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**“Managing for the Future Strategies”**

A lesson for a chaotic World, comparing ‘Anti-Fragile’ Entrepreneurs and ‘Strategic’  
Managers in Iran

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## Abstract

The publication of *The Black Swan* (Taleb, 2007) by a statistician and investment risk analyst, N. N. Taleb, introduced the (anti-) theory of the randomness and the centrality of uncertainty to a wide audience about to be shocked by the scale and suddenness of a global financial crisis that few anticipated and many believed would never occur. In 1997 the Nobel Prize in Economics had been awarded to two authors, Myron Scholes and Robert Merton for their profit-maximising trading strategy which ‘proved’ that trading in derivatives could be both lucrative and safe. Taleb disagreed strongly, warning that uncertainties defied estimation. Indeed, Scholes’ and Merton’s company *Long Term Capital Management* went on to lose \$4.6bn in less than four months.

Our research suggests that pragmatic Talebian strategies, which recognise the high probability of positive and negative ‘black swan events’ are associated with survival by Iranian entrepreneurs. Black swan events are defined as defying forecasting and as incalculable in the nature and extent of their effects. Unforecastable events have some likelihood in all country contexts. However, given economic volatility, imposed sanctions and uncertainties surrounding Iran’s international treaties, the vagaries faced by Iranian entrepreneurs are very considerable. Iran is not unique as all industrial sectors, economies and societies are vulnerable to black swans as the global financial crisis of 2007-8 showed. Iran is chosen because a) entrepreneurs’ survival here may have lessons for entrepreneurs’ survival anywhere, b) it enables the author to draw on and reevaluate the evidence of his own experience as an entrepreneur both in Iran and abroad, c) he enjoys access to many business acquaintances who operate in many of the same fields that he operates in and d) insofar as knowledge is attainable(!) knows Iran’s institutions. The study could have been conducted in other countries. Iran is chosen for practical and theoretical reasons.

The broadest aim is to suggest strategies which improve firm survival, employment security and prosperity. A comparative study of the strategies of a) surviving Iranian entrepreneurs and b) salaried senior managers represents a good test of Taleb's argument. He proposes that in a chaotic world in which small changes in antecedent conditions have large effects which magnify over time in ways that cannot be estimated, then 'anti-fragile' strategies represent one's best chances of survival and success.

The main research question is "Do Iranian entrepreneurs and strategic managers behave as Taleb would recommend and thereby survive?" Another way of expressing this question is to ask "Do 'anti-fragile' contribute to survival amid chaos?" Our subsidiary question is "Why are these two radically different forms of strategy *thinkable*?"

The study establishes a benchmark, here top managers in petrochemical companies, who rely typically on 'strategic planning', a form of strategy which Taleb objects to strongly. This benchmark is chosen a) because the petrochemicals industry is vulnerable to black swans and b) because 'strategic planning' contrasts strongly with the 'anti-fragile' strategies adopted by surviving entrepreneurs. It is shown that Iranian entrepreneurs act in ways that are consistent with Taleb's 'anti-fragile' strategy while most petrochemical managers interviewed follow something that is recognisable as the 'functional paradigm' which assumes an equilibrium state as default and treats risk as normally-distributed and therefore calculable. 'Strategic Planning' should work well *if* these assumptions held true empirically.

The author argues that regardless of the particularly unfavourable international relations which Iran has, anti-fragility has value everywhere because no social endeavour is immune to black swan events. Indeed, without risk, there is no profit so anti-fragile entrepreneurs have much to gain from chaos. Considered at the larger scale, Anti-fragility could enable Iran to prosper, not least through diversification of its petrochemical industry. It

is recommended that entrepreneurs and managers can embrace and spread enhanced anti-fragility through mutual networks.

The thesis is that preparation for chaos, errors, and fluctuations is wiser than inferring practices from historical data and wiser than pursuing profit maximisation. We should be mindful of “rare events with a huge impact” and because successful Iranian entrepreneurs are unsurprised by weekly surprises, they are well-placed to offer advice to entrepreneurs everywhere.

Our methodology places limits on what we can and cannot argue here. Though largely unconscious of it, we are confident that surviving Iranian entrepreneurs represent a *model* of practice which may be worth copying. It is also reasonable to offer the *hypothesis* that in other countries entrepreneurs who take similar steps to those practiced by surviving Iranian entrepreneurs also have better survival rates in chaotic circumstances. However, this hypothesis is not tested here.

Why it is that what cultural theorists call ‘fatalistic’ or ‘pragmatic’ reasoning (Thompson, 2008) is possible is discussed. As we will show, Grid-Group Cultural Theory offers an efficient and dynamic two-dimensional explanation for why surviving Iranian entrepreneurs have the capacity to feel, think and act in the way that they do. However, it is the *appropriateness* of fatalistic reasoning that is our chief concern rather than either the cultural conditions which make it thinkable or how far the same kind of reasoning is found in other entrepreneurs in other countries. It will be for other researchers to explore these suggestions.

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## Chapter 1

### Introduction

## 1.1 Background: Survival and Prosperity through Many Adaptations

In a series of powerful essays, Nicholas Nassim Taleb (2007, 2008, 2014) has challenged the idea that we have enough, should look for, or will ever have a big enough theory, or comprehensive enough information, to identify cause-effect relationships reliably enough to make effective forecasts. The world we inhabit is just not like that, he insists. In other words, no amount of 'gap-filling' is ever going to help us develop sufficiently comprehensive knowledge, because 'social systems' such as markets, political systems, trading blocs, international relations (and we would add even families, work groups and neighbourhoods) are not systematic. It is therefore very risky to assume that even what is assumed to be well-established and existing outside the 'research gaps' is ever permanent, solid, reliable, predictable and dependable. Indeed, the uncertainties in research gaps is not that much greater than the uncertainties in what researchers treat as known. Taleb suggests that what we think we know can also be a source of risk, because of 'narrative fallacies': stories which have the false appearance of truths.

Taleb is not the first to recommend abandonment of comprehensive planning (see Lindblom 1959; Hayek 1974; Hume, 1739, Popper, 2013/ 1966). Each of these authors argue that it is misleading, futile and often *highly dangerous* to assume that the past provides a good way of forecasting the future. Each doubt that anything can be known with certainty, especially concerning social phenomena with its 'artificial' risks. However, his claim is that the *smallest* of antecedent changes (which themselves cannot be identified in advance, or even established with certainty retrospectively) can have disproportionate effects which magnify over time is expressed convincingly, culminating in what he terms 'black swan events', of positive and negative kinds with effects which also defy accurate estimation. This world (paradigm view) is disturbing and unpalatable to theorists, but our assertion is that this is the world that

businesses operate in whether we like to admit it or not. The evidence for this assertion is the impact of the many surprises which take place at every scale and especially in markets.

Black swan events are:

- Practically impossible to forecast (though many theorists assemble narrative fallacies afterward which place some kind of imaginary order on what is really highly complex and contingent chaos).
- Very large in the magnitude and dispersion of their impacts.

Taleb uses the examples of the discovery of penicillin, World War 1, the 9/11 attacks and the Global Financial Crisis of 2007 as good examples of Black Swan events. The recent 2020 economic crisis and national lockdowns due to the COVID-19 pandemic (known as “*Corona Virus*”) is an illustration of a Black Swan events in the sense especially of the unanticipated and widespread consequences it has across multiple *social* systems, indeed consequences that are difficult to estimate accurately and will have no knowable end-date. They qualify because their trigger-points are difficult or impossible to identify (being highly coincidental) and very much smaller (such as the assassination of an individual) than their effects, which are all still unfolding with knock-on consequences without identifiable end. Taleb argues for example that the effects of the First World War are still happening and there is no way of determining the day when they will have stopped. In a chaotic world, the ripples caused by casting a stone onto water never cease and each ripple starts other chains of events with further rounds of unpredictable consequences and so on. In this world, there is no ‘equilibrium point’. The surface of the pond is never still.

A five Million USD project caused an almost \$200 million loss to Levi Strauss & Co. in 2008 (Flyvberg and Budzier, 2011). An oil and gas production project at Sakhalin island was sanctioned in 2003 at \$10bn (a value that exceeded Shell's net income for 2002). Two

years later, with the project well-advanced, Shell issued a report announcing that the cost had doubled to \$20 bn (today it is \$22 bn) (Hajikazemi et al., 2016) The Boston Big Dig project went from \$2.6bn to \$14.6) (KPMG, 2013; (Hajikazemi et al., 2016), refuting the best estimates of well-qualified experts.

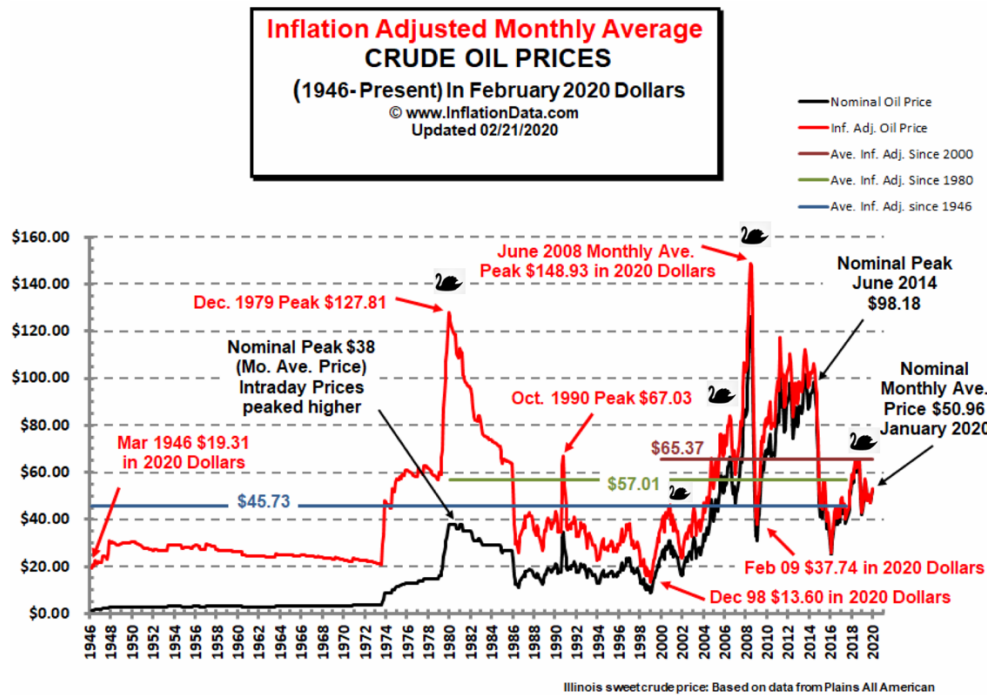


Figure 1 Crude Oil Price in the Last Century (Historical Oil Prices Chart, 2020)

The table above, could indicate the effect of the Black Swan events on the Crude Oil market during the past century. Some well-known examples of the Black Swan could be:

- World War I
- World War II
- Islamic Revolution in Iran
- Iran vs Iraq War
- September 11
- SARS Disease
- Housing Crisis 2008

- Election of Donald Trump
- COVID – 19 (Corona Virus) effects on social systems

We can be confident that in none of these cases were the chief project managers inexpert, untrained, incompetent or reckless individuals. They would all have had a great deal of expertise of many kinds to call on and yet despite all the knowledge and modelling available to them, they would have been deeply shocked by such extraordinary turn-of-events.

As an Iranian entrepreneur, in one of the most obviously chaotic 'business environments' that exists anywhere, I recognized Taleb's propositions immediately because I have always been confronted by random surprises, some of them beneficial, many of them not, some of the double-edged 'grey swans', all my business life and have always had to operate on the basis that, without having a name for them, black swans are likely. In reading Taleb's essays I have begun to reflect on the differences and similarities among the many successful and unsuccessful Iranian businessmen and the few businesswomen I know well, some of whom I collaborate with, and in particular, reflect on our survival in what truly qualifies as a 'turbulent environment' of boundary-less uncertainty.

In particular, Taleb's and Lindblom's separate recommendations (Lindblom, 1959) to conduct 'short-range experiments' (and to do everything possible to avoid big experiments) and to construct nothing 'too big to fail' seem to apply very strongly. Planning well ahead is something which I and my associates do not seem to favour or practice. We also seem very willing to abandon projects even if we have invested a lot of resources and hope in them and create projects in such a way that they can be placed 'on hold' (frozen) for months or even years, to be revived only when (and if) conditions become more favourable. We – the investors who survive that is - are not at all vulnerable to the 'sunk cost fallacy' (Green, Rosenblatt and Yao, 2015; Falah, 2016) and reason fatalistically where necessary, as the English proverb states, that 'there is no point crying over spilt milk' and that misfortunes are 'all water under

the bridge'. The 'evidence of my experience' is also that we do not pursue a policy of 'profit maximization' and there seem to be two reasons for not doing so. First, the strategy of profit maximisation can be highly successful in Iran for about four years and is then it is defeated by a black swan which totally destroys the business. Second, the same strategy leads with more certainty to such conspicuous growth that it results in the business being noticed, which risks state acquisition of the business and loss of independence. In Iran, sections of the state, for example, the military are self-funded directly as commercial activities rather than out of taxation and so maintaining independence means not being too obviously successful. While this much is 'known' it is not possible to estimate when a successful business will be noticed, when loss of control will occur or what the consequences will be for the profit-maximising entrepreneur.

Instead, this author and his associates build diverse businesses that Taleb would have identified as 'anti-fragile' (2012). According to Taleb this concept is "a blueprint for living in black swan world, the key being to love randomness, variation, and uncertainty to some degree, and thus also errors". Taleb's book features "the things gained from disorder", going beyond resilience and robustness. He distinguishes three categories, *Fragile*, *Robust* and *Anti-fragile*. The fragile does not withstand disruption and disorders; the robust would stand without any changes in disposition, while the anti-fragile would be comparatively more beneficial, resilient and creative. His 'anti-fragile' thesis is an effort to enable realisation of how to cope with the unpredictable, avoid misguided preventive managerial disposition in an environment that is vulnerable to black swan events. His general approach is not to seek immunity from black swans, but to take advantages and even benefit from them. Black swans are not invariably negative and we should understand how to react, managing complexities in an anti-fragile manner. As the following is a description of my own activities they will be described both in the 'third person' and in 'the first person'.

## 1.2 Brief illustrations of Anti-Fragility in Practice

Among other ventures, the author is the investor and manager of a part-completed project to build a hotel in a prime location in the north of the capital city, Tehran. This project has been ‘on and off’ for more than six years. We continue to hesitate before deciding on the mix of uses and the type of client-market to attract, watching changes in local, national and international circumstances on a weekly and monthly basis, and *delaying each decision as long as possible with least consequence for each subsequent decision* I must make on the project. This method of working can be viewed as highly inefficient considered from a ‘project management’ point of view. It is a textbook case of how *not* to manage a project in a stable environment which is expected theoretically to attain equilibrium in supply, demand and prices in the long run. But ‘market clearing’ never takes place, efficiency, maximum asset utilisation and profit maximisation is not the point of my actions and my environment is not stable. Our aim is *survival* through frequent use of reverse gears, maintaining as many path possibilities as possible and making as many path changes as may be necessary especially *immediately* in the light of short-term evidence in which we can have at least *some* confidence. We also endeavour to open up as many possibilities as can be envisaged. For example, I defer decisions about how much parking space, unit sizes, possible charging rates and types of client to allow for and ensure that my architect and structural engineer provide a building frame that allows for late alterations which would accommodate a wide mix of late and even ‘last minute’ decisions. That frame is over-specified and more expensive than it needs to be for many of its possible uses, because I do not know what the eventual uses will be.

Meanwhile, I have a part-completed manufacturing plant a considerable distance away. In a stable or at least ‘equilibrium-seeking’ environment, free from the risk of the imposition, lifting and re-imposition of international sanctions and in a growing economy in which Iran's highly educated middle-class female workforce would be seeking employment outside the



home, a formula baby-food factory with a trusted German or British brand-partner would be an excellent 'rational choice'. However, an even more complex mix of independent and non-inter-dependent decisions is required in order to be 'anti-fragile'. I scrutinize a very wide range of events without any expectation of being able to have anything like comprehensive knowledge about them now, or as they may turn out in future. With Taleb, though I also read historical accounts, I maintain doubts as to how much confidence to place in these accounts, assuming that what has been left out could be more important than what has been included. I am wary of what I do not know, partly because I have no way of knowing how extensive my ignorance is.

As with the incomplete 'hotel', which even now could be dedicated to some other purpose, what I can do with the factory is choose different load bearing steel frameworks which would give the option of inserting heavy-lifting capacity (cranes) and a totally different manufacturing function – perhaps precision engineering - from what was originally imagined, if international sanctions are re-imposed and an international venture with German partners falls through. The 'wholly unexpected election' of Donald Trump (a most conspicuous example of a Black Swan event) indicates that I was right, without knowing why I was going to be correct. I acknowledge the wisdom of the saying that 'He who foretells the future is a liar even when proved right!' I do not pretend that I knew what the outcome of the US election would be, but I behave as if even one improbable event among many improbable events is likely and that they will to have larger impacts than probable ones.

A 'utility-seeking, competitive, profit-maximizing entrepreneur' would not behave like this, but s/he would not survive in Iran. Moreover, I am not what Keynes called an 'animal spirit' who relies on instincts and irrational blind optimism. The emotion I trust is wariness associated with fear of disaster and ruin for my businesses, my employees and my family. With as many deferred pending decisions as possible left open, I have instructed that a very fine

stone wall is constructed around the site which I am very pleased with. Most recently I have instructed that the factory exterior walls are clad in a very fine dressed and polished stone finish. Neither the boundary wall nor the cladding will have any effect at all on what will be made within the factory but I feel some obligation to employ skilful masons and whatever my factory produces, their 'non-scalable' (Taleb, 2007) work will at least endure most natural forces into the future. In the meantime, I cultivate and maintain very good and absolutely necessary relations with local officials, explaining to them how it is the 'need for flexibility' and for no other reason that there is 'delay' to the project. They understand that I am an Iranian businessman and I think they would support my intention to translate *The Black Swan* into Farsi where his work should find a receptive readership. (Recent editions have appeared recently, but they are longer than the original and some of Taleb's thinking has probably been lost in translation.)

Finally, my own experience and that of my associates demonstrates another of Taleb's recommendations for surviving in a world of 'non-normally distributed (non-Gaussian) risks': not specializing, but instead spreading hope, efforts, investments, and energies across many fields in what is commonly known as a 'diversified portfolio'. In my case, I also have investments in:

- Polymer and plastic raw materials trading (mainly PET, PP, HDPE, LDPE, POLY STYRENES). I argue later that specialist polymer production should be diversified further as a national anti-fragile strategy
- PET bottle manufacturing which includes on-site manufacture on customers' premises, using machinery which I own and polymers which I import and supply, but using injection-molding dies paid-for and owned by customers. This means that they also have 'skin in the game'

- International Internet-based furniture trading, run partly from the UK but with suppliers and customers on different continents
- Buying further land in Iran to build a residential building or a hotel
- A web design start-up company
- Stock and currency trading

I have also entered and left many activities altogether and will continue to do so. If I had possessed god-like omniscience and omnipresence (i.e. reliable-enough information) I could have been very wealthy but I accept that 'perfect knowledge' is a foolish ambition. Surviving, remaining independent, reputable and honest are preferred aims, which are themselves sources of resilience with very diverse uses in inevitably uncertain times.

It is important to state that Taleb does not look at this kind of anti-fragile strategy as 'spreading one's bets' because in a casino, the odds are calculable and well-known to the casino owners (!) and should be calculable and by their clients even if they do not choose to calculate them. In contrast, in a business environment which is invariably even more chaotic and vulnerable to black swan events than it appears, *the odds are not calculable* and Taleb provides many examples of the foolishness of those who have tried to do so. To emphasize, most surviving, non-corrupt, independent Iranian entrepreneurs – our sampling frame - appear to pursue diversification whether as a deliberate or as some de-facto and even accidental 'strategy', without knowing the term 'anti-fragile', without knowing Hume's 'problem of induction' (Humes, 1740; Revision, 2006). They keep a lookout every day for Popper's 'counter-factual evidence' also without knowing this phrase and without having read Popper's *Conjectures and Refutations* and recognise one black swan as more important than thousands of white ones (they are more sensitive to small numbers of disconfirming cases than to very large numbers of confirming cases). For example, currency fluctuations are a perpetual concern despite having brought vast profits to globally active, locally-owned Iranian companies. These

actors received payments through foreign banks and gained large benefits from money arbitrage, while remaining highly vulnerable to entirely different out-turns. In these circumstances, the awarding of management performance bonuses for what are more matters of luck than judgement, are inadvisable. The catastrophic failure of *Long-Term Capital Management* (LTCM) in 1998, with debts of 4.6 USD, exposed the riskiness of activities that had been presumed safe (in this case, arbitrage of price-differences between US bonds and bonds in other countries which moved in an unexpected direction due to events which would have defied prior estimation). The foolishness of the company's name, *Long-Term and Management* became clear afterwards (Lowenstein, 2000).

However, it is one thing to report these casual observations and quite another to establish that Iranian entrepreneurs who have survived and even thrived under chaotic incalculable uncertainty have done so because they have behaved in a way that resembles Nicholas Taleb's and Charles Lindblom's suggestions without having read these authors. First Taleb's thesis must be distilled into a series of researchable propositions (or as he would call them 'anti-theories'). Second, these need to be operationalized into questions which can be put to Iranian business associates and acquaintances in ways that are intelligible to them and third, we need to see whether their survival can be linked with their pursuit of such 'anti-fragile' business practices. To do this we must compare their fates with the successes and failures of those following different strategies suitable to a functional rather than to a chaotic world and this is why our comparative 'managerial' sample is also vital to this study.

### **1.3 What Anti-fragility may look like at a Larger Scale**

These academic and empirical objectives are set within wider anti-fragile aims: Oil and gas are one of the few key resources to have major and fairly obvious though again quite unpredictable effects on other industries, playing key roles in other industries' growth and failure particularly in the countries with the vast energy resources. This is especially true in

Iran whose uneven development is affected by a complex web of 'geopolitical' forces whose directions has defied accurate forecasting for a long time. In this study, I aim to outline a 'managing-for-the-future' strategy (a strategy which can be implemented in any uncertain and chaotic environment) derived from Nicholas Nassim Taleb's disturbing principles, which, nevertheless can be connected and applied to Iran today.

The author is familiar with 'positive and negative black swans' having operated as an entrepreneur over two decades in Iran and internationally. That is, the intellectual impetus for this thesis begins in our experience of handling a great many unpredicted and unpredictable events many, and perhaps most of which could have destroyed me as a business owner, especially had I followed the conventional strategy of straightforward specialization, pursuit of economies of scale and profit maximization. We can point to 'black swan events' which would have destroyed such businesses.

Perhaps the beauty of Taleb's argument is that it works similarly at any scale from micro to macro. Therefore, it could be argued that diversification can work as well for the nation-state of Iran as it works for the individual Iranian entrepreneurs. Instead of relying heavily on the export of unrefined oil and natural gas, vulnerable to erratic and even wild price movements, it could achieve greater and more secure 'value-added' by producing *diverse* and *specialised* refined petrochemical materials. Many of these products would turn out to be disappointing, but comparatively few and necessarily unforecastable successes would compensate for these. By altering the country's industrial strategy Iran could attain a degree of 'black-swan-proofing' (Taleb, 2007) of the country's many related downstream industries and trades, in which I also have a presence as a polymer trader and PET bottle manufacturer. I am a polymer engineer by training but recognise the fundamental difference between the 'natural laws' which govern polymer manufacture and the much less law-like and unpredictable nature of the social world of 'artificial risks' with their associated benefits and

misfortunes. ‘Social Chemistry’ is wholly unlike Organic Chemistry and it is my business experiences which have taught me not to apply what Mary Douglas called a ‘naturalising analogy’ to what are fundamentally non-naturally occurring business phenomena.

Different experiences and evidence in different industrial sectors, in terms of trading, international sanctions and currency fluctuations have created mixed fortunes. Money arbitrage provided opportunities for to those operating internationally but at the same time, cause immediate and major problems for manufacturers, particularly the scarcity of raw materials. Without understanding why, I felt it advisable to be involved in both currency trading and manufacture as well as other enterprises.

The wider policy aim of this study is to identify strategies for the Iranian petrochemical industry as a whole and as it could exist in future, that are in conformity with the chaos paradigm. The considerable evidence of experience of the author, specifically the evidence of surprises, may thus contribute towards evaluating the vulnerabilities of entire industry sectors to chaos effects, and the consequences for most or all Iranian businesses. This is what is meant by the scalability of Taleb’s thesis and recommendations.

The production of petrochemical products from oil and gas within the borders of oil- and gas-rich countries has the extra advantages of

- job creation (and incalculable future benefits to the life-chances of household members)
- significant savings in transportation and insurance charges proportionate to reductions in imported refined materials
- reduced banking costs which are presently incurred through exposure to highly volatile currency exchange (FX) changes and preparation of Letters of Credit (LC)
- reduced transaction costs such as customs duty charges

- increased national independence, reduced vulnerability to the chaotic vicissitudes of international politics and from terrorist violence - which is a class of black swan events especially common in the Middle East at present.

The general recommendation to manufacture and sell high-value petroleum by-products instead exporting crude oil and importing refined products (to reinvest in diverse domestic downstream manufacturing subsectors) is consistent with the principles of anti-fragility. Willingness to 'mothball' particular plants and to construct factories in such a way as to defer decisions as to their final purpose would also be consistent with the anti-fragile Iranian entrepreneur's way of doing business, the particular focus of this study. Given the scalability of Taleb's argument it should be possible to move relatively easily between this narrower research objective and the wider aim. In other words, we share Taleb's position that the social world is similarly chaotic at every scale from micro to macro.

According to Taleb, antifragility applies best and most easily among diverse actors who are creative and operate in heterogeneous ways. In terms of energy Iran and other OPEC members have reduced oil production and export thus conserving resources while relying more on the value-added through trading procedures. When the oil price which had stood at 120 USD per barrel dropped as low as 57 USD (OPEC, 2017) the importance of reducing vulnerability through diverse refined materials and manufacture into creative finished products is quite clear. It went on to reach negative prices briefly in 2020.

Iran has been arranging to expand the petrochemical refining capacity by opening new plants, raising the capacities of the existing plants, absorbing investors to become the first petrochemical value-added products exporter in the region (NPC, 2016) and this study tends to confirm the wisdom of these aims.

The National Petrochemical Company (NPC) is the subsidiary of the Iranian petroleum ministry, which was founded in 1964 beginning with small plants and is now is the second

biggest producer and exporter in the Middle East. In accordance with national policy, there are several investments in this field intended for the next five years, aiming to improve production capacity and diversify this industry sector. The aim is to become the largest producer in the region, to include a very wide range of oil by-products, which in our terms would confer 'anti-fragility'. We note that the extent to which these *aims* are 'planned' is probably less the case than it was in the past. With diversification, the success and failure of each form of specialist manufacture cannot be known in advance. Whether or not policy-makers would express it this way the multiplication of diverse specialist petrochemicals on small scales with occasional great successes which cannot be forecast, is not encompassed easily by planning methodology.

In recognition, both of the volatility of global oil markets and of the need for new strategies relying more on refined oil by-products (and their subsequent incorporation into the manufacture into diverse goods) considerable domestic direct investment is taking place with the following approximate benefits:

- local refinement of petrochemical products may bring up to 400 percent added-value compared with unrefined oil prices.
- further value-added may be available as a consequence of the high demand for manufactured petrochemical products in diverse industrial sectors, many of which the author is familiar with
- with these capacities, Iran is aiming (rather than planning?) to become the first and leading refined petrochemical and petrochemical products exporter in the Middle East
- these measures would bring a degree of protection from global oil price variations, not least because oil price falls increase the margins obtainable in the production of refined petrochemicals and finished manufactured products. We stress that the lower the price of oil (itself unpredictable), the higher the relative value of value-



added through refinement into specialist products. In this way oil-price volatility might bring its own benefits, while previously it has been an unwelcome nuisance. In other words, Iran could benefit (in different ways) from both oil price increases *and* decreases through anti-fragile policy

It is recognised that industrialised countries rely heavily on for crude oil and that the rest of the world's value-added oil products refiners would rather keep those high value-added businesses for themselves (ie. beyond the national boundaries of the principle oil-producers). They would prefer to produce plastics from Iranian oil outside Iran and retain the very large added value which can result from the production of polymers and further manufacture of products which incorporate them. There are also some competitors in the Middle East, which will be affected negatively by Iran's development of petrochemical refining capacity and finished goods manufacture. We stress however that it is the *diversity* of refined products and of finished goods that confers anti-fragility. It cannot be known which of specialist refined products will be most successful and a risk appetite which is sensitive to failure but also tolerates failures, which defers decisions and avoids the sunk cost fallacy (as I and other surviving Iranian entrepreneurs already practice) is called for. Our suggestion then, is that Iran has about as much to learn from its own entrepreneurs as does the rest of the world.

These measures and fundamental changes in thinking are in a sense, beneficial outcomes (positive black swans) of the experience of international sanctions against Iran, which the sanctioning nations may not have considered. International sanctions designed on the assumption that they will bring pressure to bear by disturbing an equilibrium could have the unintended effect of further habituating Iran to black swans, improving resilience in a paradoxical way.

## 1.4 A Black Swan Turns White?

The most obvious reading of Western interventions over the last several decades is that they have been coercive towards Iran and intentionally so. The recent US and European sanctions against Iran were designed to halt its nuclear program. Although sanctions have had very serious impacts they do not amount to clear-cut black swans as their impacts, or at least their short-term impacts were a) expected and b) not all negative, though certainly c) chaotic in effects, especially in terms of short-term currency fluctuation, banking transaction issues, and some raw materials and machinery deficits.

On the other hand, and partly in response to sanctions and international hostility, as introduced above, Iran is resolved to expand the by-product capacities of the petrochemical industry as a long-term alternative to its halted nuclear future. There are several completed and ongoing projects with the collaboration of foreign companies with the purpose of investment and technology transfers. These might not be being pursued if it had not been for sanctions. At the risk of simplification and of committing the ‘narrative fallacy’ of placing more coherence on events than deserve to be placed on them, these can be summarised as follows:

- The Iran nuclear energy program led to damaging EU and US sanctions followed by UN Security Council agreed sanctions (Resolution 1747) in 2007
- On March 2008, a further set of sanctions was imposed on Iran by the UN (Resolution 1803 by the UN Security Council in 2008). This banned Sepah Bank, the second largest Iranian bank, from all international activities
- In June 2010, more sanctions were imposed (Resolution 1929) by the UN Security Council restricting most Iranian banks
- In 2011, led by the UK government, the *Central Bank of Iran* was banned from engaging in all international activities (Guardian, Sep 2011).

In other words, the Iranian government is indeed beginning to think and act more like an Iranian entrepreneur: in a more anti-fragile way. As Popper recommended, we learn more efficiently from a few surprises than from many confirmations. As stated, Iran intends to promote petroleum by-products production for domestic and foreign end-users and reduce reliance on direct export of crude oil with the intention of becoming the first petrochemical products exporter in the region (NPC, 2016). This would greatly reduce the country's vulnerability to oil-price volatility (even deriving benefits from volatility) and reduce vulnerability to the effects of oil price volatility on its currency exchange rates, themselves the most chaotic in terms of their immediate and long-term effects on virtually everything else without definable limits.

To summarise, we have sketched-out a scalable 'anti-fragile' approach which suits both the survival ambitions of individual Iranian entrepreneurs and of the nation-state as a whole and its constituent manufacturing sectors. Anti-fragility is especially important in uncertain and chaotic 'environments' which are the outcome of 'artificial' risk-making activities. We seek affirmation of this principle from the evidence of experience among a number of close business associates. To date we have inhabited and operated within, but in the absence of an explicit, reflexive, developed understanding of how our businesses have endured and even prospered. This thesis aims to take advantage of the long-term 'slings and arrows of outrageous fortune' by making a special study of how Iranian entrepreneurs have survived in the stated situation, which does not conform to the principles of profit maximisation nor with equilibrium as the supposed cumulative effect of utility-maximising behaviour by multitudes of agents. A contribution to national government strategy and to strategy everywhere is my wider aim.

A great range of studies about strategy have been conducted, and all or most have made mention of uncertain and even of 'turbulent' times (Peterson, Cumming and Carpenter, 2003). Nevertheless, as we will show, most writers in strategy still writes as if planning is somewhat

possible and desirable. In the Iranian context, we explore and recommend strategies that are ‘conservationist’ and ‘pragmatic’ rather than ‘administrative’ and ‘profit-maximising’ (Thompson, 2018), based on our expectation of the future as uncertain and of the world as unpredictable as default.

Faith in planning survives perhaps because most writers on strategy have been concerned with strategic management in the western countries where the political and economic situations though still vulnerable to major black swan events such as the global financial crisis of 2007, are more stable than the Middle East. From our point of view, the ‘classical’ model of strategy which retains some plausibility in western countries is especially inadvisable in the Middle East where black swans are daily events at every level, not least at the political level with interconnections that defy accurate estimation. It should be emphasised that what might be called ‘government involvement’ (what would be called ‘government interference’ in Chicago) exists in the ownership and control of almost every sector in Iran as this is how different organs of state obtain their funding. This degree of profound interpenetration (rather than separation) between business and government (between civil society and the state) itself negates much of the relevance of the orthodox strategy literature which assumes definite separation between the state, the market and civil society. Though in the US, as C Wright-Mills argued, actors may move between these spheres over the course of their lifetimes (for example from the military into business into government and then back into business) the boundaries between these activities are recognisable in the US in a way that is not true in Iran.

Just as importantly, the default *functionalist* textbook economic assumption that underlying ‘market forces’ will always be seeking to establish equilibria – even if this is never achieved in practice – seems even more far-fetched in an Iranian context.

Taleb makes several contrary recommendations to the Chicago/ Wall Street orthodoxy:

- People do not understand the nature of the problems they face, and they mischaracterize them as intelligible and soluble. He believes that “Some can [only] be more intelligent than others in a structured environment” (Taleb,2011). He also added in his interview with Bloomberg in 2011 that “the world we live in is vastly different from the world we think we live in”. On the other words, he assorted people into two different categories in his book called anti-fragile “those who fall apart during times of crisis, and those who profit from them” (Taleb,2012)
- A few months before the publication of *The Black Swan* it was still unclear to most actors that Wall Street had grossly underestimated the risk of an unprecedented downturn in US house prices – with the disastrous consequences of ‘inaccurate prices’ transmitted through the strategy of ‘securitization’, once a tipping point was reached. Also, in 2003 he had warned through the *New York Times* that “Fannie Mae (*The Federal National Mortgage Association*) is sitting on dynamite with taxpayer’s money” (Taleb, 2003)
- Bankers and financial analysts believe themselves blessed with superior knowledge. While peasants *know* ‘they can't predict the future', Wall Street bankers believe (or believed) that they could and acted accordingly. Taleb pointed out in his article for *Time Magazine* that bankers were gambling with society’s money and put them (and society) at very high risk. According to him “when I trade, I do not have an agency problem; I have my neck on the line. When bank or bankers trade, it is not his neck on the line” (Taleb, 2011). By gambling with other people’s assets and being rewarded for speculative successes without penalty for speculative failures, risk was being magnified well beyond ordinary understandings and precautions
- Taleb returns several times to the proposition that we all, including *Wall Street* traders, tend to underestimate the risks and impact of rare events. “The banking

system, betting against black swan, has lost more than \$1 trillion-more than was ever made in the history of banking” (Taleb, 2007). After the first publication of *The Slack Swan* in April 2007, readers should have been clear that the prevailing risk models were not properly designed for the rare and devastating black swan events. Only afterwards did this become much more clear and his book sold in very much larger numbers

- lack of understanding has placed astonishingly high costs on future generations
- the state is transferring value to banks and other financial institutions despite the institutions being the cause of the crisis. This had already occurred with the 1990 real-estate crash when “The Federal Reserve bank protected them at our expense: when conservative bankers make profits, they get the benefits; when they are hurt, we pay the cost” (Taleb, 2007)
- banks should be treated as utilities
- banks are in the business of hiding risks and should cease from doing this. He stated similarly in his interview with Bloomberg (2011), since they are adventuring and risking on our investment and “when the things collapse you and I should pay the bill” (Taleb, 2011)
- Ordinary people pay the price for the risk taken by banks (risk run by banks and financial institutions are socialized)
- bankers should not be compensated (paid) more than civil servants. “It is not a good idea to trust corporations with matters such as rare events because the performance of these executives is not observable on a short-term basis, and they will game the system by showing good performance so they can get their yearly bonus” (2007).
- *Hammurabi's Codes* covering Trade and Liability should be applied to Wall Street as the best risk management rules ever devised. Taleb wrote that *Hammurabi's*

*Code* “is a 3,800-year-old Babylonian law that stipulated that If a builder builds a house for a man and does not make its construction firm, and the house which he has built collapses and causes the death of the owner of the house, that builder shall be put to death.” whereas, Taleb believed that for bankers, “there is no downside” (Taleb, 2007). Taleb reasoned that the trading system should be transparent to the investors and all the risks to investment should not be carried only by investors but that bankers should share the risks

- markets should be understood differently. According to Taleb there is a tendency to base their understandings on their observation of trends while neglecting the impact of randomness and rare coincidence. Ignorance of the limits of what can be inferred from statistical data can also incur serious damage (2012).
- Taleb is insistent that his thesis is not new. The analytical tools which aid understanding of what happened on Wall Street have been available for at least two centuries. These *avoid* making the assumption that (social) phenomena are ‘distributed normally’ under bell curves, recognizing the existence of extremely skewed distributions much more typical of social phenomena (eg wealth distribution) than natural phenomena (such as a person’s height)
- the chief villains responsible for misfortune are those whose refuse to admit the limits of their knowledge and that their over confidence can cause serious, even *limitless*, damage
- Taleb also suspects that our evolutionary psychology which is geared to natural risks is inadequate in assessing social phenomena which are not subject, as he puts it, to “the Laws of Gravity”

Here is a brief introduction to Taleb chief concepts (his observation language) and recommendations:

- *Antifragility vs Convexity*. Here Taleb mainly focuses on gains that can be obtained through disorder. He divides actors (people, institutions) into three main categories: the *fragile*, *robust* and the anti-fragile.
- *Fooled by Randomness*. Randomness is the typical state of social systems. However, because of evolutionary biology, our thinking tends to be geared towards estimating natural phenomena which are much less random than socially created phenomena such as financial markets, trade and modern warfare. Under-estimation of randomness is a serious source of error from which inappropriate lessons are drawn. For example, the role of luck in the financial market and life is much greater than appreciated. Taleb emphasizes how we tend to acknowledge and accept randomness in our failures (bad luck), rather than in our successes (which are attributed to talent)

### **Summary**

Randomness plays a much larger role in our lives than is realized typically. We are vulnerable to ‘Survivorship Bias’s in which moderate success is assumed to be explained by hard work and skills, while extreme success is a matter of chance. Taleb’s ‘4th Quadrant Problem’ maps the logical limits of statistics knowledge as to what is true, false or no more than anecdotal. Taleb concedes that the problem is more complicated than it appears though the effect is that statistics “is aimed at the scientist-charlatan putting society at risk using statistical methods” adding bitterly that this is comparable to *iatrogenic*, the study of “the doctor putting the patient at risk”. He added that those who put society under the risk are not authentic statisticians. It is this danger zone that he chooses to call “the fourth quadrant”. This metaphor entails a map to identifying safe areas, and beyond them, areas where our knowledge is questionable and uncertainties considerable. The map metaphor indicates that it is possible to have reasonable



estimations concerning safe zones, demarcated from zones (activities) for which the risks are not known but may be extreme. Quadrant maps assists actors in realizing where their knowledge is invalid and should be avoided.

Taleb is so keen to assist readers in visualising the absence of knowledge that he invokes the concept of an 'Anti-library' of unread books. The concept of unread books is grasped easily: we do not know the content of books that we have not read. Otherwise it is difficult to appreciate the problem of unawareness of not knowing what it is that we do not know, often called 'unknown unknowns', an unknown number of which have greater consequences than 'known knowns'. Unknowable unknown unknowns exceed the importance of what is known. We hold onto what is known too tightly.

Taleb's heroes are "erudite", those who are more concerned to know more than that which they already know. "The people I go after are the false experts, those who do not accept the limits of their knowledge" (Taleb, 2007).

This dissertation seeks to operationalise these concepts and apply them to Iran. We are concerned with:

*Production capacity* and the promotion of 'anti-fragility' in industries that lie (or can be created) downstream from oil and gas extraction. The narrower research objective is to elicit, evaluate and spread anti-fragile strategies, beginning with a number of Iranian business associates and contacts – and in developing myself - who have survived and prospered over many decades. We have observed others who demonstrated profit-maximizing, 'efficient' and 'shooting star' like success followed by conspicuous 'crash-and-burn' disasters. To do this we need to talk with survivors at length and have gained full ethical approval to do so through Brunel's Ethical Approvals process known as BREO. The failures just referred to are conspicuous enough not to require interview evidence, nor ethical approvals as knowledge of them is in the public domain.

*The Environment*, by which we mean socially-created phenomena rather than natural phenomena, is rich in uncertainties. In the ‘Iranian business environment’ black swan events are not just common but typical and yet at the same time also defy estimation as to their features, consequences and therefore also control over them (Taleb, 2009).

*Technology and technology transfers* are also sensitive to both unfortunate and happy chances, such as recent major contracts between the *Iranian Oil Company* and *Total* signed recently. Again, the timing and content of technology transfers are very difficult to forecast as our own experience of importing high quality injection-moulding machines into Iran from Germany shows.

### **1.5 Ph.D. Methodology: a Talebian approach to Interviewing**

Methodology is a broad field concerned with the study of all aspects of method including epistemology (the study of how we can claim to know what we think we know), ontology (the study of the nature of phenomena, including ‘paradigm assumptions’ about the nature and operation of the social world as a whole), appropriate forms of comparison and more technical choices such as the selection and design of research techniques.

Here we are concerned with our selection of the method of comparative interviewing. Given the boundaries we have set, the choice of interviewees and the form of the interviews have had to be consistent with Taleb’s principles. In terms of ontology, it is clear that Taleb’s writing occupies the ‘chaos paradigm’ in which small differences in antecedent conditions can cause very large shifts which are difficult or impossible to forecast and equally difficult to trace. It can be inferred that actors who understand the world differently, ie. who hold different understandings of the nature of phenomena, and who act in a way that is inconsistent with the world as Taleb assumes it is, should, if Taleb is right, run into severe difficulties. By comparison, actors who hold paradigm assumption which match the nature of the world we are

in, can be expected to act in a way that results in better outcomes for themselves. In particular, it makes sense to distinguish practitioners adopting ‘anti-fragile’ policies from those practicing orthodox ‘functionalist’ business strategies which seek and trust patterns in past events on the assumption that these can be used to manage for the future and who assume that ultimately, the world is ‘equilibrium seeking’ (that, broadly, things will work out well in the end). In other words, we seek to categorise those who treat the world as a place where black swan events are common and those who treat them as exceptional.

Also, consistent with the ‘chaos paradigm’ is the notion that each respondent should be offered the freedom to detail experiences unique to themselves. It is to be expected that they will have experienced ‘twists and turns’ which the next interviewee will not have experienced. In other words, interviewees should be offered highly customised questions which are determined by each of the preceding answers that they have given. We have chosen to call this technique ‘Talebian Interviewing’. The Talebian type of interview is ‘qualitative’ in the sense that it accepts that small details matter in a chaotic world (each detail could be a tipping point). It is also ‘qualitative’ in the sense that events reported by respondents are unlikely to add up to make predictable patterns of ‘social facts’. If the chaos paradigm is accepted then it follows that the same should also be true even for interviewees who assume (incorrectly) that the world is more or less orderly, equilibrium seeking and has distinct patterns.

Different paradigm assumptions (for example that the world is fiery and driven by conflict, the ‘Conflict Paradigm’ (of that it is equilibrium-seeking and functional) would have led to different kinds of interview techniques which have not been adopted by this researcher.

In other words, beyond acknowledging that the interviewees were drawn from separate samples (surviving Iranian entrepreneurs and senior petrochemical managers) each interview was conducted with the maximum customisation that we could achieve. Although the researcher had a large set of key concepts and keywords in mind (chaos, anti-fragility, narrative

fallacy, etc.) He chose to allow the interviewee to take the interview where he wanted to take it. This allowed for flexible responses to flexible questions according to what emerges during each interview, step by step. The author sees no advantage in forcing his methodology so that it fits the standard account of method. Our approach is neither ‘Quantitative Positivism’ nor ‘Qualitative Interpretivism’ because there is:

- 1) a degree of *positivist* hypothesis-testing in it which treats ‘Survival’ as the ‘Dependent Variable’ and the presence or absence of ‘Anti-fragile practices’ as the ‘Independent Variable’
- 2) reliance on *qualitative* evidence somewhat in the manner of a detective inquiry
- 3) although small, it was anticipated that the sample sizes drawn from each sampling frame would begin to show results that would be difficult to explain according to chance probabilities.

In short, although what one surviving entrepreneur would say should differ from the next surviving entrepreneur, taken as a whole what surviving entrepreneurs say should be *significantly different* to what senior petrochemical managers say. Note the truism that ‘every quality has a quantity and every quantity has a quality’. Either way there should be differences between the samples even if each interview is highly contingent on what each interviewee states.

By ‘consistent with Taleb’ we mean that interviews must go where the respondents’ experiences and reasoning take them. The main aim of Talebian interviewing is to find out what and how Iranian business people learned from surprising events (without them needing to have prior knowledge of Taleb’s theory of black swan events). Based on the interviewer’s experience as a surviving Iranian entrepreneur the expectation was that most independent (non-governmental) Iranian business people will demonstrate implicit, tacit knowledge regarding black swans, having faced several unexpected events in a highly chaotic economic and political

situation like Iran, from which they have learned to act in what Taleb would recognise as anti-fragile ways. On the other hand, salaried managers will have drawn different lessons, probably inappropriate ones, from their experiences of surprises. For them, surprises will be seen as exceptional rather than normal and for them, the assumption will be that normal business conditions will resume eventually, once 'exogenous factors' such as international sanctions stop.

