

UNKNOWNNS BEYOND THE BLACK SWAN: A Strategic Perspective for Indian Policy in a Covid-19 World

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Abstract: Our paper suggests a novel, strategic perspective to the policy formulation process in the wake of the Covid-19 pandemic. Our methodology derives from the Keynesian distinction between risk and uncertainty, and more recent research on typology of unknownns; thus we determine that not only the outbreak, but also the progress of Covid-19 has attributes of deep or level-4 uncertainty. To manage this deep uncertainty, we draw from a management field – firm-level strategy – which has a rich tradition of strategy formulation under uncertainty, and reveals that the appropriate approach for the highly complex and uncertain issue of recovery from the economic contraction is ‘reasoning by analogy’. Our analysis suggests improvements to the processes of policy formulation and implementation, such as the need for a cross-functional task force that cuts across traditional silos of healthcare, commerce, information, and economic policy. Such unconventional policy processes are required to combat the Black Swan event that is the Covid-19 pandemic.

Keywords: Black Swan, uncertainty, Covid-19, pandemic, strategy, policy, reasoning by analogy

JEL Classification: D81, H12, L10, L52

I. INTRODUCTION

The onset of the Covid-19 pandemic was unexpected in terms of timing, loss of human lives, stress on livelihood, and more importantly change in life style. It is important to acknowledge that in the history of economic crises, most crises stemmed from financial sector and then translated to real sector, even though

contemporary observers always exclaimed that 'this time it is different'.³ In marked contrast, the Covid-19 pandemic is a 'crisis like no other'⁴. It originated from the realm of public health, affected the real sector and finally, also the financial sector. In essence, the health crisis rapidly turned into an economic-cum-financial crisis. While much research has focused on the duration and intensity of the crisis whether the shape of recovery will be V, U, W, L or other shapes hitherto unseen (K), the enduring solution lies at the intersection of medical science, social behaviour and policy.

This raises a fundamental question: Is this pandemic a Black Swan⁵ event? The question is important because if it is, then traditional economic policy may need to be supplemented with unconventional approaches. The answer to this question led us to an enquiry into a typology of unknowns, which is one of the three differentiating features of our paper. Second, our paper recognizes the difficult dilemma that policy makers the world over have faced – whether to protect life and restrict economic activity, but in doing so, adversely affect livelihood and thus life itself? World over, to address issues of public safety during Covid-19, two crucial measures were implemented viz., (a) lockdowns and (b) social distancing. The adverse impact of lockdown became all pervasive and transformed rapidly from health/lives to economy/livelihood. We attempt to address this dilemma within the Indian context, using the third novel feature of our paper – utilizing a tool from the management discipline of strategy under high levels of uncertainty – reasoning by analogy.

II. OBJECTIVES AND STRUCTURE

The objectives of our paper are twofold: one, we analyse the nature of the economic uncertainty with a view to understanding what parts are not amenable to traditional risk-based and probabilistic toolkit; and two, we attempt to address certain important but highly uncertain elements of the economic crisis of 2020, using a toolkit for managing non-quantifiable uncertainty. Accordingly, the structure of our paper is organised as follows. In section III, we explain the analytical framework with a three pronged approach viz;(a) frame work for determining level of uncertainty highlighting the typology of unknowns, (b) frame work to assess the nature of impact byaddressing the elements of Black Swan and (c) framework to address the uncertainty Toolkit with a focus on reasoning by analogy. Based on the above mentioned analytical framework we empirically examined Covid-19 as a black swan event in section IV. In section Vwe analyseeconomic impact of and further policy response to lockdown. We delve into the analysis of uncertain recovery by using reasoning-by-analogy in Section VI. We make an attempt to present the strategic synthesis of current policy and analogy driven analysis in section VII. Our conclusions are set out in section VIII.

III. ANALYTICAL FRAMEWORK

III.1. Framework for Determining Level of Uncertainty – Typology of Unknowns

The literature on uncertainty in modern economic theory can be traced to Keynes⁶, whose view of uncertainty was that it was fundamentally different from risk, in that the probability of occurrence of an uncertain event could not be meaningfully quantified. Since Keynes, some researchers have ignored this distinction even when evaluating the impact of Covid-19.⁷ However, others have cautioned policy makers against the pitfall of creating ‘pseudo-certainty’.⁸ Other research has attempted to disaggregate uncertainty into types of unknowns⁹; a useful way of categorizing issues. This research classifies unknowns into three types: 1) unknown unknowns or UU’s: events that are not only unknown, but have also not been contemplated 2) impossible unknowns or IU’s: unknowns that have been conceived, but are deemed highly unlikely and 3) known unknowns or KU’s: events that are yet to happen, but whose occurrence is considered plausible. We combine this characterization of unknowns with the idea of a ‘Black Swan’ event, which was popularized by the writing of Taleb.¹⁰ According to Taleb, a Black Swan is an event distinguished by three features/attributes:

A1: ‘It is an outlier, as it lies outside of the realm of regular expectations, because nothing in the past can convincingly point to its possibility’. I.e., UU or IU as discussed above.

