. Note the quote below.

*“You know, health experts have been warning us for years that we are going to get a pandemic of one nature another we've had. We had MERS, we had SARS. We had, like, we knew something like that was coming down the line at us at some point. So, in that sense, was it a true Black Swan event? Not really. Even if you look at the GFC, there were warnings and rumblings in financial markets for 12 months more before that actually hit crisis point. But for me, were they, if you look at the sort of theory of a Black Swan event, did they neatly fit into that? Not really” (R3)*

Therefore, 10 out of 13 respondents representing 77% of the sample, suggested the COVID-19 pandemic and the GFC as a BSE. This represented most of those interviewed. However, a few had a different view of COVID-19 and GFC as BSEs, which is evident in some quotes above. Most experts who classified both events as BSEs based their classification on the unplanned and sudden nature of these events. They believed these events could not have been prevented since they do not conform to any trend and could not have been predicted. Additionally, considering their impacts on human life and international reach makes them possible BSEs.

These events, especially COVID-19, impacted almost every aspect of human life and globally affected every country.

Notably some “outliers” opinions emerged suggesting that, either COVID-19 or GFC were not BSE, or both events were not BSEs. They classified COVID-19 as a non-BSE because they noted that there had been pandemics in the past and thus cannot be termed as new. Others also indicated they had been signs of approaching such disaster due to recent happenings. From their view, both events could have been predicted due to signs that have been there for a while. They further indicate that ignoring the signs made these events volatile and sudden but not the event themselves. Furthermore, they also believed that the reach of the GFC makes it inappropriate to classify it as a BSE as it did not significantly impact Australia and other areas of the world.

Furthermore, 11 of the interview participants noted that the responses to the COVID-19 pandemic by governments and the world through global shutdowns and related travelling restrictions could be classified as a BSE against the pandemic as no one could have predicted or planned for that reaction to the pandemic.

### **4.3 Structural Impact of these Events**

Recent events such as GFC and COVID-19 have impacted various aspects of human life and interaction, levels of government and international relations among firms and countries. These events may have medium-term to long-term impacts and changes, and these are considered. This section considers the structural impact of the more recent COVID-19 pandemic, which many have classified as a black swan event, with a few indicating otherwise in this study. Productivity Commission (2013) notes that structural changes may occur medium to long term and may also occur rapidly.

To begin with, the COVID-19 pandemic has caused a change in human interactions, either socially or personal. The pandemic has caused institutions which used to be personal interaction oriented to move and operate differently. Various educational institutions, office space jobs and markets have resorted to schemes and operations that seek to reduce human interactions (face-to-face). This change would be considered structural as it may linger on for a while even after the pandemic has been controlled.

The change above influenced and hastened the change and need for technology in the economy. The need to reduce personal interactions in institutions and workplaces made the use and need for technological change critical. Technological systems and software used for meetings and educational purposes increased during and after the pandemic. Currently, more meetings which used to be held face-to-face are held on teleconferencing software, more classes are held online, and online services have replaced other activities that used to require face-to-face level interaction. Again, these online services and software were used pre-pandemic; however, the level of patronage has increased astronomically after the pandemic. This change seems likely to stay post-pandemic.

Furthermore, the pandemic has led to various government policies that sought to control the impact of the pandemic. The government introduced some policies and measures during the pandemic, which has ended

while others are still in operation. Border closure was introduced to control and help contain the pandemic, and this policy ended after almost two years in operation. Other policies include monetary policy, quantitative easing (QE) (Wong et al., 2022), and job seeker and job keeper policies. Some of these policies, even though they were initially suggested as short-term, may remain on after the pandemic, as some of the experts interviewed suggested, in the quote below, for the QE policy to be sustained beyond the pandemic.

*“So yes and yes, I think it should and look I said that with a little bit of tongue in cheek but what other vehicle and means are there? What are the means? Are there like I mean is anyone else in the world doing it any better?.....I’m not sure. But yes I think there needs to be a response and I think interest rates are the easiest and best way to do that because we know that market sentiment responds to it we know that, and people have feelings towards it, and I would strongly suggest that it stays and maintains the same.” (I2)*

The existence of this policy beyond the pandemic may cause a structural change from the usual conventional monetary policies used in the Australian economy to the use of unconventional policies such as QE.

Finally, such events cause a change in human behaviour and perspective of life and the economy. From the quotes below, the interviewees expressed some changes evident in human behaviour due to events like COVID-19.

*“How does that affect the economy? Well, it means people are going to take control of their lives and make decisions, and therefore spending behaviours change. Peoples habitation behaviours change” (I2)*

*“My sister is a food scientist. She has very little interest in the economy or politics or public affair. Public and current affairs. When the GFC hit is the first time she has actually ever called me up and said do I need to be worried about this and the particular reason that she was calling me up was because do I need to be worried that I’m gonna lose my house because of this?” (R3)*

From the quotes, there is a change in human behaviour and consciousness of various factors in the economy. People become curious about issues and the impact those issues will have on their lives.

## **5.0 CONCLUSION**

Evidently, the understanding of BSEs among senior government officials and industry experts is well developed. The interview participants overwhelmingly suggested BSEs as those events that are unexpected, unknown and unplanned. Some of the respondents referred to BSEs as once in a lifetime event, and others also noted them as less probable events. In any event, BSEs are typically impactful adverse events that cause disruptions in various aspects of human life, namely, economic, social, financial and health.

This research revealed a significant discovery when comparing the GFC against COVID-19 in the context of BSEs or structural change. Despite the adequate and well-established understanding of BSEs among all the interview participants, not all agreed that both GFC and COVID-19 are BSEs. The COVID-19 pandemic as a BSE had a broader impact that encompassed economic implications alone. Socially, the lockdowns due to



isolation rules to curb COVID-19 affected the health and well-being of people. Those who lived alone had it tough mentally because there were no opportunities to bond and engage with family and friends. Whereas GFC was mainly economic and financial, COVID-19 affected probably every facet of human life.

Indeed, the impact of COVID-19 is still being felt worldwide and continues to be a serious threat to the world economy. Structurally, COVID-19 as a BSE has brought numerous changes to the way society, businesses and individuals operate in general and continue unabated. For example, in the housing market, digital technology has become essential in land/home inspections for home sales and purchases. Prior to COVID-19, these were present, but uptake has been accelerated due to businesses changing the structure of operations to respond to those lockdowns. It has also established that Quantitative Easing, deployed during the COVID-19 pandemic, shall form a structural rescue measure in future BSEs. Summarily, BSEs have far-reaching implications by bringing significant structural changes. We live in the climate change era, and the distinction between BSEs and Structural Change continues to dwindle with an increased frequency of artificial and natural disasters we are currently experiencing. Based on the research review of empirical evidence, BSEs seem to be asserting downward pressure and fitting into the characterisation of structural change drawing from the latest COVID-19 as an example.

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