In spite of the fact that Taleb considers himself as an 'anti-theorist,' his Black Swan/anti-fragile framework does suggest a strong alternative solution by considering the Middle East as an especially 'chaotic environment' that defies what Taleb calls 'Platonic' methodology (Taleb, 2007). Instead of looking for 'deep' *patterns* he advocates 'Stochastic tinkering' and short-run experimentation, which shares Lindblom and Popper's assumption that knowledge is extremely provisional and vulnerable to being refuted at any point. Our successful (that is surviving) entrepreneurs, we expect to engage in daily stochastic tinkering. This expectation is consistent with the evidence of my own experience.

Taleb dismisses much theory as 'mythology' (Taleb, 2011, 2014). All too often he argues, theorists place pleasing-looking and falsely reassuring patterns upon events which do not warrant such constructions. The following illustration is used to suggest what he means in stating that we theorize much too easily. The example we have chosen is therefore one taken from childhood at which stage we were aware of the absurdities of over-theorizing. It makes Taleb's point quite well:



*Figure 2 An Illustration of Narrative Fallacy*

**The search for the Essence Which Never Was. A familiar illustration of 'narrative fallacy' applied to a chaotic phenomenon.**

The temptation here is to see a left-looking face in the cloud, seen sideways on in profile, with another less clear face this side of it looking in the same leftwards direction, perhaps staring at the same far away object. Both faces are men, the first being middle-aged and the second, nearer one, very elderly. This clearly foolish 'narrative fallacy' can be taken further. It is tempting to think from their similar faces that the older man is the father of the other one and that they are in a conversation. They look thoughtful and waiting for something to happen. A very attractive and very foolish interpretation could be these are 'spirits' that have materialized briefly from men who inhabited these forests which lie beneath these clouds. With a little imagination, this narrative can be taken further to fit rare chaotically-determined weather events which happen to have coincided with similar weather which happened when historical records also show that a brutal massacre occurred within this forest exactly two hundred years ago at which time these men were killed unjustly etc. etc. Of course, children recognize that these cloud shapes are only random illusions and when playing this theorising game, do not

mistake the chaotic processes which shape clouds with human figures and historical events. But we share Taleb's point that it is very difficult for professional academics to avoid over-theorizing evidence that should not be over-theorized. (He gives an example of how Saddam Hussein's capture was used by Bloomberg TV to 'explain' market movements that should really have been treated as chaotic... in this case the same event (Saddam's capture) was used to 'explain' *both* a market *rise* and a market *fall*). Our point? It is most important to defer theorizing if possible and to keep any hypotheses as limited in scope as we can bear.

Max Weber argued this way in *The Protestant Ethic and the Spirit of Capitalism* (1930) that history should be understood as coincidental and not be theorized as having special overall causes much beyond what people thought about themselves and the world they were in at the time (Weber and Swedberg, 1999). He and Taleb agree that social history is not law-like and that history does not have an inherent direction. It makes little sense to describe actors as being 'on the right side' or on 'the wrong side of history'.

Methodologically this makes our thesis slightly unusual. We have a theory that Iranian entrepreneurs survive best by thinking and acting in anti-fragile ways (see earlier discussion). We expect that they imagine many 'counter-factuals' to their small and short-range theories and that they are very sensitive to counter-factual evidence when it occurs. They do not turn a blind eye to 'negative data' but are super-sensitive to it. We have a *theory* that they do not over-theorize and do not look for patterns where no patterns exist (they see cloud faces only for what they are - illusions). They have greater than average immunity to illusions and dismiss them quickly. Our *theory* (and it is an epistemological theory of sorts) is that they tolerate losing many small amounts of money on many different small projects and change their minds willingly and quickly with a fatalistic-pragmatic shrug of the shoulder. The transaction costs of doing business in this way are high and one of the costs is that they must spend a lot of time,

perhaps all of their waking hours, thinking about, worrying about and 'tinkering' with their businesses. These entrepreneurs have a low appetite for risk.

In short, we have a theory that surviving Iranian entrepreneurs will demonstrate anti-fragility, especially in comparison with Iran's salaried managers in large enterprises.

## **1.6 Anti-Fragile Business Practices among Business Associates**

The author has twenty years of direct business experience in Iran's petrochemical and other fields. It is our argument that no amount of experience - and no amount of evidence - would be enough to establish the comprehensive boundaries to the possibilities in these fields. This point was made by Lindblom in relation to public policy choices (1959), however it applies just as strongly, and probably more strongly to entrepreneurs' choices. The 'science of muddling through' recognises the practical impossibility of obtaining comprehensive knowledge, awareness that 'preferences' are clarified only when faced directly with choices and trade-offs and that planning according to defined and fixed goals produces disappointing and frustrating failures. Taleb adds that no amount of modern computational power is enough to forecast the eventual effects of *extremely small* variations, nor when these will happen. Attempts at what Lindblom criticises as 'root and branch analysis' is most unlikely to succeed, though just occasionally, actors will be right about what happens but for the wrong reasons.

A more useful approach is to use daily experience to outline the practically boundless possibilities that even a comparatively small number of variables might open up. This position can be explored through several interviews with the key players and decision makers in given industries, addressing how they operate, day by day and week by week. Indeed, their preferred *timeframes* are a very important feature of my interview strategy:

- How far back do they take their causal narratives?
- How much do they rely on them?



- How often have they been seen surprised?
- How many times have they been forced to change their narratives?
- Do they think much beyond the next three months or much past the last three months?
- Do they forgive their own mistakes and the mistakes made by other people?
- Do they reveal to associates when things have gone wrong, try to cover their tracks or insist on the fundamental truths of their beliefs to themselves and others?
- Do they expect their associates to keep them informed of every positive and negative black swan?
- Do they accept bad news well?
- Do they watch small details?

In the next chapter, we will examine a range of conventional strategic techniques, well-known in the academic literature, which we argue are all very vulnerable to the ‘narrative fallacy’ in ways that surviving Iranian entrepreneurs are not. Back-casting, PESTLE, SWOT and TWO-BY-TWO SPACE MATRIXES (Scenario Development) are here considered as creativity exercises with possible short-run benefits only and which remain vulnerable to black-swans to a worrying extent.

However, we begin by setting out Taleb’s sceptic position.

## 1.7 Research Questions, a ‘Research Gap’ and the possibility of a Theoretical Synthesis

The main research question for this thesis is: “Do Iranian entrepreneurs and strategic managers behave as Taleb would recommend and therefore survive? How successful is anti-fragility in chaotic circumstances?”

The *thinkability* of anti-fragile strategies arises as an associated research question. How are surviving Iranian entrepreneurs able to feel what they feel, think what they think and act

the way they act, while senior petrochemical managers are able to feel, think and act very differently? Here we find both a research gap and an interesting partial overlap between Taleb's "Black Swan Theory" and "Grid-Group Cultural Theory" (G-GCT) developed by Michael Thompson. The author wishes to bridge this gap as well as point out the partial overlap. We are quite confident that both parties, Taleb and Thompson, could make greater contributions to management science if they take each other's thinking into consideration. We believe that we are the first researcher to bring Taleb and Thompson together with the purpose of inferring what they might say to each other and because the overlap and differences between them are formal and specific, we think that the uncertainties involved in this exercise are quite low.

As a theoretical contribution in support of this aim, we suggest that there are benefits to be had by synthesising Grid-Group Cultural Theory with what Taleb prefers to call his 'anti-theory' of Black Swan events. The benefit of the black swan argument is that it enhances awareness of uncertainty and of the importance of surprises. It should be noted that each of the *four* 'thought styles' identified by Michael Thompson (see below) are worth considering because each thought style has a specific sensitivity to *four* different forms of surprises. As we will show each thought style, 'Hierarchical', 'Egalitarian', 'Individualistic' and 'Fatalistic', despite being equally reasonable, reasons differently and acts differently. G-GGCT teaches us the importance and role of different rationalities in any social system, such as an economy. What it offers is a universalistic four-way typology of risk and risk responses, instead of Taleb's also universalistic two-way typology (based on what Taleb refers to as the 'Platonic' versus 'Stoic' world views) We sense that to expand the reach of black swan theory worldwide we should take the dimensions and possibilities identified by Thompson into consideration and especially, acknowledge the existence of four different 'risk seasons' and the four (rather than two) more or less successful ways of surviving them.

As we will see, Thompson offers a simple but powerful explanation for why actors act as they do but also why they change their minds. The overlap which we will be referring to is between what Taleb calls 'Anti-fragile' strategy and what Thompson calls the 'Fatalistic Thought Style'. Both of these share a low risk appetite. There is another overlap between what Taleb sees as a characteristic under-estimation of risk among bankers and financiers and what Thompson identifies as the 'Hierarchical-'and 'Individualistic' thought styles which also see the world as relatively benign and ordered.

Before we are in a position to set out this potential synthesis, we must set out a failed business orthodoxy and Taleb's critique of it.

## Chapter 2

### Literature Review: The Foolish Search for Certainty

## 2.1 Introduction

Taleb advises that black swan events should be taken into consideration on the assumption that “some times what you don't know is more important than what you know”. It is consistent with his thesis to argue that it is difficult to estimate those points at which what we know is sufficient, from those points at which it is insufficient. In other words, it is difficult to ‘map’ uncertainties.

These assumptions compromise the notion that there could be such a thing as long-range planning. Anti-fragility is not a ‘strategy’ with much direction to it except survival by frequent changes and reversals. We recognise of course that some long-term thinking is unavoidable where investments are large and returns are only realised over long periods, if ever. Examples would include the *Channel Tunnel* between England and France, international container ports, national and international space programmes, the development of new ‘families’ of civil aircraft designs, hydroelectric, coal, gas, nuclear and renewable power stations, new oil refineries, large ship-building yards, new deep-sea oil and gas fields and so on. Nevertheless, as far as possible even these projects should, according to Taleb’s principles, involved deferred decision-making as far as possible. For example, it makes sense to build turbine halls before building the heat-exchangers, condensers, pressure vessels and before deciding on the energy source (whether coal, oil, gas, nuclear or waste).

Anti-fragility challenges economic orthodoxy in surprising ways. For example, according to (functionalist) equilibrium-based economics, in periods of prolonged economic crisis, companies and especially SMEs are affected most negatively. They should show decreasing sales, shrinking profits, rising indebtedness, difficulty covering obligations towards the suppliers. But on the contrary, many studies show (see He and Casey, 2015) that there are still some sectors hardly affected and which show extreme growth and remarkable yields. These have benefitted from crisis and unforeseen favourable chances and small firms may have the

agility to seize these opportunities. Different companies offering just *slightly* different products or services over the same geographical show very different growth paths, especially if their products and services are ‘extendable’ and have zero-marginal cost in which the *n*th. unit costs the same to produce as the first. (We are thinking here about web-based apps which have grown exponentially (*Facebook, YouTube*) while almost identical web-based apps have collapsed and been almost forgotten (*Friends Reunited, AOL*.)

Non-extendable (finite) large-scale products (such as container ports etc.) only pay back over very long time periods during which time the world will have changed greatly. Making sure that these are not ‘too big to fail’ would mean limiting the scale of each project and ‘modularising’ them as far as possible, or else investing instead in projects which can be modularised and modified much more easily. However, we, admit that there is a limit to Taleb's argument, beyond which governments will have to act as guarantors. At the same time, we want to be clear that this is not the problem that we are concerned with here. Instead, we are interested in exploring anti-fragile practices where they are used and thinking through (as a wider aim) how a strategy of anti-fragile diversification (etc.) might help Iran (indeed any economy and society) to become more like its most anti-fragile entrepreneurs. With Taleb, we argue for a ‘paradigm-shift’ (Kuhn, 1962).

A paradigm can be defined as a large body of writing that shares the same fundamental assumptions. At the risk of contradicting what has been written earlier about the need to avoid grand theories, a paradigm may also be defined as a very extensive theory about the nature of the world (an ontology) that tries to describe everything in few propositions. For example, the Marxist ‘conflict’ paradigm assumes that history has a *direction* to it caused by ‘contradictions in the mode of production’ (Marx, 1970), driven by class-struggles. The ‘functionalist’ paradigm assumes that every part in a system has a purpose and contributes to the ‘health’ of that system, which in normal circumstances approaches equilibrium balance (homeostasis);

except when ‘exogenous’ causes and ‘pathologies’ disrupt the system. Although Taleb has not discussed his own thinking as a ‘paradigm’ (probably because he is suspicious of grand theories), nevertheless he clearly has one when he argues with examples that *the world is chaotic and nonlinear*. To claim that the world is inherently chaotic and nonlinear and that uncertainties will, therefore, defeat attempts at long-run planning, is a very strong paradigm claim, which challenges the two paradigms just mentioned (Marxism, functionalism) in profound ways. It states on the contrary that history does not have a discernible direction and states with equal certainty that the world will never attain or even approximate to an equilibrium state.

In the sections to follow, the author offers an appraisal that can be described as ‘intellectual’; however, the following observations are also informed by wide-ranging experiences of operating (surviving) in highly uncertain circumstances which show few signs that could be interpreted as ‘equilibrium’ (discussed separately).

## **2.2 Chaos Paradigm**

The Chaos paradigm asserts that it is in the nature of, in this case social phenomena, that fluctuations, political, environmental or social are non-linear. It also follows from this paradigm that all antecedents and consequences are also nonlinear. The paradigm is focused on the "generated movement of a nonlinear system, the evolution of the system in time, the determination of the current state of the system at a given prehistory" (Buckley, 2006). Writers in uncertainty seem to be a little more confident when they are describing natural systems than social systems acknowledging that there *may* be a (natural) science of uncertainty and of the unpredictable which would focus on explaining that how to forecast and control the unpredictable (Snaselova and Zboril, 2015). But whether we are describing the ontology of a social or natural system, this paradigm does not treat evidence and vectors with anything like

the confident forecasting<sup>1</sup> claims we associate with orthodox (eg. Newtonian) laws of motion.

Chaos theory specifies that little thing can make big differences in a non-linear fashion with

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<sup>1</sup> My supervisor comments: Many treat forecasts and predictions as synonyms but there is a difference. The customary distinction between a *forecast* and a *prediction* was that *predictions* are made when all antecedent conditions (which a predictive model assumes to be relevant) are known with a high degree of certainty and accuracy. A *forecast* admits the possibility of the existence of unknown, unmeasured or estimated, though potentially relevant antecedent conditions. Thus it can be *predicted* that a) water at b) atmospheric pressure, which c) contains no impurities d) will boil at 100°C. But weather *forecasters* cannot be so certain about what the weather will be on that day. Strictly speaking, most theories of social phenomena are only able to offer forecasts at best, not predictions, because social phenomena cannot be defined as specifically and exclusively as boiling water. Social theories which are testable should also not be described as *deductive*, though often they are! Deductive statements *follow logically and necessarily* from their premises. For example, it is necessarily the case that a) if a mountaineer is wearing a hat on his or her head and b) if the mountaineer is standing on top of the highest point of the mountain, then c) the hat has to be higher than the mountain peak. Social theories usually admit that there may be other explanations available for the phenomenon which the theory is supposed to explain. If a theory cannot exclude the possibility that there could be alternative theoretical explanations for the same phenomenon, then it should be classed as *inferential* not *deductive*. Economists disagree with each other, for example about the causes of unemployment. What they can do is try to come up with a theory that explains more of the *variance* (upwards and downwards movements in unemployment rates) than another theory can attain. But one theory of unemployment is unable to exclude completely other theories of unemployment; this is what defines them as *inferential* rather than *deductive*.

It makes no difference whether the evidence is in the form of qualitative data or quantitative data. Although many authors describe quantitative research as *deductive*, this is incorrect. The findings of quantitative research can only be stated at a *confidence level* which will be *less* than absolute certainty. Similarly, a jury assessing what in most cases is qualitative evidence, can only convict a defendant on the *balance of the evidence*. Take the case of a person who is caught holding a smoking gun. A smoking gun is qualitative evidence. There is always the possibility, however improbable that a) someone else placed the gun in the hand of the accused, b) that the actual murderer in this case fled from the scene before anyone else arrived. It is also possible c) that key witnesses lied to the police or that d) the police lied about the smoking gun for reasons of their own. There is the possibility e) that the defendant is innocent and has been *framed* to make it look like s/he is a murderer. Even if the striations on the bullet extracted from the victim *s* match the striations on a bullet which is test fired from the same gun, it could be f) that the smoke seen rising from the gun held in the hand of the accused was caused by firing a blank shell. In this case the accused had intended to kill the victim but the victim had already been shot minutes earlier by someone else using a live bullet in the same gun. There are many other improbable possibilities as well as these which cannot be ruled-out with total certainty.

In his influential book *Conjectures and Refutations*, the philosopher Karl Popper argued that it is impossible to rule out the possibility of empirical exceptions to any theory which justifies the label *scientific*. According to Popper a theory qualifies as being scientific only if it is in principle capable of being *tested* and falsified by *counter-factual evidence*. This covers theories which police detectives develop; even the best detectives can be wrong. Scientific theories should be treated as *provisional*, even if they have been confirmed many times. Says Popper, scientists should be on the look-out for *black swan* evidence because just *one* black swan disproves the theory that tall swans are white. Theories evolve by a process of trial and error, he claims and negative findings of the *black swan* type are the most efficient way of maintaining scientific progress. Thus, a new replacement theory that tall swans are either white or black is scientific because it is still vulnerable to the possibility of, say, pink or green swans being observed somewhere and sometime in the future. For Popper, only deductive statements are true, but he complains that they are usually un-informative. The case of the that on the mountaineer's head being higher than the top of the mountain on which the mountaineer is standing would be an example of an uninformative claim because, insofar as the premises are true, the conclusion is obvious. My best guess is that Popper would be asking *You cannot even be absolutely sure that it is a hat that you can see.* It might be something else including a speck of dirt on your glasses or if we are talking about a photograph, a fault in the printing process.

The possibility that the researcher is seeing something that isn't there means that even *counter-factual evidence* such as *black swans* cannot always be trusted. The evidence might be a measurement error or even a hoax. Even in the case of what *seem* to be deductive statements, mistakes cannot be ruled out. Two types of mistakes are considered to be ever-present risks. A *Type One Error* occurs when the researcher finds a *false positive* such as that *smoking gun* found in the hands of an accused person who is really innocent. A *Type*



many inferred side effects. Chaos also describes any chaotic behaviour in a ‘nonlinear dynamic system that is very sensitive to the initial condition’ (Rao, 2012). The chaos theorists describing natural systems seek to model them nevertheless using deterministic algorithms (Snaselova and Zboril, 2015), often quite simple ones. These models can simulate emergent fractal patterns which have some regularity and show life-like similarities to empirical observations, thus:



Emergent Patterns from Chaos <http://ageac.org/en/news/new-math-could-reveal-hidden-sources-of-chaos/> accessed 17 March 2019. For non-repeating modelling of chaos in a natural system, see <https://www.youtube.com/watch?v=Qe5Enm96MFQ>

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Two Error<sub>p</sub> occurs when a false negative<sub>p</sub> evidence is found. For example, a doctor might assume incorrectly that a patient does not have cancer because the test results are negative. The problem in this case was that the research technique (a blood test for example) was not sensitive enough to confirm the doctor's initial suspicions that the patient's symptoms might be caused by cancer.

For non-repeating modelling of chaos in financial markets, see especially Thompson (2018). Within this paper, Thompson cites research involving himself and a co-worker who succeeded in creating a relatively simple and dynamic model based on a simple two-axis model of risk appetites, Grid-Group Cultural Theory (G-GCT) which also generates very life-like simulations of the relative success of each of four ‘thought styles’ under different ‘risk environments’. These four possibilities are defined by strong and weak ‘Social Regulation’ on the vertical axis and by strong and weak ‘Social Solidarity’ on the horizontal axis. The theory will be described in more detail later, however from these two axes Thomson is able to derive four conflicting yet equally rational positions: the (Fatalist) ‘Pragmatist’, the (Hierarchical) ‘Manager’, the (Egalitarian) ‘Conservator’ and the (Individualistic) ‘Maximiser’. Thompson describes his G-GCT based simulation model thus:

The game consists of a “world” (which, of course, can be in any of four different states) of just 30 firms. Each of these firms has to survive, and if possible prosper, in its environment, which is nothing more than the other 29 firms. Each firm (or automaton in the artificial life terminology) has to latch onto one of the four strategies – Manager, Conservator, Maximiser or Pragmatist – thereby becoming an agent, but has to relinquish that strategy, and latch onto one of the other three, if it finds itself surprised in three consecutive rounds. These surprises, there are 12 in all, are supplied by our “surprise matrix” ... together with the various “triggers” for the transitions from one risk season to another... [These] are the “bottom-up” rules.

(Thompson, 2018:8)

This model is dynamic in that a limited number of actors are treated interactively with the effect that their interactions alter the ‘risk environment’ within which they are operating. It is striking that the model shows that each of the four specific thought styles (described in more detail later) does particularly well (and particularly badly) in each of four equally specific risk environments. The main point we wish to make at this stage is that even after running the model very many times, the simulated sequences which the model generates show no signs of

repeating or settling into an equilibrium state. That is, there is no cumulative pattern that can be found which would forecast the likely pattern which the next run of the model would generate. Like the empirical history of actual financial markets (or the history of any social phenomenon) Thompsonian modelling shows no repeating pattern, supporting the hypothesis that in social systems more generally, history does not repeat and that what happens next is also unknowable in advance. Note that in the Thompson the model just referred to, the number of rationalities is limited to four and the number of number of actors was limited to thirty. In practice the number of actors in a social system is difficult to estimate (for example the number of actors in a financial market could be hundreds of thousands and even hundreds of millions if members of investment-based pension schemes are included). However, as we will see, no matter what the social system is, nor how many actors there are in it, G-GCT explains changes dynamically using only the four thought styles (and their hybrids). G-GCT is a simple model of chaos which succeeds in explaining complex and dynamic change. At the same time it explains why social systems are difficult or impossible to forecast.

Thompson describes his research thus:

Nothing ever goes in a straight line, no trend goes on forever, no strategy is good for all seasons...[The] peaks and troughs are not evenly spaced, nor are they of constant amplitude. The same holds for the environment, the four seasons of risk come and go, but not always in the “right” sequence, and enduring sometimes (as with the “Great Moderation” that was presided over by Alan Greenspan) for an unseasonably long time. In other words, we have erratic cycles in which none of the strategies ever goes into permanent extinction, no clear “winner” ever emerges, things never settle down into some dynamic equilibrium. We have run the game, in its old and new forms, it dates from the 1980s, for thousands of rounds and no sequence of changes ever exactly repeats itself.

(Thompson, 2018:8)

Thompson's work shows that it *is* possible to create simple algorithm-based simulations for at least some chaotic social systems, but even if an artificial boundary is placed around the simulation, here just thirty actors, that even these systems remain highly irregular, unpredictable and non-linear. Even to describe them as 'systems' is misleading as a pure system would have definite boundaries which is not the case with actual social systems whose boundaries cannot be defined with any certainty.

What we are looking for is accounts of nonlinear and irregular movements which have prominent desirable and undesirable outcomes. As we will also see even what counts as desirable or undesirable depends on competing but equally reasonable evaluation criteria. What looks like success for one thought style (rationality) looks like failure to another. Related with those for 'rationalities') ... and with infinite positive or negative consequence (see also Jafarove, 2016). Thus:

The use of 'ill wind' is most commonly [used] in the phrase 'it's an ill wind that blows nobody any good'. This is first recorded in John Heywood's A dialogue containing the number in effect of all the proverbs in the English tongue, 1546:

*"As you be much the worse. and I cast away.  
An yll wynde, that blowth no man to good, men say.  
Wel (quoth he) euery wind blowth not down the corn  
I hope (I saie) good hap [luck] be not all out worn."*

Heywood's meaning was that a wind that was unlucky for one person would bring good fortune to another. This sailing metaphor has frequently been invoked to explain good luck arising from the source of others' misfortune, and it probably pre-dates 1546.

<https://www.phrases.org.uk/meanings/ill-wind.html>

accessed 17 March, 2019)

It should be considered that this anti-theory (or 'anti-paradigm') would encompass big overall changes, but apply also to small parts (Song and Shi, 2008; Curry, 2012). In the example of

the 'ill wind' the actor which it benefits could be an *individual, group, institution* or industrial *sector* or *nation-state* or *treaty-system involving many states* such as a nuclear non-proliferation pact.

One of the disturbing implications of chaos theory is that even *profound* understanding of the initial condition may not help in understanding the ensuing movements and changes much beyond the first phase. In as few as three steps, the range of possibilities created from tiny starting variations is *extremely* large, for example market price movements (Taleb, 2008). Because this paradigm defines the world as a place in which numerous events are going on and each one may have some coincidental impact on the others (Kiel, 1994), separately or in combination, it is even difficult to work out with confidence exactly what the antecedent events to any given change will have been. Explanations carry high uncertainty and this is why explanations are mistrusted within this paradigm.

### **2.3 The Black Swan Theory**

It is for this reason that in a chaotic world 'disconfirming-' 'counterfactual-cases' or 'refutations' (Popper, 1966) should be treated more seriously than evidence which matches hypothetical expectations. In other words, one 'black swan event' matters more than many expected events. In Popper's terms, as we have suggested, just one black swan proves that not all swans are white, while there is no number of white swans that can prove that all swans are white. This is because there is no way of ruling out the possibility that the next observation, or an observation far into the future will refute expectations. When it comes to affecting knowledge-development, surprising exceptions are more efficient than reassuring confirming cases. Hence, we should put more effort into looking for exceptions than into looking for reassurance that we are correct about how things are working.

As we also stated, Taleb defines black swan events by the following more specific criteria:

- 1) an outlier event which lies outside the realm of regular expectations
- 2) which also carries extreme impacts
- 3) because our evolutionary psychology is designed to deal adequately with natural (normally distributed risks) we tend to fit black swan events into misleading narrative explanations, after the fact, making black swans seem explicable and predictable (Taleb, 2007) when they really defy accurate estimation and theorizing. As he shows, it is very easy to mistake the statement 'no evidence of cancer' for the statement 'evidence of no cancer', (2007), because it is the latter that we wish for. Narrative fallacies are a major repeating source of errors.

Compounding these difficulties, despite a great deal of planning and the making of careful arrangements, organizations still get surprised by 'unknown unknowns' (Green, 2011). According to (Taleb, 2007) large and very large time delays (indeed incalculable time delays) may take place between an antecedent cause and its impacts. He gives the continuing and future effects of World War 1 and the discovery of penicillin as two such an example. The never-born children of soldiers who died young and these putative children's children and all of their actions throughout lives that never were; the children born to those saved by penicillin, their children's children and all of their actions of lives that were lived are all part of an ever-widening set of consequences. Overconfidence in what we think we know and insensitivity towards what we do not know, Taleb calls 'epistemic arrogance'.

Taleb's discussion of the 'anti-library' - a thought experiment - expresses the extent of this underestimated problem. Taleb argues that actors focus and defend what they have studied in preference to admitting their lack of knowledge and the limits of their understanding. It is this lack of understanding that he compares with unread books. He argues provocatively that "Read books are far less valuable than unread ones. The library should contain as much of what

you do not know. Indeed, the more you know, the larger the rows of unread books. Let us call this collection of unread books an anti-library" (Taleb, 2012).

He argues convincingly that unforeseen events are disproportionate in impact. It is for this reason that he promotes 'antifragility' (Taleb, 2007), similarly Green (2011).

More recently other researchers have argued against Taleb reasserting that events are more forecastable than he has argued (Werther, 2013) and we will return to consider these more carefully at a later stage. Meanwhile, it is very difficult to state that events such as international boundary disputes, terrorist actions, business cycles, the imposing of sanctions (and lifting of sanctions), and the impacts of all of these can be forecast accurately months or even hours or minutes (!) ahead of these events. It is also difficult to see how the impact of each of these on other events could also be forecast accurately. To us, it seems safer to argue as a default position with Taleb, that the world or at least unknowably large section of it, is chaotic and vulnerable to positive and negative black swans which occur over uncertain timescales that are difficult to define and forecast. Therefore, the best that we can do is minimize their negative impacts, make our ventures 'anti-fragile' and also open to positive black swans, (Taleb, 2009), but not so positive in an Iranian context that we get noticed and get taken over by the government.

For Taleb (2007) awareness of four key concepts are recommended:

- 'silent evidence'
- 'confirmation error' (or 'platonian confirmation')
- 'epistemic arrogance', as mentioned
- 'future blindness'.

### **2.3.1 Silent evidence**

Taleb describes this concept as the tendency of the people to ignore parts of any process that are inaccessible to them preferring the parts which are accessible, in other words, as stated above, paying more attention to what is known than to what is not known (2007). In this way

evidence, which may be present remains ‘silent’ (unnoticed), at least for the present time. This evidence may become very obvious when its usefulness to us is realised too late). Once this type of evidence results in a black swan event then its presence becomes obvious to us, *but only then*. Up to that point it has been silent.

It is, he writes also possible to notice silent evidence but misread it because it is not aligned with our theoretical (narrative) preconceptions of it, or because we make it fit into an existing pattern of historical evidence. For example, Taleb argues there is a common-sense inclination to think that a thousand catastrophic deaths caused by an earthquake in California is thought of as more likely because these deaths are easier to imagine than a thousand drownings ‘somewhere’ in America. While the latter is much more likely it is difficult to imagine clearly. Disaster movies featuring San Francisco provide narratives that are vivid and memorable.

Taleb (2008) gives another example concerning people's willingness to exaggerate the talents of a well-known published author while ignoring altogether the talents of millions of writers who never had their book published (Taleb, 2008). The latter represents a good example of silent evidence. Generally, willingness to ignore silent evidence should be considered when examining how actors engage in managing for the future, particularly in chaotic environments in which silent phenomena are likely to affect outcomes to a disproportionate extent. It is central to this thesis to examine the extent to which surviving Iranian entrepreneurs are sensitive to evidence which is silent as far as other actors are concerned.

### **2.3.2 The Story of the Chinese Farmer**

In his commentary on the *Story of the Chinese Farmer*, Alan Watts comments that ‘The whole process of nature is an integrated process of immense complexity, and it’s really impossible to tell whether anything that happens in it is good or bad — because you never know what will



be the consequence of the misfortune; or, you never know what will be the consequences of good fortune.’ The story is as follows:

*Once upon a time there was a Chinese farmer whose horse ran away. That evening, all of his neighbours came around to commiserate. They said, “We are so sorry to hear your horse has run away. This is most unfortunate.” The farmer said, “Maybe.” The next day the horse came back bringing seven wild horses with it, and in the evening, everybody came back and said, “Oh, isn’t that lucky. What a great turn of events. You now have eight horses!” The farmer again said, “Maybe.” The following day his son tried to break one of the horses, and while riding it, he was thrown and broke his leg. The neighbours then said, “Oh dear, that’s too bad,” and the farmer responded, “Maybe.” The next day the conscription officers came around to conscript people into the army, and they rejected his son because he had a broken leg. Again, all the neighbours came around and said, “Isn’t that great!” Again, he said, “Maybe.”*

(Watts, 2011)

### **2.3.3 Confirmation error:**

The story illustrates one of Taleb’s key claims which links ‘confirmation errors’ and ‘epistemic arrogance’: the tendency to look only for proof and validation while ignoring disconfirming evidence (Taleb, 2007). This tendency compounds the tendency to ignore silent evidence, just discussed. As Taleb states, "corroborating evidence of an idea or worldview is always readily abundant, and by focusing exclusively on those things that support it we ignore a wealth of information in the form of instances that do not support it" (Taleb, 2007).

Confirmation error is closely related to silent evidence, but illustrates silence in another manner. Confirmation error (also known as confirmation bias) invests positive confidence in a

concept while ignoring that concept's negative attributes and inbuilt vulnerabilities (Taleb, 2008). However, the effects are similar to inattention to silent evidence.

According to Taleb (2009), following in the footsteps of Francis Bacon, David Hume, Charles Lindblom and Karl Popper, it would be more efficient and effective to identify all the evidence that does not fit (and all of the weaknesses in the adopted concept). For example, in terms of political candidates, all candidates do their best to exaggerate all the positive things they are going to accomplish in future and all their previous successes and to encourage followers to picture those future successes while encouraging voters to ignore parts of their political record that represent failures. Politicians are very reluctant to acknowledge and take responsibility for past mistakes. An anti-fragile solution would be to ask all political candidates and job applicants to list their worst mistakes and what they have learned from them. The usefulness of anti-fragile questioning is most usually ignored.

The problem of confirmation error is especially dangerous in a highly chaotic environment where the unexpected is typical. We hypothesise that *surviving* business persons will be found to be less vulnerable to this bias than the average agent.

#### **2.3.4 Epistemic Arrogance**

According to Taleb (2008), this problem concerns the differences a) between what someone *thinks* she/he knows and what she/he knows, and b) between what s/he knows and what s/he does not know. These failings are 'epistemic' in that 'epistemology' is the study of *the basis on which* we can claim to know what we claim to know (Keat and Urry, 2011). The difference between what we think we know, what we know and what we do not know is critical: "if what they actually know exceeds what they think they know, that is humility and if what they think now exceed what they actually know, that is epistemic arrogance" (Taleb,2008). Unknown knowns and known unknowns are much less risky than unknown unknowns and even known knowns. The main consequence of epistemic arrogance is a limited but exaggerated ability to

control and assess the unpredictable, overestimating our knowledge while underestimating uncertainties, simultaneously (Taleb, 2008); amounting to ‘the ‘inability to account for the factors outside of a pre-defined set of parameters’ (2008). We add that these weaknesses plague the Marxist linear view of history in which deviations are ignored and Marxism is ‘inoculated’ against its erroneous predictions (Popper, 1966/ 2013). Similar weaknesses also plague the functionalist paradigm which is immune to a defect that is obvious to outsiders, that relying on ‘exogenous factors’ to explain change (such as an unforeseen change in the level of demand for a certain commodity to which markets should then *respond*), is blatantly unsatisfactory and does not qualify as ‘explanation’.

Our suggestion would be that the President Bush Jnr. administration was characterized by epistemic arrogance particularly in terms of economic and foreign policy; similarly, President Trump in terms of what he would be able to accomplish, or has accomplished, especially in foreign policy terms. In short, epistemic arrogance carries grave implications.

### **2.3.5 Future blindness**

‘Future blindness’ is defined by how the future appears to the subject (actor) based on their future projection of their experience of the past (Taleb, 2008). In this concept, the future has been envisaged (mapped) in order to mitigate future uncertainties as well as bring about positive results. What it forgets is that this is what so many others have already tried and failed at. According to Taleb, it is "an element in the mechanics of how the human mind learns from the past and makes us believe in definitive solutions yet [without recognising] that those who preceded us thought that they too had definitive solutions" (Taleb, 2007). Note here that Taleb attributes this and other sources of failure to human evolutionary psychology. As we have begun to suggest, an alternative starting point, Grid-Group Cultural Theory offers a cultural explanation for different ‘risk appetites’, conflicting understandings of the problems which individuals and institutions face and conflicting alternative solutions to those problems. We

mention these because it may be possible to explain the thinkability of ‘anti-fragility’ as a cultural outcome. Of the four available ways of thinking specified by G-GCT, *fatalism* is a good description of the feelings, thoughts and actions to be found in surviving Iranian entrepreneurs (see below). In other words, the fatalistic thought-style is more sensitive to risk and negative evidence and more anxious to avoid minimise mistakes. The Fatalistic Thought Style is less vulnerable to ‘epistemic arrogance’, more sensitive to unknowns and more aware of evidence which other thought styles overlook in the form of ‘silent evidence’. Our suspicion is that fatalist reasoning is associated with fewer large mistakes than are the other three forms of reasoning.

Though we will be offering G-GCT as an alternative to Taleb’s naturalistic explanation for ‘epistemic arrogance’ based in evolutionary psychology, the higher vulnerability of *Hierarchical-*, *Egalitarian* and *Individualistic* thought-styles to all forms of ‘blindness’ still serves Taleb’s basic point that many and probably most actors tend to over-emphasize the observable points of confirmation while ignoring features that are not directly noticeable. Taleb (2007). These biases are especially unfortunate, Taleb argues, in a chaotic world which he characterizes memorably as having the qualities of ‘Extremistan’. He observes dryly that even in the fixed, natural world of unchanging features, the search for a ‘north west passage’ to a place that was obvious and known – India – led us to somewhere that we neither knew about nor expected to know about - North America (Taleb, 2007).

Also, sympathetic to Taleb’s thesis, Green (2011) has the following comments to make about the steps which can be taken to deal with Black Swan events:

- defining the problem and fixing it should be kept apart
- attempts at any project should be made in distinct phases as far as practicable
- a range of possible solution should be experimented with to find one which works best (abandoning those that fail)

- Uncertainty must be tolerated, despite its disturbing and distracting effects, because it is practically unavoidable

Using Thompsonian Grid-Group Cultural Theory (introduced earlier) Green's analysis of what the world is like (which we would identify as Green's paradigm) is recognisable as Fatalistic-Pragmatism. We agree with Thompson that Fatalistic-Pragmatism provides the most appropriate form of feeling, thinking and acting in the most difficult 'risk environment'. Taleb is correct, but for cultural reasons which he does not discuss in *The Black Swan*. It will be one of our recommendations that Taleb becomes aware of cultural theory and that cultural theory offers *four* positions (rationalities, thought styles) which we think of as an advance on Taleb's *dualistic* division between 'Stoic' and 'Platonic' ways of thinking. A cultural approach has the potential to be more open to a wider range of possible strategies and surprises, set out in Thompson's 'Surprise Matrix' (Thompson, 2018:7). But before returning to discuss G-GCT it is important to present some more of Taleb's examples of black swan event which match the three criteria set out above on pages 51-2.

#### **2.4 Towards Black Swan Proofing**

According to the Taleb (2007), there are several prominent examples that qualify as Black Swan events: '9/11', the credit crisis in 2007-8 and the earthquake and tsunami in Japan in 2011. It would be wrong to treat the Japanese tsunami as an especially natural event as the devastation it causes was as a result of a pattern of social settlement and risk-underestimation by a nuclear power company which failed to build protective walls high enough to hold back the waves. In other words, ill-prepared and optimistic *social* arrangements magnify the catastrophic effects of *natural* phenomena.

Taleb also cites the following as identifiable black swans:

- 5 million USD project that caused to an almost \$200 million loss in Levi Strauss & co. in 2008 (Flyvberg and Budzier, 2011)

- A massive oil and gas production project at Sakhalin island, was sanctioned in 2003 at \$10 billion (a value that exceeded Shell's net income for the prior year). Two years later, with the project well into construction, Shell issued a 6K report announcing the cost had doubled to \$20 billion (today it is \$22 billion)" (Dodson and Westney, 2014)
- The Boston Big Dig project went more than 100% over budget (from \$2.6 billion to \$14.6) in 2007 (KPMG, 2013; Dodson and Westney, 2014).

It strikes us that these major projects for which a great deal of expert scenario-development, planning and *Gantt Charts* will have been produced, demonstrate prominent black swan features.

These failures matter to the author since an aim of this study is to suggest ways of making Iran's oil and gas sector more 'anti-fragile' through diversification of downstream petrochemical industries. In doing so, an ideal – the lifting of sanction – and the less than ideal – re-imposition of sanctions – cannot be treated as calculable probabilities. However, as we discussed earlier, not all the consequences of apparently unfavourable geo-political changes (particularly of the cessation of the Iran nuclear energy program and of several disputes with the European Union and USA, and sanctions) need to be treated as negative... *if* they inspire adoption of anti-fragile practices. The Talebian approach is to seek the silent evidence and especially counter-factual evidence in all of the following 'known knowns':

- The *UN Security Council* imposed a further set of economic sanctions on Iran as UN resolution 1747 (UN Security Council, 2007)
- On March 2008, a third set of sanctions was imposed on Iran by UN Resolution 1803 (UN Security Council, 2008) which banned *Sepah Bank* (the second largest Iranian bank) from all international activities
- In June 2010, further sanctions were imposed on Iran in the form of Resolution 1929 (UN Security Council, 2010), which restricted most Iranian banks

- In 2011 under pressure from the UK government, the *Central Bank of Iran* was banned from all international activities (Guardian 2011)

It strikes us that anti-fragility could flow from these, if they promote Fatalistic-Pragmatic sensitivity to risk and surprises, confounding the expectations of those who promoted sanctions, and even confounding the worst fears of Iranian officials and entrepreneurs. In other words, the less-than-obvious outcome could be of greater importance than what was anticipated and painfully obvious to all on and after sanctions were imposed.

## **2.5 Approaches to the Unknowable Probability of Black Swans**

To summarise, chaos theory expects nonlinear movements (surprises) have disproportionate impacts and that it is wise to assume that to this extent, *the future does not exist* (Slaughter, 1998). This is at least partly because ‘outliers’ defeat planners. An “outlier lies outside the realm of regular expectation[s] since nothing in the past can convincingly point to its possibility". Taleb is sceptical of studies which posit imaginary prior solutions to Black Swan events, solutions which are only imagined retrospectively. For example, he would be critical of Murphy and Conner (2012) and Werther (2013) who suggest that there will be prior signs of Black Swans if only we had identified them beforehand, in which case we could have protected or mitigated against their consequence. What these two authors do not specify is why what Taleb would call ‘silent evidence’ should have been audible to those who were deaf to it at the time. Fools are wise after the event.

Taleb and Lindblom would be dismissive because of the extraordinary difficulty of picking out the one small prior event from the many millions of possible variables which might provide a tipping point for a series of massive events to take place months, years or even decades later on. Like Lindblom, Taleb is sceptical that the volume of data and the computational power necessary to assess the web of interconnections will ever be available no matter how well-developed the social science become. This is one of the reasons why progress

in the social sciences is difficult to establish, especially when compared with progress in the natural sciences where the mistakes which exist in scientific theories are easier to identify and correct. It is not a trivial point to state that social science is inherently more difficult and more error-prone than rocket science.

Among those who accept the inevitability of surprises and the futility of prediction are Dodson and Westney (2014). Accordingly, they offer a five-step procedure for managing the future and taming – or at least moderating - black swan events. These include:

1. *Risk Farming* ('hunting Black Swans'): planning and drawing the risk scenarios and their consequence impact we think endlessly. Again, this also reminds us of Popper's recommendation that instead of looking for confirming cases researchers should look for 'counter-factual evidence' and focus on testing 'falsifiable conjectures', not building up 'grand theories'. We stress that from Popper's point of view, mistakes are valuable because they are the most efficient method for advancing knowledge, hence the unattributed joke 'I learn so much from mistakes I really must make some more of them'
2. *Risk Strategies* ('caging Black Swans'): provide and create strategies that prevent or mitigate the results in case they occur. The attempt to avoid risk completely is abandoned. We would add that the attempt to eliminate risk altogether is too expensive and prevents learning opportunities (mentioned in 1. above) as well as investment opportunities (positive black swans). There is an incalculable risk that black-swan suppression creates further black swans as unanticipated consequences
3. *Risk Assessment* ('understanding Black Swans'): assessing and evaluating the potential cost and schedule of scenarios. However, we are not completely persuaded that 'potential costs' and 'schedules' are knowable, because each cost – even a small one – amounts to a potentially hard-to-assess impact in another unforecastable chain of chaotic future events each of which have costs but also benefits which vary in quality



and quantity and which do not add up in any simple accumulation of plusses and minuses

4. Risk brokering ('feeding caged Black Swans'). At this stage, risk estimation and allocation is attempted individually and independently. Risk brokering begins with several parties engaging separately and independently in assessing project risks. By this method and Dodson and Westney believe that all(!) potential issues should be clear to all the parties once their assessments are shared
5. *Risk Validation* ('taming Black Swans') involves endeavoring to manage Black Swans by a process of continuous monitoring and checking

The metaphors 'hunting', 'caging', 'feeding' and 'taming' seem to assume, we think, a level of 'understanding' of black swans which may not be attainable without committing the narrative fallacy. Nevertheless, the state of perpetual wariness which these authors propose is to be welcomed. Consistent with the five steps which they propose, Scenario Planning (see below) is a creativity technique which is designed to broaden the imagination of participants, improving the thinkability of a range of possibilities. It may have the effect of replacing one narrative fallacy with many narratives, but it should be remembered that these are still narratives because the futures described by scenarios should not be mistaken for evidence of realities.

Our reading is that Kenett (2013) is that he persists in believing that some black swans can be avoided by a mixture of historical data collecting (ie. extrapolation from past events), scenario-building and testing in order to identify risks at least in outline and more clearly when an event takes place. Meanwhile, Green takes Taleb's view that Black Swans will remain unpredictable, or at least extraordinarily difficult to anticipate and to prepare for in terms of their final consequence (Green, 2011). We repeat that in any case, no accurate end date can be

placed confidently on the consequence of any action in a chaotic world. We repeat that question concerning the consequences of the births that did not take place to men killed in the 1914-18 war, the children that these children did not have (and all their life-long actions that never happened), and the four or five never born generations since then and all the non-actions of their non-lives. In this way, we make a guess that the deaths of soldiers in World War One are having much wider impacts in 2017 than they did in 1918 and each soldier's death will continue to magnify in its impact forever, but in ways that are impossible to estimate. At any point, in any of these missing chains of causation a huge difference to the world could have been made, which we might label 'invisible swans' or more specifically, 'invisible descendant swans'.

Other authors have also offered 'Staging' as an approach to minimizing black swans (Flyvberg and Budzier, 2011). In this procedure, back-casting and forecasting processes are applied to break down the process, seeking to identify otherwise overlooked risks which could then be mitigated. This is another sensitisation technique widely practiced across a range of governmental, consulting and business projects, particularly in the UK and Denmark.

We observe that Taleb *did not say* that the world is *wholly unpredictable*, but only that small events have disproportionately large and unforeseeable impacts. He would acknowledge, we think, that careful analysis of simple, intelligible and well-understood cause-effect relationships in simple systems is worth the effort (for example calculations for the strength of beams when constructing simple bridges). But it is when systems become complex that the recommendations just described cannot be relied on to eliminate risk from whole systems, even if each part of the system looks simple.