A2: ‘it carries an extreme impact’.

A3: ‘in spite of its outlier status, human nature makes us concoct explanations for its occurrence after the fact, making it explainable and predictable.’

We synthesize the thinking of Faulkner and Talebin Figure 1.

Event was imagined ex-ante	Yes, event possible	Known Unknown (KU) Predicting roll of a die, chance of rain a week from now	Known Known (KK) Outcome of a roll of a die
	Yes, but thought to be impossible	Impossible Unknown (IU) Full scale war between two G20 countries in 2021	Black Swan 9/11 attacks
	No	Unknown Unknown (UU)	Black Swan Great Depression, Spanish Flu
		No	Yes
Event Occurrence / actualization			

Figure 1: Uncertainty, Unknowns and Black Swans: A Consolidated Framework

Source: Created by the authors based on concepts in Faulkner *et al* (2017) and Taleb (2007).

We illustrate the above framework with the example of 9-11 attacks, which were an unprecedented and widely unexpected negative shock to the US and its allies. The possibility of a terrorist attack on US soil using airplanes was deemed very unlikely ¹¹, an IU in Figure 1. The geopolitical and economic instability that arose from 9/11 presented several other IU's and UU's – ripple effects of the large, 9/11 Black Swan. For instance, US Defence Secretary Donald Rumsfeld mentioned in 2002 that there were not only KU's, but also several UU's that related to prevailing threats of terrorism and weapons of mass destruction ¹².

III.2. Addressing a Black Swan – Framework to Assess Nature of Impact

Post-Keynesian economic theories suggest that the impact varies for different segments of society¹³, which in turn are based on Maslow's theory of hierarchy of needs ¹⁴. Maslow posits five levels of needs, beginning with the most basic needs such as food, drink and sleep. We term these needs as important for 'Life'. Once these are satisfied, the second level of the hierarchy is the need for safety and stability, including healthcare protection and economic safety in the form of income, savings and insurance. We term these as 'Livelihood & Liquidity'. The third and fourth level of priorities relate to social needs: love, acceptance, self-esteem and prestige. The fifth level is the need for self-actualization, also referred to as moral needs. More recent research ¹⁵ has critiqued Maslow's ultimate focus on self-actualization, and has suggested that a more realistic derivation for Engel curves is possible by incorporating Bordieu's theory of 'Lifestyles'¹⁶, also referred to as the theory of social and cultural capital. A summary of these theories in the context of India, which the World Bank classifies as a Lower middle income is provided in Table 1.

Table 1: Hierarchy of Societal Needs

<i>Level</i>	<i>Hierarchy of needs: Trigg's revision to Maslow's framework</i>	<i>Equivalent income segment as defined by authors (annual INR income)</i>	<i>Proportion of Indian population, 2018[author's calculation]</i>
5	Lifestyle / self actualization needs:	Affluent (>35 Lakh)	10%
3-4	Social needs (Liquidity?): prestige, sense of belonging	Middle Class (15-35 Lakh)	25%
2	Livelihood: income, healthcare	Low to Moderate Income (0.5-15 Lakh)	40%
1	Life: food and water	Below Poverty Line segment (<50,000)	25%

Table 1 suggests that a majority of Indians were likely more focused on the deficit needs such as life (level) and two (livelihood as defined by Maslow). Hence,

all of our further analysis is grounded in prioritization of life and livelihood over higher level needs such as lifestyle.

II.3. Uncertainty Toolkit – Focus on Reasoning by Analogy

Taleb in his later work titled 'Antifragile' ¹⁷ describes systems that, unlike fragile ones, gain from disruption. While he describes strategies for converting fragile systems into antifragile ones, this and similar attempts from the operations research discipline ¹⁸ have the same shortcoming – they address future designs but do not suggest approaches for addressing an ongoing crisis that has impacted a fragile system. Another, related criticism levied against Taleb's contribution is that it is too focused on a single event, and does not address the aftermath of the event, which can also be rife with uncertainty. While the policy dynamics field does study paradigm shifts caused by exogenous shocks¹⁹, managing such a transition at a granular level continues to be elusive.

One field that does offer several tools for managing different levels of uncertainty at a granular level, is the field of firm-level strategy. An early strand of research on managing firm-level uncertainty suggests that uncertainty could range from low level or deterministic to '360-degrees' uncertainty.²⁰ Deterministic uncertainty is similar to the Keynesian notion of risk: For example, planning for a program of Covid-19 vaccination can draw on similar campaigns to eradicate polio and smallpox, as past performance and data can be used for planning and modelling program implementation. In the case of '360-degrees' uncertainty, unorthodox tools such as reasoning by analogy and non-linear systems dynamics are suggested. Intermediate levels of uncertainty, in which the range of possible outcomes is still bounded, call for tools such as quantitative scenario planning, real options rationale, and game theory. More recent research suggests that for deep uncertainty, when a causal model and the range of outcomes are indeterminate, the use of rigorous case-based decision process (also known as reasoning by analogy) is the best approach.²¹ The range of uncertainty and attendant tools are illustrated in Figure 2.