In any case Taleb (2012) insists that uncertainty and unpredictability are desirable (such as the accidental discovery of penicillin) and even essential. It is interesting that Hayek argued that without 'imperfect knowledge' and 'uncertainty' profit would be eliminated completely

because all markets would attain stable equilibrium and ‘normal profits’ in which there would be very little or no margins available to any investors.

These observations may help to explain why Iranian entrepreneurs manage to trade profitably despite and perhaps even *because* of the chaos that surrounds their activities and because of the erratic stream of positive and negative black swans that this generates (which sanctions may assist with in perverse ways). As described above, it is known that sanctions have mainly targeted the economic sector and central bank, precipitating calamities for the country in different sectors such as in Oil and Gas, Aviation, Pharmaceuticals, Banking Transactions and across several manufacturing sectors. All of these are typically in seemingly permanent ‘crisis’. It may even be a mistake to assume that (Iran’s) crises are permanent as they may also end unexpectedly and what Thompson calls ‘the risk environment’ becomes more favourable. The ‘crisis’ has created several opportunities for those, particularly outside Iran, engaging in exchange functions which have brought them large ‘windfall’ profits.

As explained earlier, I was involved in many sectors and found through multiple observations and experiences over several years that beneficial effects in one area of activity could offset negative effects in others. For example, by engaging in trading it was possible to offset costs and losses in manufacturing and/ or construction and/ or property development. Each of these sectors went through bad and better times, but the phases were not happening simultaneously or to the same degree in all sectors. In addition, my own businesses faced micro-difficulties and gains according to their detailed individual circumstances. If, when conditions were most favourable I had maximised profits by being prepared to expose each or all my businesses to potentially higher eventual down turn risks I could have profited greatly at the risk of comprehensive bankruptcy. For example, I could have relied much more heavily on debt-financing which the banks would have been prepared to grant. But, as stated, I am not a ‘profit maximizer’ but instead, shall we say, a temporary, watchful and rather nervous

shepherd of positive 'black swans' that come within my reach, which I also release and *do not* keep them 'caged' for longer than I dare.

From the above preliminary exposition and review, then, it may be assumed that there are two views toward Black Swan incident: either that they are to be forecast and managed through exceptionally powerful computational analysis, repeated through many rounds of scenario development, relying on very large data sets, enabling foresight. Alternatively, we might keep a perpetual look-out for black swans every minute knowing that we are going to have to deal with them sooner or later and therefore might as well get used to facing them now. It is the second approach which I recommend, and which I suspected most surviving Iranian entrepreneurs follow. It follows that it is important to

- learn to recognize what we now call positive and negative black swans very quickly, even in minutes
- suspect all phenomenon of being black swans as a default assumption (even what have the appearances of very normal looking events)
- treat all talk including private conversations with myself as vulnerable to what we now recognize as the 'narrative fallacy'. Doubt is a default condition
- look for whatever others have missed and what I have missed, which we now identify as 'silent evidence' everywhere, tirelessly
- treat the future as unmade while remaining mindful of it in the present, which has always been my tendency, including in private life

## **2.6 Back-casting and Forecasting**

The proposition that the future is open rather than a largely determined incremental outcome of the past means that (in the social field) the chaos paradigm is at least open to and even sympathetic to the application of scenario development techniques. There are many approaches to scenario development and there have been several claimed successes. For example, if the

future is not yet made, this suggests that it can be influenced so that undesirable futures can be avoided or mitigated and desirable ones given improved chances of being realized. It also follows that if small events can have large impacts, even a small step made in the present could have large future impacts (desirable and undesirable). Much of this is known as 'normative scenario development' in the sense that a preferred future is chosen and worked towards (though with no guarantee of reaching it). We will label this position as the 'soft' version of strategy.

However, many specialists in strategy fall on the other side of the argument, which we have doubts about, aiming to manage the unpredictable future, predict and control, collect all necessary information, understand problems in all their complexity and form a logical plan so that the chosen scenario is insured to some degree against future uncertainty (Polasky et al., 2011 and Rounsevell et al. 2012 and Regamey, 2013). This we can call the 'strong' version of strategy.

According to Schipke (2012), information and accurate story(!) analysis enables us to recognize and characterize future ambiguity and control it in advance, so that through the process of forecasting(!) future, complex problems can be drawn with some confidence and understood, and actions 'aligned' with corporate strategic 'visions' and 'goals'.

Another important suggestion is that once the desired destination has been identified (well in advance), then a back-casting exercise can be undertaken in which the destination is the start point and a path to the present is worked out as a series of backward steps to the present. This sequence of reverse steps (Robinson,1990), can be depicted as a five-step or seven-step comic strip or a series of 'tableaux'. The back-casting process is claimed to be useful for long-term planning (Dreborg,1996) and this may be necessary when there is nothing else to turn to, especially in the case of large-scale heavy investments, as acknowledged above.

Back-casting theory has been defined as the complementary technique for anticipating and working towards the future in a more mindful way than would be possible otherwise. Through this method, more than one future will be visualized initially, through the process known as scenario development. This involves choosing and cross-tabulating two dimensions to form an  $x$ - $y$  matrix then to see what contents could be attributed to the four cells defined by the chosen dimensions. For example, in contemplating 'healthcare futures' an  $x$  dimension might be 'public responsibility/ private responsibility' while the  $y$  dimension might be 'health promotion/ disease fighting'. In this case the four cells would be:

- *Public Responsibility with Disease-Fighting*
- *Public Responsibility with Health-Promotion*
- *Private Responsibility with Disease-Fighting*
- *Private Responsibility with Health-Promotion*

In this way, it becomes easier to detail each of the cells, notice the differences and similarities among them, discuss and choose 'best', 'worst' and 'most likely' futures then using back-casting to then identify how different strategies and activities beginning here and now might lead to the desired future (Robinson, 1982). We point out that this is a collective process that brings together many minds in an organization or across many organizations and this can be useful in helping to alert organizations to risks (black swans) which only a few members have thought about. If participants feel unconstrained by existing narratives, then the capacity of an organisation to think critically may be increased, by summing all fears, and summing all dreams.

However, to an Iranian entrepreneur doubts begin to occur when we read what comes next. It is recommended that once the clear, desirable and realistic (i.e. plausible and convincing-looking) goal has been drawn, and all actions are 'aligned' as 'requirements' of the strategy, then the pathway is more or less fixed as a path from the current situation forwards in

the light of whatever uncertainties there are (Robinson,1982). Given the probability that circumstances will change on the way (fresh black swans will appear) then having actions 'aligned strategically' to the destination as a requirement would cause me considerable anxiety. From an Iranian entrepreneur's experience having fixed actions would create brittle new risks that are easier to avoid in a diversified owner-controlled enterprise than in a large managerially joint-stock company with bureaucratic reporting systems designed to ensure strict 'compliance'. This would be the administrators' desired state, providing illusory assurance that if all actions are compliant then there is no reason to suppose that the project will not succeed. The danger is increased when attention is concentrated of processes and procedures, reducing vigilance for black swans.

Perhaps we can say that when thinking about large firms' scenario development, back-casting and scenario planning, gathering information and considering the possible impacts of internal and external factors (political, economic and environmental) is the best that might be available (Hojar et al,2011 and Robert,2005). We think that back-casting is useful in that it acknowledges some freedom of creative action and the possibility of willing futures rather than accepting whatever chance throws up. It also sets out a clear methodology for doing this (Wilson et al., 2006), but at the risk of greater rigidity afterwards. We also fear – again from experience – that through a participative process, policies will be implemented with much greater willingness, enthusiasm and confidence than is safe. Participants will find the process enjoyable or at least energising especially those from the bottom and middle ranks of an organisation who tend not to be asked to express their opinions.

Most fundamentally, there is the problem of *which* two dimensions to select as the basis of scenario development. How do we judge one set of dimensions over any other set? In the example of 'health futures' just described, why not explore:

$x$  ‘acute medicine/ public health measures’ cross-tabulated with  $y$  ‘individualised/ population-wide’

or instead;  $y$  ‘medicalisation of life/ De-medicalisation’

or  $y$  ‘self-testing and diagnosis/ collective testing and diagnosis’

or  $y$  ‘nationally-regulated state-owned and controlled care system/ free-traded care system

or  $y$  ‘professionalised/ bare-foot’ provision

or any combination of any two of these or any other two from, say twenty dimensions?

To scenario plan all permutations of twenty two-dimensional combinations would be very time-consuming and why stop at two-dimensional representation? Why not add a  $z$  dimension to create eight-cell boxes?

Notice too that dimensions have implicit normative as well as the ‘objective’ qualities which they are supposed to have. What will appear desirable to some actors will create fear in others, so that the ‘best’ outcome will not be a unanimous choice. Our sense of it is that this may at least reduce the risks posed by adhering to a single-minded brittle strategy.

It is reported generally that the first-time scenario-development was applied was in the oil and gas sector with the purpose of the long-term future planning by *Shell* in late 1970, in response to the ‘oil crisis’ created by OPEC. The technique spread rapidly across several industries, and is applied to analysis of climate change, ecological systems analysis and environmental protection (Dreborg, 1996; Holmberg and Robert, 2000; Carlsson- Kanyama et al., 2008; Hojer et al., 2011; Kok et al., 2011; Quist et al., 2011; Berkel and Verburg, 2012; Kok et al., 2003; Strachan et al., 2008). These approaches have been used at a very large scale in developing EU policies and they will accept both qualitative and quantitative data (Anderson et al., 2008; Ault, Frame, Hughes, and Strachan, 2008; DECC, 2011; DTI, 2006; McDowall, 2006; National Grid, 2012; UKERC, 2013).



Fig 2.6 describes back-casting procedure beginning with problem definition and information gathering through to a final solution in three phase. According to the following figure, at the ‘visioning’ phase, scenario planning and evaluation influence the whole procedure and Robinson emphasises the special importance of completing this stage carefully and deliberately (Robinson, 1982).

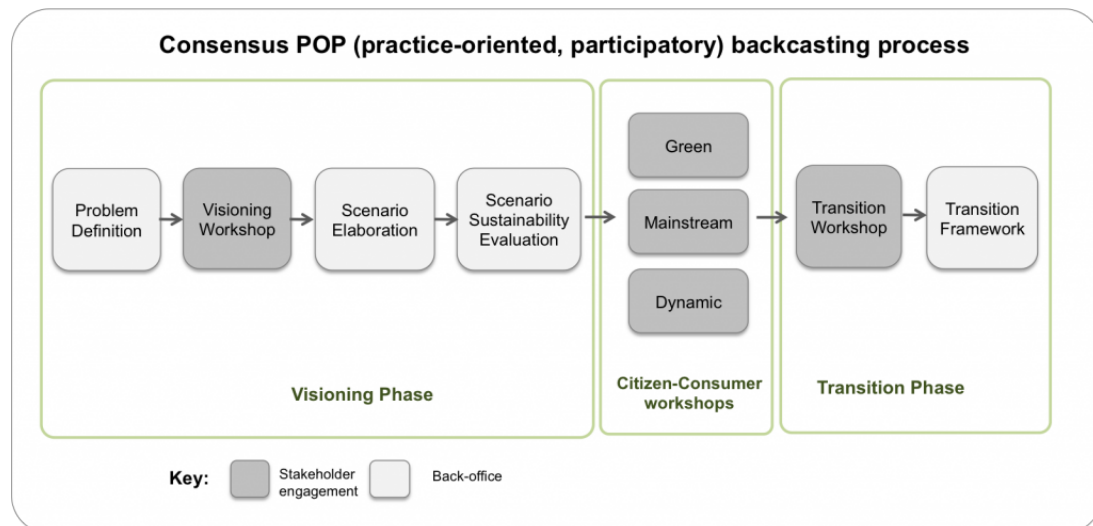


Figure 3.6 Back-casting Process (after Robinson, 1982)

The claim has been made that to ensure that strategy and techniques work effectively at reducing undesirable futures and the current situation and resources are matched and allocated meaningfully and accurately, the main objectives and demands need to be integrated (Gret-Regamey et al., 2012; Cavender-Bares et al., 2015; Wolff et al., 2015). We read this as assuming a responsive political system either at a national scale or within a single governmental or non-governmental organisation, that is accessible to many different participants. Whether this translates into the Iranian entrepreneur’s experience is an open question, for whom ‘citizen/ consumer participation workshops’ may have very different connotations in a state that is an official Islamic Republic and therefore participants might have quite different statuses to the ones Robinson has in mind.

Nevertheless, according to the advocates of this approach all(!) internal and external factors should be identified and the effect of each factor on the whole system should be assessed (e.g. Bryan et al., 2010; Huber et al., 2011; Burkhard et al., 2012; Gre<sup>^</sup>t-Regamey et al., 2013b; Bagstad et al., 2014; Castro et al., 2014; Schulp et al., 2014; Stürck et al., 2014; Bagstad et al., 2015). Again, this strikes us as highly ambitious, complex and in Taleb's and Linblom's estimation, unattainable, inefficient and even dangerous.

As the overall aim (if not objective) of this study is to envisage an anti-fragile Iranian petrochemical industry with diverse downstream activities, we do need to consider what contribution such approaches might make, especially as the scale of investments and timeframes involved are considerably larger than faced by me as a more typical private Iranian entrepreneur who also pursues anti-fragility.

## **2.7 Flexible Strategies?**

Scenario planning promises one of the most effective means of managing in a way of managing in the present that is at least *mindful* of the future especially in industrial sectors where external events can have a major impact on the growth and decline of an enterprise (Berkel and Verburg, 2012). *Target-setting* and *process assessment* based on scenario development, selection and then planning is a variant on this much-discussed approach (Robert, 2000 and Ney 2006) with the intention of managing the future by creating a strategy that is compatible with uncertainty and therefore allows different possible outcomes (Peterson et al., 2003; Madlener et al., 2007).

No advocates claim that scenario planning means anticipating the future with precision. The word 'forecast' is used in preference to 'prediction' as 'forecasts' admit the possibility of occurrences which are attributable to features that lie outside the system as it is defined, whereas 'predictions' assume that all relevant features are included within the calculation. Scenario planning is a method for anticipating different alternative futures that might occur in

order to reduce undesirable surprises (Heijden, 1996). As discussed, planning can be done backward' or 'forwards' but the backwards steps seem better-suited to 'long-term visioning'.

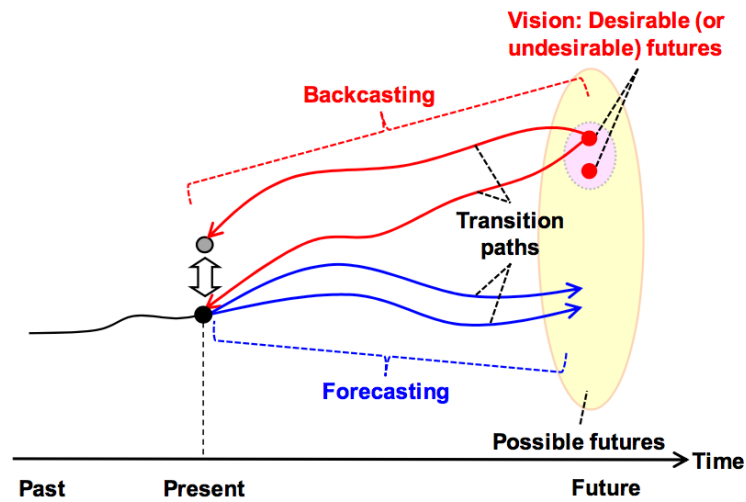


Figure 4 Forecasting and Back-casting Process

The attempt to bring more possibilities into consideration strikes us as welcome as long as we remember that it can never be a comprehensive method of mapping the future due to the high probability of scenarios being overtaken by dynamic changes (Eisenhard,1999) including dynamic responses by other actors in response to what the forecasters are attempting and who may be hostile to it (for example, competitors and enemies). In our view, this stronger version of strategy may *marginally* improve our grasp of short-term variability but carries the danger of mistaking what is a system-wide narrative for something that is more empirical than a narrative. In other words, these techniques may make us even more vulnerable to the narrative fallacy because they appear worked-out, considered, comprehensive, reliable and shared.

As stated above, scenarios are developed usually by taking two dimensions and building four scenarios out of them in two-by-two matrixes. The scenarios that you get depend on the dimensions that have been chosen. So here is the problem: if the scenario developer had chosen a different *x* dimension but kept the same *y* dimension in a given scenario development exercise, they would have developed four significantly different futures to the ones they

actually worked with. They would not have chosen the preferred destination that they 'back-cast' towards and their process of 'strategic alignment' of the organization would have been different. The fate of the company could have been significantly or completely different to the one that it followed, simply because some scenario players ran a workshop in a slightly different way to the way they could easily have done so, one Thursday afternoon during an 'away day' event. The presence or absence of a single participant, let us suppose, who had a special concern with, say High or Low Regulation of the Tourist Industry as a dimension worth considering and who did not express this concern, did not get it incorporated into his or her company's strategic vision. According to our preferred paradigm, then, scenario-development processes are highly susceptible to very small chancy variations in the antecedent conditions – here the presence or absence of a single conscientious individual actor; perhaps because her car broke down on the way to the event or an emailed invitation was overlooked because her inbox was full.

The alternative for followers of Taleb (2008) is to split and subdivide risks rather than to manage or avoid them. He and I would be doubtful of the claim that strategic scenario planning can align organizational practices to the external factors in a comprehensive process (Chermack et al, 2001), or rather that if this is attempted that it can be overturned dramatically by an unforeseen event (which afterward, someone will say should have been possible to see coming). Our point (and Lindblom's and Hume's) is that no process can ever be truly comprehensive, especially in covering such chaotic fields as the political, economic, social, and legal). These are all vulnerable to black swans separately and together. At best, it may be possible to become sensitized to vulnerability (but not to identify particular outcomes with much accuracy or confidence) and then be prepared to move more quickly when unexpected events happen (Jayal and Badurdeen and Jawahir, 2012). Perhaps having a plan makes it clearer, sooner rather than later that the world defies the plan and this might be a useful lesson.

What implications do ‘anti-libraries’ (Taleb, 2009) have for scenario development and planning? The process of creating polymers and a wide range of high-value aromatic compounds from oils is now well understood and products can be specified very accurately within known parameters. Polymer science obeys the laws of chemistry. Neither we nor Taleb argues that expertise should be discarded concerning known chemical and physical processes though even at this level, unexpected variations can take place and process engineers can be taken by surprise if they are controlling several variables at the same time, especially in large scale facilities. This is a reminder that when scaled-up, what happens safely and predictably in a small experimental test rig can result in lethal catastrophic failures which no expert foresaw. What has happened here is that a chemical process governed by nature has been extended into a complex social system involving petrochemical engineers, production engineers, sales engineers, gas-flow analysts, instrumentation engineers and even ‘financial engineers’ is now at work.

Taleb emphasizes that awareness of what we don't yet know (and cannot know) should count for more than it does in practice (Taleb, 2012). Knowing the results of the last four, sixteen or thirty-two quarters may mislead us very seriously as to what the next quarter will bring. In other words, over-dependence and over-confidence on expertise beyond what can be expected from it is where danger exists. While I claim considerable expertise as a petrochemical engineer, I do not claim expertise in the petrochemical products *markets* because markets are far more vulnerable to randomness than the manufacturing process itself (which already has more variations in it than is desirable). I hypothesize that other surviving Iranian entrepreneurs act less and less like experts depending on how vulnerable to randomness is the businesses they are dealing with. Entrepreneurs are not truly experts. The Talebian point may be to limit the role of expertise to quite simple activities where they can be trusted to be left in

charge within domains which have well understood boundaries. If black swans are likely then the presence of experts may make their effects worse.

For example, the expert may stick to targets that black swans make impossible or too costly to reach. We have some doubts about the following recommendation by Robert and by Ney, that once a target has been set for the future, how the organization stands in relation to this target is determined, what target-oriented corporate policies should be adopted are identifiable and if followed should move the organisation from its current state to the fulfilment of the target (Robert, 2000; Ney, 2006). Experts may have strong views about how to accomplish 'change management' in relation to 'targets' but we need to ask why so many change management programs seem to fail completely (Gavetti and Rivkin, 2007; Ringland, 2010). It is this kind of negative data that should ring alarm bells about the use of the techniques under discussion here. Radical changes may lead to "what Schumpeter would refer to as 'creative destruction', and dealing with these changes requires more than traditional strategy formation processes and tools" (Schumpeter and Opie, 1934).

By definition, scenario planning as it is being conducted, is protected from future environmental complexity and uncertainty (Walsh,2005; Gausemeier,1998; Schoemaker, 1993). It is the softer variants of scenario planning methods which include many feedback and testing loops as a proportion of all the processes which scenario planning can include. The softer the version, the greater the sensitivity to exceptions. Indeed, when we compare typical scenario development, backcasting and scenario planning with Iranian entrepreneurial practices perhaps the main difference is that for the Iranian entrepreneur:

- Exhausting mental re-enactment and revision of the model never ceases
- The x y and z variables are never settled on
- As the model is always in doubt so are the 'outputs' of the model
- The future goal is never quite drawn

- The steps towards it are never quite defined.

Something goes better or worse than expected most days and sometimes very much better and very much worse than expected even on the same day. This reminds us of what Dreborg states (1996) pointing out that changes may be required anywhere during the procedure (Dreborg, 1996), but we would add, at any time and that the procedure is not fixed. This raises the question as to whether Iranian entrepreneurial practice can be described as ‘procedural’ in the accepted sense of something replicable *proceeding* in set stages.

Quantification does not seem to us to change things fundamentally. It is acknowledged that scenario-development and strategic planning may be served by both qualitative and quantitative elements (Swart et al., 2004) and it is claimed that quantification allows dynamic extrapolation from past trends (Vested et al., 1992; Brabec et al., 2001), even that understanding past trends and historical changes create the best possible strategies toward the intended goals (Cinq- Mars and Wiken 2002).

These claims for computational methods look very optimistic after the shock of 2007 because the omission of very small data sets can lead to massive errors – especially by persons who think of themselves as experts - even in a short time scale. We emphasise that writers who inhabit the chaos paradigm do not believe that the nature of the social world means that it is not possible to identify and consider all external drivers that cause changes in all interconnected components (IPCC, 2000; Tietje, 2005). We think it unlikely that it is possible to attain the necessary accuracy, the precision and detailed step by step process mapping and identification of all the drivers, to such complex problems in all the details which proponents of the strong version of strategy claim is both necessary and possible:

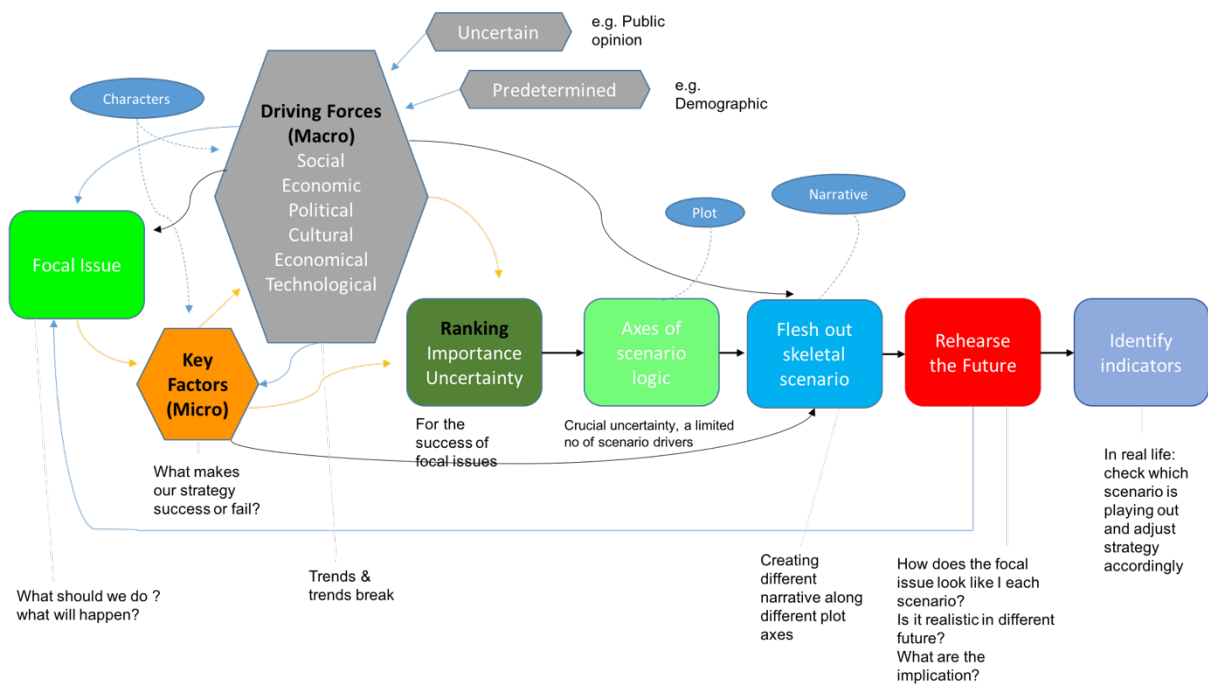


Figure 5 Scenario Process Diagram (do Prado Leite et al., 2000)

## 2.8 Weak and Strong Definitions of Scenario Development

We do not want to reject everything that these authors claim because there is one thing that is fundamentally convincing and this is the claim made by all but the most rigid ‘extrapolators from the past’ that the future is unmade and does not exist. The aspect that seems worth keeping is the idea of scenario *development*, but as a permanent and never-ending exhausting but never exhaustive activity under constant revision. We also think that it should be much less systematic than the literature suggests and should have a reduced role for experts (because the more chaotic the circumstances the more dangerous experts might be). According to Taleb (2010), scenario planning is not dependent on expert skills, since uncertainties involve not expertise, but lack of understanding. Our suspicion is that over-simple clarifications, even if the scenario development process is complex, is vulnerable to unidentifiable risks whose future impacts are unknowable even with any amount of computational power that can be imagined.

Scenario planning is a creative method of describing future which should accept the assumptions that a) the chief relationships between the ‘drivers’ and their consequences are not



completely predictable (Amer et al, 2013; Kahn,1967; CERF, 2012) but that drivers identified and the anticipated consequences are at least roughly appropriate, defensible but provisional.

The aim should not be to create an end point to be cemented in place, but instead to make strategies much more responsive to uncertainties in the interpretation of evidence, contexts and to differences in 'scales of decision and degree of recognition of the spatial dimension in the issues addressed' (Navarro-Ligero and Valenzuela-Montes, 2016)

Scenario development has been defined usefully as a "tool for ordering one's perceptions about alternative future environments in which one's decisions might be played out" (Schwartz,1966). This soft or weak definition strikes us as acceptable. Among the weaker definitions scenario development (also known as scenario analysis or planning) "is a systematic method for thinking creatively about dynamic, complex and uncertain future, and identifying strategies to prepare for a range of possible outcome" (Madlener et al, 2007; Peterson et al, 2003). However, the contrast with stronger definitions are is worth emphasising: it has been described as "a coherent, internally consistent and plausible description of a potential future trajectory of a system" (Oteros and Rozas et al., 2015). We reject each of the keywords contained in this statement as well as the complete proposition on the grounds that the stronger it is, the more dangerous it is in practice.

Here is another of the stronger definitions, that the scenario development procedure should confirm *all* the principal, drivers, and variable that consequently impact on the future possibilities, internal and external to the organisation to make the scenario useful for purpose of *any* events that might happen in future (Van Der Heijden, 2005). However, advocates of the strong version admit that three or four different scenarios must be developed to accommodate enough decision makers who should be involved in a systematic way. This strikes the author as too strong.

More than trying to avoid and minimise future complexity and reduce the uncertainty, scenario-development can incorporate many short-run feedback cycles (loops) to test alternatives more-or-less continuously to prepare decision makers for wider range of futures and uncertainties than might be possible otherwise (Kok et al,2007; Walz et al,2007). We notice here that the weaker the definitions employed, the closer scenario development comes to Iranian entrepreneurial practices.

Which is followed in practice? The ‘hard’ or ‘soft’ definitions and claims made for scenario-development and scenario-planning? There was intuitive logic to the method practiced by *Shell* in recognition of significant uncertainty about the company's future development that was recognised by the company’s own analysts during the 1970 (Wack,1985). With the massive and unanticipated oil price increment following the Israel-Arab conflict, *Shell* became better-prepared in comparison with its competitors and the intention was to become more *resilient* than its rivals (Wilkinson & Kupers,2013; Jefferson, 2012). What strikes us here is that medium- and longer-term resilience rather than profit maximisation was the aim. As an outcome of multi-scenario planning, *Shell* developed three different scenarios for future development as follows:

- 1) Chemical Products
- 2) Construction product
- 3) Hydrogen

(Kallemtets, 2016; Parker & Blumberga, 2017). This case illustrated the softer variant which is not about drawing the future precisely but about clarifying different possibilities to be kept in mind by decision makers acting in the present, so that they can aim for alternative futures more of their own making and design courses of action accordingly (Johnson,2017).

Treated as such, scenario work may indeed help industries and governments to clarify, manage, evaluate and even plan for risks and opportunities. In practice, it has played a major

role in the planning process for future management (Kwakkel & Pruyt,2012; Bryant & Lempert,2010; Jones et al.,2010; Salter et al., 2009; Volkery et al.,2008; Andersson et al.,2008), the aim being to "boost the ability of the top managers to identify a superior course of action that is different from the status quo and to foresee the consequences" (Gavetti & Menon, 2016).

The question then arises about whether scenario work mitigates the problems of perception which Taleb (2007) identified (introduced above), for example what does scenario work do for *confirmation bias*, for *silent evidence*, and to promote an organisation's notional 'anti-library'? If scenario work mitigates all decision-related biases, including the over estimation of knowledge and underestimation of ignorance (O'Brien & Meadows, 2013) then it should be welcomed with caution.

However, there are much stronger versions than we have introduced so far, which seem to us to *worsen* biases by promoting 'epistemic arrogance':

## **2.9 MITIGA Framework**

According to Owens, it is possible to approximate to *right responses* (Owens et al., 2004) likewise Abbott believes in a framework that generates concepts and intended objectives while managing complexity and uncertainty (Abbott, 2005). MITIGA is a decision-making support prototype tool with the claimed ability to provide strategic performance evaluation under different future scenario conditions. It contains three main features:

- a "strategic-options analysis concept based on the combination of different policy components"
- a straightforward assessment framework which qualitatively links the expected performance of, say, transport and urban development strategies with future trends, founded on evolutionary concepts ('transitions', 'trend stabilization/destabilization', etc.)

- a scenario generator... “principles of traditional prospective techniques” (i.e. morphological analysis) (Godet, 2006; Wiek et al., 2009; Tietje, 2005; Nguyend and Dunn, 2009).

The main purpose of this model is to accept input information flexibly, be adaptable to many different types of cases and to sustain a continuous decision cycle (Godet, 2006; Wiek et al., 2009; Tietje, 2005; Nguyend and Dunn, 2009). From a Talebian perspective, this should be advantageous, but only if each cycle does more than deepen existing narrative fallacies.

Another claimed capability of this model is its simplicity and transparency in dealing with different complex drivers and problem assessments to assist in the construction of vision, and story planning for precise decision making in the scenario planning process (Ligero and Valenzuela-Montes, 2016). Here it is the term ‘story planning’ that is most questionable and even self-contradictory.

According to Taleb and to the chaos paradigm in general, simplicity and transparency do not make a comfortable fit within the paradigm. But in this strong version of strategy transparency refers to direct relationships between a driver and the driven components. There are many exceptions which throw these relationships into doubt in very surprising ways. For example, at the time of writing, despite *authenticated, comprehensive and documented compliance* by Iran as assessed by an expert panel of highly qualified international inspectors, the US president was indicating his intention to ‘de-certificate’ multilateral agreements which had led to a lifting of sanctions, while the EU had also ratified two very large and documented banking and investment deals with Iran. It is difficult to place these contradictory developments within a scenario planning process and still construct ‘simple visions’ from it. A default assumption that ‘anything might happen’, surely the nul hypothesis of any scenario planning activity, should be retained as a possibility, we think. There should be willingness to accept the null-hypothesis at any point.

Following Taleb, we caution against the assumption that increasing the amount of information extracted through scenario process mapping necessarily provides 'black-swan proofing'. This is because, we stress, practically-speaking, information is never complete (and how far from being complete cannot be known either). As Taleb shows the *smallest* omissions of data (such as one day's stock historic price movements several decades ago) and single events (long ago and *forgotten*, or contemporary and *not noticed*) can have extreme effects on outcomes in any chaotic system. We question Marsden's optimistic confidence (2012) in target setting, exploration of alternatives, final decision making and solution selection, model evaluation and strategy generation. He writes that this "MITIGA assessment framework was designed for benefiting from comprehensive qualitative analysis of an open set of policy 'contents' and 'contexts' (objectives, logics, mechanisms, instruments, scales, locations, etc.) and all of them *known* as policy components" (Marsden et al., 2012, emphasis added). In fairness to Marsden, it may be that his confident-sounding terminology allows for the implicit problems that I feel lie hidden within scenario planning, if his words are read carefully. But he continues with a worrying degree of confidence, to claim three scenario metrics:

- Judgement of the effectiveness of different strategic options and of different assessment criteria for dissimilar scenarios
- The stability[!] and internal relativeness of each scenario
- Assessment of the observed distance from the current situation to different scenario in our terms, measurement of the distances to be travelled

The last bullet point is a significant qualification to Marsden's other bold technocratic claims. In our terms, the 'observed distance' between 'scenario' and 'current situation' should be the main focus. And to be even clearer: any surviving Iranian entrepreneur operates with many 'what-if' scenarios in his or her mind – inevitably – and every day checks these against welcome, unwelcome and wholly unexpected 'grey swan' surprises which are difficult to assess

as good news or bad news. It is not that entrepreneurs do not engage in scenario planning, though without calling it this, but they, to my knowledge, do not aim at comprehensiveness and do not plan very far ahead. In their lifetimes, foreign powers have switched from being powerful allies to being formidable adversaries and then softened and then hardened their positions, while also saying one thing and doing another simultaneously. We tend to treat it as a happy *coincidence* that 'scenarios' and 'current situations' ever match, rather than the outcome of effective information management, scenario development, and strategic planning. Indeed, to repeat that saying, 'He who foretells the future is a liar even when proved right!'

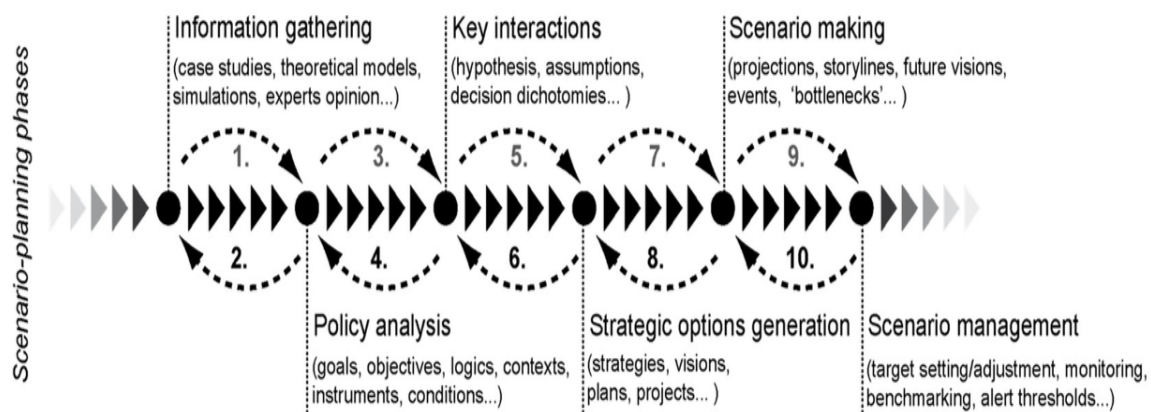


Figure 6 MITIGA Assessment Framework and Methodological Steps (Navarro-Ligero and Valenzuela-Montes, 2016).

Nevertheless, we reproduce the MITIGA framework. As can be seen from the above figure, the first stage is about the identification of policy components and the structure of the different scenarios including the driving forces and trends. Note the assumption that drivers can be distinguished from non-drivers. At this stage, the planner should list policies and their presumed effectiveness using reports, studies and simulations. The second stage involves formulating the relationship between the driver components and hypotheses to envisage how the driver components will affect future conditions. Some estimate is made of the likely failure or success of the policy under different sociological, political, environmental and economic conditions. The next stage shown as 5 and 6 defines the alternative strategic aims. Here all(!)

policies and driver combinations should be explored for different strategic options. All the boundaries, variables and effects on each component policies should be clarified before generating scenarios accordingly (Wiek et al., 2009; Tietje, 2005; Nguyend and Dunn, 2009). Then follows scenario management which calls for defining and analysing performance indicators (developed for each target) and for defined indicators (alert thresholds). This then, is the 'root and branch method' which Lindblom described as practically unachievable, not least because goals (or what Lindblom calls 'values') are not known until that point when the actor is faced with a forced choice between more or less of two possible *goods* both of which are desirable but which involve regrettable trade-offs (more of one means less of the other). It is only at that point that a policy maker discovers what it is that they seek most. Lindblom's criticisms of the 'root and branch method' of public administration and his famous preference for the 'science of muddling through' apply here. He argued that this kind of comprehensive approach calls for more capability than any administrator would ever have available to them. Both Lindblom, Taleb, and Popper agree that short-run experiments and 'piecemeal' 'trial and error-elimination', i.e. a flexible and contingent approach, will be much more workable and successful in practice. Lindblom stressed that in any case (and he lists many areas of policy) administrators and policy makers may not *know* what their values are until they are faced with choices in which one path may have to be sacrificed at the expense of another. This is probably true for individual citizens as well. Only when forced to make a choice between two preferences (for example even simple menu choices from a very appealing restaurant menu) do we know which one of them we really prefer. Even then we may decide too late that what the other person chose at the table would have been preferable to one's own choices. And another time we might prefer the other choice if it was still available, when in administrative practice that possibility had already disappeared.

We do not think either, that Taleb's evaluation of Mitga would be complimentary, given the almost inevitability that the scenarios will be overtaken by events and the impossibility of making more than very rough approximations for all the policy, driver and outcome interactions which this model demands.

It is difficult to know how to assess 'all' possible combinations of drivers, policies and outcome interactions in advance, given that it is already difficult to know what the interactions are now or were in the past. And if one only knows what one wants at the moment when our existence is actually threatened, here and now, then the difficulty of doing this for future preferences is much greater. Only 'when the chips are down' do we know in ourselves what we really care about as individual actors; meanwhile other actors will be finding their own and probably different preferences. If even *self-knowledge* difficult, how much more difficult is awareness of the kind of comprehensive information which strategic planners are supposed to wish for, across giant organisations employing tens of thousands and their millions of current and future customers and suppliers.

Nevertheless, the MITIGA prototype promises extreme sophistication in which the relation between individual trends and policy components are treated as if they obeyed naturalistic interaction rules and as if the effectiveness of each component can be defined in relation to different policy alignments (Fig 6). The alignment between existing barriers, potential opportunities, and future trend behaviour is envisaged thus:



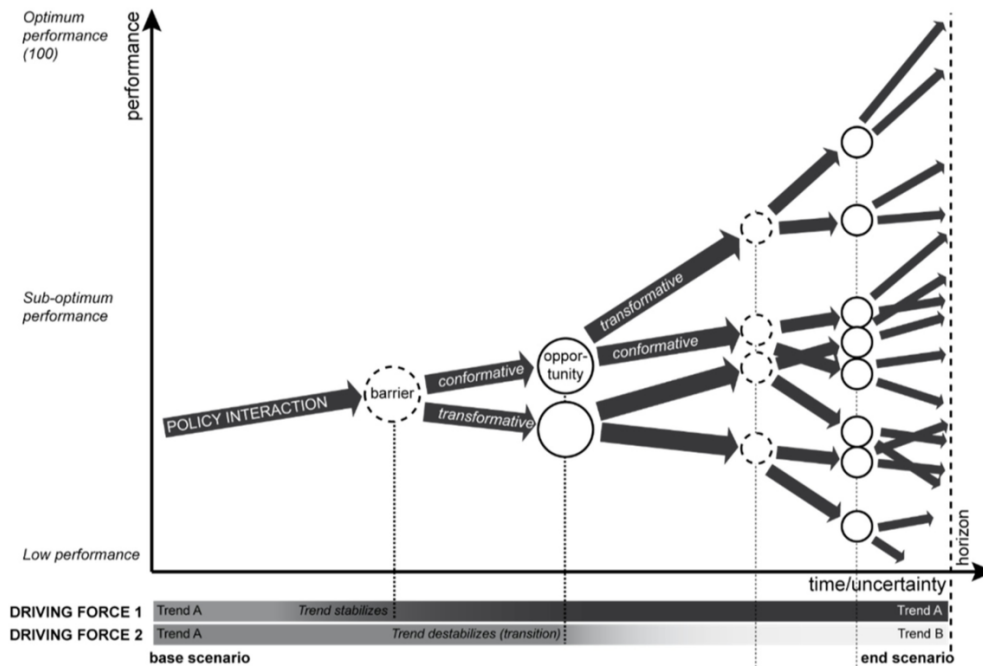


Figure 7 Policy Alignment, As a MITIGA Assessment Concept (Navarro-Ligero and Valenzuela-Montes, 2016).

In the MITIGA prototype, two path configurations are presented as follows:

- Confirmative (trend-adopting). In this configuration, barriers are about to be overcome and the desired results achieved in accordance with our strategic wishes.
- Transformative (trend-breaking). In this configuration, opportunity based policies remain locked and only become effective with an alteration in context

There is acknowledgement of *Inactive Rules*. "the final set only included simple Boolean rules based on absence/presence premises (rule is active when some instance combination happens in a given policy and end/base scenario presents a certain trend or trends combination) and on additional synergistic effects (rule is active also if another policy instance combination is present in the same strategic option)" (Ligero & Valenzuela-Montes, 2016).

Proponents suppose it is possible to define each single base scenario, then the associations and the consequences of each policy can be generated (all the drivers, trends and forces). In the end, another column is added to the matrix for scaling and valuing each part which aims to strategically understand expected future behaviour for each scenario. From

Taleb's perspective, this resembles a very rich method for producing narratives, but only narratives. Therefore, concerning the claim which follows, he would point straight to the warning sign which accompanies it:

- MITIGA promises that by scaling and weighting the different scenarios, opportunities will be defined which could be planned, managed and controlled strategically

The following table sets out how such a matrix is envisaged, based on the previous studies (Wiek et al. 2009 or Nguyend and Dunn, 2009).

Scale value	Interpretation in 'consistency analysis' (for each possible trends pair in end-scenario)	Interpretation in 'transition depth' analysis (for each possible trend in base-scenario)
4	Mutually conditional	Virtually "locked-in" (no signs of break)
3	Highly supporting/roughly conditional	High inertia (few or weak signs of break)
2	Supporting	Moderate inertia (some signs of break)
1	Weakly supporting	Weak, easily reversible (strong signs of break)
0	Independent	Uncertain (not known, unstable, difficult to predict)
-1	Weakly obstructive	Latent or likely (strong signs of transition)
-2	Obstructive	Latent, but possible (visible signs of transition)
-3	Highly obstructive/difficult to believe	Roughly possible (weak signs of transition)
-4	Contradictory	Virtually impossible (no signs of transition)

*Figure 8 Discrete Scales Used for Consistency and Transition Depth Analysis (Navarro-Ligero and Valenzuela-Montes, 2016).*

The conceptual terminology interests us. Terms such as 'transition depth' and 'driver identification' surely place this thinking in a different paradigm (different world) to the one occupied by Iranian entrepreneurs. The world which MITIGA occupies seems to presume dimensions (for example 'depth' which are meant to be quite easy to picture and measure accurately) and forces, such as 'drivers' which would be much like 'vectors' in Newtonian physics, which can be plotted with confidence. Talk of 'scales', 'weighting', perhaps 'precise information gathering', have similar Newtonian implications which do not really suit the world as experienced by surviving Iranian entrepreneurs. Nor does MITGA place an estimate of the

time involved between the ‘base’ and the ‘end’. Bearing in mind Taleb’s suggestion that consequences of World War One are never-ending, placing a time limit on an ‘end scenario’ would have been unwise in any case.

We prefer to begin by defining success as a capability for dealing with and surviving unexpected changes and uncertainty. In a chaotic world, this is the most reasonable of starting points, with time frames defined in terms of days, weeks and months, not the capabilities that might apply to a parallel, far simpler world assumed to exist by comprehensive strategic planners.

### **Can the Iranian Petrochemicals Industry Be Described Comprehensively?**

Most technical elements of the Iranian petrochemicals industry are definable (especially at plant level), given a large enough book of inventory, though comprehensive technical diagrams of every pump, valve, heat exchanger, conduit, supporting framing, tanks, pressure vessels, flows, volumes, power requirements, cooler groups, bypasses, distillation towers, acid-recovery plants, vents, pieces of instrumentation and so on would produce a model so complex that it would not be than much useful than the material objects which it describes.

When it comes to the ‘socio’ elements of ‘socio-technical systems’ these are practically boundless, vertically – in terms of Iran's social and political structure - and horizontally – in terms of regional geography the reach of Iran's diaspora. To apply the MITIGA methodology, in principle all of this would need to be captured and inputted, then all(!) ‘external drives’ added, to reveal ‘barrier’ and ‘opportunities’. This task strikes us as super-human and infinite omniscience, but even more is demanded by an application of MITIGA. According to the literature, supply and demand should also be integrated for precise(!) scenario planning (Gret-Regamey et al., 2012; Cavender-Bares et al., 2015; Wolff et al., 2015).

We only attempt and offer modest descriptions. The *National Petrochemical Company* (NPC) is the subsidiary of the *Iran Petroleum Ministry* founded in 1964 with small plants added later becoming the second biggest producer and exporter in the Middle East. This industry is considered, reasonably, as one of the most important sectors in the Iranian economy. This much is obvious to any observer.