As seen above, Level 3 in figure 2 represents some elements of Covid-19 response. For example, the agencies for mass vaccination program go beyond the traditional public health infrastructure. However, the present paper is focused on issues that have 360-degree or level 4 uncertainty. For example, the unprecedented economic contraction presents such an issue: there are multiple sources of uncertainty, such as soaring unemployment, diminished appetite for investment, rising inflation, disruption of supply chains and distribution chains, and liquidity/ credit crunch.

In this context, strategy literature has suggested using reasoning by case method or analogy ²², which are suggested to be combined with methods for cross-

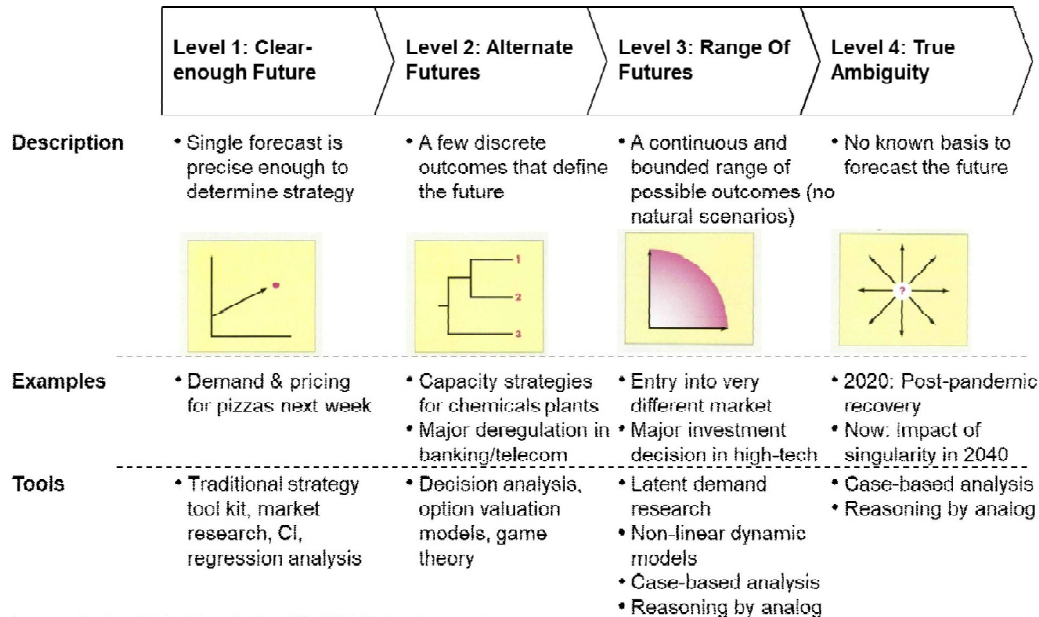


Figure 2: Firm-level Uncertainty Toolkit

Source: Strategy under Uncertainty, 1997 HBR, H. Courtney *et al.*

case analysis²³. Accordingly, our methodology first identifies the target problem to be solved, using the methods described in previous sections of this paper. Second, we search for source analogues that share sufficient similarity with the target to be relevant. The similarity analysis first decomposes the analogues to characteristics of interest, which are then compared with the characteristics of the target. If similarity is sufficient, the solutions from the source analogues are translated and adapted for consideration as candidate solutions for the target problem. In the similarity mapping as well as solution adaptation, common cognitive biases such as anchoring and confirmation bias are checked and eliminated. It is important to note that the solutions emerging from reasoning by analogy are considered as guiding beacons in the dense fog of extreme uncertainty, and not hardened policy. The hallmarks of all policy under uncertainty are agile and adaptable (an ability to adapt at a rate that is close to change in drivers).

To sum up, in order to make appropriate policy formulations, policy-makers first need to identify the level of uncertainty; to do so, we presented a framework with a typology of unknowns (KU's, UU's, IU's, etc.); once this framework is populated with relevant issues, the issues can also be assessed in terms of importance based on a hierarchy of needs. The twin assessments of level of uncertainty and importance can then be prioritized based on our novel framework

of strategic policy. Finally, the target issues of high uncertainty and high importance can be analysed using the case-based reasoning approach.

III. COVID-19 A BLACK SWAN EVENT

The uncertainty framework as set out in the preceding section, is used in this paper to determine the level of uncertainty for the onset of the Covid-19 pandemic, to emphasize that this is a Black Swan event. We begin by asking the question – had the possibility of the Covid-19 occurred to any individual? Was it widely known and expected? To discuss this point of view (Taleb, 2020), we first define a hypothetical proposition for 2019.

H0: 'In 2020, a global pandemic would kill millions, and create a global recession, with greatly reduced economic activity for several months.'

We then ask which individuals could have imagined H0 as a viable possibility and at what time. According to phylogenetic studies, the SARS-CoV-2 virus is estimated to have its origins in October or November of 2019.²⁴ As with the example of the 9/11 attacks, popular media had created mass awareness of such a pandemic, even more dire than Covid-19.²⁵ However, similar to the 9/11 attacks, H0 was not prospectively deemed plausible: Even though first alerted to the new viral infection in December of 2019, the World Health Organization, (WHO) escalated to a pandemic advisory only in March of 2020.²⁶ Hence, the IU elements of H0 resolved to KU in March of 2020 and till December of 2019, the pandemic clearly met the defining characteristic of 'it lies outside of the realm of regular expectations' in India and much of the world. Given its extreme impact, we conclude that the Covid-19 outbreak was indeed a Black Swan event. This is important as it compels policy makers to think beyond orthodox policy remedies. It also allows for a deeper analysis of the consequent economic, geopolitical, social, trade and psychological issues.

Next we examine the ripple effect of further IU's, UU's and KU's during the aftermath of outbreak of Covid 19 based on the key economic issues arising out of Covid-19 as well as important variables needed to resolve the same. We disaggregate the issues into related drivers as summarized in Table 2 below. The most crucial and familiar debate is the interaction between 1.1. (economic activity) and 2.1 (Covid-19 infection rates). As we are familiar, reopening commercial and community spaces has had devastating effects on public health, which in turn have led to reclosing and higher uncertainty on reopening. One important driver of overall uncertainty (2.2, death rates among infected), seems to be resolving into more positive and reduced risk. However, the shadow of a more virulent second wave remains, as it did one hundred years ago, during the Spanish flu epidemic. The likelihood and nature of reinfection introduces further risk.

Table 2: Integrating Unknowns, Uncertainty and Risk using Parametric Analysis of Key Economic and Health Issues for Covid-19: an Indian Perspective

<i>Sr No.</i>	<i>Economic and Health issues, sub- issues</i>	<i>State of knowledge on Economic and Health issues and related drivers as of August 2020</i>	<i>Type of Unknown (UU, IU, KU)</i>	<i>Overall level of uncertainty (scale of 1= lowest to 5= highest)</i>
1.	Economic activity (GDP growth)	Many drivers and unknowns: Divergence of expert opinion on shape of recovery (U, W, or L; V largely ruled out) due to negative feedback loops of reopening too early. Production, particularly manufacturing, collapsed. Shrinking demand in several sectors highly dependent on public health issues. The shape of recovery could be V shaped or U shaped or even K shaped.	KU, UU	4
1.1	Consumption	Q1 data revealed Private consumption declined by 36.4 per cent.	KU	3
1.2	Investment	Q1 data of revealed investment (gross fixed capital formation) both private and government declined by 89%.	KU	3
1.3	Unemployment	High unemployment as growth contracted.	KU	3
1.4	External Sector	Current account deficit could be in a surplus in 2021 but pressure on capital flows continue.	KU	3
1.5	Exchange rate	Pressure on exchange rate could be there due to net capital outflows (inflow minus outflow). Uncertainty in financial market.	KU	3
1.6	Inflation	Could be higher than the target rate due to higher food inflation. Uncertainty in inflation expectations.	KU	3
1.7.	Fiscal Deficit	Absence of fiscal space. Collapse in tax collection. Higher Fiscal deficit. The fiscal deficit to GDP ratio (both centre and states) could be 12% as against the fiscal rule target of 6 per cent.	KU	3
1.8	Public debt	Vicious cycle of deficit and debt. Debt to GDP ratio (both centre and states) could be about 85% as against the fiscal rule target of 60%.	KU	3
1.9	Liquidity	Massive liquidity injection of 5.5% of GDP carried out by RBI.	KK	1
1.10	Increasing Poverty	Poverty (Below the Line) has increased (World bank 2020).	KK	1

2. Health Indicators	Susceptible-Infected-Recovered model does not take into account reinfections.	KU, IU
2.1 Infection rates	High variability in region-wise infection rate. This is taking a U turn. Regions not affected earlier now affected.	IU 5
2.2 Recovery rate	Faster Recovery rate.	KU 3
2.3 Death rate	Improved treatment protocols (e.g., use of convalescent plasma therapy, anti-inflammatory agents have reduced death rates) Sufficient capacity of healthcare infrastructure. Faster vaccine trials have increased the chances of developing herd immunity by late 2021. The chance of a more virulent mutation of the virus causing a deadlier second wave, and/or reinfections. This has largely been ignored as too pessimistic or difficult to model.	KU 3
2.4 Continuation of first wave	How long the first wave of Covid-19 will continue? High uncertainty driven by vaccine efficacy, production, timing of launch and distribution and reinfection.	IU 5
2.5 Possibility of a second wave	Depends on vaccine efficacy, distribution.	IU 5
3 Migrant Labour	Labour returning to work (Interstate, Intrastate).	UU 4
4 Opening of cross border travel	International travel and tourism, while partially resumed, are impacted by airline bankruptcies and new waves of contagion.	UU 4
5 Resuming supply chains	Time taken to resume supply chain domestic and global.	UU 4
6 Opening spaces of commercial entertainment	Time taken to open entertainment venues, such as movie halls, theatres, concert halls, museums and other locations.	UU 4
7 Opening of educational Institutions	Time taken to open of Educational institutions.	UU 4
8 Complete withdrawal of lockdown	Time taken to complete withdrawal of lock down and quarantine.	UU 4
9 Complete withdrawal of social distancing	Time taken to complete withdrawal of social distancing.	UU 4
10 Other Indicators	Comprise labour movement, travel, tourism, supply chain, hotels.	IU 4

Source: Developed by authors based on their analysis.