As a useful simplification, the petrochemical industry is usually categorized by practitioners as 'upstream' and 'downstream'. Upstream covers drilling and extraction of base material, refinement of petrochemicals such as methanol, ethylene, P-Xylene (PVC), while downstream we have the production of finished products ready for end-use, for example, polyethylene and polyvinyl chlorides, PET and different grades of Polypropylene. Here are some officially recognised attempts to describe it:

#### Iran's Petrochemical Industry Growth Plan

Projects under implementation	
Number of projects	67
Designed capacity	61.1 million T/Y
Saleable products	49.8 million T/Y
Net Sales Income (based on 8 year FOB prices)	\$25.7 billion
Feed cost	\$7.9 billion
Value Added	3.2
Total Investment Cost	\$40.1 billion

Figure 9 Iran Petrochemical Annual Report 2014, Source:(English.nipc.ir, 2018).

Nominal Output Capacity and actual Production in 2014-2014:

Region	Nominal capacity	Actual production
Mahshahr Special Economic Zone	25.3 million T/Y	17.8 million T/Y
Pars Special Economic Energy Zone (Assaluyeh)	23.2 million T/Y	17.4 million T/Y
Other areas	8.6 million T/Y	7.3 million T/Y
<b>Total</b>	<b>57.1 million T/Y</b>	<b>42.5 million T/Y</b>

Figure 10 Iran Petrochemical Annual Report 2014, Source:(English.nipc.ir, 2018).

Volume and Value of domestic & Sales export in 2014-2015:

Region	Export		Domestic sale	
	million tons	billion dollars	million tons	1000 billion Rials
Mahshahr Petrochemical Special Economic Zone	4.5	3.4	6.3	154.4
Pars Special Economic Energy Zone (Assaluyeh)	6.8	5	6.5	135.4
Other areas	3	1.8	2.1	40.4
<b>Total</b>	<b>14.3</b>	<b>10.2</b>	<b>14.9</b>	<b>330.2</b>

New investment opportunities in petrochemical industry by 2026	
Number of projects	36
Designed capacity	62.2 million T/Y
Saleable products	29.6 million T/Y
Sales revenues	\$32.1 billion
Investment costs	\$31.4 billion + 263.5 thousand billion Rials

Figure 11 Iran Petrochemical Annual Report 2014, Source:(English.nipc.ir, 2018).

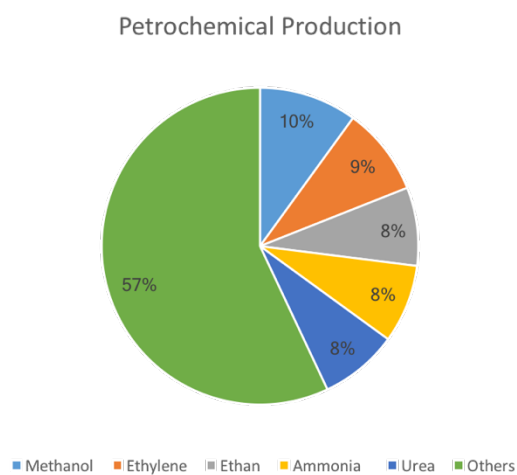


Figure 12 Iran Petrochemical Annual Report, Source:(English.nipc.ir, 2018).

## 2.10 The main objective for the future

What these diagrams do is provide some indication of scale. It is however refreshingly easy – perhaps too easy - to declare strategic objectives and many of these have official status either as declared or implicit aims, to:

- Become the largest regional producer in terms of product range, capacities and value up to 2025
- Greatly increase the percentage of oil and gas by-products and reduce the country's reliance on crude oil and natural gas exports
- Invest 50 billion USD over 20 years
- Reach 34% of the total Middle East output capacity (6.3% in the world).
- Achieve 120 million tons of production annually
- Produce 7.5 million tons Methanol (18% of the world capacity and 20% of global trade)
- Produce 12 million tons Ethanol annually
- Produce 8.5 million tons Urea annually
- Produce 4.5 million tons of Aromatic Compounds annually
- Produce 10 million tons of polymers annually
- Achieve the largest production capacity of Ethylene, Urea, and Aromatic in the Middle East
- Increase the output efficiency of the existing process plants to the level of their nominal capacity
- Complete unfinished projects envisioned under the 4th and the 5th five-year development plans (progress stands at over 60%)
- Complete unfinished projects envisioned under the 5th five-year development plan (progress ranges between 20% to 60%)

- Complete unfinished projects formulated under the 5th five-year development plan (progress is lower than 20%)
- Launch new petrochemical projects to compensate for delays in the performance targets of previously demand plans
- Pave the way for the balanced growth of the downstream sector to facilitate petrochemical value chain development
- Create legal conditions that would allow for consultancy, technical and engineering services to privately-owned projects
- Create legal conditions that would enable finances from the National Development Fund to reach privately-owned projects under NPC management and supervision
- Broaden the activities of Petrochemical Research and Technology Company (NPC-RT) to develop new technologies locally and to help find solutions to technical problems at below-nominal capacity petrochemical plants (NIPC, 2016).

As it can be seen from the main objectives, all the growth and development plans relating to Iran's petrochemical industry have been outlined, but to 'describe' each of these meaningfully would be immense and open-ended tasks. Notice in passing that many of these plans encompass the completion of previous plans that remain incomplete and the realizing of existing unmet nominal productive capacity.

In other words, these plans are laid on other plans which have other antecedent conditions which are very difficult to inspect because they were created in the past by actors whose thinking is difficult to know. Yet by MITGA scenario planning methodology, it is supposed to be possible to identify, in addition future uncertainties and how they should be managed, to remove and eliminate the effect of 'controllable' factors and mitigate the uncontrollable factors, leading the achievement of the plan.

We hope we have written enough to cast legitimate doubts and again, to ask whether uncertainty should be our starting point instead.

We conclude this brief review of Strategy by examining each model to see how much (if anything) each of them concedes to:

- Uncertainty and surprises
- Contingency and decentralized decision-making
- Willingness to change direction or explore several paths at the same time as compared with
- Confidence in the comprehensiveness of knowledge
- Rigid command and control
- Bold determination to fulfil a plan which sets out a very clear visionary direction

## **2.11 Strategic Management of Everything**

In general, strategy typically means drawing up at least a provisional plan intended to support the achievement of objectives by dedicating resources to achieve defined goals (Davies, 2000). However, a surprising number of concepts have now been associated with the prefix 'strategy' by different authors, for a wide range of reasons. The word 'strategic' has been placed in front of all of these and more; thus, there are literatures in Strategic-

- Learning
- Enterprise Development
- Vision
- Innovation (in knowledge, technics, and services)
- Knowledge Management and Data Processing
- (Smart) Manufacturing
- Performance Measurement Systems (SPMS)
- Downstream products development



- FDI
- Fire Safety Management
- Pollution Reduction and Management
- Technology Transfer
- Leadership
- Investment

Across these different literatures, goal-orientated activity is the common thread though in both ‘hard’ and ‘soft’ versions. It has been claimed that a new conceptual model framework can be developed that will guide businesses in managing complexity and the interconnection of multiple and diversified elements. At least for commercial organisations, the defining objectives, mission, and vision for organization growth feature (Lager, 2010), likewise management defined missions. A strategic plan is described as "integral and coordinated set of liabilities and activities developed for employment of fundamental competencies and obtaining the competitive advantage" (Hitt, Ireland and Hoskisson, 2011). According to several strategic planning advocates, this process involves identifying ‘opportunities’ and ‘threats’ treated as environmental factors, then monitoring and evaluating the organization in terms of its resources and capabilities treated as internal factors, finally arriving at a competitive strategy that is aligned to its objectives (Johnson and Scholes, 2013; Wheelen, Hunger, Hoffman and Bamford, 2015). The company strategy is developed with the aim of achieving goals effectively by considering all drivers that may have an effect on reaching intended objectives and goals (Shahmirzadi, 2017). This strikes us as nearer to the ‘comprehensive’ ‘root and branch’ approach rejected by Lindblom as impractical, **then** to his ‘science of muddling through’.

The recurring assumption is that the time-frame for visions is long-term to which resource and capabilities can be aligned. Recast as a Talebian project long term vision should not exceed

the ambition “to be anti-fragile”, which means in a sense to have “anti-vision” only “provisional interconnections” and only temporary goals beyond the chief permanent one: “survival”. We mean that in a chaotic world, “growth” should be secondary to “survival”.

Anti-fragile principles could embrace "use of new possibilities and opportunities under the assumptions concerning company's long-term future operations" (Eisenhardt, Sull 2001; Markides, 2004; Steensen 2014), as long as *survival* is the long-term objective and solutions are revised according to current challenges (Savanevicien et al, 2016). The question then arises as to what empirical evidence might exist that tests the claim that the ‘harder’ definition of strategy succeeds in its own growth-orientated terms any better than ‘soft’ and ‘anti-fragile’ strategies succeed in their own (different) survivalist terms. Another way of expressing this question as a values question is ‘How is *growth* to be evaluated against *survival*?’ Put this way we see that the choice is ethical more than empirical. Is there any way of asserting which valued objective should have precedence? In a sense this question is undecidable except pragmatically: a high-growth Iranian enterprise would not survive the medium term, let alone the long term and many very high-growth, profit-maximising and competitive Wall Street firms failed spectacularly post 2008. In other words, we ask how far the implicit values in the strong versions diverge from anti-fragile values:

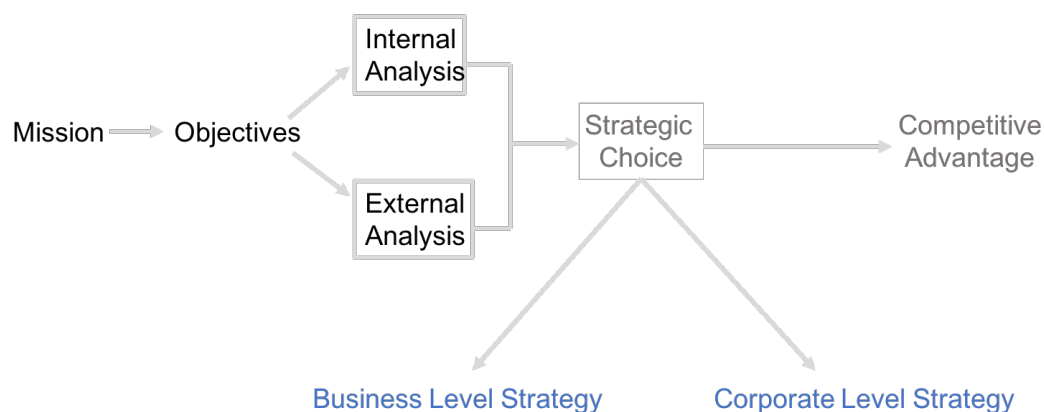
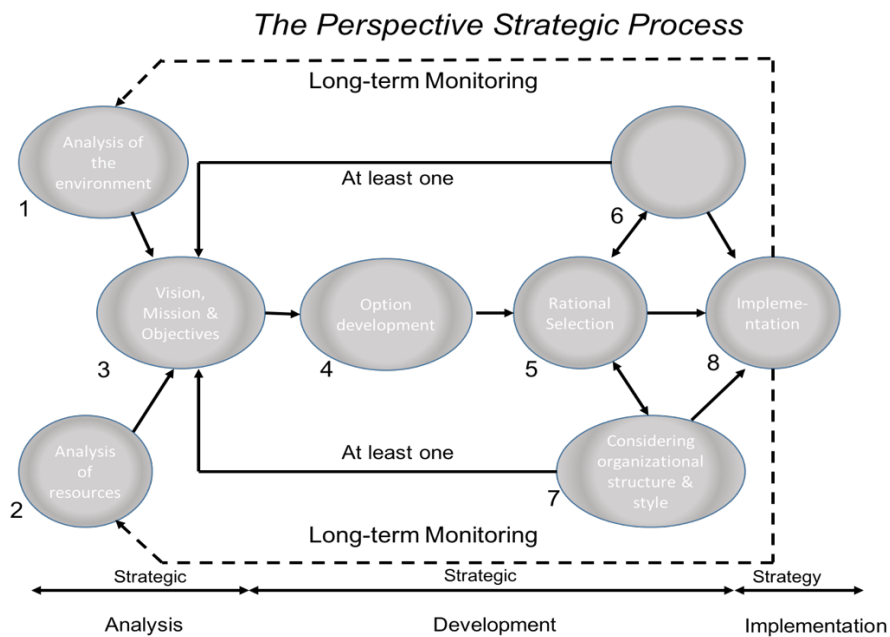


Figure 13 Source: General Strategy Path

We note that this figure treats ‘mission’ as the starting point, for which we could read ‘value’, say ‘growth’, or ‘survival’ (there may be others) while the ‘objectives’ might be more specific; perhaps a time frame. ‘Internal’ and ‘external analysis’ make the assumption that the boundaries between these two are known. ‘Strategic choice’ comes next with ‘competitive advantage’ as the fifth stage. The arrows suggest that these are events that happen in a linear sequence and that the end of the process is a good outcome. The ‘counter-factual cases’ such as competitive disadvantages are not shown. The arrows pointing from ‘strategic choice’ to ‘business level strategy’ and ‘corporate level strategy’ imply that both must be aligned to the strategic choice. The above is one of the most linear models of strategy that we have seen.



*Figure 14 Perspective Strategic Process*

This next diagram has seven feedback loops, however it remains semi-linear in that ‘strategic analysis’ comes first, then ‘development’, then implementation (followed by adjustments due to feedback loops). One of the difficulties found with this model is that it separates activities into different cells with the implication that they are carried out at different times. ‘Rational selection’ appears to be separated by a long way (at least on the diagram) from ‘analysis of resources’ for example. It begs the question, for a cultural theorist like Thompson about which

of the *four* prototypical rationalities (thought-styles) the model supposes to be in operation. From the evidence of my experience (an adult lifetime of involvement as a multi-enterprise Iranian entrepreneur and contact with many other Iranian entrepreneurs) it is possible with effort to recognise the meanings of the words shown in the cells. However, in practice I (and the associates I know well I think) do all of these things all of the time. The feedback loops are probably the most important in practice. But there is a problem in that the routes taken by the lines are much simpler and clearer than in my experience of approximately these processes. For example, it is not always clear how negative an outcome is (they are often ‘grey’ rather than either ‘black’ or ‘white’ swan events). This means that it is difficult to assess what implication an assessment of how well or badly ‘implementation’ has been carried for the ‘analysis of resources’.

It may be that in very large bureaucratic organisations with many management layers there will have to be committees, with policies, processes and procedures that meet in cross-coordinated cycles over many weeks or months. This diagram may fit this type of example. The diagram could be useful because it suggests that large organisations could face very serious difficulties due to time delays and uncoordination between all the activities. A conspicuously successful, and in our terms, also ‘anti-fragile’ organisation such as Ricardo Semler’s *Semco*, (Stockport, 2010) with highly devolved and ad hoc decision making units, which are self-organising and exchange personnel and which identify and pursue many diverse projects, does not seem to work in the way that this model describes. For example, at *Semco* individual employees choose and help to define which projects they want to work on, choose to join and leave teams, choose their own rates of pay, job titles, working hours, pricing, designs (collectively in small units) and do not create budgets for longer than three or four months at a time. *Semco* abolished annual budgeting. These arrangements enable *Semco* to change its mind many times a year across its many products.

In other words, while it is just about possible to relate the above diagrams to my experience and to agile organisations like *Semco* it is not clear that this is useful. Finally, if the diagram is meant to apply to very large and very small firms as if they were the same, then it is ‘saying everything and nothing’. It is not the worst model because it is not absolutely linear, but it is still quite a long way from the world I inhabit.

However, in its defence, note that Stewart allows for tacit knowledge and seems to recognise the importance of deferred decisions. For Stewart et al (2013) the effectiveness of strategic planning on enterprise success or failure and maximizing the strategy process quality depend on:

- The "amount of quantitative, qualitative, explicit and tacit...insight that can be integrated into the strategizing process before the levels of tangibility, transparency, and clarity become insufficient"
- The quality and wide range of analysis that leads to strategy formulation and to enabling a fusion
- The flexibility of the strategy that allows room for any additional details for any option and choice, into the process.

Alternatively, it has been suggested that it is possible to manage in the present in a way that is more mindful of the future by recognizing alternative scenarios and then applying and controlling them according to desirable and undesirable changes that result from? environmental changes (Lee, 2015). Lee and Stewart strike us as much closer to both Taleb and Lindblom and to Iranian entrepreneurs known to the author. That is, in accordance with the chaos paradigm, managing for the future does not require a comprehensive strategy and the desire for comprehensiveness would be treated with suspicion. ‘Additional details’ can and do enter into the process at any time. From our experience, knowledge of market demand,

competitors' activity and the 'environmental' is difficult to obtain and it is difficult enough to have anything approaching full knowledge of what is happening within each of my own businesses all of the time. It strikes us as most unrealistic to expect larger organizations to identify, measure and assess external factors and drivers, company resources, capabilities and internal factors with accuracy, at least not with any better accuracy than their competitors. Perhaps the bulk of the much-quoted strategy writers (Johnson and Scholes, 2013; Wheelen, Hunger, Hoffman, and Bamford, 2015 and Parayitam and Dooley, 2009) should reassure strategic managers that they will succeed by following their recommendations principally because their competitors are just as vulnerable to unforecastable surprises (ie. black swans in our terms) as they are. Survival is then determined by whichever company makes the biggest mistakes in a very roughly evolutionary process of survival of the least fragile.

However, our suspicion, informed by Taleb is that several small mistakes and just one or unplanned success (within uncertain time frames) will satisfy the surviving Iranian entrepreneur more than one conspicuous, deliberate, planned strategic success followed sooner or later by a spectacular crash-landing without parachutes, or government take-over (total loss of independence).

We are also unsure about the conventional division of strategy management between micro- and macro-, in which micro concerns only the organization's human resources and organizational structure (Aguinis et al, 2011), while market and environmental changes are treated as 'macro'. Of course, this distinction is meant to be about scale, but it misses the point that chaos can exist at *any* scale from the very small to the very large. That is, no scale is free from unpredictability and it is probably misleading to imply that there is a *qualitative* difference between micro- and macro-scales.

For example, in my organization, a very small misjudgement which I made of a

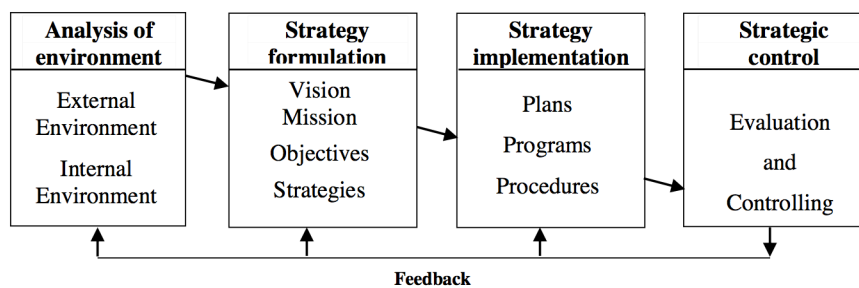
colleague, several months ago has the potential to cause much more damage than almost any other 'macro' event that I can imagine, almost without any boundaries. This individual poses a threat that is so great that I cannot estimate the limits. My mistake was simply to have trusted him to behave conscientiously pursuing responsibilities which I had devolved to him. To my surprise he abused the trust I had placed in him and registered key intellectual property in his own name rather than in the company name. From this now very powerful position he was then able to threaten to hold me to ransom. My point is that black swans can strike from anywhere, inside or outside and one individual can be as dangerous as a severe and unexpected change in the value the currencies in which I trade.

Nevertheless, according to Papula and Papulova (2015), in the strategic management process, the success of the strategy is *directly related* to the *precise identification* of the internal and external drivers and of their influence consequently. Equally fundamental to at least the 'strong' definitions is the claim that the direction which strategic planning sets is the outcome of a flow from a past and a present that is known with confidence, towards a future which has been made as certain as possible. The direction is usually laid out on the page as running from left to right, as we have seen in all of the preceding strategy diagrams. Realisation of imagined futures is a matter of confidently sticking to strategical identification of all relevant and therefore significant external and internal drivers that will have an impact (Papula and Papulova, 2015) and continuing onto the 'next page' in a more-or-less linear movement.

Given the unforecastable and irregular (inconvenient) time intervals with which black swans will occur it is worth emphasising the unfortunate linearity of most descriptions of strategic planning. Why do writers' strategic narratives, with the conspicuous exception of Thompson, allow so little room for confounding 'surprises' entering from any direction and unexpected happy events which diverge in any direction? Our survey of the literature finds

that the strategic planning procedure is meant to include the following major parts (David, 2013; Porter, 1999) which are again presented as a sequence, though here with feedback, which we presume take into account surprises (though these are not stated explicitly):

- Environmental Analysis
- Strategy Formulation
- Strategy implementation
- Strategic control



*Figure 15.3 Strategy Planning Process*

Strategic analyses involve first, evaluating the current situation of the organization and assessing the other factors that have an impact on the organization growth and competencies (David, 2013). By defining and analysing the problem the factors that influence the solution will next be determined, studied and understood. Next comes the design of the strategy, enabling ‘effective’ future performance (Sternberg, 2009; Volna and Papula, 2013). Ideally speaking an organization is “both planning strategically and strategic planning” (Linn, 2008).

The beauty of this sequence is spoiled as soon as black swans collide with it, which can be at any point and may involve more than one simultaneously. There could even be black swans present along the feedback loops, when for example a vital piece of information is miscommunicated or filed incorrectly or left in an unopened single sentence email. In my mind



as an Iranian entrepreneur and if I have understood strategic management authors correctly, any black swan should reset the process back to the very first step, 'environmental analysis'. Each 'refutation' should call the entire theory (narrative) of what we are doing into question. To put it even more strongly, the first confounding event should cause the strategist to ask themselves what planet they are on, in other words, they should be willing to reconsider their paradigm assumptions fundamentally.

Given the number of unexpected events which biographical experience teaches us we are likely to continue to face, Iranian entrepreneurs trying to follow the strategy literature will always be resetting the 'process' back to step one and be very reluctant to progress beyond it. There would be no 'implementation' for example that is anything but provisional. Powerful top-down 'strategic control' which ensures that the organisation is doing what it is supposed to be doing is very flattering to senior managers. But it assumes they have a special genius for 'visioning' that more junior personnel do not have. Within the paradigm within which I survive, senior managers are not less vulnerable to surprises than ordinary, wary citizens.

The world is neither linear nor approximating to equilibrium and for both these fundamental reasons I and other Iranian entrepreneurs do not find the strategy literature useful. On the contrary we find it dangerous, and not because we have not understood it or read widely enough, or misapplied it. It would not be suitable for us. Instead, we need to *implement* here and there, *undo* a little here, *abandon* something completely there, while making a *quick move* somewhere else, sometimes on an hourly basis with what (unreliable) information we can manage to obtain. The most favourable way of looking at the four-step model just given above is that we only have two or three days to go through all the stages before we must start again. If we did strategy properly and deliberately we would not survive long enough to progress to stage two.

Nevertheless, there is, we acknowledge, a tempting range of strategy tools just for that first stage: evaluation and analysis of the *current situation* of the company. These include the QSPM, BCG, SWOT, and SPACE MATRIX. In order to analyse, the current situation of the company (say, *Iran Petrochemical*), the SPACE Matrix strategy and SWOT analysis could be applied. Let us examine these strategic ‘tools’ more closely.

## 2.12 Space MATRIX Strategy

Mintzberg (1987) offers a ‘5P’s’ strategy described as:

- ‘Strategy as a Plan’
- ‘Strategy as Ploy’
- ‘Strategy as a Pattern’
- ‘Strategy as a Position’
- ‘Strategy a Perspective’

Based on his description, the organization should firstly have defined their precise position in their market and this could be done through the two well-known heuristic tools such as the SPACE Matrix and SWOT (Radder, 1998; Bafandeh; Zende, 2012). These two tools can be complementary since the space matrix accommodates financial strengths and competencies of the company as internal factors and environmental stability as external factors, while SWOT focuses on the company's weakness and strength as internal factors and market opportunity and threats as external factors (David, 2011). By ‘heuristic’ I mean that these tools are not so much theories as handy short-cuts and useful rules-of-thumb.

However, as we have stated, there are problems with misplaced exactness and there are reasons for being cautious about the internal/ external distinction (above).

External strategic position	Internal strategic position
<p><b>Environmental Stability(ES):</b></p> <ul style="list-style-type: none"> <li>• Technological change</li> <li>• Rate of inflation</li> <li>• Demand variability</li> <li>• Barriers to entry into market</li> <li>• Competitive pressure</li> <li>• Price range of competing products</li> <li>• Price elasticity of demand</li> </ul> <p><b>Industry Strength(IS):</b></p> <ul style="list-style-type: none"> <li>• Growth potential</li> <li>• Profit potential</li> <li>• Financial stability</li> <li>• Technological know-how</li> <li>• Resource utilization</li> <li>• Capital intensity</li> <li>• Ease of entry into market</li> <li>• Productivity/capacity utilization</li> </ul>	<p><b>Financial Strength(FS):</b></p> <ul style="list-style-type: none"> <li>• Return on investment</li> <li>• Leverage</li> <li>• Liquidity</li> <li>• Capital required</li> <li>• Cash flow</li> <li>• Ease of exit from market</li> <li>• Risk involved in business</li> </ul> <p><b>Competitive Advantage(CA):</b></p> <ul style="list-style-type: none"> <li>• Market share</li> <li>• Product quality</li> <li>• Product life cycle</li> <li>• Customer loyalty</li> <li>• Technological know-how</li> <li>• Vertical integration</li> </ul>

Figure 16.1 Space Matrix Strategy Process

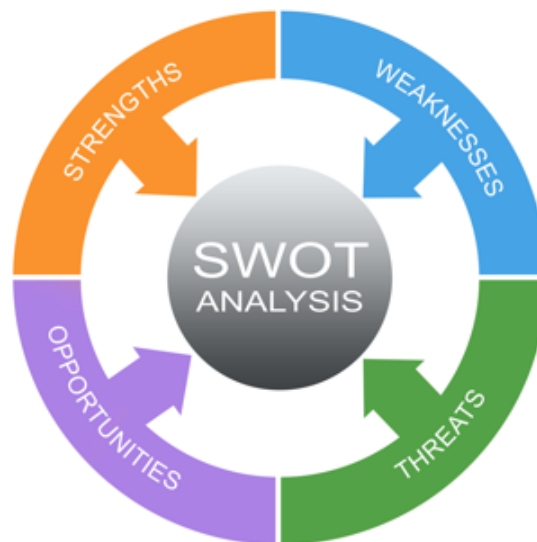


Figure 17 SWOT Analysis

The space matrix contains four positions as follow: *Aggressive*, *Conservative*, *Defensive* and *Competitive* (Hunger, 2007). These four possibilities are striking in that they can be compared with the four dispositions identified by Grid-Group Cultural Theory... which goes further by explaining why each such position is available to be thought. After assessing an organization's

position, the recommended approach will be defined according to its position. In other words, a strategy is pre-determined by position.

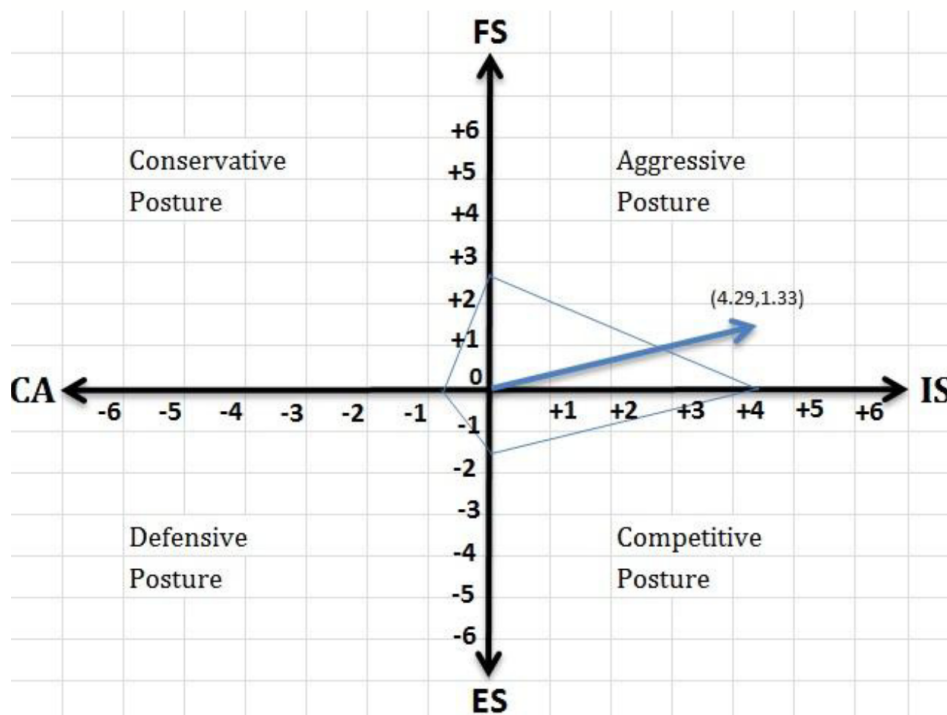


Figure 18 Space Matrix Axis

These postures are fascinating in that they seem to resemble Thompson’s application of Grid-Group Cultural Theory to banks and other financial institutions, in which four ‘Thought Styles’ lead to four distinct ways of reading risks and responding to these assessments, known as *Hierarchical-Rank*, *Egalitarian-Enclave*, *Individual-Competitive* and *Fatalist-Isolate*. The difference between the above diagram and Thompson’s is that the above diagram needs to be rotated one quarter turn clockwise to fit Thompson’s typology. We will return to this ‘cultural’ treatment of strategy later. But notice that if evidence emerges that the world has changed, which the *Space Matrix* could allow for, then strategy could also be changed radically. This is an attractive feature of the *Space-Matrix* which it shares with Thompson’s Grid-Group Cultural Theory (see below).

It has also been suggested that different types of tools are needed for different phases of strategy development assuming progress is possible beyond the first stage of assessment. It is claimed these allow for globalization and business complexity (Daniel, 2006 and Mintzberg, 1994). These formulations seem to demand keen attention to both internal and external factors (Narayanan, Zane and Kemmerer, 2011).

What is known as *Robust Strategy* aims to optimize strategy formulation by considering future scenario planning responsive to environmental changes treated as external factors (Lempert, 2010; Hammerstein, 2006). In other words, external black swans are acknowledged as likely though internal black swans do not seem to feature. The reader will understand why we give *Robust Strategy* a half-welcome. Notice that the (unstated) assumptions that black swans will not arise *within* an organisation also trusts its managers and personnel to a high and perhaps unrealistic degree (as the case of my untrustworthy manager mentioned above illustrates). It assumes that if an organisation is run well enough, no unpleasant (or favourable) surprises will occur. This assumption which is implicit in the model, is unfortunate.

The 'second' stage is implementation and this is where we seem to find the greatest emphasis on procedural accuracy, precision (including precise in resource allocation), careful attention to functions and process flows (Johnson and Scholes, 2013; Wheelen et al., 2015). Furthermore, much or all the strategy literature is agreed that 'strategy implementation is composed of sense giving, sense making, and issue selling' (Narayanan et al., 2011).

We make two observations here. First it is worth aiming at precision *where this is possible* but there is no point in aiming for precision where this is not attainable. Furthermore, attainment of precise control should not draw attention away from where it is not attainable. In other words, it should not mean abandoning scrutiny of fuzzy evidence. Second, sense-making and issue selling are *narratives*. A narrative which works well and issue selling that persuades many persons, could lead an organisation towards a catastrophe with a lot of

conviction and enthusiasm. This seems to have occurred in banks and other financial institutions prior to the 2007-8 Global Financial Crisis, contributing to that ‘environmental’ crisis itself. The questioning of narratives, and seeing narratives for what they are, would be more anti-fragile.

### 2.13 Blue Ocean Strategy: Becoming a Black Swan

A further strategy not mentioned so far is *Blue Ocean Strategy*, which involves a disruptive move by adding value to a process and/ or displacing competitors at a stroke with the introduction of a new product (Kim and Mauborgne, 2005). It may involve an ‘organization in creating new demands in an uncontested market space rather than competing in an existing industry’ (Kim and Mauborgne, 2005). The introduction of ‘touch-screens’ which no customer had asked for and all mobile device competitors had to follow would be an example <https://en.wikipedia.org/wiki/Touchscreen#History>

In our terms, this strategy amounts to surviving and prospering by becoming a black swan, in other words, by being the unexpected, unforecastable event as far as competing organizations are concerned. More specifically in a blue ocean, there may be no competitors at all.

The main purpose of this strategy is to find a strategic move based on value innovation that could be in any part of a process such as delivery, services or products. For example, in the case of the Iranian petrochemical industry, a blue ocean strategy could be demonstrated at many leadership points – if one has the imagination to devise them. This strategy seems more within the reach of an Iranian entrepreneur than the fully-formed classical models of comprehensive strategy presented earlier, because comprehensive strategy features compiling ‘knowns’ as far as possible, while a blue ocean move has no precedent in the evidence as far as existing actors can see. Nevertheless, there have been attempts to ‘domesticate’ this type of black swan upon a blue ocean and somehow turn this unforecastable event into a familiar-look

process:

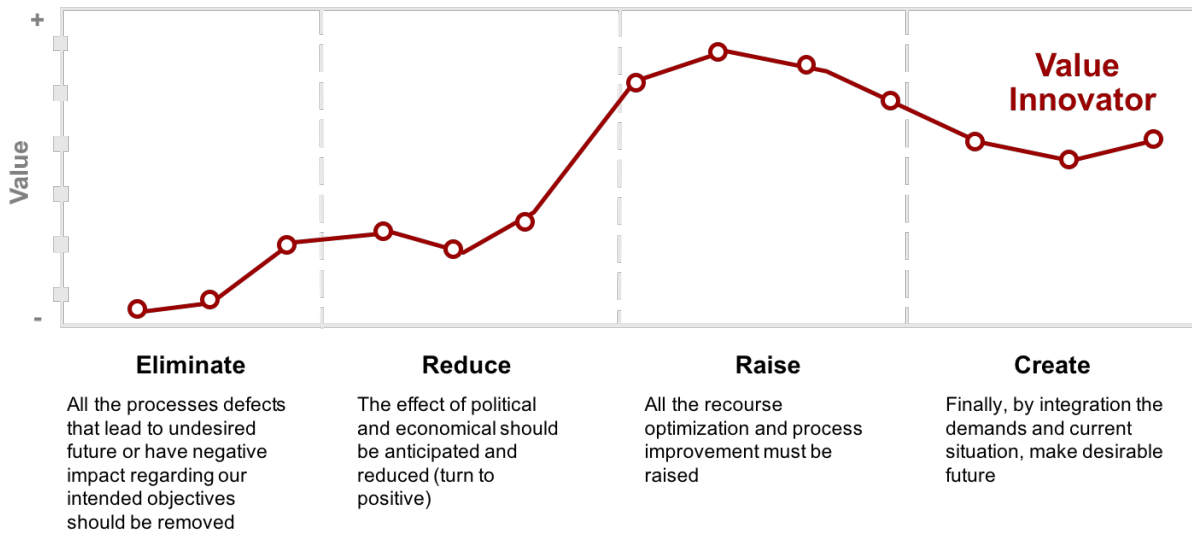


Figure 19 Blue Ocean Strategy Process

There is quite a lot that can be said about this model. First, the ‘value’ of each step is difficult to assess (the vertical axis). Blue ocean products and services fail as well as succeed (depending on various fortunes and misfortunes), so it is difficult to place a value on them or on any stage in a ‘blue ocean strategy’. Second, the stages described above describe mundane practices that most organisations would treat as unexceptional day-to-day attempts. Thirdly it is difficult to see that ordinary practices would lead to blue ocean innovation. What this figure suggests to us is how determined analysts can be to place a surprising event within a familiar functional world. The above can be applied to positive black swans after they have appeared by which time the inventive step which they represent will seem as if it was fairly obvious in ‘the prior art’ and rather like nasty events, ‘an accident just waiting to happen’.

## 2.14 The Strategic Leader

Another of the implicit implications of the comprehensive model of strategy is that the CEO possesses those super-human powers that Lindblom stated would be required in order to use the ‘root and branch method’ as compared with ‘muddling through’. In more recent writings

this assumption seems to be rising to the surface in the form of the idea of the strategic leader as a ‘visionary’. The concept of the super-human CEO may go some way to explaining the rapid rise in CEO pay, due to the assumed rarity of their powers, underestimating meanwhile the vulnerability, even of geniuses, to mistakes. Here the dangers of the narrative fallacy may be greatest. Think again of the knighthood bestowed on Fred ‘the Shred’ Goodwin and the attempts made to strip him of his title once the catastrophic effects of his aggressive growth-maximising strategy became clear to those who had backed him during the period in which he seemed to have the ‘golden touch’ and the ‘risk environment’ remained benign.

Once the vision is created, then the organization is supposed to be ‘aligned’ with realizing the vision by fitting all its activities with the company's goal (Fry, 2003). The implication is that the visionary leader somehow personifies all the knowledge and inspiring confidence needed. S/he is like Keynes (1935) ‘animal spirit’ entrepreneur who (in Keynes view at least) paradoxically is confident enough to operate in the absence of information which may not be available to any competitor in any case. They make emotional decisions because there is not enough knowledge to make rational decisions.

In the case of established large firms, who have just recruited a visionary leader, it is for the leader to determine strategic planning and scenario planning simultaneously. However, this is very risky because the success or failure of the organization becomes heavily dependent on the leaders’ capabilities (Latham, 2014; Shahmirzadi, 2017). And visionary charisma is inconsistent with planning which is intrinsically more mundane. If circumstances change then the founder's vision may be inappropriate (an example would be Henry Ford's reluctance to replace the outdated *Model T* which had been an early ‘visionary’ approach to standardized mass production and Ford’s reluctance to believe in hydraulic brake systems after his competitors had adopted hydraulic brakes successfully).



I am very reluctant to compare myself to a 'visionary' because I do not see a 'shining path' marked out in front of me for me to follow. I do not expect my employees and business partners to believe in such a thing either. I am not god-like and I do not expect others to see me in this way. And it may be because of this that none of the mistakes which I have made have destroyed my businesses and none of the unexpected events which have happened have been serious enough to destroy all of my ventures. The visionary model suits few, perhaps only one successful Iranian entrepreneur that I am aware of among the scores of entrepreneurs known to me. In addition, visionaries have prominent profiles and from my observation's survival is more likely from a position of quiet anonymity, not conspicuous leadership.

Note that in most or all of the approaches described above, writers treat strategy as part of a system, even in the 'visionary' model (in which the system is made to follow his or her will). It should be added that some writers offer ways of measuring leadership performance based on the *transactional* and *transformational* leadership styles (Antonakis; Cianciolo; Sternberg, 2004) which we must acknowledge here:

The transactional model of the powerful leader is concerned with assessing the extent to which followers' behaviour conforms with what the leader expects from them (Keller, 2006). Here leaders set the requirements (Judge, Piccolo, 2004) and s/he and followers can be judged by how little or how much deviation there is from these requirements. Transformational leadership performance is based on follower inner motivations (Bass, 1997). The greater their willingness and belief, the greater the leader's performance, at least in the eyes of followers.

Again, I am reluctant to define myself in either of these terms but some thought may be given to how well these distinctions apply to surviving Iranian entrepreneurs and how their success can be measured. The suggestion that occurs to us is that survival/ annihilation is a simpler (binary) measure of success that is less vulnerable to the narrative fallacy, adding (after

Hume) that evidence of survival to the present day is no guarantee of survival to the next day. These comments are made in the light of my experience in sectors which might be assumed to show fairly predictable variations (business-to-business PET container manufacture and supply) as well as those subjects to stochastic volatility (currency trading, global internet-based furniture sales), with property development somewhere in between these types of variations.

## **2.15 Enterprise Development**

*Enterprise development* is defined as the strategic planning involved in addressing all the challenges that organizations might be faced with from the emerging stage to achieving the intended objectives.

The expression ‘growth and development’ refers to distinct process, since "not [all] growth leads to organizational development and not every development is demonstrated in company's growth" (Witek-Crabb, 2014). Growth concerns about the increase in the size of the entity (measurable in different ways such as market share, sales volumes) while development involves the changes in functional operation. In organizational research, development is described as the "process of transformation in which diversity, complexity, and [the] excellence of a system increase" (Tchorzewski, 1992; Szczepanski,1963). Included in comprehensive definitions, development presents as "system-wide application and transfer of behavioural science knowledge to the planned development, improvement, and reinforcement of the strategies, structures, and processes that lead to organization effectiveness" (Cummings, Worley, 2005). Development could be applied in different part of the organization such as its culture, competitiveness, and profitability as [the] purpose of improvement and innovation (Egan,2002).

For the purposes of our thesis, enterprise development could cover development of an organisation’s ability to accommodate positive and negative black swans and ‘process planning’ once a black swan event is recognised as having taken place. Since Iran is located

in the Middle East region rich in black swan, this is the place to look for models of what this might mean in practice. What might a ‘developed’ organisation that takes black swans in its stride and gains from uncertainty, look like? How has it managed to learn from its experiences?

The literature presents development as including *organizational structure, operational improvement, market development, innovation* and etc. Based on the research objectives and author experience in the petrochemical field specifically, we ask whether it may be possible to operationalise (specify) ‘development’ as the creation of anti-fragility through scenario development procedures.

## **2.16 Critique of Risk Management Models and Standards**

Given an understandable wish to reduce uncertainty several risk management and risk mitigation models have been proposed. These include:

- Contingency Planning
- Enterprise Risk Management - ERM
- Project Risk Management - FMEA
- Federation of European Risk Management Association methodology – FERMA
- Risk Management Standard – ISO 31000
- Business Continuity Management
- The National Forum for Risk Management in the Public-Sector ALARM

Of these, our assessment is that *Contingency Planning* probably qualifies as black-swan sensitive however it encompasses naturally occurring events. While some of these defy accurate forecasting, notably volcanic eruptions and tsunamis (even with the best scientific instrumentation available), at least natural mechanisms are well understood. This is not strictly true of social upheavals. Moreover it is the social impacts of natural phenomena which amplify

their reach over space and time. Thus, a tsunami that affects Japan, affects its financial markets, with further rounds of global effects which surely defy accurate estimation.

### **2.16.1 Contingency Planning**

“*Contingency Planning*” is nevertheless claimed to provide an economical risk management strategy for the consequences of major disruptions such as flood, earthquake, avalanche and other natural misfortunes (Martinez, 2011). The main aim of the contingency planning is to develop a decision-making ‘tool’ to pinpoint appropriate rapid and responsive volume-flexible backup supply chains. It proposes a Mixed Integer Programming (MIP)-based capacity planning tool which creates supply chain contingency plans in advance of stochastic interruptions the character and timing of which is difficult to forecast (Madanipour, 2010). For accurate(sic) decision making, the impact of critical operational characteristics such as slowed response times and congestion are to be taken into account on the basis of scenario development (Westergaard, 2008).

‘Decision tree analysis’ is an attempt to systematise uncertainties by setting out matching response speeds which could at least minimize expected impacts and costs on supply chains. Three different approaches are considered for decision making towards different risks. A sensitivity analysis, it is hoped, provides an assessment of the impacts and estimates of failures and recovery times over a period. It is interesting how various sources of ‘congestion’ are acknowledged while mitigation measures are attempted (Martinez, 2011).

Note however that time-frames and ultimate consequences are, in Talebian terms, not knowable, a conclusion that follows from his point about the unknowable origins and consequences ‘World War One’.

We are not strongly opposed to Contingency Planning in that it does pose valuable questions such as ‘What Might Go Wrong?’ ‘Could it be avoided?’ and What Could We do About it if it Cannot be Avoided?’ The more it focuses is on natural systems probably the more

accurate the plans. However, we worry that the plans it generates might be mistaken for being more robust than it is possible to attain for associated *social* systems. Indeed, an exercise conducted 2016 by the UK, named ‘Exercise Cygnus’ which supposed that a global respiratory viral pandemic might strike the country was a failure:

- It was never published; indeed, its findings were *suppressed* although the UK government recognized a pandemic as the most serious emergency threat to the UK
- It assumed a variant influenza virus, unlike COVID-19
- The practical steps which the exercise suggested, notably stockpiling PPE were not implemented
- The incoming administration took no notice of its findings
- The exercise had negligible *if any* impact on public health policy even after knowledge of COVID-19 was being passed from China to the rest of the world
- Critical supply chains, notably in food manufacturing and distribution proved to be surprisingly robust in practice

The *Guardian* newspaper reported:

A [board paper for NHS England](#) appeared to acknowledge that the exercise had revealed critical shortcomings, concluding: “Plans are currently being revised to incorporate the learning from this exercise and ensure our continued preparedness for future pandemic influenza outbreaks.”

Phillip Lee, a former Conservative MP who subsequently defected to the LibDems, [said earlier this week that he had participated in the 2016 exercise](#) when he was a junior minister at the Ministry of Justice. “Ministers had to decide what to do as the overwhelming scale of the pandemic became apparent,” he wrote.

But the former MP – who trained as a doctor – said he believed the opportunity to prepare properly for a pandemic had been missed. “Serious questions need to be asked of the ministers and civil servants responsible for acting on the findings of that 2016 exercise. Who was in charge of getting us ready for a pandemic (something we knew was a top risk), and what went wrong?”

<https://www.theguardian.com/world/2020/apr/02/labour-urges-government-publish-findings-2016-pandemic-drill>

What is striking is that plausible weaknesses *were* identified with a fair degree of accuracy, however the political class and senior public servants, that is two interlinked *social* systems failed to act almost entirely, one suggestion being that the findings from *Cygnus* were ‘too frightening’ for public release. In other words, Contingency Planning, in this case, was derailed by black swans which the planners can hardly have forecast and accounted for: the incapacity of institutions to acknowledge and act on risks which had been identified. The consequences of this *social* failure have been tens of thousands of avoidable deaths, which some sources have estimated at more than half of all COVID-related death in the UK. The gaps left by each of those lives lost (the actions they won’t be taking, the children that will not be born) will continue to get bigger indefinitely.