IV. ECONOMIC IMPACT OF AND FURTHER POLICY RESPONSE TO LOCKDOWN

The COVID-19 pandemic is, first and foremost, a health crisis. However, it rapidly turned into an economic crisis. A look at previous pandemics, going back to the Black Death in the 1300s, can help fill this gap by shedding light on their medium- to long-term economic effects. In extrapolating from historical trends, though, it's important to note one crucial distinction. Past pandemics such as the Black Death occurred at times when virtually no one survived to old age. With today's longer life spans, perhaps this time may be different: COVID-19 mortality appears to disproportionately affect the elderly more than the young. Another difference with past crises is that accompanying the huge loss of human life is a contraction of economic activity, consumption, investment, coupled with collapse of trade.

Indian authorities in their policy strategy prioritization gave precedence to protect life with very strict and mandatory norms for lock down. The immediate impact was on the livelihood of labor force in organized sector and also on migrant labor force. India's macroeconomic scenario in the post-Covid era represents contraction of economic activity. The challenge facing the nation is unprecedented in many ways. Coupled with the uncertainty caused by the pandemic that is still taking a toll, a global scenario that is equally dismal requires the nation has to brace itself for a long grind.

From the data released by the National Statistical Office of the Government of India on August 31, 2020 real growth measured in terms of GDP at constant prices down by 23.9 per cent over the corresponding period of the previous year. This is the first firm official data led indication of the huge toll that the pandemic and the subsequent lockdown is exacting on the nation. The Reserve Bank of India (RBI) has projected that in 2021 the Indian economy will further contract by 9.5%. However, they have also projected a growth rate of 20.6% in Q1 of 2021-2022. Thus, they implicitly assume that the recovery will be V-shaped. Notwithstanding this, the RBI has observed that 'near term outlook remains hostage to virus and attendant uncertainty around the discovery of the vaccine'. Therefore, in our considered view, Covid-19 pandemic remains a Black Swan not only at its onset, but deep into 2021.

In India in the absence of fiscal headroom, monetary policy has taken precedence. RBI, through its various policy instruments, has injected liquidity to the tune of 5.5 per cent of GDP. There is no sign of respite from the infection even though recovery rate has improved and death rate has come down. Currently, there is a geographical 'U' turn in India. States that were not much affected earlier now are severely affected. This development makes a case for lockdown and is an impediment of production. Thus, there are strong possibilities that the pandemic will continue for some more time (at least till we get the vaccine). This uncertainty and risk of severe health hazard will jeopardize the traditional demand

management stimulus interventions and in our considered view the pandemic triggered economic crisis will be in all possibility be 'U' shaped.

All countries are now facing what IMF has called "*The Long Ascent*" – a difficult climb that will be **long, uneven, and uncertain**. IMF in its World Economic Outlook, October 2020, has observed: "When looking at the recovery path ahead, the importance of voluntary social distancing as a contributing factor to the downturn suggests that lifting lockdowns is unlikely to rapidly bring economic activity back to potential if health risks remain. This is true especially if lockdowns are lifted when infections are still relatively high because, in those cases, the impact on mobility appears more modest."

V. ANALYSIS OF UNCERTAIN RECOVERY USING REASONING-BY-ANALOGY

To address the deep uncertainty associated with the economic recovery in India, we begin the reasoning by analogy by selecting three analogues that bear broadly similar characteristics to the current situation. Our criteria for selection of analogous cases were: i) the crisis was global in scope as such crises introduce complications that are absent in national and regional crises; ii) the crisis created severe distress in the economy and/or public health; iii) presented deep uncertainty for policy makers; iv) illustrated effective policy development in reducing the potential impact of the socio-economic crisis. We further narrowed our scope by selecting events and cases that occurred in the period from the twentieth century to date, due to wider availability of literature for analysis, and the concurrent emergence of global communication networks and rapid, mechanized, mass transportation.

Based on the above we analysed three events as analogy by reasoning viz;(a) The Great Depression of the 1930s,(b) The Great Financial Crisis of 2007-2012, and (c) The Spanish Flu pandemic of 1918-1920. From the first event, we examine salient characteristics of policy making in the US, which initially struggled with crafting a response to the unprecedented crisis, but later managed to develop the New Deal, which is widely regarded as a classic of recovery and reform policy. Within the second contraction, we selected the case of Germany, which was the only major economy in the European Union (EU) that avoided double digit unemployment rates. From the third event, we examined the variation in response within the US to the Spanish Flu Pandemic, and consequent economic recovery.