By accident, *Cygnus* revealed something about parts of the system which it did not cover. Our best guess is *Cygnus* personnel would have got into trouble if they had investigated ‘political incompetence at Cabinet level’ and how this might affect whether or not ‘lessons would be learned’ from the exercise.

In short, the most relevant of all recent UK Contingency Planning exercises had no useful practical effect.

### **2.16.2 Development and Innovation**

One of the curiosities of complex modern systems is how resistant they are to what might be described as ‘obvious problems and weaknesses’ that are also slow-moving rather than sudden. Consider Iranian oil:

The oil extraction and processing industries are multiple span industries that include all the processes of manufacturing. All of these stages can be modified and developed by process improvements and innovation to improve ‘value-added’. Petrochemical raw material manufacturing is one of the process industries which requires innovation and development in its parts, particularly in order to prepare for future management. Perhaps it will surprise the

reader to learn that an oil-rich nation such as Iran has to *import* petrochemical products, (mostly from south-east Asian countries), rather than produce them all domestically. Low added-value crude oil is exported and higher value-added petrochemical products re-imported, with identifiable, avoidable and damaging effects on Iran's balance of payments. Given exchange rate volatility and 'on/ off' international trade sanctions, domestic on-shore refining and petrochemical product manufacture would go a long way towards reducing Iran's special vulnerability to black swan event, simultaneously enhancing profitability and productivity, especially by reducing transaction costs and time delays.

In passing it is worth asking why 'basic' producers of raw materials have been discouraged or prevented from entering high value-adding activities such as polymer manufacture. Those who know a little about the modern history of Iran may know that upstream stages have been largely owned and controlled by foreign companies sometimes called 'the Seven Sisters'<sup>2</sup> who have preferred to see the high value added stages completed in their home countries for profitable re-export back to source countries. They continue to hold inter-locking directorships with banks. The interactions between these policies and highly changeable foreign policies towards Iran have been plagued by unfortunate black swans, up to and including proxy warfare, coups against elected leaderships, assassinations and attempted assassinations and a wide range of 'interventions' such as sponsorship and training of terrorist groups, each of which has resulted in 'blowbacks' with surprise effects (black swans) for both Iran, its neighbours and for the foreign governments involved (Piccone, 2014).

Several studies and researches have been confirmed that the innovation effort of companies brings the competitiveness (Neubaum, Craig, Dibrell, 2014; Covin, Slevin, 1989; Miller, Friesen, 1982; Kirzner, 1987). Hence, innovation in petrochemicals has beneficial

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<sup>2</sup> Anglo-Iranian (formerly the Anglo-Persian Oil Company (now BP), Gulf Oil, Royal Dutch Shell, Standard Oil Company of California, Standard Oil Company of New Jersey (Esso, later Exxon, now Exxon Mobil), Standard Oil Company of New York (later Mobil, then Exxon Mobil) and Texaco (merged into Chevron).

attributes supporting Iran's intention to become the leading refined petrochemical producer in the region and regional leader in industrial innovation. This approach as suggested in our Introduction is consistent with developing anti-fragility against geo-political black swans, as well as improving the added-value and profitability obtainable by producing petrochemical oil by-products, including the more technically demanding ones. In establishing the processes associated with applied industrial research and development of new product categories, pilot testing, laboratory infrastructure, the production engineering skills necessary for designing and constructing new plants, positive black swans become a probability. Indeed, a major impetus for our study is the more than twenty years' experience of the author as a petrochemical industry insider.

We recognise that the many process and product innovations in the petro-chemical derivatives industry are likely to generate black swans, negative (failed compounds) but also positive such as the discovering of new possibilities and opportunities arising by chance in unforeseen ways from new configurations of technology integration and actor networks (Neubaum, Craig, Dibrell, 2014; Lumpkin, Dess, 1996), (Allen, 2011), (Méndez-Fajardo and Gonzalez, 2014) particularly greater inter-connectivity between downstream and upstream actors.

Indeed, *Actor Network Theory* (ANT) can be re-read in a Talebian fashion as a strategy for creating 'positive black swan-creating environments' which generate happy accidents. It maps existing actors of many different kinds and their connections. ANT treat innovations as the outcome of the properties of networks. In other words, it does not see innovation as the result of individual genius, but of a set of social connections and capabilities. A given innovation can be mapped within the web of often *coincidental* connections which it emerged from by processes that are also coincidental as well as routine and institutionalised. Early examples would be 'Lunar Societies' of individuals who met in each other's houses when the



moon was bright enough for night-time travel. The coffee houses from which *Lloyds Underwriters* emerged would be another example. ANT is not strictly a theory, but a mapping activity which attempts to describe the connections within which an innovation was associated; and only as far as the links and the events can be known. One actor may give a quite different description of her/his network than another actor in what *could* be the same network. The way ANT allows for uncertainty about causes is attractive and we think it is also realistic. The policy recommendation of ANT is to add new ‘nodes’ and actors in the hope that something useful might happen as a result of many potential new connections that the network allows for. It allows for the probability that nothing will happen as a result from altering a network, which is also difficult to estimate.

For these reasons the ANT strategy of mapping *distributed* networks and filling potentially useful gaps strikes us as preferable to the hierarchical root and branch strategy described above as ‘strategic planning’ and much more preferable than the ‘strong’ versions of strategic planning. ANT offers flexibility by considering the capabilities for the modification of networks in and between any ‘industrial districts’ that might link very different kinds of activities. As the author understands it, there may be a link between the shape of the networks and the diversity of its actors but this could be quite difficult to demonstrate beyond noticing that some industrial districts and cities seem to ‘punch above their weight’. For a more orthodox approach to the relation between the innovation and company profits claimed for strategic planning see Neubaum, Craig and Dibrell (2014;); Titus, Covin and Slevin, (2011); Craig and Hansen (2011); and) Velamuri, (2006); Barringer and Bluedorn, (1999).

We prefer an approach which would define positive black swan opportunities such as new petrochemical products or enhanced creativity and process improvement less in terms of ‘strategic management’ of what are bound to be unknowns and more in terms of widening the

scope for favourable future uncertainties (Korsgarrd, 2013; Eckardt, Shane, 2003).

Another difference between ANT and the orthodoxy is that instead of advising actors (e.g. firms) to do competitor analysis in order to avoid *copying what competitors already do well them* the stress can be on what competitors do *differently but in ways that could lead to useful inter-firm collaborations* (Teece, 1994) which would combine ‘complimentary assets’ for the first time. We favour the authors who favour flexibility and open-ness over rigidity and defensiveness. For a range of opinion see Heinonem, Hytti and Stenhol, (2011); Heinonen (2010); Puhakka (2007) and Miller (1987). If it is possible to ‘plan for flexibility’ and allow for adaptability in the face of inevitable but hard to forecast environmental changes this would probably appeal to surviving Iranian entrepreneurs (Neubaum, Craig, Dibrell, 2014; Titus, 2011; Wiltbank, 2006).

This argument is consistent with our proposition that entrepreneurs need to consider uncertainties and black swan events even while planning and to prioritise adaptive capacity in the face of inevitable but unannounced events in order to survive. By assuming ‘chaotic environments’ and unforeseen events as the *default* condition for action, planning could be thought of as an attempt to ‘create one’s own luck’ rather than an attempt at ‘comprehensive’ competitor analysis and environmental assessment. Because opportunities are not foreseeable it is likely that the first to see them will gain the highest rewards simply because others are slow to see them and thus to begin with the actor has no competition to deal with. This is consistent with Hayek’s argument that uncertainty is the key to profitability (uncertainty as a friend rather than as an enemy). The growth of the innovative petrochemical products would affect innovation and growth in other related industries but not in a way that can be planned for. Indeed, on this argument, the more that planning was possible, the smaller the profits would be.

We do not think it is possible to *plan* for, say reduced imports of finished petrochemical products, job creation, savings in transportation, insurance and transaction costs; but the conditions under which these become more likely can be conceived and put in place. The process will be recursive with many short-term adjustment, changes in direction and about turns without ‘road mapping’ and ‘controlling’ and business strategies ‘aligned’ with innovation objectives. In any case, according to Minzberg (1999), innovation in process activities will produce new company perspectives which revise the strategy of the company. The idea that organisations are not the same from one week to the next seems preferable and less dangerous than the urge to control everything in a futile attempt to *fix* a destination *years* ahead, in a world which will have moved significantly, nullifying that original destination and even causing it to disappear as a meaningful end-point. The latter is a recipe for ‘brittle fracture’ (Teece and Pisano, 1994; Sendil, and Winter, 2003; Sendil, Prashant, Kirshman and Singh, J.V, 2005; Regner, 2008; Zollo and Winter, 2002).

## **2.17 Grid Group Cultural Strategy**

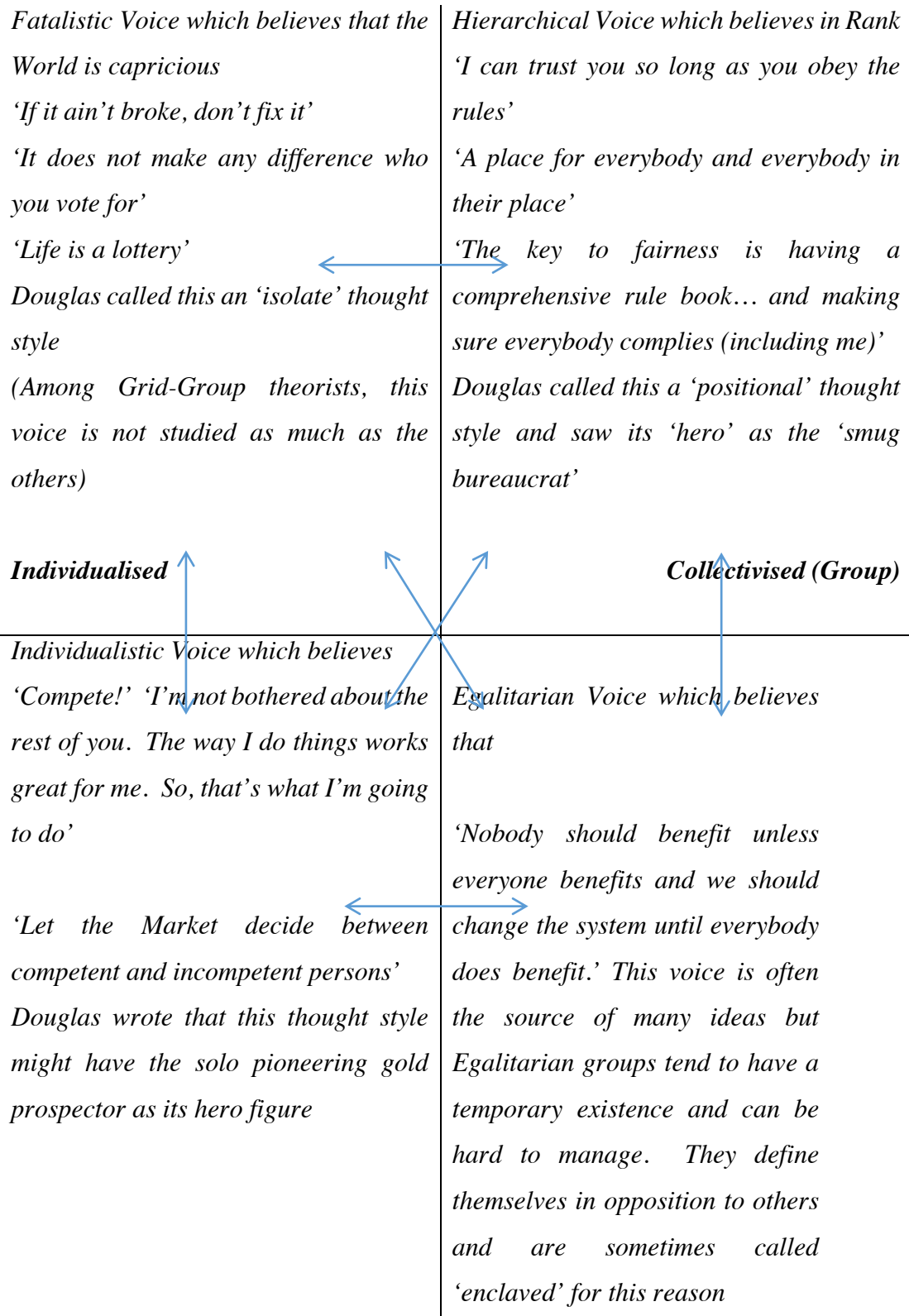
It strikes me as intriguing to see that what individual ‘sovereign agents’ think of as their ‘own opinions’ is thinking that is made possible by our membership of societies which have constantly varying degrees of Regulation and Solidarity. In the grid group, cultural model, no balance or equilibrium position is found because change is driven endogenously by a procession of different clashes in thought styles (competing yet equally reasonable rationalities) which are unavoidable. The ability to map all ‘cultural preferences’, present, past, future and all circumstances is claimed by the 'Grid Group Cultural Typology' on only two dimensions, and it is claimed by its developers that it is the stepmother of all kinds of typologies. The question which engages the author is why different thought styles provoke and conflict with each other, even when the personalities involved (say two ‘extroverts’) and the preoccupation (say, preventing deviance, or existential threat) are the same. For instant, the

'Hierarchical Thought Style' - the one favouring More Rules, Policies, Processes and Procedures which is observable in UK Higher Education – is, on the evidence of my experience, shifting, because an 'admin rich environment can produce more chaos and less order. Moreover, the more rules that are created, the more deviants will be created, whose past behaviour now conflicts with restrictions which were not there before. Thus, the imperative to limit deviance has the paradoxical effect of increasing it.

Grid-Group Cultural Theory works as follows:

## 2.17.1 Grid-Group Cultural Theory: Clumsy Solutions to Wicked Problems

### *High Social Regulation (Grid)*



The following section is drawn from a draft of an unpublished paper by Dr. Stephen Smith and

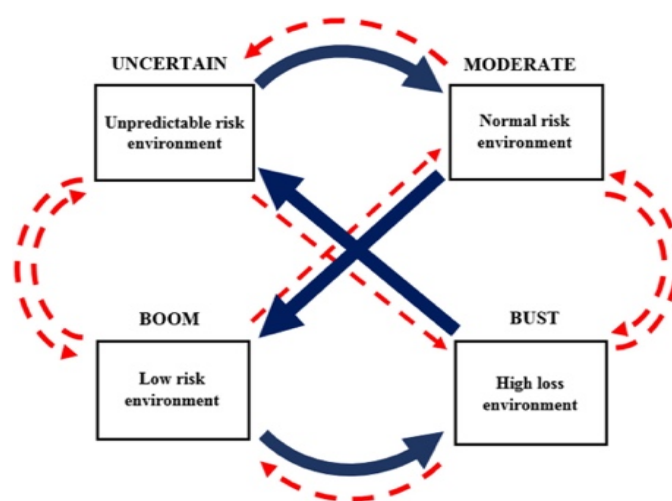
Kate Darlington, *How Entrepreneurs Think*, which explains how Grid Group Cultural Theory operates. It is reproduced with permission.

Grid group cultural theory was developed by the researches Mary Douglas, Michael Thompson, Aaron Wildavsky and other co-workers. A comprehensive, universal two-dimensional typology was distilled by Thompson and Douglas which suits all non-naturally occurring phenomena, or in other words suits all cultural phenomena for all times, places and circumstances.

The horizontal dimension indicates the extent that one tends to belong to a group or stand as an Individual, while the vertical dimension shows the extent that one is subject to External Regulation by others or is not constrained by external rules and regulations. The dimensions can be thought of as continua between Strong Social Regulation and Weak Social Regulation and between Strong Social Solidarity and Weak Social Solidarity.

Of many applications of G-GCT to cultural phenomena we will consider its application to banks and other financial institutions, by Michael Thompson.

## 2.18 How Banks and other Financial Institutions Think



(Thompson, 2018)

The following section thus draws heavily on Thompson (2018) *How Banks and other Financial Institutions Think*". One remarkable property of the model is that interactions between each of the four rationalities, *Hierarchical-Rank*, *Egalitarian-Enclave*, *Individualistic-Competitive* and *Fatalistic-Pragmatic*, create changes in what we tend to think of as 'the environment' and these changes present each thought style with 'surprises' which they are not well-equipped to deal with (but which the other rationalities can deal with more successfully). These surprises bring about changes-of-mind with the effect of altering the 'risk environment' in ways that create other types of surprise for other actors. In other words, solutions, which work well in some risk environments stop working when the environment shifts, and specific solutions which failed in the past now regain their usefulness.

Here Michael Thompson has described different seasons of risk:

- Normal risk environment
- Low risk environment
- High loss environment
- Unpredictable risk environment

In a Boom (low-risk environment) it does not seem to matter how much risk is taken during this stage. Firms can apply for and get very high levels of debt-finance, growing rapidly to maximise the rich-pickings that are available to be made. In this risk environment, most risk-taking decisions pay-off very well and the cheaper uninsured risk beats the more expensive insured risk. During this environment, people slowly drift away from being concerned about risk. In this low-risk environment, markets can move into speculative bubbles and will move out of equilibrium.

In an Uncertain (unpredictable-risk environment): activities become very risky. Almost any course of action presents potentially fatal threats. An unexpected event triggers a shift from one environment to another, with those shifts being generally tied, Thompson argues, to system capacity.

In a Bust (high-loss environment) most risks have turned into losses. The survival of the entities (and potentially of the entire system) is uncertain. The market senses that many previously respected firms will not survive this period, and these spreading suspicions slows business activity. In this phase, the focus needs to be on finding, opportunistic actions that will save the firm from destruction. In this high-loss environment, markets may cease to function altogether, such as happened to 'Zombie Banks' for a period of time. However, the risk season will not persist indefinitely

In a Moderate (normal-risk environment) long-term averages serve as an adequate basis for forecasting. Most investors experience profits and their gains and losses are small enough to concentrate actors' thinking on appropriate risk management measures. Market volatility lies within a more normally distributed range. Capacity for risk-taking is carefully matched up to risks, but taking risks right up to an organisation's full capacity is usually seen to be the best course in this environment... so long as the risk environment lasts in this state.



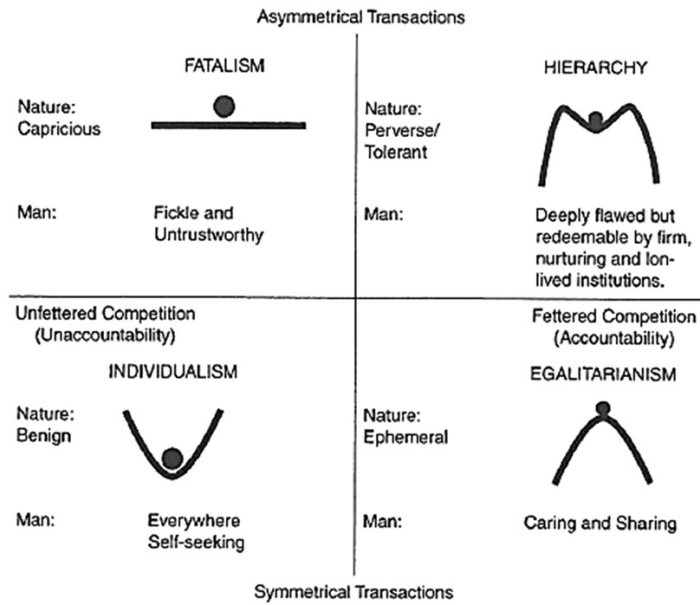


Figure 20 The fourfold typology of cultural biases/rationalities. (Thompson, 2018)

Thompson’s thesis is that risk perceptions fall into four distinct, which he calls Managers (sometimes aka. Administrators), Conservators, Maximisers and Pragmatists.

Given their ‘view of nature’, their sense of Social Solidarity and confidence in the rightness of Regulation, *Managers* (‘Hierarchy’ in Figure 19) hold a reasonable expectation of a moderate risk environment, are are therefore confident that the real world can be modelled, managed and administered within rules.

From their very different but equally reasonable ‘view of nature’, *Maximisers* (‘Individualism’ in Figure 19) are convinced that the world is benign, and as long as the risk environment conforms with their understanding, they can be very successful in their own terms, growing rapidly and booking exceptional profits. They have no concern for others and what they would regards as ‘healthy disrespect’ for regulations.

*Conservators*, having a high concern for others and a weak commitment to regulation (i.e. egalitarianism in Figure 19), have reasonable expectations of disastrous losses, which would pose an existential threat not just to their entire organisation (or ‘enclave’) but to the whole world, preferring to assess their risks using ‘stress tests’ and ‘worst-case scenarios’.

Thompson reasons that they may forego some (or all) of the gains available, due to their lower risk positions. But they will also incur smaller losses than other actors which are animated by other thought styles, notable, smaller than those run-up by *Maximisers*.

*Pragmatists* (i.e. fatalism in Figure 19) see the world as operating without rhyme or reason, having no care for others and feeling constrained by rules they can do nothing to change, they see no point in spending time and money on building models that assumes that the range of future outcomes is forecastable. They diversify, placing their eggs in different baskets and adopt survival as their success criteria.

Thompson continues:

It could be argued that, people feel, think and act only because they are all cultural subjects. When ... systems move towards the right-hand side of figure 19 they experience high social solidarity... more connection...more obligations...whereas, when...systems move towards the left-hand side of the figure 19 lower social solidarity is experienced among the people...

Cultural systems (which include financial markets and all their actors of different sizes) can also move upwards as Regulation intensifies, depicted across the top part of the table; or downwards as Social Regulation weakens. Diagonal clashes (between Pragmatists and Conservators and between Maximisers and Managers) are most fiery, because the conflicting rationalities which confront each other vary in *both* the vertical (Regulation) and horizontal (Solidarity) dimensions. It should now be clearer why a) culture never sleeps b) each actor thinks the way they do c) why they act differently with varying success from one risk season to the next, d) why they are surprised by qualitatively different kinds of black swan events which e) bring about changes in feelings, thoughts and actions.

Note that actors can be in more than one mind and therefore be 'torn' between different actions. It is these hybrid forms of thinking which Thompson calls 'clumsy' and he reasons that clumsy solutions stand the best chance of success when a large number of actors face complex or 'messy' problems which no single rationality is capable of dealing with.

We note that each rationality, if it becomes hegemonic, such as Individualistic

Maximising on the eve of the 2007-8 Global Financial Crisis, will create an environment rich in black swans which are especially surprising to that way of thinking, but which are much less surprising (and repairable) according to the other thought styles. From these other positions will come the words: 'I told you so and you did not listen to my warnings!', or similar messages linked with particular solutions that were overlooked previously: 'government bail-outs', 're-regulation', 'going into administration' and 'fire-sales'.

## **2.19 Conclusion**

Does the inevitability of black swans make strategy dangerous, pointless or necessary?

Black swan events are an unavoidable feature of any social (cultural) system anywhere, but especially unavoidable as the consequence of uncertainty due to chaotic political and economic environments in the Middle East. We perceive from the Grid Group Cultural Theory that instability is part of any cultural system because cultures are bound to create disagreements in thinking. This insight reinforces Taleb's claim that surprises are bound to occur, but unlike Taleb, Thompson explains their origins not so much as the outcome of coincidences, 'wild-' and 'super-wild distributions' but of intelligible mutual antagonisms between equally rational but conflicting thought styles.

Taleb's argument remains that black swans mean they cannot forecast except by happy accident; in Thompson's terms, it is a happy accident that Pragmatists might be in charge of an institution at the moment when bull market ends and similarly an accident when the risk environment becomes suddenly much more favourable and Maximisers jump to take advantage. We mean that because it cannot be known which direction the risk environment will go next; actors will be fortunate or unfortunate depending on which thought style inhabit them at that moment. This is the same as the 'ill wind' and 'Chinese farmer' cases mentioned above. While Thompson would agree that it is not possible to forecast which direction the next cultural shift will be, he is clear as to the forces which will cause it to happen.

We think that both Taleb and Thompson see that ambition to take all external and environmental factors that might have an impact on the process into consideration is unrealistic. Nevertheless, this has not ended this ambition among strategic planners, especially the more hierarchically minded of them, to be 'comprehensive' in the hope of realising more favourable futures (Myer and Kitsuse, 2000). In other words, we see that the 'strong' version of scenario-development and strategic planning are driven by Hierarchical-Managerial reasoning.

Since the number and type of 'drivers' is itself unknowable (even after the event) the 'stronger' the version of scenario planning that is adopted, the worse the underestimation of risk. Anti-fragility would enable the companies to become more robust in chaotic situations as well as benefit from the unexpected. While 'environmental assessment' is bound to feature even in the 'soft' version of strategic planning, an ontological understanding of the nature of the world and its future as defying estimation should determine organizations' 'dynamic capabilities' chiefly their anti-fragility (Walker et al., 2010). This argument carries full force when the 'risk environment' and actors' understanding of it match up. It is also consistent with our observation that Iranian entrepreneurs pursuing the Maximising strategy do indeed succeed in their own terms (growth, profits) more conspicuously than we have done, but only for short periods, before the risk environment and their own bravery (high risk appetite) worked against them.

Part of the difficulty is recognising an 'environmental factor' and understanding its potential impact and accommodating them in management processes (Kerkovsky and Vykypel, 2006). The more obvious the factor, the less useful it is in that other organisations can see it too. We support Davidson (2014) who treats scenario planning as "producing a number of divergent plausible future scenario from which to then consider the implication for present-day policy making", identify the hypothesised barriers and opportunities presented by each scenario doing so as a core procedure (i.e. a dynamic capability). In accordance with our 'soft' premise,

several tools have been employed in the attempt to assess the challenges that organization could be faced as a result of a black swan (Lyons & Davidson, 2016). We mean “strategy as preparation for the future by thinking about the future... and imagin[ing] the future” but *not* to “know the future” (Papula and Papulaova, 2012).

To describe strategic management as formulating a plan by which an organization can achieve the intended objectives through the internal and external analysis depending on the political, economic and governmental situation of the region that organization operating (Tej, 2011; Wright and Nemec, 2003) raises too many un-knowables simultaneously. Back-casting could be useful in improving mindfulness of many (but never all) slip-ups that may occur between one step and the next. That is, techniques which multiply the number of uncertainties and mindfulness of them, rather than reduce them, are welcome. To repeat, and writing as a Pragmatist, the lower our confidence that we really know what is coming, the better. This is what being anti-fragile requires (Taleb, 2009). Meanwhile being more confident that there will be positive black swans and that a look-out should be kept for these, also makes sense to an Iranian entrepreneur reasoning at that point only, as a Maximiser. Our wish to show Iranian institutions of all kinds the benefits of anti-fragility is a Conservator’s (Egalitarian) intuition. And my strong opposition to the strong versions of scenario-development and planning combines these three rationalities against the Hierarchical-Managerial reasoning favoured by those planners.

Walker (2010) defines four different level of uncertainty as follow:

*level 1) A Clear Enough future*

*level 2) An Alternative future*

*level 3) A Multiplicity of Plausible future*

*level 4) An Unknown Future, known as ‘deep uncertainty’*

We mention Walker because although different ‘levels’ of risk can be established and distinguished *by definition* as an empirical claim, his distinctions are less helpful than they might appear and even spurious. The temptation... the danger even, is that in common-sense deductive terms uncertainty levels 1 and level 2 should be manageable roughly conventionally, while levels 3 and 4 would present challenges associated with ‘incomplete information’. *However*, if we apply Taleb’s thesis to Walker, it warns us that it is too easy to mistake level 4 as if it was level 1, familiarity breeding complacency. In other words, Hume’s Problem of Induction always applies except to the very simplest and uninformative deductive statements:

You never get something for nothing and never empirical hypotheses from empty deductive definitions. At best your observation can tell you only that the real world (or some subset of it) *is not exploding*; your theoretical model or system will always be an idealized representation of the real world with many variables ignored; it may be precisely the ignored variables that keep the real-world stable, and it takes a significant act of inductive inference to rule this out and permit the Correspondence Principle to deduce properties of the idealized model

(Paul A. Samuelson (1955: 312), cited Boland (1989, 119), emphasis added).

Taleb’s analysis leads to the conclusion we share with him that the point is not to attempt to deduce and avoid future uncertainties, or rather, not attempt to infer them, but to maintain anti-fragility as a perpetual disposition. Bracker (1980) argued that strategic management is a *process* to improve the use of organization resources (which would place it within the ‘resourced based view’ (RBV) of the firm, helping in dealing with the future changes. While we agree that strategy should be a process, our preceding discussion leads us to infer that when arriving at ‘anti-fragile’ processes, probably the less comprehensive in its ambitions, the better.

As the main research question for this thesis is: “Do Iranian entrepreneurs and strategic managers behave as Taleb would recommend and therefore survive? The chaos they inhabit which, even in Iran, will not involve the blatant ‘explosion’ of their world, involves them, and ourselves, in some attempt at inductive inference, in order to qualify as informative. And as a theoretical contribution in support of this aim, we suggest that there are benefits to be had by synthesising Grid-Group Cultural Theory with what Taleb prefers to call his ‘anti-theory’ of Black Swan events. The benefit of the black swan argument is that it enhances awareness of uncertainty and of the importance of surprises, at every step. In other words, in a world which does not exhibit obvious regularities, it makes sense to treat circumstances as if they were at ‘level 4’.

We note that each of the four thought styles by Michael Thompson are worthy to be taken to the consideration because each thought style also comes up against surprises, but reads them differently and responds differently (and sometimes not at all). The grid group cultural theory teaches us the importance and role of different rationalities in any system. We sense that to expand the reach of black swan theory worldwide we should take the dimensions and possibilities identified by Thompson into consideration and especially, acknowledge the existence of four different ‘risk seasons’ and the more or less successful ways of surviving them.

The Hierarchical ‘Manager’ reasons that deviance is the problem and an improved rule book (regulation) will deter and punish the next deviant-led occurrence. This thought style creates ‘procedural justice’... its *black-swan reducing process* would aim at punishing the deviants who bring sudden misfortune. The clear difficulty of such a process is that the impacts of most negative black swans cannot be disciplined in this way. For example disciplining reckless financiers post-2008 does not have an effect on the effects of that Global Financial

Crisis, after the event. It may have some effect on deterring future ‘deviant’ black swans, but it is questionable whether better rule books foster positive black swans. Meanwhile the Manager, having a moderate risk appetite assumes that the world is normally quite benign, a deviant minority being the main danger.... In Walker’s terms, Level 1 risk is acknowledged. But if the Risk Season had been misread, then this stance would be inadvisable, because it would be out of step with ‘surprises’. If Thompson is correct then these should trigger changes in the actor’s cosmology/ paradigm (understanding of the nature of the world).

The Egalitarian ‘Conservator’ reasons that there are high risks to all and that the whole system needs changing so that everybody can benefit. They picture ‘Alternative Futures’ and would attempt to join forces with others to create change. The ‘Manager’s’ strategy annoys the Conservator because of its belief in Regulation.

The Individualistic ‘Maximiser’ assesses the risk environment as benign and takes the most adventurous path, doing things differently in ways that the ‘Manager’ and ‘Conservator’ both see as selfish. Only if the risk environment *is* very favourable, then the Maximiser will prosper dramatically.

The Fatalistic Pragmatist assesses risk as very high and takes the most careful and cautious steps. Our argument that in chaotic circumstances this is the best strategy but to the Conservator especially, this way of life looks both too selfish and pessimistic. In the most hostile risk environment, this strategy will succeed well in its own terms. Survival is what matters, not inventiveness, stamping out deviance or making the world a better place.



## Chapter 3

### Research Methodology

### 3.1 Introduction

To argue that surviving Fatalist-Pragmatic entrepreneurs think and act differently to senior salaried Hierarchical-Managers managers calls for the use of the comparative method. In this case, we mean to make a comparison between entrepreneurs and managers who are contemporaries in the same country. In this sense this study is ‘cross-sectional’ meaning it is a comparison made at a point in time. However, by reflecting on adult lifetimes of past experiences a time dimension is also suggested, including the experiences of the author, sometimes known as ‘critical incidents’ or ‘critical incidence analysis’ (Norman and Redfern, 2008). There is an inference that at least some aspects of my own experiences will be found among other surviving entrepreneurs in particular, but that salaried senior managers will evaluate risks differently. The other two available risk attitudes, the Egalitarian-Conservator and Individualist-Maximiser are not included especially in this study, though observations concerning the latter have already been offered. These are shooting-star entrepreneurs who grow rapidly and maximise profits but only for a short period. We invite other researcher to study both of the omitted thought styles.

While Taleb is clear on what he means by black swans and anti-fragility he is a statistician rather than a social scientist, so it is possible to read his work without finding explanations of how actors change their minds about their chaotic world and start to act differently. He makes a strong case that actors should try to become anti-fragile and why many or most find this difficult to do (because of their ‘cultural biases’) but he does not explain why some are already anti-fragile (which is what we suspect). The comments he makes about social analysis are usually dismissive, seeing most of it as belonging to the ‘Platonic fold’ as he calls it and demonstrating ‘epistemic arrogance’.

Our hope is that what Iranian entrepreneurs do and how they think may give us a clearer view of what anti-fragile strategy looks like in practice and not just in principle. In this way,

our investigations are informed by Taleb but are also aimed at clarifying his (anti-) theory using Iranian entrepreneurs to do this. There should be useful feedback loop between Taleb's approach which we have adopted and what surviving Iranian entrepreneurs say. We can also compare what surviving entrepreneurs say with the cases of failure which are known to the author, especially the phenomena of tremendous growth followed by total collapse of 'profit maximising' businesses in four years or less.

This chapter will explore different approaches to method. It begins by describing and distinguishing between research philosophies. Because methodologies are cultural phenomena, there will be Hierarchical, Egalitarian, Individualistic and Fatalistic preferences. Our research, like half my sample is somewhat aligned with the Pragmatic and Individualistic thought-styles. Methodological Pragmatist argue that methodological choices should be 'the slave of the research question'. The design of the research – here comparative – and the choice of technique – here face to face interviews, follows from the research question; the research question is informed by theory and that theory has to earn its keep by generating practical implications.

The choice of comparative qualitative interviews which explore and contrast the explicit and tacit knowledge of Iranian entrepreneurs and petrochemical company managers, follows quite directly from my immediate concern with survival in the face of futures which defy accurate estimation and which generate black swans (unexpected events which have major consequences, positive and negative). The interview schedules (which have to be flexible, given the above comments, because we need to allow respondents maximum freedom to describe their particular and varied occurrences) are designed to find out how, what and whether the respondents (entrepreneurs or petrochemical top managers) have learned from the surprising events. Secondary data from the literature, will be used to address the research questions and objectives wherever this is possible. Data will be collected from fifteen

petrochemical and refinery companies, and from fifteen independent and surviving Iranian entrepreneurs, which can then be used to draw a larger picture of the problem that companies may face in Iran and how it might be possible to develop an industrial strategy which has anti-fragility as a guiding principle.

Having about twenty years of experience as an entrepreneur in Iran as well as distributing plastics and petrochemical raw materials as his main business fields, the author has experienced and witnessed a great many occurrences, developed many contacts in these industries. Again it is for pragmatic reasons that the author has chosen his business connections as his sampling fram. We have chosen more successful entrepreneurs and well-known managers. Considering that there are few petrochemical companies in Iran, fifteen very senior petro-chemical managers is probably as many as could be included for interview. However the ‘manager’ sample was drawn so as to be diverse enough to allow for differences in their experiences and dispositions. As we will see their thought styles were rather similar though some expressed some divergent views.

It could be argued that the responses received from entrepreneurs are more trustworthy and reliable comparing to petrochemical managers as they do not have to take political considerations so much into account as do the senior managers who hold positions in state owned enterprises.

It is probably an advantage that no respondents should know anything about NN Taleb and his black swan thesis. Interviews need to be as naturalistic as possible, capturing the ordinary (though contrasting) ‘common-sense’ which we expected would be expressed within the two samples. However, based on the author's experience we had strong prior suspicions (a hypothesis) that most Iranian entrepreneurs have attained implicit tacit knowledge regarding black swans, because their risk chaotic environment would have presented several unforeseen

events (which constitutes our independent variables) and that this tacit knowledge has been critical to their survival (the dependent variable).

In this research, we are critical of what Smith (2010; 2011) calls the ‘standard account of the method (SAM)’. The standard account describes business and management research as a choice between "two traditions": "qualitative "phenomenological" interpretivism" and "quantitative ‘scientific’ positivism". These traditions are usually presented as opposed sides in a ‘paradigm war’, although, confusingly, it is often stated that these ‘opposites’ may be ‘mixed’. It is hard to see how if two sides involved in a paradigm war would want to use the methods of researchers which they regard as enemies. In this sense the standard ‘two traditions’ account appears unconvincing, and even ‘enclaved’.

Nevertheless, it is not difficult to find extremely hostile comments directed from one side to the other. From a ‘critical’, ‘anti-positivist’ perspective (McAnulla, 2006) writes stating his opposition to ‘the tired old methods indebted to the assumptions of logical positivism with the sovereign subject of ‘Science’ enslaving those selfless subjects that labour in its citadels’. However, my hypothesis introduced above is *positivist* in the clear and important sense that it can be *tested* and *rejected* if the evidence does not support it or directly falsifies it. Testability is what Karl Popper called for many times as the key feature of any theory which was justified in being called ‘scientific’. (He dismissed non-testable theories as ‘metaphysics’, putting Marx, Hegel and Plato in this category). To emphasise, *our epistemology is positivistic*.

Epistemology is one thing but technique (qualitative or quantitative) is another separate dimension altogether. Our principle research technique is the extended interview which is a qualitative technique. Knowing the two sample groups rather well we soon rejected the idea of researching them using quantitative structured questionnaires. This was for three reasons:

- Iranians have reasons for being mistrustful and it is doubtful that clear enough

details of their experiences would be given by them when asked to fill in large spaces in text boxes without very clear assurances that their comments were absolutely confidential

- Writing down experiences is time-consuming and we could not expect respondents to put in the effort of writing enough detail, especially if they did not have the researcher in front of them. With the researcher present, then the responses could be recorded as spoken, with prompts to go further when it came to the details of their 'black swans' and their reactions to them
- Questionnaires, even ones with a lot of space for free text, have to be the same or similar for every respondent within the same sample population. This requirement conflicts with the exploration of black swans which will be different for each respondent completing the survey. Even what might seem to be the same black swan to one respondent may have been experienced differently to another, with different reactions. It is difficult to see how a structured questionnaire could be flexible enough to allow for these very particular variations

That is, pragmatic considerations mean that I will be:

1) using elements which the standard account treats as 'opposed' and presumably incompatible, because they lie on opposite sides of a 'paradigm war'. It is difficult to see why hypotheses should not be tested qualitatively, which is what happens in the courtroom or the parliamentary inquiry. The prosecution hypothesises that the accused is guilty on the basis of almost entirely qualitative evidence. The jury, as Smith points out, is asked whether the accused is guilty 'beyond reasonable doubt', here 'reasonable doubt that they may be innocent' is the equivalent of the 'null hypothesis' that there is no relationship between the dependent variable (say, the death of the victim) and the independent variable, the accused and his or her

motives. Testable hypotheses feature in everyday life and surprises, including black swan surprises, represent conspicuous 'counter-factual evidence' tending to refute those hypotheses, for example that the bunch of keys in my pocket will fit my front door. They do almost always, but it is not possible to rule out the example that, when the keys I am carrying turn out to be someone else's keys which I picked up by mistake. My positivist, testable hypothesis that the keys I am carrying (the independent variable) is at risk of being refuted by the qualitative evidence of the keys that won't fit. No large sample survey method is needed to know that there has been an error.

It is also difficult to see why posing testable hypotheses should be 'enslaving', either of the researcher or of my respondents, rather than being informative and liberating. Smith argues for a 'go-anywhere representation of inquiry-space which resolves...category mistakes' such as collapsing 'epistemological', 'technical' and other dimensions in to one simple binary opposition. Instead he treats epistemological, technical and other dimensions as 'orthogonal' (unrelated) and 'articulates' any three dimensions as what he calls '3-D spaces' (see figure below). He argues that ordinary persons articulate twenty or more dimensions in order to make their inquiries (up to twenty-seven dimensions which can be combined in thousands of ways according to the inquirer's pragmatic needs). Even children are naturally gifted without having had any formal training in the philosophy and techniques of method. 'Our suggestion is that methodology is the boundary to the informal, providing space for talk; it describes what's worth talking about, why we disagree, furnishes the necessary words and finds new words for liminal subject-matter. There is always more to say and happily, language is as clear-cut as it is spacious. Therefore, abandon the standard account of the method and begin with students' earliest memories of making inquiries.'... 'methodological choice is vast and...the methodological choices that the researcher makes should be the slave of their research question' (Smith, 2010).

He adds ‘this space is an informative description of the freedom of inquiry’ (Smith, 2010) defined by many dimensions as we experience it. (He gives many examples of naïve inquiry where uneducated persons articulated different methodological dimensions in a sophisticated way in order to develop their understandings of many kinds of phenomena.) He rejects altogether the standard one-dimensional polarisation of ‘anti-foundational’ ‘qualitative interpretivism’ versus ‘establishment’ ‘quantitative positivism’ because it results in too many anomalies which he also spells out clearly through numerous examples. Chief among them from our point of view is qualitative hypothesis testing of the ‘key that won’t fit the lock’ type described above.

2) We have a pragmatic need for face-to-face or voice-to-voice interviews that are Talebian and ‘anti-fragile’ in themselves. Interviews are approached on the assumption that respondents will report surprises but the researcher cannot claim to know before time what these surprises will be or what the respondents will say about how they reacted to them in practice. Like the fictional ‘TV. Detectives’ which Smith refers to, my questioning needs to be flexible and my listening has to be very careful and acute. So, although each interview will have some similarities, it is important to allow for side-paths, especially ones which are surprising to this author. With the freedom, which we are going to provide the interviewees, there will be more possibility of receiving accurate and reliable responses, though we accept that no respondent can ever give a truly comprehensive description of their experiences and of the cause-effect relationships which they are caught up in. It is consistent with our Talebian paradigm view, that nobody knows for certain even what has happened to them or why it happened because that would require ‘root and branch’ investigations which are beyond the amount of time and other resources that are ever going to be available. Interviews can last as little as half an hour, but even a four-hour interview must fail to cover an unknowably large amount of an unknowable range of events.



With these requirements, limitations (and freedoms) in mind, the author will now proceed to rationalize the approach to this investigation. The chapter is divided into seven sections; (3.1) Introduction, (3.2) Primary research (Definition and Overview), (3.3) Secondary research (Definition and Overview), (3.4) Qualitative Interviewing, (3.5) Research Philosophy and Technical Approaches, (3.6) Ethical Consideration and (3.7) Summary.

### **3.2 Primary Research: Definition and Overview**

In this thesis, the author interviewed individuals for evidence-gathering purposes to explore how (and if) they recognise black swan surprises and react to them. Research is characterized differently from subject to subject, but each field creates literature over time. These literatures indicate to researchers an understanding of the meaning of being a researcher considering research in their particular chosen field of study (Soomiai et al. 2011). As an example, engineers, focus on testable knowledge with high but never complete reliability in their wish to design and build. There is a design process, aided by many tools to their research and models, both mathematical and in the form of scaled-down three-dimensional representations, providing life-like simulations, and a variety of destructive and non-destructive tests to see whether a design is likely to function well or fail. Engineers also acquire an aesthetic sense of what good solutions look like, such as ‘truth to materials’, ‘elegance’, ‘ingenuity’, ‘high reliability’ and sometimes the expensive ‘proper engineering job’, which other professions may evaluate negatively. The sociologist learns to research by observation, monitoring, interviews, statistical analysis to have a better understanding of individuals, culture, and societies (Johnston, 2014). To these should be added participant- and non-participant observation, oral histories and unobtrusive methods which involve gathering only ‘naturally occurring data’ such as snippets of spontaneous speech (Griffin, 2007). Use can also be made of ‘secondary data’ (qualitative or quantitative) which has already been gathered by third parties such as

government ministries, official records, diaries and memoirs, newspaper sources, photographic collections and many other kinds. There are many more techniques than these.

The point is to make defensible choices which suit the aims and objectives of the research, which the researcher will need to present and defend within his or her research community. There is a case for trying to replicate existing findings to see how much confidence can be placed on them, but where the researcher is entering new territory, they are not restricted to what has already been used in other fields. Perhaps even more so than for engineers, it is practically impossible for a sociologist to write the last word on a topic, especially as sociologists have been unable to agree to share the same paradigm. But sociological research involves developing papers that are worth defending, and worth attacking from rival positions. Sociology is a cultural project.

To be clear, primary research, the focal point of this study, is to gather first-hand evidence as opposed to relying on existing sources (books, journals etc.). John Stuart Mill in the nineteenth century is credited for being the first person who developed the theory of investigation in his book *Philosophy of the Scientific Methods* (Mill, 1989). However, the same claim could be made for Francis Bacon and his *Novum Organum Scientiarum* (1620) and probably for many other more ancient scholars.

Primary research is consistently founded on the assumption of something recognised as scientific strategy (Soomai et al. 2011). From field to field, the use of the scientific strategy is claimed to involve the development of research theories and questions, enabling information gathering that is quantifiable and 'objective', using recognised scientific methods and techniques. Nevertheless, many fields, even in the natural sciences began with *qualitative* data such as cloud shapes (meteorology) rock outcrops and rock formations (geology), physiology (of plant and animal parts in biology) catastrophic failures (bridge engineering) and illness symptoms as illustrated by life-drawings and photographs (medicine) and disease spread, using

distribution maps (epidemiology, public health). One of the most important aspects of directing primary research is to explore something new that can be presented to and challenged by others while following a line of inquiry, including those who think that lines of research should be directed elsewhere.

The author is aware of no research that applies a Talebian approach to contemporary Iran, chosen as a country which generates many black swan events and which is vulnerable to black swans which originate outside the country. It is a place within a region where the inside/outside distinction makes relatively little sense. While doing we bear in mind the extent to which scenario development (at least soft versions of it) may apply to entrepreneurship and wider industrial strategies of encouraging development of new and diverse down-stream activities in the petrochemical industry sector in Iran, at least to a *defensible* extent.

While we do not aim at comprehensiveness, we think it is important to collect evidence from experienced experts in the petrochemicals and entrepreneurship fields, recognising that practitioners are quasi-scientific in their own rights. They have implicit and explicit lines of inquiry and they form communities. Additionally, I have drawn on (a sample of) twenty years of experience developing my own business connections, totalling a sampling frame of probably hundreds, and perhaps thousands of ‘weak ties’ (Granovetter, 1983). From this sample we interviewed

- 1) fifteen key players in the petrochemical industry (senior salaried managers who could be described as ‘strategic managers’ and CEOs)
- 2) fifteen Iranian entrepreneurs

In a population of thirty drawn from two contrasting and deliberately different sampling subsets, if significant differences exist then we should be able to find them. By ‘significant’ is meant differences that cannot easily be explained-away as the outcome of chance. Our judgement is that in principle, qualitative data can also be assessed as to whether it shows

significant or non-significant differences. For example, a ‘scouse’ accent distinguishes Liverpool residents from Newcastle ‘Geordies’ with a confidence level approaching  $p=0.000$ , here with ‘residence’ as the independent variable and ‘accent’ as the dependent variable in a combined sample drawn from two populations.

The aim is to see, even if only in outline, whether anything can be learned from inside the second (entrepreneurial) sample that could be useful to the first (managerial) sample. We ask

Can anti-fragility be copied from one field of activity to another?

Whether or not anti-fragility can be transferred successfully, of course, cannot be answered within the time frame and resources which this researcher has available because it may take decades for transfers to happen and be applied in practice. But this is at least the long-term policy aim and we would welcome specialists in the study of ‘knowledge transfer’ to investigate this.

What should be clear enough already is that in a Talebian type of interview, two main questions will be asked of the interviewees, leaving them as free as possible to describe their experiences and outline their preferred strategies. Based on interviewee descriptions, improvised questions will be asked, excavated from what will have been mentioned, using our Talebian understanding of black swans at every turn in the interview. After a brief introduction and a briefest possible description of what a black swan is, the following questions are posed initially to independent entrepreneurs and then separately to senior petrochemical managers and chief officers:

- *Do you as an Iranian entrepreneur behave as Taleb would recommend or not?*
- *How do you explain your survival?*
- *How might ‘environmental factors’ affect future management strategies in Iran?*

Note that these are very wide-ranging questions chosen deliberately to allow a large degree of freedom for interviewees to range across their field as they see it and as they choose. The next question would follow:

- *From the brief description, I have given, what do you feel is the possibility of developing long-term profitable strategies based on the need to respond to surprises?*
- *Can you describe your 'view of your world' to me, or as social scientists sometimes would ask, What is your 'paradigm'?*

Please note that while these are the headline questions, how I phrase them must vary from respondent to respondent, using their 'day language'. In addition, there will have been several sub-questions inserted during the course of each interview and these also vary from respondent to respondent depending on what they say. Some prompting and encouragement is needed for hesitant or shy respondents who may never have answered questions like these before, especially for the purposes of an academic study. It is the researcher's belief, however that questions like these will have arisen implicitly for most or all respondents and that they will have developed tacit answers to them to themselves. This is because it is difficult to live any life without pondering on it to some extent, at least for brief moments.

### **3.3 Primary or Secondary Research: Definitions and Research Choice**

According to Hakim (1982), secondary analysis is defined as any further analysis of an existing datasets which presents interpretations, conclusions or knowledge additional to, or different from, those presented in the first report made on the initial results of an inquiry. The idea of secondary data examination is credited to Glaser who began re-analysing data which had been gathered initially for other aims (Johnston, 2014). However Johnson's claim ignores the analysis of centuries old Parish Records (occupations, births, marriages and deaths) and other kinds of inventories which local historians have been researching for far longer. Secondary data examination is claimed as an observational exercise with procedural and

evaluative steps as well as being a flexible (Doolan and Froelicher, 2009). With the growing tendency towards open access publications and even to the underlying data-sets, previously collected information is becoming more accessible to the researchers in any case. Secondary data analysis is seen as a legitimate research strategy as it brings fresh eyes and more different uses and challenges to existing work. There are also some structured forms of access available to the researchers (Andrews et al., 2012 and Smith et al., 2011), under which open access has been made a condition by research funding agencies.

However, there remain difficulties to doing this (Andrews et al., 2012 and Smith, 2008). Secondary data analysis is of course one step further away from the initial work and it may pile new errors on top of those which the original researcher made (perhaps without realising they had been made). In the case of interview data specifically, *in the first place*:

- The interviewee may not have understood the question that the researcher meant to ask
- The answer they gave was therefore to a different question
- The answer they gave will have been incomplete, quite likely in important respects (given the impossibility of comprehensiveness)
- The interviewee will have been vulnerable to lapses in memory
- Without the interviewer being aware of these happening except if they also interviewed many interviewees in the same field who gave consistent answers which showed up which of the respondents were providing unusual or contradictory responses
- In most cases, and certainly in the case of this research we consider it unacceptable and deeply unethical to make our 'raw' interviews made freely available to others. This is because of the sensitivity of the research.

While I welcome examination, evaluation, discussion and criticism of this thesis, the evidence it is based on is completely and strictly confidential

However, in primary research such as ours, these kinds of problems can at least be reduced at the first stage by asking a number of similar questions in different ways (including overlapping questions within the same interview) and comparing the responses. When it comes to secondary re-analysis by other researchers, for example of the interviewee quotations shown below

- Most or all contextual evidence will be unavailable (the interviewee's tone of voice, pace of delivery, visible confidence or lack of it, room layout, its tidiness or untidiness)
- The secondary researcher cannot know how accurately the testimony was transcribed
- The secondary researcher's research question may be even more alien to the respondent who was interviewed (or observed) than it was at the primary stage, stretching the link between research aim, its operationalization and conclusions even further
- Because social systems do not stand still, there are difficulties in reinterpreting what a respondent said ten or twenty years after they said it
- Anonymity means that the interviewee cannot be traced (and should not be traceable unless they have given written permission to be identified) as a check on the secondary interpretation that is being made

There is a case for secondary research if:

- The secondary researcher has no language skills in the language of the respondents s/he is interested in learning about

- There are other barriers to access including lack of contacts within the sampling frame, visa restrictions and even fear of arrest on suspicion of questionable activity
- The secondary researcher does not have any knowledge of how local institutions work and therefore does not know where to begin or how to evaluate what is being said

However, none of these restrictions affect this author who:

- Is a fluent native Persian speaker
- Has very many contacts to call on, all of which know him or his business and family directly or by reputation
- Has a lot of experience of the relevant institutions
- Knows what his research aims are and
- Can assess how well he is being understood according to the responses received while the interview is taking place
- Can use follow-up telephone calls and skype calls to clarify ambiguities

To put it even more strongly, secondary research cannot be conducted where no primary research exists, which is the case here. Here is a new topic as far as the research community is concerned. This author is the first to evaluate black swan vulnerability and anti-fragility among surviving Iranian entrepreneurs and salaried senior ('strategic') managers. For this author, secondary data analysis involved reading and re-reading Taleb several times, notably his diagrams and critical reading of both 'hard' and 'soft' versions of the fields of scenario development and strategic planning. We notice that much of the latter is *normative* ... sets of recommendations and linear steps (sometimes with feedback loops) which are meant to represent best practice, *without any primary evidence* that they succeed if followed, *no primary evidence that one model works better than another in practice* and therefore *no secondary*



*analysis of failures and successes* either. There may be some theory behind each of the normative models discussed earlier, but we found that theory (in the sense of explicit causal explanations) were often absent.

While it is possible to re-read Taleb's sources (particularly the tradition known as *scepticism* and the statisticians who were most sceptical about the usefulness of normal distributions) he does not provide much detailed primary research himself. His work includes many illustrations taken from many sources and a few from his own experiences. Thompson (2018), does report different 'risk appetites' and with others has produced computational models which show how each of these do more or less well as a result of dynamic interactions both with each other and in relation to the risk environments they create. As we have noted earlier, it is useful to see that his model has never reproduced the same pattern after hundreds of repetitions, confirming Taleb's principle substantive claim that financial forecasting tends to be inaccurate or highly inaccurate.

### **3.4 Qualitative Interviews**

In qualitative interviews (the main technique used in this research), the interviewees are offered space to expand their answers and record their experiences, purposes and perspectives. Their answers are not constrained through the meeting plan. Qualitative interviews are consistently used in an exploratory way to record the respondent's world as they interpret it, although in our case there is an hypothesis to test. Researchers don't expect to know in advance all the points of interests that may be recorded (Gubrium and Holstein, 2001), (Grenz, 2005). The interviewer can do some exploring of the respondent's experience, making and checking suggestions efficiently and checking association (Gubrium and Holstein, 2001). It is interesting as a type of research which enables researchers to explore themes, feelings and findings that respondents may have (Stopfrod, 2004).

In our case, the semi-structured questionnaire is only partially open-ended because it has to be open to evidence of black swans which, though knowing how to define them, the researcher should not try to guess at beforehand. Respondents must have the opportunity to expand on their (Talebian) surprises without being made to appear and feel inadequate for not seeing them coming. This is why it was decided to introduce the “Talebian theory of Black Swans” during the interview, though only very briefly. This introduces the idea to interviewees that surprises are normal.

While the interviewer will not attain comprehensive knowledge, an open-ended questionnaire can give the author the chance to develop an appreciation of what respondents have faced, as individuals and across their industry. Thirty different top salaried managers and Iranian entrepreneur have been chosen, and the main questions asked in order to allow the interviewees to freely express their point of views and to describe their strategies. Based on the interviewee descriptions, extra questions can be and were ‘excavated’ from what they mention when they mention it. The interview approach taken is *different* to the key steps of the more *typical* questionnaire design process which is shown as follows, because interviews are vulnerable to black swans they can be expected to emerge during the interview:

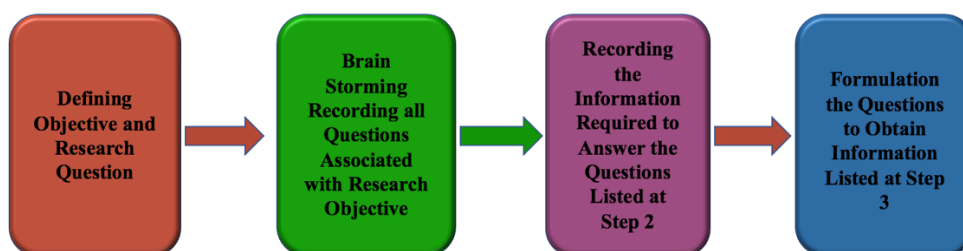


Figure 21 Main Step Questionnaire Development

In our case, fresh questions were expected to form during every interview.

The author paid careful attention not to disturb interviewees’ flow, or cause them embarrassment or restrict their openness. Moreover, we tried to avoid asking the questions which might result in them disclosing confidential information about the company or private

details, needlessly. Although phrased in different ways the following questions were tied to my framework as indicated here:

- Do Iranian entrepreneurs behave as Taleb would recommend? And is this how and why they survive? This question is not as binary as it looks as Egalitarian and Individualistic as well Pragmatic and Hierarchical risk attitudes are allowed for
- How might black swans affect the management of Iran's various petrochemical sectors and how could their negative effects be reduced? This question also allows for up to four types of reasonable responses
- What is the possibility of developing long-term and profitable strategies based on Taleb's anti-fragile principles? In an important sense, among other responses, this question allows for Egalitarian/ Enclave aka. 'Conservator' responses in the form of the survival of Iran against share existential threats
- What is each respondent's experience of their world most broadly? In other words, what is their paradigm?

### **3.5 Research Philosophy and Approaches**

In short, the pragmatic approach chosen for this study is to draw comparisons between two sets of qualitative interviews by paying special attention to the tacit knowledge of interviewees who would not have had any knowledge of Talebs writings.

Smith writes forcefully that:

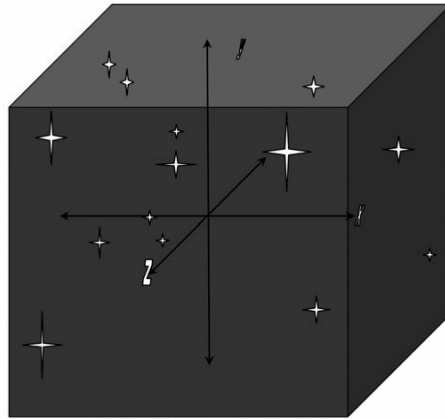
“The Standard Account of Method (SAM) describes business and management research as a choice between “two traditions”: “qualitative “phenomenological” interpretivism” and “quantitative ‘scientific’ positivism”; each the enemy of the other. Students assemble “advantages and disadvantages” of each, pledge their allegiance, or a preference for “mixed method” (wishing for a “truce” in the “paradigm war”). In our increasingly Fordist academies, these variants attract

grade-weightings of typically 20%, defined by "marking schemes" which are also standardized. Fordism is the management strategy of standardization, deskilling, low unit-cost, simple assembly and central control. We argue that SAM "Fordises" the intellect and confounds our experience that inquiry entails the greatest customization humanly possible. Moreover, unlike Ford's River Rouge plant, SAM is plagued by faults: thousands of category mistakes caused by collapsing unrelated methodological dimensions into one simple-looking yet multiply mistaken dichotomy. Happily, natural language facilitates myriad methodological distinctions which untutored inquirers articulate with more facility, pluralism, and precision than SAM. By providing better labelling for their easy instincts, naïve inquirers can recognize and revel in what they did not know that they knew" (Smith, 2010).

This position allows for the kind of 'customisation' which suits research into managers and entrepreneurs exposed to black swan events and into how far they are well-prepared or damaged by them.

### **3.5.1 The Spacious Alternative**

Dr. Stephen Smith offers a representation of what a 'go anywhere' inquiry-space would look like. This 'avoids the category mistakes which the SAM creates by collapsing a number of separate research dimensions into *one* qualitative-interpretivist versus quantitative-positivist dimension'.



*Figure 22 Inquiry Space; Cosmos*

He continues:

“Natural language abounds with spatial metaphors and methodology can be pictured as a proliferation of 3-D cosmos. Think of Cosmos 1 as the "room" shown in Figure 1, but without walls. Dimension x (running left-to-right) is still our epistemological continuum from empiricism, (trusted sense-experience after Berkeley), to realism (trusted in intellect after Plato, Hegel, and Marx). Let positivism mark halfway (theories trusted insofar as they survive the test of experience, after Bacon and Popper).

Y (top-bottom) represents that technical continuum between quantitative and qualitative data, with maps and graphs on the “half-way point”, recording both quantities (distances, heights, contour-lines) and qualities (like the “Boot of Italy”). Children distinguish quantities (“twice as many peas”) from qualities (“pea-green”, “not tasting like beans”).”

The front-to-back dimension is ‘ontological’, running between typically unthinking ‘behaviour’ and deliberate and intentional ‘action’. Some researchers record ‘behaviours’ other prefer to explore respondents ‘meanings’, how their world looks to

them and how they experience it. As with the  $x$  and  $y$  dimensions, researchers are free to choose any point along the  $z$  dimension it which suits their research question. In other words, researchers, can locate their research anywhere within this three-dimensional space, here suggested by ‘star-plots’.

Concerning this research, it is Qualitative (low on the vertical axis), Positivistic (at the mid-point on the horizontal axis) and concerned with ‘meaningful action’ rather than ‘behaviour’ (let us say at the nearest end of the  $z$  axis).

### 3.6 Discussion

Writes Nigel Laurie (quoted in Smith, 2010), ‘we tend to think of expertise as involving a capacity to reflect on its exercise in order to develop it further. Of someone with unconscious expertise we’d say they were naturally gifted’. He also asks how methodological development is possible and whether children have enough methodological awareness for its further development? A referee defends interpretivism' willingness to criticize science. Smith replies:

Contra the assertion that the “discursive is the boundary of the meaningful” our suggestion is that methodology is the boundary to the discursive, providing space for talk; it describes what's worth talking about, why we disagree, furnishes the necessary words and finds new words for liminal subject-matter. There is always more to say and happily, language is as clear-cut as it is spacious. German and French realism and Continental Philosophy is understood in English, which is the first-language of empiricism and pragmatism. The likelihood is that all methodologies are available in all languages including the language of play and in students' untutored genius for inquiry; therefore, abandon the standard account of the method and begin with students' earliest memories of making inquiries. You will share smiles of

mutual recognition

(Smith, 2010).

What we take from this is that:

- The standard account of method is a very one-dimensional representation of methodology ('qualitative interpretivism versus quantitative positivism')
- That the space for methodological choice is vast and permissive
- That this multi-dimensional space allows for any inquirer who wishes to make pragmatic methodological choices so that their methodology and techniques can be the 'slave of their research questions'.

To illustrate the vastness rather than the narrowness of 'research space' Smith calculates that 'there are upwards of 27 dimensions to [even] naive inquiry, *any three* of which describe a 3-D space (with axis x, y z), this allows for 2,925 discrete 3-D permutations, i.e.  $27! / [(27-3)! * 3!]$ . Each permutation contains eight cells, thus there are not 'two traditions' but 23,400 unique and discrete 'spaces' within which inquires may be defined ( $2,925 \times 8$ ). The number of methodological possibilities is practically infinite. Like many traditions, these 'two traditions' are recent myths without substance (Smith, 2010: 96-7. See also Smith, 2011 and Sheldon, 2003). In other words, there is more available to the researcher than the binary choice between quantitative positivism and qualitative interpretivism or some 'mixing' of these two 'opposed' traditions. The standard account of method is mistaken and not just in a small way.

Perhaps the most pragmatic concern we have is the survival of Iranian entrepreneurs including an understanding of my own survival. Beyond that it is also pragmatic to ask what Iranian entrepreneurs and their practices – especially how they think, what they do and how they survive uncertainties and black swan event – can teach the Iranian petrochemical industry as a whole.

The broadest aim of this research is to provide an insight into Iran petrochemical industry as well as different entrepreneurs to suggest what anti-fragile strategies would include. Fifteen interviews with top managers in the petrochemical industry compared with fifteen interviews with entrepreneurs is a way into this question that is within the resources and language skills of the author. If the fifteen entrepreneurs are using what Taleb would recognise as anti-fragile strategies and if our senior petrochemical managers and chiefs act as if black swan events are less likely than they are, this would be a useful beginning. The qualitative method adopted was chosen to allow respondents to answer naturalistically when describing experiences which may be diverse and cannot be guessed at except very hypothetically before each interview begins, the reason for including many spontaneous questions.

However, we expect to find significant differences between the two samples even though the evidence is qualitative. One way of thinking about this process is to think of how we can tell whether the food from one restaurant chain tastes different to the food from another restaurant chain, or whether one chain of hotels provides different service quality to another. As long as the responses within each sample show far more similarities than differences and the other sample shows *different* and *distinct* pattern of similarities, then it should be possible to decide, even with small samples, that the two populations differ in a way that could not be explained by chance factors.

Secondary data from the literature, will be used to address the research questions and objectives wherever possible. Data collected from fifteen petrochemical and refinery companies, and from fifteen independent and surviving Iranian entrepreneurs, can then be used to draw a larger picture of the risk environment and its challenges that companies face in Iran and how it might be possible to develop an industrial strategy which has anti-fragility as a guiding principle.



### 3.7 Ethical Considerations

Ethical issues and principles are described well in the literature and have been divided usefully into four main categories, which can appear in different settings. Based on Bryman and Bell (2011), the categories are as follow:

1. Harm to participant
2. Invasion of privacy
3. Lack of informed consent
4. Deception (Diener and Crandall, 1978).

Note that these concerns are those of the Hierarchical Thought Style (concern over deviance). Because it is a cultural phenomenon, research ethics could also include Egalitarian ‘benefit to the public’, an Individualistic requirement for inventiveness and improvement on prior research and even a Fatalistic requirement that the researcher should not come to any harm. Saunders, Lewis, and Thornhill (2012) highlighted the vital importance of ensuring that the information remains confidential, and that the researcher explains what they are aiming to do using appropriate language with no unusual terminology, so that respondents can know what they are agreeing to or deciding not to participate in. Ethical concerns are vital and practically inescapable in any type of researcher. For most purposes, including ours, the importance of the research aims cannot justify harms to respondents. While it is possible to think of exceptions to this principle, for example where interviewees are guilty of serious and violent crime which is a threat to the welfare of the community and which the researcher is attempting to expose, this was far from being the case in our research. We were able to accept and adhere to the principle that the researcher must assess whether any harm could be done to respondents and prevent it while s/he pursues the research aims and indefinitely afterwards. Except in rare cases where the respondent wishes for their identity to be given (for example when the research involves writing biographies of prominent political leaders or cultural figures), the participant's

right to confidentiality is absolute. This applies in the same way to qualitative and quantitative research though it is easier to obscure the identity of participants in large scale surveys than the identity of thirty Iranian business persons. In our case, extra care has to be taken, changing all names (including company names) and even changing details such as job titles and exact locations which are unimportant to the study. The researcher should not provide enough information so that a reader could work out the identity of the respondent without being told.

The purpose of qualitative research is to investigate, describe and examine the individuals and their experience but in this study, as we have stressed, also to ‘test’ for non-random differences between samples. Therefore, mutual confidence and clear communication plays a vital role in the relationship between the researcher and the participants. In making an intensive analysis of each individual's contribution, the author must not compromise this relationship of trust (Orb et al., 2000). In qualitative research, every individual who is participating in the research are intimately involved as they are disclosing private thoughts often for the first time. The result of *any* inattention to the researcher’s ethical obligations can cause serious and completely unacceptable damage to the reputation of both respondents and researchers.

The author adheres to three basic ethical principles in this research;

- Beneficence (Hierarchical and Egalitarian)
- Autonomy and Inventiveness (Individual)
- Justice (Hierarchical)

We mean to do no harm in the short- or long-term and do some good in the long term. We recognise potential respondents’ right to refuse to participate or withdraw at any time. We recognise that a breach of confidentiality would be a serious injustice, violating the code formalised in the information sheets provided to them as approved by Brunel University. The participants’ rights to be informed about the subject of the research in order to provide informed

consent and to withdraw without penalty, both characterize the principle of autonomy (Orb et al., 2000: 95). All the participants were indeed informed about the aims of the study, explained in Persian and we remain confident that they gave informed consent. They were notified that they could skip any questions which they were not happy to answer and that they *can* leave the interview at any point for any reason, without explaining that reason. They have been informed how the data will be used and published and that the author has made a solemn guarantee that their identity will never be revealed.

### 3.8 Summary

This chapter has explained our choice of research method with reference to the literature, establishing that our the methodological choices have been pragmatic and in accordance with our research question, aims and objectives. It is also indicated why a ‘Talebian’ type of qualitative interview needs to include flexible responses according to what emerges during each interview. Although there is a hypothesis at the core of the research (that surviving Iranian entrepreneurs demonstrate more anti-fragility than senior salaried managers) our approach to interviewing also needs to be anti-fragile. This means ‘expecting the unexpected’. Moreover, the study relies heavily on primary evidence supported by secondary analysis or reporting of published sources especially as theoretical and philosophical reference points. The author sees no advantage in forcing his methodology into one camp or another to make it fits the standard account of method. We see it as productive to involve 1) a testable *positivist* hypothesis and 2) *qualitative* evidence.

## Chapter 4

### Interviews and Data Collection

## 4.1 Author's Assumptions Before Interviewing

Having about twenty years of experience as an entrepreneur in Iran, distributing plastics and other petrochemical raw materials and manufacturing containers as our main business fields it was clear that how government or part-governmental managers think is different from the Iranian entrepreneur. By coming into contact with both managers and entrepreneurs, perhaps thousands of times, we can say with confidence that these two groups dwell on strategy, survival and risk differently. Entrepreneurs are more likely to take more risks but at the same time they are wary. At the risk of oversimplifying, they are rather nervous about taking risks but take them anyway. Petrochemical managers are also reluctant to take risks to the point of not taking them. They consider and maintain their positions, but without taking black swans to the consideration. While both entrepreneurs and managers are wary of risk, the former take them and ask themselves rather obsessively 'Have I made a mistake' while the latter take the least risks they can which leaves them more vulnerable to surprises, we think. The difference is not total but there is a difference.

The author would begin by defining black swans to interviewees in just a few minutes, defining their characteristics the same way that Taleb does. In between their answers to the principle interview questions listed above, the author introduced the notion of 'paradigms' as big theories of everything, in enough detail so that interviewees had some sense of the 'chaos paradigm' and how different it is from the idea that history is the constant forward march of progress ('conflict paradigm') and from the idea that everything settles down eventually into an equilibrium ('functionalist paradigm').

The researcher's background in the same industry and country were quite helpful as was the 'bracketing technique'. Bracketing involves engaging in interviews with an outside source to uncover preconceptions and biases (Rolls and Relf, 2006). Bracketing interviews held with a non-clinical and non-managerial colleague or research associate, constitute a negotiated,

supportive relationship, which serves as an interface between the researcher and the research data. This process is sometimes formalized through payment of a fee and scheduling of meetings, and should entail agreement on the confidentiality of material discussed. Bracketing interviews conducted prior to, during, and following data collection can uncover weaknesses in a researcher's ability to listen to respondents or trigger emotional responses in the researcher that may foreclose on further exploration. Bracketing interviews can increase the researcher's clarity and engagement with participants' experiences by unearthing forgotten personal experiences; it can also protect researchers and participants in emotionally charged research topics, and simultaneously develop the researcher's capacity to understand the phenomena in question (Razbani, 2015)

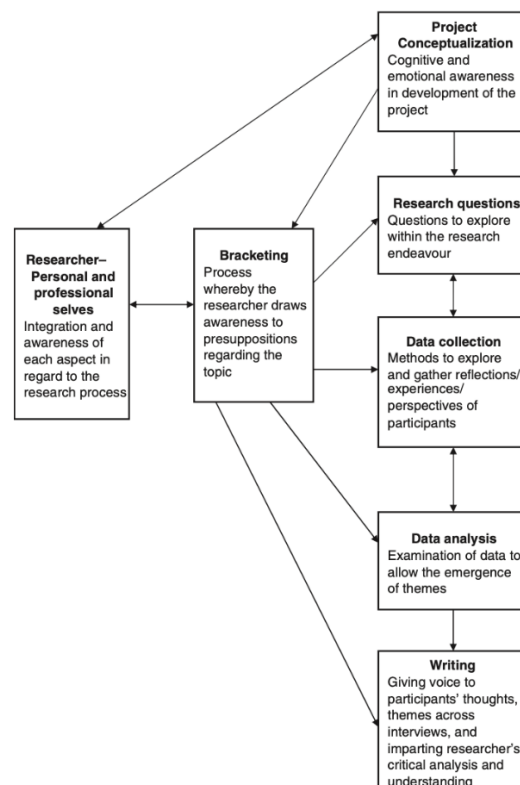


Figure 23 Bracketing Method

## 4.2 Interviews with Iranian's Petrochemical Senior Salaried Managers

Senior salaried managers in Iran's petrochemical industry will be exposed to surprises. What does interviewing them show about how well and whether they prepare for black swan events? Does anything they say conform with or depart from Taleb's claim that most in *Wall Street* were 'fooled by randomness' and committed the 'narrative fallacy'? Do they conform with or depart from his 'anti-fragile' recommendations? Here we report interviews with Iranian's petrochemical industry top managers, while recognising that petrochemical *processing* is much less vulnerable to black swans than the social systems that processing is surround by such as erratic oil prices, regional wars and worsening or improving international relations.

Please note that in the quotes that follow, minor changes have been made to convert from Persian syntax and figures-of-speech into English syntax and expressions. However, where the meaning is clear enough, Persian syntax has been kept. At some points the author has added emphases that were not part of original speech in order to highlight features to the reader, for later analysis and comment. For reasons of space available I have quoted the most salient parts of each interview and some responses to extra questions which were put in in passing have been left out. However, I have taken care to 'sample' the interview responses in a way that preserves the respondents' meanings. This is done to enable the reader to judge whether or not all the responses *within* each sample have anything in common and later, whether or not there are significant (non-chance) differences between the two samples.

### 1. Interview with the Managing Director of J Petrochemical Company

**Mr. M, would you please describe Iran's position in the world oil and gas industry? To what extent do you think the future will be chaotic and bring unforeseen 'black swan' events?**

Fortunately, Iran has the largest storage of global gas reserves, and in total Iran's oil and gas reserves are ranked one of the largest, and this requires the *proper planning* for these resources. In comparison, we have to say, for example, in the traditional agricultural sector, we are facing water scarcity, and certainly in this area there are not many manoeuvres possible with traditional methods that could be taken into consideration and hence, there is a need for serious action.

But the advantages of competition in Iran is more in the field of oil and gas and its related industries, which is very diverse and has a high level of job creation.

The characteristic feature of the oil and gas industry is that its *extensive technical knowledge lies within its reach* and our experts have been able to make significant progress. In this area, and of course, whatever the industry develops, we will move from the point of view of knowledge to a higher position.

Fortunately, the level of this knowledge is so deep [and] the oil and gas industry... is a modern, modern industry. It has a high scientific status. We will get a higher ranking in all industries.

**What are the most important issues which Iran currently faces in the development of its downstream petrochemical industries?**

One of the most important problems is the provision of financial resources, the supply of equipment and components, and the licenses, which requires a lot of energy in the current situation. We will *definitely* accelerate our pace, and we



will see the boom in the petrochemical industry with full lifting of sanctions and we can equip and reequip.

We would like to buy new technology and think about the relationship with foreign partners, and I emphasize that one of the goals of the new foreign partner investment is to pursue the goal of guaranteeing security and investment security.

We need to try to encourage the private sector to do more research in the petrochemical industry and its benefits, and even prepare to do it with private companies investing in it, and give this hope to the partners as long as the plant is profitable and sustainable. Allow shares to be transferred to the investor through the stock exchange, and eventually we will invest in another new company, and in fact, our role will be as a producer and thus create new industrial clusters on high-value issues.

**Do you think the Iranian petrochemical industry is in an appropriate position considering unforeseen political and economic situations in the Middle East?**

For instance, China does not have conventional gas fields, it extracts gas from coal and consumes gas and high-energy petrochemicals, but has grown in the petrochemical industry, and today, urea production in China is about 15 times higher than Iran's production of urea and ammonia. Whenever we want to invest in industrial, providing FS or technical and economic studies, the main issue is the target markets. Therefore, investors investing faster hence, they will make the market themselves easier. For example, if we want to establish a production facility for ammonia production, we should study whether there is a factory with these products. Is there a target market for selling products? Currently, China plans to launch 17 Alfani factories, whereas, before Iran, Iran should launch these factories by producing a variety of grades, because Iran has the ability to produce certain levels of olefin at a global level. Iran's petrochemicals should cooperate and engage with foreign investors in the production of basic products of olefins, including PE, PP, and other products on a global scale. Hoping for the day we can produce 20 to 30 million tons of PP, PE, and other petrochemical products from new grades, we have to push our position to this

end. "We are looking for a new generation of new grades to be produced at the national level, which will result in a lot of jobs and value for the country," he said.

The next question was expressed deliberately in very large terms, in order to invite the respondent to think on a very large scale, i.e. to think paradigmatically:

**What is the impact of the development of the petrochemical industry and global interactions and the role of Iran in the international economy?**

It must be said that the global economy is interconnected, and this interconnection has brought about closer ties between countries, and if our industries have the ability to meet the needs of foreign companies, our dependence will certainly be created and this economic tension in the country's political and international relations will affect with regard to the importance of Iran how ... the petrochemical industry...develops and is developing.

The position of Iran in global bargaining and international relations, as well as the level of Iran from the spiritual dimension in international relations and *international equilibrium*, is affected, and this is the meaning of income.

Having encouraged the interviewee to consider the world at a large scale and explained briefly what is meant by 'paradigm' I asked:

**What is your main paradigm?**

The type of paradigm we follow is mostly functional.

## **2. Interview with Managing Director of BA Petrochemical Company**

In this case, we chose the following way of expressing the opening question:

**How would external environmental factors affect future management strategies in Iran's different petrochemical sectors?**

*The country faced two major challenges at the 50th anniversary of petrochemicals; one of the hasty detentions of some petrochemical plants and the other, cruel sanctions. In the fifty-first anniversary of petrochemicals, this industry can regain its strength. Certainly, all the industry's associates and enthusiasts are waiting for entry into the future with lifting of sanctions, but that does not mean that all the work has been stopped and corporate strategies are only based on this.*

*By entering to the environment with no sanctions, we should not miss out the new opportunities and existing strengths, and with the previous implemented researches regarding the future could be created related space, some researches about the growth scenarios in this industry should be taken to consideration and the system should be managed systematic manner.*

**What is your view about the possibility of developing long-term and profitable strategies based on Taleb's theories of how to manage for the future?**

The readiness of the country's petrochemical industry to exploit post-war opportunities and favourable prospects for investment and growth for the industry is for those who have a license, for the investors and technology owners of the industry. Their very active presence over the past year and their calls for long-term cooperation in this industry is clear.

... First-level companies (top stream producers) were clearly visible

By exploring and choosing the best in these collaborations, the foundation of this industry is to build on the strength of the technology that is at the cutting edge of today's knowledge.

The key is transparency in contracts of cooperation with foreign investors and assurance in the preservation of their funds, relying on the use of the latest technologies in each sector of the industry's projects by carefully studying and using the experience and knowledge of our country's specialists in this industry, especially the industry's leading players in the development period of this industry. The industry has played a huge role in past years, and now some have retired, it can prepare the space for attracting foreign investors...starting with the willingness of investors to begin cooperative operations now.

I then asked:

**How to do feel about foreign partners with High Tech Knowledge?**

Participation of domestic companies with foreign companies in the field of engineering and implementation of projects has also existed before the sanction, and we hope that this cooperation will start again and proceed with strength. In the context of joint ventures with foreign companies, if it is transparent and respectful of the rights of the parties, it would seem to be a great start for the rapid development of this industry. *Similar examples have been*

*very successful in the past.* The evaluation of this industry requires infrastructure studies, futures studies, all-around.

Since the industry has been rich in oil and gas resources in Iran then this positive advantage must be definitely taken to the consideration to develop this industry growth.

Again, having had the meaning of the word ‘paradigm’ explained (with brief examples) we asked again:

**What is your main paradigm?**

We are using a mixture of chaotic and functional paradigms in our company.

**3. Interview with Mr. H.H the oldest Former Petrochemical Manager, and currently Managing Director of P.P Co.**

**Would you please describe us the overview about the history of the Iranian Oil and Petrochemical industries over several past decades, considering unexpected ‘Black Swan’ events?**

With the nationalization of the oil industry, the professors of the Abadan Oil Department left Iran. Due to the needs of the remaining faculty, I taught various courses, including mathematics, chemistry, and physics, while completing my semester on a full-time mechanical engineering course [as a student] . In 1337 [1957], I was transferred to the Abadan Oil Refinery, and I worked in the process engineering department until 1347, and I have to admit that I learned

the knowledge of the oil industry over the course of 10 years at Abadan Oil Refinery.

In 1347[1967], I was transferred to the National Petrochemical Company, and until early [1977], I was responsible for managing various projects, the most important of which was the Iran-Japan Petrochemical Project, and in the last four years of my service at the National Industry Company, I was a member of the Board of Petrochemicals.

Regarding the disagreement in the implementation of a project called AM Petrochemical Complex with the managing director of the National Petrochemical Company and some other directors, I was forced to early retirement in early 1977.

After the change in the management of the National Petrochemical Company in February 1977, I served as an Operations Manager and member of the Board of Directors of the National Petrochemical Company, which I was still exempted from serving in the company.

In other words, this respondent had had a 'colourful' career with big upheavals for both him and the institutions he worked for.

**Considering your experience as former CEO of NPC for many years. What were the main management challenges in the unpredictable political situation of those years?**

Every human being can be considered as an economic machine and behaves in a way that can accomplish its purpose. People such as Dr. Mossadegh, who implemented fantastic and surprising actions which were unpredictable in Iran's system, was critical and he did not employ anyone from his family in the cabinet... The definition is not constructive and it is only criticism that can be constructive. The unpardonable structure will never succeed. I know fully about them, but I will not talk about them. As I said, I was ...disagreeing very strongly with them, leading to my pre-retirement retirement.

It is not the fault of them, but if community space is not the atmosphere of criticism, things cannot be well-advanced.

What we hear here is that the respondent believes that open criticism is a way for dealing with surprising outcomes and that some surprises were in any case positive and uncharacteristic of what could have been expected.

**Again, posing a question calling for a high level of generalisation I asked:**

**Do you believe that foreign technology can help in the development of this industry?**

I firmly believe that it is still necessary to use foreign technology and assistance for various stages of production, refining, and conversion of petrochemical raw materials. It should be noted that Hydrocarbon industry technology and many other industries are not transferable. Despite the fact that in addition to a century of production of hydrocarbon (oil and gas) in our country, the foreign associations haven't transferred their main technical knowledge, *therefore, our country still requires to pay license fees.*



After my pre-retirement retirement, I established an engineering company in the field of hydrocarbon industries. To implement projects related to hydrocarbon industries, an engineering company needs at least 200 experts in many engineering fields. To maintain this number of experts plus supportive human resources (totalling about 600 people), the need for continued implementation of the project and the belief, the faith and commitment of the contractors and the employer, and the comprehensive support of government agencies for the institutionalization of technology and the ability to construct projects is all vital.

Based on this, the same path has been followed in [all] developed, advanced and industrialized countries.

**What are the main challenges which you have faced in implementing your hydrocarbon-related projects?**

Unfortunately, the extent of process development over the last eight years has shrunk due to the transfer of projects to affiliated companies and to the armed forces of the country and has stopped in many private companies.

It is important to note that in recent years, especially in the last eight years, engineering companies in the hydrocarbon industry have not succeeded. Interested, innovative, and creative graduates on average more than three years (that is, when they have learned experience and engineering companies which

could then use their experience) .... Unfortunately, most of these engineers have left the country to work and live better.

Obviously, in the event of the management and creation of a sound and logical framework, including improving living and working conditions in the country, engineering companies will not be able to withstand the emigration of this large number of engineers and experienced experts, and this huge volume of financial and spiritual capital will be exhausted.

Why we do not have in our country nongovernmental companies such as Bechtel, Lamas, Flora, the Clock and dozens of similar companies in other countries of the world? And for the implementation of hydrocarbon projects from the beginning, we need foreign companies.

Why do Iranian companies with more than 40 years of experience and honest, lively and loyal management now have no organization like these?

The answer to these questions is that the opportunities offered by companies such as Flora, Lamas, Yo - Obi and so on have not been given to Iranian companies. Companies affiliated with the government and the armed forces of the country cannot implement hydrocarbon ...innovations and new technology. A person who takes responsibility in the organization must be fully aware and [in control] in order to progress. In large foreign companies, such as Dow Chemical, employees are on a hierarchy level. They [work at] different levels of work and are supervised to give them responsibility after a few years.

Managing Director after 10 years possibly. If no choices are made based on merit, there will not be any progress.

In the industrial countries managers and ministers usually have some free time to think about system developments. But in Iran the situation is opposite. Technocrats are unemployed and some managers work about 16 hours a day. We need to get the right system for development. The private sector could achieve some success in this regard.

**What is your main paradigm?**

The main paradigm in our company is functional.

**4. Interview with Former Petrochemical Planning Management**

**When you planned to establish the IM Petrochemical Complex (Iran-Japan) in the period which many black swan events happened what were the main challenges when implementing the plan?**

I refer to the Iran-Japan Petrochemical Complex, which was built with a 50-50 investment. Mitsui's company had many subsidiaries. The first reason was to use the technology of this company. We spent about \$70 million for the construction license of the complex. Japan was not an industrial country in 1950, and it did not have our resources. On the side-lines, I must point out that the country's greatest resources are not oil resources, but human resources. Many years of teaching at the university proved to me that we have a very powerful and efficient workforce. The second reason was the consumption of

foreign companies. About 500,000 tons of plastic were produced at that time, up to 10 percent of the country's demand, and the rest should have been exported.

The average recovery of crude oil is about 25% or we can say that about 75% of the country's oil 'reserve' is abandoned. Therefore, it would be better to invest in existing fields by choosing domestic technology institutions, to increase the production [by controlling and refining the abandoned crude oil] instead of investing in new fields and inviting foreign companies to this end. To recapture Masjed Soleyman's oil field, after about a century of production, it still has more than four billion barrels of oil in place. Is it not expedient to foreseen the production of oil at the required level and to create secondary recycling for the existing oil fields?

In year 1973, our country's revenue from oil sales increased by four times, but industrial countries and advanced oil importers tried to eliminate their issues due to a fourfold rise in oil prices with proper planning after a year, but the problems of our country due to lack of planning about how to use and reinvest the four times income has begun after a year.

In general, the study of the production and consumption of energy in each country is a dynamic issue on a long-term horizon and *static studies of energy in the short term are misleading*. Unfortunately, there are three important and independent entities in our country, including the *Ministry of Energy*, the *Ministry of Petroleum* and the *Atomic Energy Organization*, as well as other

less important institutions covering the management of energy production and energy use in the country.

The sad fact is that in many cases, these institutions plan and decide in parallel with each other with little contact and in some cases, in mutual opposition...

Would not it be better like many countries in the world, a ministry called the "Ministry of Energy" be responsible for energy policies, including the new green energies as well as allocation of suitable feeds for the country's petrochemical industry especially in the long term?

If this were to happen, the production and use of substitute energies such as solar, wind, geothermal, biogas, and atomic resources, would have been cleared, while familiarizing ourselves with the technologies and having potential for increased productivity in the country... This is necessary, but not economical... given the existing supply of energy from hydrocarbon resources. It is not justified.

The priority of investing in research and development and attracting the talented and creative people of the country should undoubtedly be considered to hydrocarbon industries.

Note: from the authors point of view these can make the country more anti-fragile against the international sanctions.

### **What are your suggestions in planning for the future of petrochemical industries in Iran?**

In general, industries in Iran are economically viable, which is superior to the same industries in other developed and industrialized countries of the world. In the petrochemical industry, at least 50 percent of the cost is related to the integrated feed complex and connected infrastructures. Now, if a petrochemical product in Iran is to be compared with food, the price of which even without subsidies and discounts is significantly lower than that of the industrialized countries, it is undoubtedly economically feasible to produce food in Iran.

For example, the price of oil, which is one of the main determinants of the viability of the upstream petrochemical industry, is not very different in Iran and in the industrialized countries, so petrochemical complexes in Iran based on oil feed are not economically feasible.... Light hydrocarbon compounds such as methane, ethane, propane, and butane for export have to be ... cooled to temperatures of 163, 89, 40 and 5 Degree of Celsius and the concentration, storage, maintenance, loading, ship carrying and discharging these compounds, all of which is a suitable feed for the petrochemical industry, is very costly. Since these compounds do not need to be used in Iran, their prices in Iran are significantly lower than in those industrialised countries importing these compounds. As a result, the cost of producing petrochemical products whose feeds are methane, ethane, propane, and bromide are less than industrialized countries and their production in Iran *is* economically feasible.

In addition to the privilege of food, I believe that the creation of petrochemical industries in our country should have other characteristics that are most important:

Small and food-dependent petrochemical complexes are not competitive and should be integrated with other petrochemical complexes and a so-called petrochemical company to survive.

Petrochemical products are highly vulnerable in terms of technology, quality, cost of production and investment. Therefore, it is necessary to have a research and development centre for petrochemical industries. The location of the R & D centre should preferably be located in Iran's temperate region with its good weather and at a good location which is able to expand... It should be noted that the cost of the applied part of the Research and Development Centre is usually monitored by the applicant's petrochemical plants.

The location of petrochemical complexes should be preferably along the river or the sea but adjacent to the feeds. Since the gases produced with crude oil and raw gas of independent gas fields are the main sources of feed for Iran's petrochemical industries, construction of a gas refinery within the complex of petrochemical plants with the proper design to feed the units has a clear advantage.

Due to the requirements to service the petrochemical units, especially electricity and steam in various conditions, the construction of a power plant

inside the unit is necessary to provide the needed utilities to increase the plant's efficiency and reduce the required energy for water cooling systems.

**What is your main paradigm?**

We mostly follow the functional paradigm in our organization but I myself [am] interested in chaotic paradigm as well.

**5. Dr. R, Senior Academic within a Polymer Science Institute linked to the Petroleum Industry**

**How do you see the future of Iran's different petrochemical sectors being affected by their environment...? I mean the social and economic environment?**

Fast speed of development in petrochemical industries, as well as too much attention to developing basic materials, are the most challengeable aspects in this area

He mentioned that in recent times there had been only one, incomplete petrochemical site in Iran (the joint Iran – Japan site in Khuzestan) now known as *Bandar Imam Petrochemical* Figure 3. In 1986 *Mitsubishi* sold (?) its share to *National Iranian Petrochemical Company* and since then, it is known as *Bandar Imam Petrochemical Company* (2017). In conversation Dr. R, said that when active, *Iran – Japan Petrochemical*, met a small proportion of the demand for polymeric materials in Iran. However, neighbouring countries including Qatar and Saudi Arabia refined oil into petrochemical materials and fulfilled international market demand quickly. He commented: 'It could be noted that the speed of development in the petrochemical products industry in Iran is reasonable and appropriate. However, there are some problems in that area.'



He continued by saying that his polymer institute was trying to understand historic issues and to suggest the solutions to them. He continued by saying that investors have been investing to improve petrochemical processing facilities and develop old sites with the aim of overtaking and replacing foreign imports, while entering the international export market themselves.

One of the problems he saw was that investors were not planning for the future and had only improved existing sites without planning for altogether new plants for the future. He admitted that it was yet to be seen whether what was hoped for petrochemicals production in Assalouyeh and Bandar Imam would be realised or not. Notice here that he argues for both a cautious (anti-fragile?) wait-and-see approach *and* for a much bolder long term strategy of investment at new sites.