VI. DEVELOPMENT OF THE NEW DEAL DURING THE GREAT DEPRESSION IN THE US

The Great Depression, beginning in 1929, affected most world economies, for varying durations and extents. The average time for countries to achieve pre-crisis levels of economic output in the Great Depression was 10 years, and the US was

one of the most severely affected. The election of F. D. Roosevelt to the US Presidency in 1933 ushered in a number of reforms and programs that resulted in eventual recovery from the Great Depression, and are collectively known as the “New Deal”. The essence of the New Deal can be summarized as the ‘3 Rs’ (**Relief, Recovery and Reforms**): Relief for the poor and unemployed; Recovery of the economy to pre-crisis levels; and Reforms to prevent a recurrence. Despite criticism from conservative analysts, the New Deal has been recognized by a majority of economists and historians to have helped US recovery. While the issues that beset the policy makers of this era were unprecedented, the policy formulation of the Roosevelt administration was also unusual. A study of the policy-making processes of Roosevelt by historians revealed the following key characteristics: 1) Unusual channels of information gathering: instead of solely relying on official channels of bureaucracy, Roosevelt leveraged a diverse set of information sources, often informal. 2) Structure of policy making bodies: Roosevelt also created new government agencies to generate the energy and daring required, as he felt existing departments, even with new chiefs, could not. While these administrative innovations created stress and often demoralized subordinates, it enabled ‘initiative and innovation’ both in policy formulation and also execution. 3) Administrative decision making and execution driven by competition: Much to the frustration and confusion of subordinates, Roosevelt deliberately kept grants of authority incomplete, jurisdictions uncertain and charters overlapping. This resulted in a number of governmental departments developing policies that intersected and sometimes even contradicted others. The motivation for such an unusual strategy was Roosevelt’s recognition that the unprecedented crisis needed vitality and vision, more than fidelity or the usual diligence. To foster this ‘creative conflict’, Roosevelt even staffed agencies with employees from different ends of the political spectrum: often, ardent ‘New Deal-ers’ found themselves working with those who were vehemently opposed.

V.2. The Response of Germany During the Great Recession

While the US experienced the Great Recession from December 2007 through June 2009, the European Union (EU), comprised of 28 member states, were in and out of recessions beginning from Q2-2008 through Q1-2013. During this period, Germany’s performance in keeping unemployment low was likened to a miracle. While Germany’s fall in GDP was greater than the US (6.6 percent and 4.1 percent drop from peak-to-trough respectively), its rise in unemployment rate was much lower (small decline vs. the US increase of 5.5 percent). About 40% of this labour market ‘miracle’ was attributed to policy decisions and not structural forces. For instance, the German government greatly expanded the *Kurzarbeits* scheme that subsidized shorter working weeks, which enabled businesses to keep employees on payroll. In contrast, US policy response, in the form of the American Recovery

and Reinvestment Act of 2009, was largely driven by an enormous increase in public spending and national debt. Although Germany also announced bailouts and stimulus efforts, the country controlled the increased borrowing by adopting a Swiss-style debt brake and a spending-cut-heavy budget.

Another major source of uncertainty during Great Recession was the possibility of Greece exiting the European Union (EU) and the Eurozone due its government debt crisis. If Greece were allowed to exit, it invited the possibility of other in-crisis economies to follow, hence threatening the very viability of the EU. As Germany was deeply committed to a unified EU, Merkel led the call for an unpopular EU bailout of Greece not once, but twice. During these periods of uncertainty or 'policy fog', Merkel's strategy was one of pragmatic compromise, combined with of *nichtregieren*, literally translated as non-governance or more accurately, masterful inaction. Similar to postponement of policy decisions by Roosevelt, this is akin to the rationale behind real options, in which delays are considered valuable tools for resolving deep uncertainty.

V.3. US Responses During the Spanish Flu Pandemic of 1918-1920

Before Covid-19, the deadliest pandemic in US history was the 1918 Influenza virus, often called the Spanish Flu. In the United States, estimates suggested a quarter of the population caught the virus, 675,000 died, and life expectancy dropped by 12 years. Estimates of mortality rates were close to 2.5%, compared to less than 0.5% for the Covid-19 disease. Similar to the current pandemic, there were no treatments and attempts to develop effective vaccines failed. Hence, the only public health policies that demonstrated efficacy were non-pharmaceutical interventions (NPIs), such as social distancing, mask wearing and hygiene. There was also no coordinated national response to the health crisis, which resulted in different states and cities adopting different responses to the disease. The economic impact of the responses by various US cities during the 1918 pandemic has been studied, and findings indicate that total mortality rates were lowest in those cities that acted quickly and aggressively in implementing NPIs. As NPIs also resulted in disruption in economic activities, the research cited above examined economic indicators such as manufacturing employment rates and indices of business activity. It was found that in those states that were more severely affected by the health crisis, a sharp and persistent decline in real economic activity occurred. Also, early and extensive NPIs resulted in a relative increase in real economic activity in the medium term, after the pandemic. It was expected that NPIs constrain social interactions and thus economic activity that relies on such interactions. However, in a pandemic, economic activity was also reduced in absence of such measures, as households reduced consumption and labour supply to lower the chance of becoming infected. Thus, while NPIs lowered economic activity, they could have solved coordination problems associated with fighting disease transmission and

thus mitigated the pandemic-related economic disruption. Hence, measures that were designed to protect life first, resulted in better economic outcomes as well.