He did however talk through risks and gains at every step such as obtaining licenses, developing sites, installation- and operations management, marketing and aftersales. He wanted evidence concerning whether or not petrochemical products produced within Iran have the same quality as foreign samples. He considered that in principle Iranian-manufactured materials could compete within foreign products because recipient could easily substitute home products at lower cost.

"Dr. R" notes that if Iran relies on its energy sources, success would come quickly followed by more problems as time passes. The point was to identify and repair problems quickly. He closed by emphasising that there would also be 'revelations' which would come from intensified R&D which were very difficult to forecast.

Despite these comments he answered to the question:

**What is your main paradigm?**

'The type of paradigm we are using is functional.'

## **6. Head of Product Development of the same institution**

**What are your suggestions about developing long-term and profitable strategies based on the hard-to-estimate probabilities of ‘black swan’ events?**

Producing of different grades is highly recommended. Iran has investigated the existing grades of Polycarbonate (PC) across the world as well as their usage and demand growth. Therefore, it is decided to produce six different grades of PC in Iran out of forty different grades.

However, there is a question whether consumers of the main classes will continue to buy it from other countries. It is also critical to investigate the most important properties which exist in these products and following that, at the next step it is crucial to match them with the suitable machinery.

One of the important factors in the petrochemical industry is to identify and use suitable machinery for the raw materials to have the excellent and appropriate finishing... it is very important to identify companies that can provide the best machinery as well as have the best and proper after sales in terms of...spare parts and... the opportunity to develop production lines in the future *if this is needed*.

At the end of the day, a comprehensive and strategic report that can be trusted could be obtained and accordingly there could be fundamental planning. In the petrochemical industries, it is very common to produce a product and send it to the market regularly, hence, nowadays most petrochemical sites are providing

low-cost materials and sending them to market with insufficient concern about quality.... exposing themselves to commercial and public criticism.

In recent years... companies are formed traditionally. For instance, a group of people heard that the market requires CD and after the general overview of the market they bought a CD machine. However, they were unable to investigate the type of CDs that the market required. Such companies need the education to inform them and help them to understand technical problems. If we could communicate with them providing up-to-date information and data, not only could they develop appropriately but also create a perfect market for staple petrochemical materials.

Increasing downstream industries' knowledge and encouraging them to produce new, different products can be lead to good sales in basic petrochemical materials, which is known as "Product Development."

**What is your main paradigm?**

We aim to mix the functional and chaotic paradigm in our company.

**7. Interview with Mr. K Manager of NPC**

**Mr. M, would you please describe to us Iran's position in the world oil and gas industry?**

**To what extent do you think the future will be chaotic and bring unforeseen 'black swan' events?**

The most significant challenge in petrochemical industries is to produce and distribute more than 30 Million tons' products into the domestic and foreign markets.

Mr. K was confident that Iran his company could attain 71 percent of its nominal (theoretical) output capacity, amounting to a growth of 108 percent compared to the previous year. He said that if the National Iranian Gas Company (NIGC) provide adequate feed to Iran's petrochemical industries, then NPC was capable of producing more than 42 Million as at the end of year, 2017 amounting to 73 percent of petrochemical output in Iran.

As he described them, the existing problems preventing the petrochemicals sector from achieving its full production potential were 'the lack of adequate feed' and 'problems with maintenance'.

**Again, following a brief introduction, I asked:**

**What is your main paradigm?**

Here we are 'functionalist'.

The interview was not a long one but instead to the point. Note that though asked about unexpected events, none were mentioned. The difficulties he mentioned were known as far as he was concerned.

## **8. Dr. J CEO of Jam Petrochemical Complex**

**Mr. J, would you please describe to us Iran's position in the world oil and gas industry?**

**To what extent do you think the future will be chaotic and bring unforeseen 'black swan' events?**

It struck us as interesting that Mr J gave his answers as if they were bullet-points and I have presented them in the same abbreviated way that he spoke:

Let me summarize as follows:

- Non-strategic and frequent interventions by the public-sector market mechanism. The participation in the non-state sector by the government in the petrochemicals markets means that the Institute does not play an active, leadership role in distribution
- Focus on supporting and creating new units instead of developing existing capacity: Currently, most governmental supports are to build new units rather than developing current capacity, and this has led to the opening of some new and small units. However, they are low-output which is not practical. Their scale means they cannot...compete internationally and expand their units.
- Fluctuation in policy: frequent changes without notifying in advance, and also changes in tariff rates and political priorities etc. These lead industrial operators to have a short-term view of their activities. They should think of long-term business relationships as well as undertaking research, exploring long-term investments more than they do, more innovation in their products, production lines and so on.
- Closed environment and weaknesses in establishing international exchanges: most existing investments are based on the policy of replacing imports with

domestic production for the domestic market. For this reason, this industry is less involved in international markets and it concentrates on the local market.

**What is your main paradigm?**

I believe that the type of paradigm we are using is a mixture of functional and chaotic paradigms.

**9. Interview with Mr. A. H, Production Control Manager of National Petrochemical Company (NPC)**

**Mr. J, would you please describe to us Iran's position in the world oil and gas industry? To what extent do you think the future will be chaotic and bring unforeseen 'black swan' events?**

Again, he made some comments as if in bullet points:

Investment is considered as one of the primary variables in economics that can be lead to growth in the wealth of a country as a whole. The priority in this area is to attract Iranian private investors as well as foreigner investors... Private investors such as Iranian people who live in foreign countries and Foreign Investors consider two points before they enter the industry in Iran which are as follows:

- Political considerations
- Non-political considerations

Political attention is about whether and how Iranian organisations cooperate with other countries, Iranian foreign policies...sanctions, international relations, conflict with other nations as well as political crises, internal political disputes and factions of political will. Security, is considered as a primary factor in the minds of ... domestic and foreign investors.

The non-political considerations including the economy, infrastructure, technical, legal, labour law, insurance, taxes and so on. The active participation of the private sector is needed to prepare a proper economic environment and technical investment, and the legal infrastructure for the private and governmental sectors, which can lead to petrochemical industry economic prosperity as well as creating more jobs and increase the added value.

In the upstream petrochemical units, production capacity is already very high, so the economic justification... for investors, would only be in the major product lines. There are many manufacturers of these products, which means competition to [lengthen] shelf-lives and to sell at lower prices.

In...downstream units, the role played by technology, production machinery and skilled human resources is vital in judging final prices of...core products. In this sector, although the tonnage of production is small, because of the more complex...knowledge and technology needed, there is...higher added value compared to the price of the initial materials.

It seems that to achieve growth and...greater added value, it is necessary to invest, develop and complete value chains in petrochemical products, form clusters with upstream producers, including clusters around adding value to methanol and ethylene.

**How would you say ‘environmental challenges’ could affect management strategies in Iran’s different petrochemical sectors?**

The realization of desired values for the petrochemical industry (value added, employment and industrial development) along with the need for a balanced evolution of the petrochemical industry, means direct relationship between well-developed industries and downstream petrochemical processors. Ultimately we should integrate petrochemical value-chains.

But the growth of downstream sectors, compared to upstream petrochemical is minuscule and incomparable because there are...problems...developing the beneficiary companies...in the country. Outputs from downstream industries cannot enter...international markets. But they are also not yet able to compete in the domestic market.

Generally, downstream manufacturers continue to exist based on the non-governmental investments. The primary weakness of this industry is non-competitive products, as well as the comparative advantage of the country which is basic extraction.

The respondent was familiar with Porter. He continued:



Based on Porter, the competitive advantage of a country...is expressed as the ability of companies to use the country as a platform for doing the business which it is suited to best. This is what is expected from the petrochemical beneficiary companies.

He cited Porter as arguing that:

Porter points to characteristics of a country in his model from which you can create a competitive advantage or prevent that from happening. The factors are internal conditions of production, demand conditions, related and supporting industries, strategy, structure, and the competitiveness of an enterprise.

Challenges which are facing the beneficiary industries can be stated in the format of Porter's Four Forces.

**What is your main paradigm?**

We use a mixture of functional and chaotic paradigm.

#### **10. Dr. B. B CEO of Jam Petrochemical Complex**

**Please describe to us the main existing challenges due to governmental management systems and banking challenges and your suggestions for coping with them.**

Irresponsible government agencies, public service providers and government] products: the large share of the economy taken by the, its policies for manufacturing activities, and a significant portion of the market for services as well.

But the problem is...customers would like to get the discount according to *market* prices at the time when the payment is due...in one to one relationships just between the customers and the sellers. But in the circumstances, we have, beneficiary industries are not professional enough to enter world markets so the extent that there is a possibility of offering their products to compete even in the regional market, is minuscule. As a result, they always face into closed domestic markets even though threatened because these markets are full of cheap products which are provided from China.

Though he appeared to be making a case for free competition he continued his suggestion by emphasising:

Reducing competition in the domestic industry: the multiplicity of actors in petrochemical downstream industries of small size, causes dimming and destructive competition among businesses in the industry. Due to small size, the practitioners are reluctant to operate in international markets, and usually look for profits by developing domestic markets or eliminating a competitor.

The most common example of this is the prevalence of coping with numerous and parallel organizations, owing to the fierce competition at home and difficulty in procuring inputs, the rate of operation and the volume of production in this industry is low. This factor, along with high financial costs such as the costs of working capital, high inflation, old technology and Iran's labour with its low level of productivity, all leads to an increase in the final price.

It is evident that a product with lower quality and not having strong business network support which means prices are not competitive price, will not have the chance to present in the export market. Due to that, as there is no international market for their products, therefore, the margin between the costs of production and prices charged means decreased output.

Not having the tools, support, and development of export markets: the lack of suitable mechanisms for support and development programs. Access to export markets in the downstream industries is another obstacle to the elaboration of this industry in Iran.

Lack of management vision within the domestic market, to earn the most added value: one of the points which commerce and politics neglects is the intrinsic value of the country's large potential domestic markets and its features. Iran as one of the most populous countries in the Middle East and has local market which ... are not used correctly.

Following our usual format of posing a 'large scale' question first we followed by asking:

**What is your main paradigm?**

My paradigm is functional.

### **11. Interview with Dr. A. R (Private Petrochemical Company in Iran)**

**Do Iranian private petrochemical companies behave in a way that matches Taleb's recommendations, as I have described them and therefore, survive?**

Let me summarize the existing weaknesses as follows:

Lack of comprehensive network? formations: the lack of strong, supportive, professional and non-political industry organizations in the country causes problems for petrochemical industries. In the absence of an active group, it cannot be expected that a governmental organisation can protect the interest of producers. The weakness in supportive institutions and their support in the service sector too:

Lack of developed supply chains for small-scale industries, required basic materials for production units...has led to a sharp rise in the price of finished goods and reduce the competitive power... In most countries around the world, the supply of necessary materials. is available from defined producers.

Lack of support services for technology development: although there are reviews, comments, and rules covering many services as well as financial support for industry...there are few tools providing development support the industry. Technology is one of the most significant competitive advantages that could enable companies to compete in international markets, with *unique planned program* to develop their tech. Unfortunately, in Iran, there is no center that works to adapt foreign technology or create new technologies in the field of petrochemical downstream operations. Even in universities and research centers, there are no serious efforts in this area. Centers of scientific work tend to concentrate on practical work instead of paying attention to promoting new applications of new technology.

Lack of developer companies: the development of the ‘midstream’ industry as the interface between downstream and upstream petrochemicals, which would complete the petrochemical production chain, requires development businesses in the country.

Weaknesses in financial structures: the main problem in the downstream industry in the financial institution...because the banks are not specialized enough. The financial system needs replacing along with economic structures. Unfortunately, the banks are currently not able to provide expert and useful pieces of advice while providing funds and therefore, development of petrochemical downstream industries is restricted.

The respondent had described how companies and institutions work (or fail to work) but I decided to press my respondent by asking again:

**Would you please suggest the possibility of developing long-term and profitable strategies based on Taleb’s recommendations?**

Petrochemical projects due to being high-volume operations, need *scientific planning, in detail*. Therefore, weaknesses in project management in the petrochemical area in Iran is more visible, and as a result of that, it is hard to find many petrochemical projects in the country that were completed according to the schedule. So, it is critically important to improve...management skills by training and educating project managers which would be possible through partnerships with foreign companies. It can be argued that through joint

contracts in the field of project management, the optimal level could be reached earlier than...expected.

On the other hand, most of the existing approaches in the area of project management can be mentioned as the cost and timing of...projects, and based on these two factors projects can be evaluated. A project is an excellent opportunity to attract a technology from a foreigner partner, enabling projects to be finished on time, based on the schedule, and it is more cost effective. Whereas, the *technology development cannot be purchased with money*; hence, it is imperative to consider the contracts as *joint collaborative projects* as well as technology transfers from foreign' companies to be used to develop the technology based on signed contracts.

We observe that there is *something* Talebian in this. Having paraphrased the three principle (sociological) paradigms (Functionalist, Conflict Theory, Chaos Theory) I asked

**What is your main paradigm?**

If I want to choose between a functional, chaotic or mixture of these two, I would say that I am using a functional paradigm.

**12. Interview with Mr. N Managing Director of Petrochemical Developing industry**

**How do you see 'environmental factors' affecting future management strategies in Iran's different petrochemical sectors?**

*The political and economic situations for the general contractors are not predictable* (maybe they cannot continue their contract due to international sanctions) and employers and the general state of the country will suffer from losses. According to statistics, foreign companies have not invested well in Iran. Another reason is that the renaissance of foreign companies is more to do with the political aspects of the theorem than it is due to technical factors.

Basically, investors would be encouraged to invest in Iran if the political and economic situation was more stable, especially given the recent disagreement with the general contractor in the country.

... A consortium or general contractor, are of course important in themselves, but the word content is important, but it's not too long before we need to discuss the...country and we have not reached the final end. Our problem with project management is that, as long as we do not consider future unforeseen elements of the project management system, all legal methods will have almost the same results. In the case of general contracting, if the General Contractor is well-qualified and qualified to carry out its responsibilities and ...can coordinate the subcontractors, it will be possible to obtain the right of intermediation with benefits...for the country.

...I believe we have the ability to do feasibility studies in the country. For example, in a project with Shell and BP, the results of feasibility studies conducted by the Petrochemical Industries Planning Directorate were very close to the results of studies that Shell and NPC (National Petrochemical

Company) made the following year. Since the foreign party was the first to participate in such a large project, it was possible for it to carry out a feasibility study for itself.

Feasibility studies needn't relate to the type of investment and investor. For example, feasibility studies of various 25-year plans for petrochemicals have been carried out. Nowadays, any contractor, including project financiers can participate ...and it does not matter to us whether the contractor provides credit from outside the country or from inside. These feasibility studies, if updated, are prepared in accordance with international standards, are also acceptable to foreign companies.

Contractors claim that problems such as banking issues, such as opening LCs Letters of Credit etc., are blocking their way, and that they cannot provide bank guarantees and guarantees of exploitation. Loans required by the contractors are long-term, but banks usually provide short-term loans, though petrochemical projects are usually long-term investment.

### **What measures have been taken to solve these problems?**

Considering the field of contracting, both sides (Government and Contractors) have mutuality. The government should support the decisions taken inside the country since eighty percent of contractors are governmental and the rest are supported by the government... Another case is... the finance. Foreign governments will support financially if they see benefits for their companies'



participation in our projects. This could be done for...Iranian contractors; of course, but these issues and problems are gradually being resolved.

**What is your main paradigm?**

We think functionally.

**13. Interview with Managing Director M Petrochemical**

**Would you please describe us your point of views about expanding the petrochemical raw materials production in chaotic and unpredictable circumstance?**

The respondent began by insisting on the integration of the petrochemical industry, as all of the world's leading companies have the concept of integration and incorporate it into their business model.

Selling petrochemical products is more than the one-year sales of oil and gas in the country. According to forecasts, in next two decades, the petrochemicals sectors will overtake the oil and gas economy in the country, provided that the government supports it.

He stressed that the petrochemical industry was the most important basis for the country's future economic growth:

Iran's petrochemicals are an exceptional opportunity, but there is only a limited time ahead. If this opportunity is not used, then it's time to wait for its threats, because rivals are growing rapidly and can threaten even the existing petrochemicals export capacity of the country and its market. By evaluating the application process of the material used in industries, it can be concluded that

the products of the petrochemical industry have contributed significantly so that the scope of these various products is already known.

Petrochemical products in cars have grown from thirty kilograms to two hundred kilograms already and according to forecasts, they will reach two hundred and fifty by 2030, which will reduce energy consumption as well.

Concerning raw materials feeds into petrochemical products he added that again according to forecasts, the use of both vegetable-derived and crude oil feeds is a growing probability.

He stressed the need for integration in the petrochemical industry as all major companies in the world were pursuing integration and were structuring their organisations accordingly. *Total* had been integrating petrochemical production into its operations in the last two years of its seventy-four years of existence. This has led to maximizing the benefits of dispersed designs and minimizing exposure to the risk of losses, optimizing production processes, increasing flexibility in quantity and qualitative while improving self-reliance in its feeds and energy sources.

**What is your main paradigm?**

Functional.

#### **14. Interview with Mr. K, the head of R&D in A.P. Petrochemical**

**Would you please describe to us the effect of environmental factors on the future management of R&D strategies in Iran different petrochemical companies? And secondly, what is the possibility of developing long-term future plans?**

Considering the R&D department in petrochemicals in Iran, it could be noted that the National Petrochemical Industry in Iran conducts only a *primary* R&D. It does not compare to R&D departments in developing countries.

It is well worth noting that Iran contacted some of the top universities and asked them to cooperate with Iranian Universities such as the Petroleum University of Technology to develop R&D capacity and update their facilities. But R&D in Iran is not considered as of central importance which could be why ...we have difficulties ... competing with other countries in the Middle East such as Qatar and Saudi Arabia.

Dr. R described how the Institute of Science and Polymer Technology had gathered scientist, petrochemicals managers and other experts to investigate and discuss existing problems and opportunities in petrochemicals. Following the gathering; they have set up a core group to identify and define a 'zero phase' which attempts to estimate production amounts required by consumers across the world as well as supply and demand trends.

Currently, in the Middle East, there is destructive competition instead of creating a new formation. To be more specific, it could be said that, for instance, Iran, Qatar, Saudi Arabia, and some other countries produce PVC (PolyVinyl Chloride). Sometimes Iran can sell its PVC and sometimes other countries. By having more cooperation to produce different grades...all of the petrochemical companies across the Persian Gulf would be able to have continuous exports and sales. All of them produce PVC in the same grades, which is entirely wrong

and the market could be enhanced a lot by producing different and more valuable grades.

**What is your main paradigm?**

In between chaotic, functional and mixture of these two. Yes a mixture of the chaotic and functional.

**15. Interview with Managing Director of NPC**

**How do you see changing environmental factors affecting future management strategies in Iran different petrochemical sectors? What could be done about unforeseeable risks... so called 'black swans'?**

Economic sanctions imposed on Iran in recent years, causes many economic and political problems including for technology development, investment, transferring money, and obtaining spare parts. Because of sanctions, there are severe restrictions and obstacles to moving new technology into the country. Due to the embargo on equipment parts, there is no possibility of Iran entering international supply chains and achieving sustainable development.

Experience shows that petrochemical project finance methods are not suitable...for transferring technology. Funding projects through foreign investors reduces the bargaining power of Iran as well as restricting the transfer of the technology in the contract. In international law, those projects which are funded from foreign countries, eighty-five percent of the required equipment has to be provided from the states which supported the project. Therefore, despite massive investment in the petrochemical industry, there is a limit

market for domestic producers and petrochemical industries are inhibited in making technology transfers.

Experience shows that contracts mean the donors of the technology i.e. the investor, is unwilling to provide technology updates leaving no space for optimization and improvements to productivity. While mutual investment through joint ventures with technology licence owners, not only could we remove some of the problems but also have a convenient mechanism for technology transfer. If technology owners...sharing the benefits on projects, they will try their best to use the latest, and up to date technology to improve their competitiveness while facing fewer competitors.

Besides, this could help Iranian employees to become more educated and to improve their skills by learning from foreign experts.

**What is your main paradigm?**

Functional.

**Comment**

There is noticeable consistency across most or all of the senior managers' responses which we suggest reaches an acceptable level of significance. According to their interpretation of their own experiences the barriers to the expansion of petrochemicals industries concern misfortunes that are known and familiar to all: sanctions (with all their resulting problems), petrochemical product duplication, the sheer difficulty of promoting downstream diversification due to a widespread condition of underdevelopment. They are confident that things could be a great

deal better if only certain conditions were met, in which case Iran could thrive not only as a crude oil extracting and basic refining country but as a producer, consumer and exporter of high value added petrochemical products. There is a common *narrative* here: things could be and would be better if a relatively small number of known difficulties were resolved.

However, the conditions under which these problems could be solved are, we think, themselves most difficult to specify with any certainty as the US President's handling of the so-called *Iran Nuclear Deal* (the UN Treaty) shows. The range of possibilities is itself very difficult to establish and few if any senior and very senior managers addressed this problem of unknowability. Most opted for the 'functional paradigm' either as a direct expression of their experience or perhaps as a wish, which some admitted the simultaneous existence of a parallel world of chaos.

There is considerable sympathy for the proposal that diversification into high-value petrochemical derivative products would reduce Iran's vulnerability, however, and that this would be very desirable. Serious discussions are reported to be taking place among academic polymer scientists, industry practitioners and policy makers. These might provide 'positive black swans' over a timescale that is hard to estimate. In our reading, these kinds of initiatives hold out the possibility that Iran could 'make its own luck'.

But if there is an overarching common theme in these interviews it is that *better planning* and *improved coordination* are the key; though between Gulf States that have international relations, for example regional alliances, that are (in my view) very vulnerable indeed to uncertainties.

These respondents are in very senior positions so their testimonies are extremely valuable and because of the similarities it is possible to generalise beyond the sample. I mean that if the same number of interviews were conducted with another fifteen senior managers, similar findings would be made. The consistency of the evidence given also suggests that, as

a thought experiment, if all fifteen respondents were brought together for a discussion, they would be able to agree with each other without great difficulty.

The text shown in italics is included to demarcate consistent opinion across a number of respondents, especially their ‘functionalist’ thinking.

### **4.3 Interview with Entrepreneurs**

#### **1. Interview with A. R the Founder of HAMCO, Mani Makan Sanat and Abadsazan Madares (a reflection on the author’s practices)**

**Under questioning by my supervisor, ‘The respondent’ was invited to ‘describe your businesses’ by responding to the following main three questions (with questions added as the interview progressed)**

- I. How have you survived? Do you as an Iranian entrepreneur behave as Taleb seems to recommend?
- II. How do you see ‘environmental factors’ affecting the way you and other companies in the Iran petrochemical sectors manage for the future?
- III. How do you rate the possibility of long-term, profitable strategies based on what Taleb says about future ‘black swans’?

**Do you and Iranian entrepreneurs behave as Taleb would recommend? And how have you survived?**

I’m quite familiar with N. N. Taleb’s theories based on my MBA project...as well as through my PhD research. It is ...the most interesting management

subject and I am saying this after twenty years of real business experiences in petrochemicals and using and supplying plastics as raw materials.

I am also a multi-business company owner who has survived in Iran's chaotic situation... and have found it possible to take profit and advantage from many unpredictable events (black swans). So, in my view these experiences could be developed in similar condition of uncertainty, but on a much bigger scale as a future strategy for Iran polymer and petrochemical industries as a whole, and even for the polymer and petrochemical industries across the Middle East. This is very much a Chaotic environmental, full of even greater uncertainties than Taleb discussed in his book, *The Black Swan*.

I have got used to behaving and making decisions as Taleb would recommend surviving, even though I did not know his book at the time. If it has worked for me, it should work for others who also seem to make decisions the way I do.

**How would you describe the possibility of developing long-term and profitable strategies based on Taleb theories of managing for the future?**

I tried to develop *diverse business fields* in ways that I now know are consistent with what Taleb would recommend, the key being to love randomness, variation, and uncertainty to some extent as well as considering the dangers and the possibility of making errors.... Taleb is interested in what he calls “the things gained from disorder” which he tries to take beyond resilience and robustness. Taleb tries to help people understand the importance of what they cannot know and how should manage and cope with the consequence of the unpredictable events, with better results. Once we realise how many events are



really black swan events (I mean unforeseeable and with big consequences) then our strategies should change, particularly in environments full of black swans such as the Middle East.

On the other hand, I believe that black swans are not undesirable and humanity should understand how to react and manage complexities and becoming 'anti-fragile'. Many good things have been black swans such as the discovery of penicillin that was a result of an unexpected observation in a petri dish.

What does this mean for me?

I have a part-completed project to build a hotel in a prime location in the north of the capital city (Tehran). I am hesitating before deciding on the mix of uses and the type of client-market to attract, watching changes in local, national and international circumstances on a weekly and monthly basis, and *delaying each decision as long as possible with least possible consequence for each subsequent decision I must make on the project*. This method of working can be viewed as highly inefficient considered from a 'project management' point of view. It is a textbook case of *how not to manage a project* but under an assumption that there is a stable environment. But efficiency is not the point of my actions. It is *survival through frequent use of reverse gears, many path possibilities and as many path change possibilities as I can create*.

Meanwhile, I have a part-completed baby food manufacturing plant a considerable distance away. Or I should say it was originally supposed to be a baby food manufacturing plant in the beginning, but it might not be one when it is finished.

In a stable environment, free from the risk of international sanctions and in a growing economy in which Iran's highly educated middle-class female workforce would be seeking employment outside the home, a formula baby-food factory with a trusted German or British brand-partner would be an excellent 'rational choice'. But in case circumstances change, what I can do and have done is to choose different higher load bearing steel frameworks which would give the option of inserting heavy-lifting capacity (cranes) and a totally different manufacturing function – perhaps precision engineering - from what was originally imagined if international sanctions are re-imposed and an international venture with German partners fall through.

The 'wholly unexpected election' of Donald Trump (a good example of a Black Swan event) indicates that I was right, even though I acknowledge the wisdom of the saying, which is claimed to be an Arab saying, that 'He who foretells the future is a liar even when proved right!'

I do not pretend that I knew what the outcome of the US election would be, but I behave as if improbable events are likely and that they have larger impacts than probable ones. A 'competitive, profit-maximizing entrepreneur' would not behave like this, but s/he would not survive in Iran. In the meantime, I have instructed that a very fine stone wall is constructed around the site which I am very pleased with. This will have no effect at all on what will be made there but I feel some obligation to employ skilful masons.

In the meantime, I have maintained very good and necessary relations with local officials, explaining to them how it is the *need for flexibility* and no other reason that is the cause of the delay. They understand that I am an Iranian businessman and I think they would support my intention to translate Taleb into Farsi where his work should find a wide readership.

Finally, my own experience and that of my associates demonstrates another of Taleb's recommendations for surviving in a world of 'non-normally distributed (non-Gaussian) risks': *not specializing*, but instead spreading hope, efforts, investments, and energies across many fields in what is commonly known as a 'diversified portfolio'.

In my case, I also have investments in:

- Polymer and plastic raw materials trading (mainly PET, PP, HDPE, LDPE, Polystyrenes)
- PET bottle manufacturing
- International Internet-based furniture trading
- Buying land to build an office building or a hotel
- Establishment of a company in web design as a startup
- Some stock and currency trading

I have also entered and left some activities altogether and will continue to do so. I considered very seriously the idea of setting up a ski-resort complex and researched the power systems that could be used and the altitude above sea-level which it should be, accounting for variations in snowfall and possible use as an international conference centre. Iran has a well-developed ski resort

industry and thousands of Iranians holiday in the mountains for skiing inside Iran. I can show you photographs which would make you think they were taken in Switzerland or Austria. But I have set this project on one side for as far as I know for now.

If I had possessed god-like omniscience I could have been a very rich man but I accept that 'perfect knowledge' is a very foolish ambition, instead of surviving, remaining independent, reputable and honest, which are themselves sources of resilience in uncertain times.

As an actual case, the currency fluctuation would be a concern since it has ...involved a huge profit for the companies that operate globally but are owned locally. They received all their payment on foreign banks and get the huge benefit from money arbitrage. But I do not take this as 'evidence' that this should be my main business.

However, it is one thing to report these casual observations and quite another to establish that Iranian entrepreneurs who have survived and even thrived under chaotic incalculable uncertainty have done so because they have followed Nicholas Taleb's and Charles Lindblom's suggestions without reading these authors. First Taleb's thesis must be distilled into a series of researchable propositions (or as he would call them 'anti-theories'). Second, these need to be operationalized into questions which can be put to Iranian business associates and acquaintances and third, we need to see whether their survival can be linked with their pursuit of such 'anti-fragile' business.

### **What is your paradigm?**

My...paradigm would be the chaotic paradigm and I sensed this even before I knew what a 'paradigm' was and knew how important it is to surviving. I did not know that I knew this. It was an 'unknown known' to me!

### **2. Interview with Entrepreneur CEO of RAHGO...**

#### **What was the first business you set up and how did you go about entering entrepreneurship for a living?**

From childhood, I had a feeling which encouraged me to do new things. I looked around and had issues that were almost different from others. I remember about forty or forty-one years ago, when we came to Tehran to meet some relatives, for the first time, I saw an *Atari* computer and an idea came to my mind with the use of this device in the village to make money. As a result, once I returned from Tehran, I rented a machine for a price of 500 Tomans for 48 hours. During that time, I allowed children to play with that device and, during this time I earned 800 Tomans for that 48 hours.

I followed in the same way until I was able to purchase an *Atari* machine, and then I bought another device, and I expanded to computer games and eventually I established a special store for games like that.

#### **How did you start your plans in existence of chaos?**

One of my characteristics is planning only based on market demand, and I had this feature from my childhood. I remember, during the war [with Iraq], I was renting video equipment, playing movies and martial arts in the countryside,

and I had a good income. I created a village cinema. In the same way, my childhood tendency was at work and I used every opportunity to earn a solvent income.

**What are the challenges during your entrepreneurship?**

My worst challenges are unprovoked promises by some of the officials who use to send entrepreneurs away for meaningless reasons. My other bad memory was regarding a great achievement in year 2005 when I saw a great way of saving water. As soon as it was published in the newspapers, I was invited by a foreign country to run this as a project in that country. However, after being invited to use the same method in Iran, I refused to go to the foreign country and run the project abroad. But there was not one step from relevant authorities in Iran and nothing happened.

**What is your main paradigm?**

*Chaotic!*

**3. Interview with Mr. R. A CEO of a Medical Company**

**Do Iranian entrepreneurs behave as Taleb would recommend? And can it help them survive?**

Entrepreneurship development in Iran requires more government support, revision of banking laws and regulations, labour and trade laws, cuts to the inadequate administrative bureaucracy in public organizations and reform of public institutions that are entrusted with issuing...licenses for entrepreneurs and owners of small and medium businesses. Unfortunately, the government

does not provide strong-enough support for projects that have...taken commercialization steps that fit domestic needs.

For example, in the same device, in the justification plan, the most important competitive advantage over the imported samples is saving in water and energy, and in correspondence with the Ministry of Energy.

**What are your suggestions to the government...?**

One of our suggestions for the government was that the universities and dental centres that our customers are aware of should be supported in commercializing patents in the domestic Iranian market. Creating an insurance fund for entrepreneurs to reduce their concerns about capital loss is a positive step that could be taken to develop entrepreneurship in the country.

At present, tax exemptions, lending at 4% interest and provision of facilities are on the government's agenda. There is a facility that can be used for *Innovation and Welfare* companies that are able to register themselves as 'knowledge bases' to reduce the taxes.

**What is your paradigm?**

Chaotic, as you have described it.

**4. Interview with Dr. N. R Managing Director of Hotel E**

**How do you see the possibility of developing long-term and profitable strategies in the Hotel and Tourism industries?**

The tourism industry is delicate, complex, sensitive and completely dependent on the stability, security and social, political and economic needs. Most importantly, it requires national representatives speaking in the international arena...in every sentence, in their own words, to address the interests of the private sector and investors in this field. To observe. Obviously, the industry needs the security of tourists guaranteed when entering...cultural, natural and human-interest tourist attractions.

In recent decades, major tourism destinations are emerging in developing countries. Unfortunately, these countries are facing two major issues: lack of necessary infrastructures for tourism development and destructive unsustainable agricultural activities that lead to the destruction of natural resources which draw tourists to the attraction. .... Fear of social crisis, unemployment and the image of costly and inefficient ventures are the main reasons for not raising the required capital and technology investment for tourism infrastructures...

It is clear that tourism development requires international capital and... security at the destinations. Could Iran today be a competitive threat to the world's tourism destinations as Dubai? Definitely not Because Dubai is an international ...destination, attracting capital from more than one hundred and thirteen countries, and especially...capital from the world's most powerful countries. The threat to Iran as a tourist destination is, aggressive war-like declarations towards the world.



### **What limits Iran's hotel and tourist industries in your experience?**

There are... limitations that cannot be addressed. The arrival of branded hotels or large investments in this sector cannot be expected. Most of the limits I have witnessed during my twenty years' experience in tourism and hotel management:

Unavailability of cheap land...free of...construction restrictions by urban municipalities. In the rest of the world, hotels are considered as urban services. Uncertainty over land ownership.

Expensive sites that present construction difficulties...especially in large cities, land which could be considered for more than half of the investor's capital.

The unthinkable profit of the banking facility for the construction of a tourism facility virtually eliminates any tourism project and project inefficient.

The system of hotel rate pricing deters domestic and foreign investors[the main reason is decreasing the Iranian currency power which discourages the investors when considering the exchange rates]

Under-developed project pitching to investors, especially to foreign investors  
Scarce information, ...unrealistic statistical data over-claiming the number of domestic trips made.

### **In which situations are Taleb's recommendations needed?**

From my point of view, the unprofessional involvement of practitioners and government officials in the country's tourism industry and of various bureaucratic organizations and in the business of hoteliers. This somehow propagates *their* view that the owners of these businesses need... protective guardianship in order to save...investors' capital.

This response suggests that the respondent had not quite understood the question, and it was probably ambitious to put what is my research question so directly to him. However, it is included because it does show that he did not see government 'involvement' as providing protection against crises. It is true meanwhile that Taleb is also critical of governments which allow institutions that are 'too big to fail', and that when they do fail they have to be rescued at tremendous costs (increased government debt).

**What is your main paradigm?**

A kind of mixture of the chaotic and functional paradigms.

**1. Interview with Dr. Z. H CEO of P.T**

**What are the possibility of developing short term and long term and strategies based on Taleb's recommendations?**

In the short term, we would like to carry out the spread of Semi-art [the activities which are including arts such as making TV advertisement videos] more extensively in Iran.

We have introduced new areas of activities such as making a short advertisement video, creating a scientific documentary, video, media, news, insurance, etc. We are dynamic and profitable. On the other hand, in long-term, we would like to Perform more cross-border performances [overseas activities] in order to gain international honours and compete with large organizations and ultimately creating credible international holding companies for the next 10 years. We tried to help the emergence of a semi-art education method in Iran by using the blue ocean strategy. [From the authors understanding the interviewee aims to expand their international activities to gain more overseas reputation and income]

**How do environmental uncertainties affect Iranian entrepreneurs such as yourself?**

The unstable economic situation due to political challenges and disruptions can cause several issues for the entrepreneur...including: the circulation of improperly misleading newsletters by the newcomers to the labour market, which, along with companies' actions, create a false picture of...toxicity among the business community. I mean propaganda that does not respect the principles of trustworthiness and intellectual property.

Anyone who succeeds, naturally, has a work life of both successful and unsuccessful experiences. Experiences like breakdowns in trust, in collaborations with others mean continuing by working alone. To succeed well I have had to have...unsuccessful experiences.

We wish that parliament updates the rules at the same time as changes in the world. There is a lack of legal frameworks in the country and a lack of support for new service work.

...The biggest concern, from time to time, is the difficulty...convincing all my relatives to [trust] and respect my beliefs. We expect the council to consider new supportive packages to promote new collaborations and new entrepreneurs raising their profile. The government is subject to a lot of conflicts and it would be great if we do not [have to] expect them.

**Would you recommend to apply for bank facilities in a chaotic environment?**

So far, I have not used any bank facilities and wouldn't recommend anybody do so. Unfortunately, the interest rates in Iran are quite high. Banks are charging massive percentages for lending money which put businesses under severe pressures and risks.

But in a chaotic situation, in which everybody expects uncertainty, return of money will be riskier and hence, it is not practical and reasonable to lend money from banks and financial institutions.

**What is your main paradigm?**

Chaotic...

**2. Interview with Mr. Gh. Z. M CEO of M.M (Sea) Production**

**How do you succeed in a chaotic environment?**

It is practically impossible to avoid 'black swans' in real business condition particularly in a country like Iran, so I have tried hard to enhance my employee's security when facing unpredictable events.

The main reasons for my success: preparing my main managers to cope with chaotic conditions, working purposefully and with strategy, teamwork, access to good manpower, continuous effort, the perseverance of key stakeholders, empathy and conscientiousness of all employees, developing a good sales team, obtaining primary resources, establishing good communication, gaining the trust of suppliers and buyers, creating a strong supply chain and the excellent support from the banking system.

**How many obstacles have you encountered and what steps have you taken to deal with them?**

The most important barriers include the lack of foreign investors and available funds. We managed to resolve the problem by consulting with the relevant banks and authorities.

It was very difficult to get...good human resources at the beginning, but with experience, we were able to get...suppliers and overcome the problem of lack of recognition and trust. We were able to deal with honesty and fulfil our obligations, ourselves.

**What were the main risks which you considered to start a new business?**

Lack of primary resources, economic instability...with a fifty percent probability of a lack of supply of fresh water.

Investment in deprived areas is fraught with as many negative risks as there are positive chances.

**Your ‘paradigm’?**

Principally it is the chaotic paradigm at our organization.

**3. interview with Mr. M.B.S CEO of a Solar Energy Systems company**

**Would you please describe us the main issues when developing strategies in chaotic environments?**

The first issue is the financing community. Another important problem is the importing system for goods, the system in the country needs to be reformed and supported by domestic producers should stick to a new imports system such as applying for new customer tariff and not engage in smuggled import.

The third problem for entrepreneurs is the country’s laws and regulations...We have legislated eleven thousand laws over a hundred and ten years, while in two hundred and fifty years, France has approved only two thousand seven hundred laws. The majority of these laws have hampered business...and steps should be taken to solve this problem.

Other issues in our sector which are often discussed [are] pricing and energy costs, as well as international sanctions.

Our administrative system should be the facilitator of entrepreneurship. The entrepreneur must express innovation and creativity. Entrepreneurship requires taking steps beyond the granting of permissions and licences.

Authorities must take steps in order to form innovation networks in the provinces for the development of entrepreneurship. These networks should lead to new start-ups. We must be responsive at the last years of the resistance economy, what we have done for entrepreneurs. Rank one-hundred and thirtieth as a country is not a proper place for Iran and Iranian business space by having such a huge resource. Work should be worthy in this blessed country and environment.

The reference here to *networks* as a way of fostering entrepreneurship is interesting as it admits the role of chance and of maximising the probability of happy outcomes. Our reading is also that network development is a route to attaining anti-fragility, because networks can enhance the resilience of network participants.

**In such chaotic circumstances as you experience, how would you summarise the main problems?**

The main problems can be expressed in two categories:

Financial problems and lack of government support.

Problems related to familiarity with many and sometimes complicated administrative rules at different stages in projects that slow down the process and reduce motivation.

As a country, we direct entrepreneurs to a particular path, while entrepreneurs are really ahead... and, as a rule, we must adapt ourselves to them.

So, it seems like there are two things to be done. One is the issue of setting up new rules and regulations that embrace the entrepreneurial process from the earliest stage of creating ideas to the stage of sales and commercialization of the idea, the creation of a product or service, then offering it to the market. And one is the question of the removal of disruptive laws. In Iran, we have *more than twelve thousand laws*. ...This multiplicity of laws, which in many cases may be divergent, leads to a lot of energy being used-up by entrepreneurs and a kind of sluggish, deterrent environment for them.

**What is your main paradigm?**

‘Chaotic.’

**4. Interview with Mr. F.M Managing director of Start-up company**

**How does the environmental affect the management strategies of Entrepreneurs like you?**

This is a really good and interesting question...I would like to explain it...as follows:



***Abandon your current job!*** If you want to devote yourself to setting up and launching a successful business, it's hardly possible to manage positions at the same time. You may be able to spend little time on 'the baby' during the holidays and the end of the night, but know that if you want to grow it properly, you should leave your current job. Leaving your current job position for a long and unpredictable job opportunity may seem a bit scary, especially if you have not had the experience of setting up a business in the past. Unfortunately, there will not be any shortcuts. You just have to...and not reinstall your instinct.

***Form a working team*** This is especially hard if you do not have any setup and leadership experience for a team... Experience shows that selecting an appropriate team for a startup can be a stressful and hard task. It's not enough to find the best candidates to fill the seats, but you should consider the cost of having such people in the business and the extent of their cultural compatibility with your team. Such monitoring can be very difficult when you are under pressure to fill all your team positions.

***Inspiration*** As the founder of a start-up, you have to have the ability to confront and manage new ideas. When you discover a competitor, it is your responsibility to set up a specific program to deal with this rival. When your team faces impassable barriers, your job requires an alternate program to move forward. Having a creative mindset and lack of business experience may be a bit contradictory. The less experienced you are, the more stressful you will be, the harder you will be spending time on designing an acceptable business plan.

*Loneliness* This is a much-neglected problem in the field of entrepreneurship, and many new business owners will not be prepared for this challenge until its time is over. Entrepreneurship makes us a little isolated, because it is a personal situation and you do not have colleagues and teammates to rely on entirely. You have to work many hours and you cannot see your family as usual. And your employees are somewhat distant from you.

**How would you describe financial issues for entrepreneurs in an environment full of unforeseen events?**

In an area and environment full of chaos, it is always a problem to find the foreign investors as they are not sure about the security of their investments. *Experienced* entrepreneurs know that it's not easy to set up a new business financially, and they...have several advantages over newcomers to this field. They may have a stake in the profits from their previous business sales and can use this backing to set up their new business.

Even if they have failed in their first business, they have good connections with investors and customers who will help them in their next investment. As a new entrepreneur, you have to start working as if you are thirsty for any new communication and networking in your area of work, and you have to think about all the imaginable options for setting up your business before you start doing anything.

**How do you face unknowns in business?**

It is a very interesting question and I would like to point out that usually, every entrepreneur asks himself the questions such as:

How long will my business last?

How profitable will it be?

Do customers like our products?

Will we be able to have a consistent financial path?

None of these questions will have straightforward solution, even in start-ups with an excellent idea and the availability of all the resources needed to develop this idea. The existence of unknown factors in the business path means that your viability will fluctuate, and many of your long-term plans will be lose relevance over time, with new advances and innovations. Coping with this volatility is one of the most difficult aspects of entrepreneurship for a novice entrepreneur.

**What is your main paradigm?**

I would say... 'chaotic'.

**5. Interview with Mr. H. S Managing director, Medical Tools Production**

**How would you describe the financial issues affecting management strategies in your business?**

In industries like medical equipment, it's not only about raising funds. We also expect the government to spend the same amount consistently to guarantee the purchase of our products. When the product is made and the customer is not buying, the producer is in debt to large creditors and this is a defective downwards cycle. Companies can somehow think their market share...is healthy, only to be undermined by imports and smuggled imports. Imports in most industrial sectors have bent the manufacturer's back.

We are new and less knowledgeable...so we will be more vulnerable. And if the imports of these types continue and the government does not stand firm here ...preventing imports and supporting domestic production, there will be nothing but bankruptcy of the for-profit and knowledge-based companies.

**Can you give an example of the main problems that chaos presents?**

The administrative bureaucracy in our country causes entrepreneurs...major problems. I'll give you an example. At the *Farsi, Medical Science Fair* hosted by the *University of Medical Sciences*, the sparkle of hope for all exhibitors was highlighted by the authorities' attention to their products, and they all believed that after the end of the exhibition, through agreements with large companies or organizations they would be buying medical equipment ...

But after the end of the exhibition, part of the agreements was completely ignored by the officials, and the other part had not yet left the secretariat, being delayed awaiting signatures and approval by other branches.

Although...festivals and exhibitions appear to be the place for marketing, unfortunately...communication between buyers and the sellers does not come to fruition...

The next challenge is the military elite, which takes as much time as...soldiers take, all because of the various stamps and signatures, and going from this building to the next building. According to the famous saying, 'wear iron

shoes'. [which means being consistent and robust in facing bureaucrat systems and follow up to finalise something].

### **How does the environment...affect management strategies in Iranian medical entities?**

The growth rate of entrepreneurship in each country is a symbol of its credibility, and it is more about the economic credibility of countries depending on the number of entrepreneurs and the innovators of that community, and of course, much of this growth goes back to the ones that laws can create.

From this angle, I know the tax laws, social security laws, municipal laws and customs regulations as a serious obstacle to entrepreneurs, and the administrative bureaucracy and the numerous signatures that must be taken to obtain authorization from various organs are pits and wells in the way of the producer and of the entrepreneur. ... In my opinion, state laws and regulations do not encourage entrepreneurship in Iran.

Of course, the challenges are not merely a matter of law. One of the problems in the field of medical equipment is smuggling and imports, as well as the harsh and strict conditions ...imposed on producers at their time of registration.... Where is the company? How many meters? How many manpower employed? and many types of things that really do not qualify as relevant to...production. However, Merchants and importers enter the field without any impediments, without any of the ties that are in the way of the manufacturer.

Nevertheless, the capacity of the Iranian market in the field of medical equipment is great. The domestic customer is assured that when the goods pass the standardization process when Iran or foreign products are level on quality, it is possible that the Iranian goods are better in terms of after-sales service. ...So we can hope that this market will help to grow our business in this area.

**What is your main paradigm?**

Mostly chaotic but *sometimes* functional.

**6. Interview with Founder of Op. Co Mr. N.Gh,**

**From your point of view, as Iran faces many unpredictable events, how might it become an entrepreneurial powerhouse?**

Key features of Iran's economy have been obscured, however, its upward movement hasn't. The four hundred billion economy which is the second biggest in the Middle East, is required to create around seven percent growth a year from now, according to the World Bank.