VI. STRATEGIC SYNTHESIS OF CURRENT POLICY AND ANALOGY-DRIVEN ANALYSIS

An analysis of the current policy challenges of the Covid-19 crisis suggests that not only was it a Black Swan event at the onset, but multiple uncertainties, which form important drivers of policy, persist. For example, a wide range of predictions have been offered on when the case count in India will peak. These estimates are complicated by different testing modalities, risk and severity of reinfection, degree of reopening of economy, and the emergence of a viable vaccine. This in turn is driven by various sources of uncertainty: proven safety and efficacy, affordability, variation in production and distribution bottlenecks, which in turn are driven by firm-level production capacity, product-specific requirements and coordination between private and public agencies. In addition to rising infections, reinfections, and vaccines, a number of other variables are driving further uncertainty and complexity with the recovery: increase in extreme poverty, changes to the nature of work, reduced effectiveness of online relative to in-person education, and geopolitical tensions. The RBI Report also observed that near term outlook remains hostage to the virus and attendant uncertainty around the discovery of vaccines. Thus, the high uncertainty and associated risks have made the Covid-19 truly a Black Swan event.

To resolve such deep uncertainty, our use of strategic analysis can be summarized in Table 3. Table 3 suggests several insights for policy development under the prevailing, deep uncertainty. First, in all cases of effective policy for economic recovery focused on the first two levels of Maslow's hierarchy: Life and Livelihood, followed by higher level needs such as self-esteem, wealth accumulation and social prestige. Our cross-case analysis also suggests that policy makers that ignored this fundamental focus on Life (e.g., US states that deemphasized the importance of mask-wearing, while reopening their economy during the Spanish flu), faced a longer and deeper recessionary trend. We believe that initial response of the government of India – in terms of a strict and prolonged lockdown – was well-aligned with this principle. Consequently, the initial infection rate in India was low, relative to other countries. However, the later exodus of migrant workers from urban centres in unsafe conditions, and the slowness and lack of clarity in reopening procedures, had an adverse impact on both health and economic outcomes.

Second, our analysis reveals that when faced with multi-dimensional uncertainty, the policy development process needs to be innovative in both structure and style. Instead of a fragmented focus on health issues that are separate from economic and business issues, and again separate from education and training

Table 3: Strategic Synthesis based on Analogy and policy response of Global Economic Contraction in 2020

Case	Salient Characteristics of Crisis					Key elements of policy response
	Nature of global crisis	Key economic characteristics of crisis	Country-specific economic background before event	Sources of deep uncertainty at time of crisis		
Target case: India's response during the pandemic in 2020	Health and economic	Loss of life, longest duration of lockdowns, unprecedented contraction of the economy.	Low-middle income country, third largest economy in PPP adjusted GDP terms	Increasing health crisis without cure or vaccine in 2020; national lockdown of 69days, loss of employment and exodus of migrant labour.	See section IV: Economic Impact of and Further Policy Response to Lockdown	
Source cases 1) Great Depression and the New Deal in the US	Economic	Banking crisis, 4-year decline in GDP, deflation, loss in employment, 40% drop in household incomes, poverty, net emigration.	High-income country, largest economy by GDP, 50% of GDP contributed by banking sector.	Multiple crises in multiple sectors of economy: banking, agriculture, housing, with concurrent macroeconomic issues of deflation and unemployment.	Innovative policy processes: creative conflict, new agencies, data sources, Relief as the foundation for Recovery and Reform. Delay decisions till enough uncertainty resolves.	
2) Germany during Great Recession	Economic	Banking crisis, decline in GDP, trade deficit, loss in productivity and possible exit of Greece from the EU and Eurozone.	High income country, economy driven by exports and small-to-medium enterprises.	High income country, trade surplus driven by small and medium enterprises	Tripartite agreements between unions, corporates and German government. Compromise with EU partners. Delay - <i>nichtregieren</i>	
3) US cities in 1918 Spanish flu pandemic	Health and economic disruptions	Multiple waves of virus, with the fall (second) wave being the deadliest.	High income country. Post War US economy, period of general growth,	Deep health crisis resulting in economic disruption.	Varying extent of timely, extensive NPI's. Earlier and aggressive health interventions	

issues, there needs to be an integrated, cross-functional and dynamic approach. While the gathering and analysis of economic series data should continue, we also advocate proactively integrating such data with qualitative and quantitative, non-economic information related to epidemiology, public health and education. As the world bank chief economist Reinhart, an authority on crisis, has observed: 'If it (Covid-19) is not over on the disease; it is not over on the balance sheet.' (Pazzanese, 2020).

In the Indian context, this suggests a modification to the current, fragmented approach of the finance, commerce, health and education ministries. Hence, we advocate a high-powered, cross-ministry task force that can develop flexible options for repairing and restoring not only the economy, but its key drivers: public health, education, information & broadcasting, business and trade. This will involve a closely coordinated allocation of public resources. For instance, policymakers should support economic reopening with clear, consistent, and persistent communication to on public health and safety. This would include providing guidelines and examples of social distancing, reducing vaccine hesitancy, facilitating a reallocation of resources toward less-contact-intensive sectors, and promoting the adoption of new technologies to limit the contact intensity within given sectors. Such policy will need to be simultaneously supported by spending on treatment, testing, contact tracing, and ultimately, vaccine development and distribution.

This leads to the third insight from our analysis: the policy formulation process needs to be inclusive not only in the nature of factual inputs gathered, but also in the stakeholders involved in the design. For instance, the expansion of the *Kurzarbeits*scheme in Germany during the great recession required a tripartite dialogue and close coordination between labour, management and the government. Such a dialogue better informs policy development and greatly eases the feasibility of policy implementation. In the Indian context, this implies inclusive dialogue and coordination not only between ministries, but also with external stakeholders such as healthcare providers, industry, organized labour, educational establishments, and state and local governments. As fiscal accounting is important at the end spender level, which are the state and local governments, we recommend strengthening the local government and local administration for effective and efficient use of resources for health infrastructure, as well as fiscal stimulus. Fiscal stimulus also needs to be creatively reimaged, in discussion with industry and labour: stimuli for job creation, especially in green technology, needs to be supplemented with retraining and reskilling of workers, expanding the scope and duration of unemployment insurance, tax deferrals, credit guarantees, cash transfers, and wage subsidies. Equally important is continued monetary accommodation and liquidity measures to ensure the flow of credit, especially to small and medium-sized firms—thus supporting jobs and financial stability. Cut the lifelines too soon, and the Long Ascent becomes a precipitous fall.

Finally, we discuss a more defined and traditional issue, especially in low-income countries: the challenge of national debt. India entered this crisis with already high debt levels, and this burden has only become heavier. In order to fight the crisis and maintain vital policy support; and to prevent the reversal of development gains made over decades, India will need more help—and fast. This means access to more grants, concessional credit and debt relief, combined with better debt management and transparency. In some cases, global coordination to restructure sovereign debt will be necessary, with full participation of public *and* private creditors. While incurring more debt, lessons from the German case are illuminating: a ‘credit brake’ for instance can create a useful balance between spending on the one side, and fiscal prudence on the other.

VII. CONCLUSIONS

The Covid-19 pandemic is a Black Swan event of persistent duration and has grappled almost all the economies of the world. The life and livelihood of millions across the world, and in India have been adversely impacted. Economic activities measured in terms of GDP witnessed a record contraction with high level of unemployment. The worst part as IMF chief economist of IMF has observed: “The poor are getting poorer with close to 90 million people expected to fall in to extreme poverty. The ascent out of this calamity is likely to be long, uneven, and highly uncertain ... This is the worst crisis since the Great Depression, and it will take significant innovation on the policy front, at both the national and international levels to recover from this calamity.” However, to date, policy makers have only tried and continue to try, conventional interventions that are both fiscal and monetary in nature. In our view, this has not resulted in robust recovery, but on the other hand, we have seen an increase in debt burden, and a sporadic disruption in financial markets.

There has been an animated debate on the impact of Covid-19 resulting in a plethora of literature. However, the gap in the literature mirrors the lack of creativity in practice: most research papers have focused on deterministic predictions on recovery rates, and policy prescriptions. Our paper, in contrast, has started with the fundamental premise that the pandemic is nothing short of a Black Swan event, with attendant, deep uncertainty of a nature that is not predictable. Hence, our paper selected an approach that was appropriate to the situation: built from the literature on firm-level strategy under uncertainty. We illustrated this toolkit by applying the ‘reasoning by analogy’ method to the policy for Indian economic recovery, a higher order problem, which is driven by several ‘IU’ and ‘UU’ type of unknowns, leading to it being categorized as a Black Swan. Upon application of the above ‘reasoning by analogy’ method to the Indian recovery, we were able to synthesize four recommendations that address gaps in the current policy infrastructure: 1) innovate the policy making apparatus and

processes to be more interdisciplinary and inclusive 2) maintain a dual-focus on life and livelihood; when required – prioritize on life 3) during policy formulation and implementation, seek a deep dialogue between public and private stakeholders and 4) back spending for relief and recovery with processes for monitoring and controls on debt.

With the advent of more transmissible viral variants and vaccine hesitancy, the likelihood of herd immunity has faded across the world, and the idea of repeated vaccinations for the foreseeable future, especially for the most vulnerable, has emerged as a real possibility. In the near term, vaccinations will continue to play a vital role in controlling infections and the consequent economic costs of lost productivity, hospitalization, and death. Effective vaccination will need to be wrought from not only medical and epidemiological considerations, but also social behaviours such as vaccine hesitancy, inter-firm coordination of supply chains, and public policy. As the initial, deep uncertainty of 2020 unfolds into a profound complexity in 2021 and beyond, strategy tools related to managing complexity will be needed in policy research and application.

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