Considering what happens on the off-chance that you coordinate that sort of financial development with a college framework that produces 233,000 researchers and designers a year, in a domain associated with the greater part of the world's economy oil... this could mean thousands of start-ups and independent companies - if nothing acts as a burden.

According to the statistics, every year around two hundred and thirty-three thousand students are graduated from all universities in Iran including engineers, doctors, lawyers' accountants, scientist etc. By matching this

number of graduates to the economic growth, you can easily see an economy which has the ability to produce thousands of start-ups and other small businesses.

**What are the main steps which should be taken in this chaotic environment?**

The most essential thing which is required in a chaotic area and environment is the talented mentorship, leadership and the learning.

During the last three years, more than two-hundred start-up companies have been established in Iran and this can...accelerate. However, there are some hurdles facing businesses in Iran environment. Entrepreneurs in Iran which is considered as an unstable area and environment, due to the strategic location of this country within the Middle East, always have to be prepared for unforeseen events.

In addition, whether businesses are successful or not, is always depending on governmental policies that either...support their ideas and businesses or not. Policy towards small business is of even more concern than geopolitical turmoil and there could be growth.

**What is your main paradigm?**

Our company experience is of 'chaos'.

**7. Interview with M.R Professor of Entrepreneur at University**

**Do Iranian entrepreneurs behave as Taleb would recommend and therefore, survive?**

Some Iranian entrepreneurs consider that the role of small firms and the entrepreneurial process is complicated and that stimulating the country's economic growth involves many various intermediary variables all playing different roles.

Of course, at the outset, it should be noted that the purpose of entrepreneurship here is not just job creation; what in our country is mistakenly taken from the concept of entrepreneurship...often confuses the concept of ordinary business and how entrepreneurship... brings creative destruction through innovations and new technologies. There are a number of jobs, like many new technology-driven distribution companies that deviate from the traditional model. Considering this, we must admit that our country has not made any significant progress, despite all the efforts that have been made to expand entrepreneurship over the last few years, from the formation of institutions and associations to the inclusion of entrepreneurship in educational curricula in schools and universities. Of course, it cannot be ruled out and these efforts are totally ineffective, but the fact is that...progress...in these areas is fast enough. The small steps we take, are not noticeable by international institutions.

### **How do unquantifiable uncertainties affect entrepreneurs' management strategies?**

Three factors are...the main environmental barriers across different business fields and entrepreneurship in the country:

Institutionalization in the field of entrepreneurship - what has happened so far has been to create more infrastructures in the area of governance. For example,



in the year 2006, the government applied the rule that all ministries and organizations...have an entrepreneurial office under the highest authority of that institution. This helped me to get upgraded to a deputy, and eventually, an Entrepreneurship and Employment Vice President was set up across all fields... But this policy failed, and practically-speaking a large proportion of ministries and organizations did not do this. After this, mostly through workgroups, commissions, and committees that advised the government itself, it attempted to compensate for this institutional vacuum in entrepreneurship, and became more process-oriented. That is, there were good debates in these meetings, there were good laws, but the outcomes...had no output.

Often, the programs that are developed by governing bodies for the development of employment are not entrepreneurial, dedicated to entrepreneurship... The problem of employment *is* a serious problem, and almost all governments are opposed to...unemployment.... Timely solutions to reduce the unemployment rate and increase resilience are welcome. But an *entrepreneurial* approach is [something else], hence the low response. The third point, then, is that we do not show leadership in the field of entrepreneurship. It has been said many times that in our country entrepreneurship is an orphan.

**What is your main paradigm?**

‘Chaotic’ and ‘functional’.

**8. Interview with Mr. N. former senior advisor to the *World Bank***

**How do uncertainties which cannot be forecast affect the management strategies of Iran entrepreneurs?**

The chaotic economic condition due to political challenges and disruptions can cause several troubles for an entrepreneur. Most companies were highly affected by various sanctions from the United States and its allies during the past ten years. Secondly, Iran has faced various management disruptions due to the short-term view and sudden decision-making by senior government strategists.

Nevertheless, Iran *is* currently producing fast-growing companies....

**Could you be specific about what could attract entrepreneurs to invest in Iran, based on your experience?**

Iran has a population of nearly eighty million, with unbeatable manufacturing capacity unchallenged within the Middle East. Ten percent of the Gross Domestic Product belongs to Oil and Gas.

For many past years, sanctions from the US have remained in place, however, companies based in Europe and Asia *are* pouring investments into Iran. The population is highly educated and there is a good potential for Iran to grow fast. However, there are some unforeseen events.

Around seven and a half million of Iran's population have higher education qualifications...as large as Jordan. The country is considered a power in tech fields. If it was not for US sanctions, US entrepreneurs would be happy to establish long-term business relationships between US and Iranian companies. It has to be taken into account that the other countries cannot command?

Iranian, so entrepreneurs have to consider that in order to establish a business they have to keep communications open.

**Are there any restrictions for new entrant entrepreneurs?**

One of the restrictions for entrepreneurs is the visa process as it makes it difficult for all groups, Iranian, American, European, to apply for visa and travel to expand their business relationships. The country's infrastructure is undergoing a renewal and change is happening faster than people expect. A U.S.A based venture investor stated that the entrepreneurial revolution remaking the Middle East told the story of his two visits to Iran. He said that on his first trip to Iran, there was very little access to 3G and 4g. He said that people told me it's coming, while the oligarchs said 'No way, it won't happen'. But a year later, when he came back there were twenty million subscribers. One of the hallmarks of an entrepreneurial economy is a pace of change...that...increases over time. In the United States, many industries have already been disrupted by technology: entrepreneurs come up with ideas and hope they find a market or a problem. In Iran, young entrepreneurs are facing real issues, whether it's pollution or climate change or socio-political change.

**What is your main paradigm?**

'Chaos' is what our organization deals with.

**9. Interview with the Managing Director of an Iranian start-up company.**

**Please describe to us the main issues which you have in e-business and how you solve problems as an entrepreneur?**

In my opinion, there are no big and unsurmountable problems for e-businesses in Iran. However, some people believe that e-business survival is barely possible...due to the lack of infrastructure and of an internet shopping culture.

I disagree with this. Of course, there are challenges and problems that may or may not be present in more developed countries. For example, problems with ...the e-commerce infrastructure from distribution systems to enough high bandwidth and internet speed for ordinary consumers, lack of specific laws and trust in this area and, most importantly, non-transparent economic space.

About two years ago, a venture capital investor invested in the company, the results were very good, indeed excellent. *The Economist* recently estimated the value of the company at one-hundred and fifty million US dollars. I have been working an average of thirteen to fourteen hours a day since the company's establishment and I believe that if anyone now decides to start a start-up company or business, they must work for eighteen hours a day for the first couple of years in order to achieve the good results.

**What steps have you taken to succeed as an entrepreneur in a chaotic environment?**

The first step was to design a digital business model and develop it according to the country and the audience. At first, we began to produce rich and useful content in Persian, which attracted more visitors to the site. The high number of visitors was a great achievement due to this rich content, and then the reliable digital platform. It was a great achievement and made us a successful brand.

**Why does your company not import certain products like Apple itself to cut down intermediaries?**

Distribution and retailers throughout the world have a number of distinct structures. A change to structures and in an unstable environment, will disturb the distribution system. We prefer to get closer and stronger to our brands suppliers? and distributors and to be in the distribution system as a large online retailer. Nowadays an online retailer is a knowledgeable company and does not concentrate on mere trading activities like importing goods. Our focus is on online retailing, effective communication with customers as well as winning!

**What is your main paradigm?**

Our company lives with [the] chaotic.

**10. Interview with Mr. S. Gh head of P Co.**

**As an entrepreneur who created several jobs, how do you describe the possibility of developing long-term job-creation plans and profitable strategies?**

...In the economic literature, the entrepreneur is someone who undertakes to organize, manage and accept the dangers of an economic activity. Therefore, in addition to...managing and organizing the economic unit, he also accepts risk, hence he needs support. Under these conditions, the state can play its role as a compliment. This would remove the inhibitors facing the entrepreneurs.

Employment and production have a two-way relationship...That is, the production process involves a workforce proportional to productive activity, on the other hand, creating income and employment as one of the outputs of

productive economic activity. ...Employment is both a production factor and one of the outputs of...production. ...Currently, the country's producers face many problems and obstacles ...and it isn't appropriate to enter the economic space and start a business.

This response was rather general, though how did make a case for risk sharing between government and entrepreneurs. So, we asked:

### **How do you cope with law changes from the government's side?**

After several years of communicating the general policies of Article 44<sup>3</sup> of the constitution and the adoption of the law on how these policies should be implemented, the government's main objectives are still to compete and reduce ...monopolies and increase the power of the private sector, tries to expand the cooperative sector and assign the public sector to the nongovernmental sector.

The desired outcomes have had not been reached and conditions...make ...entry into the economy difficult. Also, manufacturing activities need to be licensed in a variety of ways, and this has put obstacles in the way of manufacturing activities.

Another issue that has encountered entrepreneurship in the country is labour laws. There have always been problems between the triangle, the worker, the

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<sup>3</sup> The ARTICLE 44 of Islamic republic of Iran constitution was confirmed and announced by the Irian parliament that forces the government to sell the governmental entities to the private section. This decision will lead to decrease the centralized economical governmental power and enhance the management systems and profitability of the companies which were allocated to the private investors.

employer, and the labour laws, and they provide a space that none of them are satisfied with currently. Workers are always dissatisfied with the level of salaries, wages and benefits. On the other hand, the employer has always been protesting about cumbersome laws, and policymakers face complicated situations due to this situation. In any case, the current situation indicates that labour laws are not flexible enough and these regulations only...favour...those who have jobs and can...make it even harder for the unemployed to get a job. That is why, in countries where unemployment is high and young people in need of work are in difficulty, labour laws are usually more flexible. Over the past few years, with the facilitation and possible use of various types of contracts, this situation has been somewhat improved, but flexibility should be facilitated only to the extent that it does not lead to exploitation of the workforce.

**What is your main paradigm?**

I would like to say that the main circumstances we experience are chaotic.

**15. Interview with Mr. M. J Chairman of F T H Co.**

As usual I paraphrased Taleb's notion of 'Black Swan Events' and then asked:

**Do you think businesses in Iran face many Black Swans?**

As there are some external factors that affect Iran's economical and political situation it could be argued that all Iran is currently facing Black Swan events. After the election of Mr. Trump as the USA president, the USA put more pressure on the *Iran Joint Comprehensive Plan of Action (JCPOA)*. Accordingly, most investments and businesses were affected.

**Do Iranian entrepreneurs behave as Taleb would recommend? And therefore, survive?**

In a chaotic environment, such as the Middle East, it is hard to make the correct decision. This is because of the fact that every movement in the area could affect Oil and Gas prices which could then affect all industrialised countries, particularly western countries and hence, doing business could be very hard and difficult to predict. Therefore, it's quite important to have a crisis management plan. This is basic leadership which has to be done by businesses to enable any association to manage a sudden and noteworthy negative event. It ought to rotate around limiting the negative effect that an unfavourable surprise will have on the organization should it happen. I mean a considerable amount of focus should be on emergency administration.

Let me summarize the responsibilities of a businessman from my own point of view based on my studies and experience: Risk Management, Data Management, Claims Management, Enterprise Risk Management... Involvement of all the C-suite leadership - Financial, Legal, HR, Logistics, Operations, Strategy, Marketing and stakeholders...that can contribute to solution development, including tactical action steps.

Getting ready for Black Swans is the overwhelming endeavour for any organization to attempt.

### **What is your main paradigm?**

Here...our organization is a mixture of the chaotic and functional.

### **Summary Comment**

The question is whether or not what entrepreneurs have said is significantly different to what senior salaried managers have said, that is different enough to make it difficult to explain any



differences as the result of pure chance. This author has a complicating doubt because we cannot be sure that managers self-identifying as 'functionalist' could implement their plans in such a chaotic environment like Iran.

We were only slightly disappointed that the entrepreneurs, like the senior managers tended to talk in quite general terms rather than about the specifics of what had happened to them and what their organisations *did* in practice. In this particular respect, both sets of responses are similar. We knew from experience that Iranians are reluctant to go into detail and to press them on this is considered a little intrusive and even rude. Though I asked a similar question where the previous answer was general, I felt unable to press my respondents beyond the point where I sensed that they were becoming comfortable.

Another similarity is that both the entrepreneurs and the managers believed that improvement was possible if certain conditions were met.

However, there were distinct differences between entrepreneurs and the previous sample.

- Entrepreneurs were much more likely to talk about the legal system (claiming that there were too many laws, that not all of them were appropriate and that some were not being implemented well or were not having the effects intended)
- While it is perhaps typical of entrepreneurs to make the case for more freedom and flexibility, Iranian entrepreneurs did see a role for the government in the form of risk sharing with entrepreneurs. This was mentioned several times though in different ways
- The favourable human resources of the country were mentioned several times, especially the number of highly qualified graduates which Iran produces every year. It

was almost as if these seemed to count for as much as the country's oil and gas reserves and perhaps for even more

- Most entrepreneurs made the case for constant attention in the form of long or very long hours working on the business
- And while the managers mentioned sanctions as well, the entrepreneurs seemed to be more concerned with the erratic effects which sanctions have caused, including erratic imposition and then lifting of sanctions

A more complete analysis will be found in the next chapter.

## Chapter 5

### Analysis and Discussion

## 5.1 Introduction

The interviewees addressed were drawn from two main samples: Entrepreneurs and Senior Managers/Chief Officers/Administrators of Petrochemical companies.

One of the essential elements that has been considered about the interviewees was having adequate direct experience of Iran's economic and political environment over the years, which promotes the capability of gathering credible and relevant data from the interviewees. It did help to be an 'insider'.

In terms of educational background the author tried to find the respondents who were well educated to ensure that they had a better understanding of issues and capable of making and expressing reasoned interpretations of national and firm-specific strategic plans as well as describe black swans in their industries. However, some of the entrepreneurs especially have implicit tacit knowledge about management and black swans without having educational background, being 'self-made'.

The responses addressed the central concerns of our study and we have grown in confidence that the responses offered by those interviewed are consistent with the hypothesised synchronic differences we expected.

Entrepreneurship studies are included within in Iranian higher education and it was important to have an extended discussion with an academic who both knows the literature *and* knows Iran. One of the interviewees chosen was therefore a university professor, who teaches 'entrepreneurship'. He considered that Iran was still struggling to establish 'a stable business environment'. He agreed strongly that Iran is very vulnerable to black swan events. After introductions and brief explanations of what our research was concerned with, the professor was clear: Iranian entrepreneurs typically do not behave as Taleb recommended. **However in** saying this, he makes the common distinction between doing ordinary business and entrepreneurship, specifically:

At the outset, it should be noted that the purpose of entrepreneurship here is not just job creation; what in our country is mistakenly taken for the concept of entrepreneurship is *any* kind of business while the concept of... *entrepreneurship* is creative and destructive innovation and technologies. There are a number of jobs, like many new technology-driven shipping companies that gradually drop out of the established way of doing things. In this sense, we must admit that our country has not made any significant progress, despite all the efforts that have been made to expand entrepreneurship over the last few years, from the formation of institutions and associations to the inclusion of entrepreneurship in the educational curricula in schools and universities. Of course, [disruptive innovation] cannot be ruled out and these efforts are not totally ineffective, but the fact is that the progress of some countries in [entrepreneurship] is faster, while the small steps we take, do not compare favorably with foreign institutions. We do not see much genuine entrepreneurship in Iran.

What this narrow definition of entrepreneurship-as-disruptive leaves out are the many Iranian businesses that persist with risk-taking without destroying, transforming or re-constructing the sector they are in. While the professor's definition can be applied, it is probably too strong and restrictive to include most of the entrepreneurs introduced to the reader above. However, it is interesting that the professor did not excuse business failures as being due to Iran's troubles nor in particular to international sanctions.

Unfortunately, this respondent did not comment more specifically on anti-fragility as a way of having more flexibility to cope with unforeseen and unforeseeable situations as a way of avoiding harm, minimizing the effects of negative black swans and grasping the positive possibilities associated with at least some black swan events. We also judge that the academic distinction between 'business' and 'entrepreneurship' does not side-step the important and effective real geopolitical and strategic position that Iran occupies in the Middle East. Partly

by an accident of geography and mineral riches, Iran remains one of the world's main 'crossroads', with a huge potential near- and international market of approximately five hundred million people. The proposition that Iranian institutions have only a small contribution to make to market expansion may be premature when the contribution made by semi-state actors, such as MITI in Japan and different varieties of 'corporatism' in South Korea, Singapore and Scandinavia, is recognised (Royo, 2002). While the professor seemed to have American tech companies in mind when he talked about disruptive innovation, we sense that state and federal institutions mean that in the USA entrepreneurs have to face significantly fewer negative black swans than typical Iranian businesses do.

From the authors point of view entrepreneurs (defined broadly and not *narrowly* as only the 'disruptive') and managers, can hardly ignore tightening international sanctions, but they can rely more on negotiations and partnership arrangements with other private and public entities as a way of reducing risk and increasing the range of possibilities by becoming more robust and anti-fragile in an intensifying chaotic situation. Their daily lives are 'disrupted' enough. In other words, the professor's preferred analytical distinction between 'business' and 'entrepreneurship' talks past Iran as we find it today. His plea that Iranian businesses should behave in more disruptive ways than they do at present, we feel, with respect, misses the point.

It is not as if Iran needs more disruption than Iranians are experiencing now, in order to succeed tomorrow. The methodological implication which follows for this author is that it may be more productive to compare senior managers (who you might call *bureaucrats* or *technocrats*) with 'entrepreneurs' defined as 'persons doing business on their own accounts', as we have been doing. We consider this more realistic and researchable than looking only for Iran's next Bill Gates or Mark Zuckerberg.

## 5.2 The adoption of Taleb Theories in Iran

Our position is that practicing, surviving entrepreneurs in Iran can benefit from adopting Taleb's recommendations concerning anti-fragility and black-swan readiness, and that those who do survive conform, probably unknowingly, with Taleb's principles. Our reading of most of what most of our 'ordinary' entrepreneurs say they do to survive and even prosper in what is by international standards the most extreme business chaos – especially when their comments are compared with what managers say – is that they survive by focussing on *avoiding failure rather than changing the world*. They do keep looking for ways to exploit emerging opportunities (before these opportunities vanish) and remain ready to abandon projects which are big enough to destroy all their businesses if they were to fail.

We note that their timescales tend to be very short (hours and weeks rather than months and years) for both opportunities and threats, however 'corporatist' institutions (government/private associations) may have some capacity for looking for fresh ways of benefiting from the chaotic Iranian situation. We have argued that innovation in high value-added polymers is probably the most promising strategy that could be applied at the national scale. Indeed, due to the tightest possible sanctions that Iran is experiencing that are only just a short step away from an outright declaration of war by a foreign power, a national 'agency for positive black swans' may be the only realistic possibility as far as institutional developments are concerned. We do not think this can be thought of as a 'planning agency' because as Lindblom argued so strongly many decades ago, no institution has the computational power to judge all the possible effects of every possible policy by a 'root and branch method'. Actors however big or small they are need to be places of unrealistic hopes and highly realistic fears, seizing possibilities and doing what they can to minimise catastrophes. In principle, our thesis has the long term aim of promoting a) pragmatic and very cautious and even anxious defence measures against disasters (by minimising how far their negative effects spread) and b) agile grasping of quite

improbable but beneficial possibilities. This involves not classical planning or planning in most or all of the alternative and complex, strong and weak forms reported by the literature (above) but managing in a way that is more mindful of futures which have a ‘scope’ that is difficult to establish beyond some very basic continuities.

Iran *has* oil. Iran *could* diversify into downstream research and development of oil and gas-based polymers and hybrid materials with a wide range of physical properties and applications. Iran *has* a car industry in which an electric future can be envisaged. High-strength and lightweight composite materials *could* have an important part to play in this industry... and so on.) We urge the development of positions (institutions, networks) capable of taking advantage of positive black swan events on a larger scale in a business environment that will remain full of uncertainty. We do not urge the minimisation of uncertainty, though the ‘pragmatic’ minimisation of risk remains part of our recommendation.

It makes sense to look to surviving entrepreneurs for the skills that are needed for developing strategies that are more responsive to chaotic uncertainties.

As the founding owner-manager of HAMCO the evidence of my experience has been that the unpredictability of Iran’s political and economic situation makes it a prime environment in which entrepreneurs and managers might make prompt decisions to *seize* opportunistic projects when these are possible while *deferring* decisions when any project is faced by dangerous black swans. One has to sense the right time to defer projects and in my experience, deferring is much more common than stopping a project altogether. Travellers in Iran will be able to see many deferred projects along the roadside. Although not part of my method, we propose in all seriousness that roads could be sampled and deferred projects counted per kilometre. From this and the known distance of roads of a similar type, a national estimate could be produced for urban, suburban and rural areas. Where projects show obvious



decay, they could be classed as abandoned. But from our observations while travelling extensively in Iran, these are a minority.

In reflective fashion and with the benefit of being interviewed (debriefed) extensively by my supervisor at every supervisor meeting from the beginning of my registration for PhD studies, I have been able to state my practices concisely and explicitly. What is noticeable to myself is how long it takes to turn our own 'tacit knowledge' into explicit (conscious) knowledge. The following case descriptions are much more detailed and specific than most of the interviews reported above. It can be inferred from what follows that all our respondents know considerably more than they realise, as well as being instinctively private (for reasons which are discussed later):

I have a part-completed project to build a hotel in a prime location in the north of capital city (Tehran). I am hesitating before deciding on the mix of uses and the type of client-market to attract, watching changes in local, national and international circumstances on a weekly and monthly basis, and delaying each decision as long as possible with least consequence for each subsequent decision I must make on the project. I have only one area of activity that inhabits what Taleb would recognize as 'Mediocristan' (in which risks and opportunities are anything like 'normally distributed'). But even here (the manufacture of polymer components) surprising opportunities and risks are quite common.

I hesitate for years if necessary but can also act very quickly. I am engaged in a permanent daily conversation with myself and others, rehearsing what I know but also what I realize that don't know and cannot know. It has been said that managerial work is mostly conversations (Mintzberg, 1999) and this is true, in the sense that what I do more than anything is have imaginary conversations for hours at a time on different

topics. These conversations do not run in straight lines and are often inconsistent with each other when one week is compared with the next. This permanently unsettled method of working in which doubts out-number hopes, can be viewed as highly inefficient considered from a 'project management' point of view. It is a textbook case of how not to manage a project in a stable environment. But efficiency is not the point of my actions. It is survival through frequent use of reverse gears, many path possibilities and as many path change possibilities as I can create.

But when I saw the opportunity to purchase injection molding machines and dies from a German manufacturer, I could see that even though these were not the best pieces of capital equipment in my field, at least I could buy them at a very reduced price and I could see that they would be useful. Some of my competitors thought I was 'mad' as they told me, but there was little or no risk when the possibility of buying the best equipment was non-existent or about to disappear due to tightening international sanctions which in my pessimistic view were already a realistic possibility. Because this type of machinery is now unobtainable, I could 'see' that buying it was not at all risky, or at least I could see that the risks I was exposing myself to were being over-estimated by my competitors and other industry associates known to me. I had the necessary technical expertise to judge that these molding machines and dies were as good or better than what I already had and better than what I (or my competitors) could have purchased in Iran at that time. I also sensed that the necessity for plastic containers, for example, would mean that there would be a continuing market for them. So, in my world, while it is very important to listen to one's own fears, over long periods of time, it is also quite important to see past the very gloomiest 'narrative fallacies' of others and act quickly.

Several hours of interviewing by my supervisor, amounting to on average, two hours per supervisor meeting, again with the aim of formalising the ‘tacit skills of surviving Iranian entrepreneurs’, led to the formal realisation that not all businesses can thrive in an unpredictable environment. There follows the example of the company I established to partner with western countries as a method for safeguarding it from future international (American-led) sanctions against Iran:

Meanwhile, I have a part-completed baby food manufacturing plant a considerable distance away from Tehran. In a stable environment, free from the risk of international sanctions and in a growing economy in which Iran’s highly educated middle-class female workforce would be seeking employment outside the home, a formula baby-food factory with a trusted German or British brand-partner would be an excellent ‘rational choice’. However, I have made many revisions to the specification of this factory, which a long time ago I doubted would ever produce formula baby-food – though it is imaginable that it could. By improving the specification of the steel framing of the building and altering the ground plan it is now also capable of being an engineering shop for producing capital equipment. The authorities have questioned me in a searching way trying to discover why the factory completion has been delayed more than once. When doing so my permissions were put at risk of being cancelled. So, I knew that I would have to explain my ‘anti-fragile’ thinking to them and how it flows from Taleb’s essays. Thankfully they accepted the truthfulness of my reasons and what lies behind them and my permissions have been extended. One day there will be a factory and it will be manufacturing something for which there will be a market. I do not know what or when and fortunately I have the resources to finance deferred decisions, because I did not try to maximise the profits from which my resources have come.

The following observations were also extracted from these and other extended conversations between myself and my supervisor:

Successful Iranian entrepreneurs are not born; they learn particular lessons from chaos without fooling themselves that they are experts. We are suspicious of text-book formulas for success. The 'subject' (in this case myself) has never thought of himself as having special gifts or intelligence. He jokes quite seriously with his supervisor that 'I really know nothing'. This is my starting point. For example, I really know nothing about designing and building apartments at Iranian ski resorts, yet I am building one which is the result of a series of unfavorable and favorable events which could not have been planned for:

I like skiing and so does my family and we visit a skiing resort in the northern part of Tehran as often as possible. I started to think about building apartments and even a ski-lift and about how a project could be made to work if the snow did not fall when expected. I thought about power-generation and how high up or far down the mountain a development should be constructed. I learned that a plot of land was for sale and I wanted to buy it, but it was for far too much. Unexpectedly a better plot of land at a lower price suddenly became available next to the land I had been wanting to buy. This was a positive black swan because straightaway it showed that I was right not to buy the over-priced land. How I got offered the land was also a result of at least two or three other chaotic coincidences.

It could have been offered to others but it so happened that the vendor knew of me and of my reputation for being straightforward to deal with. I did not have permission to build these 'better apartments' on this better site, but because the apartments would have river and mountain views on three sides and mountain views on one side I

commissioned an architect and structural engineers. Like many or perhaps all municipalities, the local authority is in competition with other villages to be 'the best'. Again, it had so happened that I had sponsored a local winter sports charity event for school children, for no better reason than I like skiing and so do my family and children. The event only cost a few hundred dollars and it was a great success enjoyed by many children. This is how I became known to the person who wanted to sell the 'better' land. If I had not put on the sports day it is very unlikely that he would have approached me. It would have been offered to someone else that he knew for whatever reason that he knew them.

I did *not* run the snow sports event to gain planning permission and in any case, I had abandoned hope of obtaining the original site because it was over-priced in my view (in other words, I could not afford it). I had *not* expected to be in a position to buy a better site for a lower price next to the original plot which I had considered buying. But I got offered it by someone who was in a hurry to sell and who now knew of my existence. Why he was in a hurry to sell is difficult to know and there may have been many past black swans in the seller's life so it would not be able to know with any confidence why in the end the land came to me. Because it is a better site it is a positive black swan that I did not buy the first site, perhaps by driving a hard bargain or mortgaging my other businesses to buy this land (which I could have done).

I was granted the necessary permissions, for what is I believe are very fine modernist apartments (see illustration) after I had also said 'yes' to supporting a local gala event scheduled for a religious day marked on the Iranian calendar. The municipality was very aware of successful galas put on by a neighboring village in a different (rival) municipality and wished to put on an even better event. I agreed again not knowing

what the consequences might be, and sometime later the permissions were granted. I emphasize that I had not had to ‘bribe’ any agency in order to obtain land and permissions, but my inner conversations told me enough: the costs were low and the unknown outcomes might be beneficial. At least some school children and myself would have a successful sports day to look back on... then positive black swans arrived: better land with better views at a lower price plus permissions.

Recently there has been a setback. The authorities state that sustainability and conservation are important and they are important to me too. In the case of the authority they have decided to use a ‘river bed model’ of the behavior of the river in front of the apartments as it was flowing more than a hundred years ago. At that time, it was wide and fast flowing and because of this old survey the authority is stating that I have to move back the apartments so that they are 4.5 meters further back from the river than all the existing apartment developments. The river has declined to a small proportion of its original size and flow due to population increases and water extraction up-stream. It is doubtful that it will ever flow as it did before, but as chaos also affects weather patterns such as heavy rainfall I am not annoyed with the authority for being so cautious.

It is still unclear what their reasoning is exactly and I am trying to find this out to see if the extra 4.5 meters is fixed, but my architect is very angry that a project he ‘put two and a half months of his life into’ could have to be redesigned into something much more ordinary or ‘a block just like any other block’ as he calls it.

This requirement to site the apartment block further back from the river is *probably* but not definitely negative black swan - a massive future flood that destroys the apartments would be much worse. It has led to further thoughts about how to realise future earnings through the project. Some apartments could be sold 'Off Plan' before any work has begun. But these prices would be lower than for completed apartments. Many potential buyers could be worried about the chances of a war with the USA which would destroy the market for new buildings immediately. My intention is to sell some apartments Off Plan soon, some after construction has begun, some near completion and some right at the end. What this means is that I get less than I would get by selling only completed apartments, but this is much less risky than 'profit maximizing'. It is an anti-fragile way of doing business because income begins soon on a project that I do not want to become 'too big to fail'.

The worst case I can imagine is that war is declared on Iran just as the apartments are finished and they are all being marketed as built. There may be even worse possibilities which I cannot imagine. But at least apartments for sale are less risky than apartments for rent by skiers. Renting could mean higher yields but also higher costs, such as setting up a rental company and if the snows failed to fall, then the project could be faced with massive overhanging debts which would be hard to finance. I know this much after having a long conversation with three very experienced senior managers who had worked for more than thirty years in the ski resort business in many countries including France, USA and Switzerland. 'Uncertainty is the problem *even in Canada!*' they emphasised.

So when I say that I know nothing about developing apartments in ski resorts, this was true at the beginning. I also feel that it is still true today, despite the fact that the project is looking likely to be successful - but not as successful as it could have been if *only* positive black swans had happened. I still do not think I know anything about developing apartment blocks *anywhere else* because it is unlikely that anywhere else, even just in Iran, would present the same circumstances. Even in *the same village* the same set of circumstances will probably not occur again.

In other words, a quite successful ski-resort apartment project, a very successful importation of injection molding equipment and PET supply business, a deferred factory project that has seen many changes of mind and a downtown hotel in Tehran that has seen a similar number of changes made to it, *do not* make me a successful ski resort apartment developer, a successful polymer raw materials and parts supplier, an unsuccessful factory developer or an unsuccessful hotel developer.

The industry specific knowledge I gain has limited value which does not last long and is not 'transferable'. In a chaotic world, it is not safe to suppose that positive experiences mean that the entrepreneur is 'good at' what they seem to be good at and it does not mean that they are ineffective over ventures that have gone very slowly with many backwards steps. The problem is that learning is quite easy but what you learn is not usually relevant to what happens next. Realizing this on reflection now, my next project will almost certainly not be another ski resort apartment block, or another hotel or another factory. Nor would I ever want to claim to be a 'consultant' in any of the industries I have invested in.



I can see that I could be seen as an example of a person who gained a lot from the chaotic situation following the Islamic revolution and the war between Iraq and Iran. Lack of service and accommodation companies meant an opportunity for the author to start a successful business. The author stumbled across the principles of anti-fragile strategies, gaining positive results from the chaos caused by black swan events, by realizing happy chances and especially by minimizing unfortunate mistakes.

The Iranian entrepreneur best known to me and for a long period of more than fifteen years spoke as follows:

From childhood, I had a feeling which encouraged me to do new things. I looked around and had issues that were in almost all respects different from others. I remember about forty or forty-one years ago, when we came to Tehran to meet some relatives, for the first time, I saw an Atari computer and an idea came to my mind that with the use of this device in my village could enable me to make money. As a result, once I returned from Tehran, I rented a machine for a price of 500 Tomans for 48 hours, during that time I allowed children to play with that device and, and during this time I earned 800 Tomans for the 48 hours. I followed the similar way until I purchased an Atari machine, and then I bought another device and I expanded into the supply of computer games. Eventually I established a special store for games and consoles like that. One of my characteristics is ‘planning based on market demand’ or ‘not planning!’ and I had this feature from my childhood. I remember, during the war [with Iraq], I was renting video equipment, playing movies and martial arts films in the countryside, and I had a good income. Next, I created the village cinema.

In a similar way through my childhood ... I used every opportunity to earn an income which I could survive on.

My worst challenges have been some uninvited promises [made] by some officials, which they did not fulfil. They sent entrepreneurs [like me] away to do meaningless actions [that turned out to be futile].

My other bad memory was regarding a great and practical innovation [I devised] in the year 2005, about saving water. As soon as it was published in the newspaper, I was invited by a foreign country to run this project in that country. However, after offering to support me [to introduce] the same method in Iran, I refused to go and run the project abroad. Yet the relevant authorities in Iran took not one step [resulting in a failure].

### **5.3 Our practice paradigm is chaotic!**

What is interesting about this entrepreneur's latest, most risky and also successful project which involved drilling through many mineral layers to find an economic concentration of a rare mineral, at considerable depth, is that he insists that he could not have taken this risk unless he was able to treat all the money it cost as something he could afford to lose completely. This fits Taleb's rule of thumb that eighty percent of investments should be dull, low risk and placed in 'mediocristan', while the rest may be high risk and on the assumption that they could result in complete failure without wider financial damage. However, a note of caution: the contrast Taleb draws with 'extremistan' does not fit entirely this 'rare minerals' case. In Taleb's extremistan the cost of the *n*th unit is no more than the cost of the first unit (for example downloadable apps). However, in the rarer minerals case, the extraction of the *n*th kilogramme does add proportionate cost to the project. Minerals are not 'zero marginal cost' commodities. Nevertheless, their market prices may vary wildly and 'super-wildly'.

It is noticeable that a few interviewees say something consistent with this rule-of-them when they state that some of their activity is in the ‘functional’ world while some of it is in the chaotic paradigm.

The next interviewee felt that ‘the growth of entrepreneurship’ was ‘a symbol of the country’s credibility, and that the uncertain regional economic situation and reliability should be taken to the consideration. But at the same time some ‘functional’ corrections in tax, customs, municipal and social security laws could reduce obstacles for entrepreneurs. Reducing ‘unnecessary’ administrative bureaucracy and ‘the numerous pits and wells in the way of the producer and the entrepreneur is recommended’.

During the Interview with Mr. H. S Managing director of Production medical tools he also argued for hybrid (Two-World) institutional arrangements, which once more reminds the author of Taleb’s distinction between the two realms of ‘mediocristan’ and ‘extremistan’:

In industries like medical equipment, it’s not only about raising funds, but also we expect the government to spend the same amount to guarantee the purchase of our products instead of [us having to rely on] loans. But, for example, when the government does step in to products such as wheat, [this] ... while this ensures that this product is guaranteed and cheap to buy, by not also paying attention to the market and the customer, and to surrounding features like ... quality... the result can be that ... customers don’t buy and the producer is in debt to large creditors. This is a defective cycle.

Companies can somehow be misled into thinking of their market share and the whole market [as] healthy [while] ...we are faced with a huge amount of imports and smuggling. Imports in most sectors have bent [Iranian] manufacturers’ backs.

We are new, ‘knowledge-based’ company so we will be more vulnerable.

He continued to argue on the one hand ‘functionally’ for governments to act to reduce risk by imposing import restrictions on medical equipment and acting in a reliable and predictable way to create confidence.

And if the import of this type continues and the government does not stand firm... and support domestic production, there will be nothing but bankruptcy [for] knowledge-based companies.

...Administrative bureaucracy in our country causes entrepreneurs to face major problems. I’ll give you an example. At the Farsi, Medical Science Fair hosted by the University of Medical Sciences, the sparkle of hope for all exhibitors was highlighted by the authorities’ attention to their products, and they all believed that after the end of the exhibition, through agreements with large companies or organizations buying medical equipment [as a circle] the ‘red part’ [risk] would be taken out of [the market]. But after the end of the exhibition, part of ‘the agreements’ was completely ignored by the officials. The other part had not yet left the secretariat. ... Delays with signing and approval by other branches of government followed. Although fairs, markets, festivals, and exhibitions appear to be a place for marketing, unfortunately, in Iran, there isn’t consistency... in communication between buyers and the sellers and ... contracts are not drafted adequately.

The next challenge faced by many elites and inventors is the effort and time it takes for them to be exempted from military service. It takes as much time [as it would to serve in the military] ... and all because of the various stamps and signatures [needed], and [time going] from this building to the [next] building, according to the famous saying, ‘Wear iron shoes to get this exemption.’

He continued:

The growth of entrepreneurship for each country is a symbol of its credibility, and ... and of course, much of this growth goes back to what ... laws can [enable]. From this angle, I know the tax laws, social security laws, municipal laws and customs [are] a serious obstacle to entrepreneurs, the administrative bureaucracy and the numerous signatures that must be taken to obtain authorization ... In my opinion, state laws and regulations do not encourage entrepreneurship in Iran.

But of course, the challenges are not merely a matter of law. One of the problems in the field of medical equipment is smuggling and imports, as well as the harshness [of reporting] that is imposed on producers at the time of registration, such as where is the company? How many people [forms your] manpower, and [even] items that really do not qualify [as relevant] for production. Simultaneously merchants and importers enter this product market without any burdens, without anything as much as a shred of the requirements that are placed in the way of the manufacturer.

Nevertheless, the capacity of the Iranian market in the field of medical equipment is great if the domestic customer is confident that the goods have passed the standardization process ensuring that Iranian equipment reaches a high international standard of quality. ... Iranian goods could reach the same level of after-sales service. It can work better, so we hope that this market will help us to grow... The type of 'paradigm' we are using is mostly chaotic but sometimes functional when it comes to [legal frameworks and processes].

Another interviewee argued differently that Iran stands a great chance of thriving *from* the chaos the country faces. He pointed out that despite negative black swans, Iran remains the

second largest economy in the Middle East giving it ‘depth’. He saw this as the basis for huge potential market opportunities between Iran and its neighbours.

This feature of Iran’s economy has been obscured, however, the upward movement hasn’t stopped. The \$400 billion economy which is the second biggest in the Middle East could create up to seven percent growth a year from now, according to the World Bank.

Considering everything that can happen on the off chance if you coordinate that sort of financial development with a college framework that produces 233,000 researchers and designers a year, in a domain recently associated with the greater part of the world’s economy: the result could be thousands of start-ups and independent companies - if nothing acts as a burden.

According to the statistics, every year around two hundred and thirty-three thousand students graduate from Iranian universities including engineers, doctors, lawyer’s accountants and scientist.... By matching that number of graduates with economic growth, you can easily find that the economy has the ability to produce thousands of start-ups and other small businesses.

Here was a vision of Iran as benefiting from many happy coincidences among hundreds of thousands of graduates in a growing economy with incalculable happy coincidences.

Chaotic economic conditions and political uncertainties bring troubles for the entrepreneur. Most companies were highly affected by various sanctions by the United States and its allies during the past ten years. But secondly, we faced various management difficulties due to short-term thinking and sudden decisions by

governmental managers [and strategists. Nevertheless, Iran is currently producing fast-growth companies.

Said another:

Manufacturing activities need to be licensed in a variety of ways, and this has put obstacles in the way of manufacturing activities. Another issue that has encountered entrepreneurship in the country is labour laws. There have always been problems between the triangle, the worker, the employer, and the labor laws, and they provide a space that none of them are satisfied with the current situation. Workers are always dissatisfied with the level of salaries and wages and benefits. On the other hand, the employer has always been protesting the cumbersome laws, and policymakers face complicated situations due to this situation. In any case, the current situation indicates that labor laws are not flexible enough and these regulations are only in favor of those who have jobs and can even make it harder to get a job for the unemployed. That is why, in countries where unemployment is high and young people in need of work are in difficulty, labour laws are usually more flexible. Over the past few years, with the facilitation and possible use of various types of contracts, this situation has been somewhat improved, but it should be facilitated to the extent that it does not lead to exploitation of the workforce.

#### **5.4 Government Support on Establishing an Entrepreneurial Environment**

Talebian unpredictability is a special threat to the hotel and tourism industry, as our experience in this sector shows. A number of interviewees said much the same:

The tourism industry is delicate, complex, sensitive and completely dependent on the stability, security, social, political and economic and most importantly, it

requires official [government announcements] in every sentence and word to addresses the interests of private...investors in this field.

It is clear that tourism development requires international capital and hence, the entry of foreign capital ensures the security of that destination. Can a [third party] country today threaten the world's tourism destinations such as Dubai? Definitely not because Dubai is an established international tourist destination, investing capital from more than 113 countries and especially capital from the world's most powerful countries. [Any] threat to that tourist destination would amount to a declaration of world war.

### **5.5 External Influences on Management Strategies in Iran**

Since Trump's election as the USA President, America has put more pressure on the Iran Joint Comprehensive Plan of Action (JCPOA). Accordingly, it affects all businesses in ways that would be difficult to specify or avoid. Although they did not use our terminology especially, an entrepreneur commented that

In a chaotic environment, such as the Middle East it is hard to make a correct decision. This is because every movement in the region could affect Oil and Gas prices which ... highly affect not just us but Western countries too, making doing business very hard and difficult to predict. Therefore, it's quite important to have a Chaos and Crisis Management Plan as basic to any organization's leadership. This should enable an association to manage sudden and noteworthy negative events. It ought to rotate around limiting the negative effect that an occasion will have on an organization should it happen. [I mean] emergency administration.



Besides regulations, among other obstacles which entrepreneurs reported facing in Iran are poor infrastructure, especially for e-commerce; being forced to work for long hours to survive and non-transparent economic space:

There are challenges and problems that may or may not be present in more developed countries. For example, problems can be the e-commerce infrastructure from poor availability to [low] bandwidth and internet speeds for ordinary consumers, lack of specific laws and regulators in this area and, most importantly, non-transparent economic space. About two years ago, a venture capital investor invested in the company, the results were very good or excellent. The Economist [journal] recently estimated the value of the company at \$150 million. I have been working an average of 13 to 14 hours a day since the company was established and I believe that if anyone now decides to start a start-up company or business, they must work for 18 hours a day for the first couple of years in order to achieve the good results.

### **5.6 Major Issues Iran Faces in Petrochemical Industry**

The fast-changing technology in the petrochemical industry and more focus on the development of basic material were offered as main issues facing the petrochemical industry, however my respondents seemed to disagree whether technical change was too fast or too slow as they also recognised that international sanctions will continue to hold back the adoption of new technologies from the advanced countries. One respondent clarified what this might mean:

Fast speed of development in petrochemical industries, [but] too much attention to developing [low value-added] basic materials...is the most challengeable aspects in this area.

Another issue noted was the fact that producers struggle to meet the market demand for petrochemical products. Mr B stated that the petrochemical industry struggled to 'produce and

distribute more than 30 Million tons' of products into domestic and foreign markets' and that attaining '71 percent of [nominal] capacity in petrochemicals' had itself represented a 'growth of 108 percent [output] compared to last year'.

When invited to consider what, a strategy based on Taleb's theories might look like, a petrochemical managing directors believed that those who have been in the petrochemical industry for some time do stand a good chance of realising profitable plans. We find this response interesting as it shows continuing faith in planning and some difficulty in assimilating Taleb's view that surprises are as unavoidable as they are unpredictable. According to one of the other interviewees Iran should engage in promoting policies that ease the entry and operationalization of high value-added petrochemicals production in Iran:

The readiness of the country's petrochemical industry to exploit post-war opportunities [meaning the costly war with Iraq] and favourable prospects for investment and growth is for those who have license, the investors and the technology owners of the industry.

They have been a very active presence over the past year with calls for long-term cooperation in this industry. [Iran's oil and gas fields mean] that petrochemical industries in Iran are economically viable compared with the same industries in the developed and industrialized countries of the world. In petrochemicals, at least 50 percent of the cost is related to 'integrated feed'. Now, if a petrochemical product in Iran is to be selected for food, the price of which without subsidies and discounts is significantly lower than that of the industrialized countries, it is undoubtedly economically feasible to produce it in Iran.

## 5.7 Iran Petrochemical Industry and Global Interactions

However, the senior managers acknowledged that political instability, the threat of war, currency fluctuations and volatile commodity prices due to sanctions interacted in unpredictable ways to cause great uncertainties in the Iranian petrochemical industry: All combined to produce an environment rich in black swans:

Political difficulties in cooperating with other countries, [those countries'] foreign policies, ...sanctions, internal political disputes and factions of political will [and] political insecurity, all affect attract [liveness to] domestic and foreign investors. ... Non-political considerations include the economy, infrastructure, ... labor law, insurance, taxes and so on.

The Iran petrochemical industry, according to one senior manager, faces considerable challenges in surviving the black swans which these circumstances produce. As he saw it, these included

Lack of developed supply chains for small-scale industries, lack of support for technology development, lack of developer companies and weaknesses in financial structures.

The political and economic situations for general contractors are not predictable and maybe they cannot deliver on their contracts due to international sanctions. The employers and the whole society will suffer the consequences.

## 5.8 Summary

The two samples, the entrepreneurs and the senior managers/ administrators are not *entirely* different in their descriptions of 'the world' (paradigm) they occupy, how they understand it and how they act. There are *some* managers and some entrepreneurs who report that they live

in two worlds: a chaotic one that is full of unpredictable surprises (a world where black swan events are common) and a ‘functional’ world in which there are systems that work, or at least an imagined future Iran in which reformed systems *could* work one day. The two samples include interviewees who think that there could *eventually* be better working arrangements between governmental agencies and both entrepreneurs and managers of Iran’s upstream and downstream petrochemical industries.

However, despite these recognised overlaps, standing further back from the interview data there are significant differences between the two samples. These differences are significant in the sense that they are too great to be explained as if they were caused by random chance variations. In other words, if we took the same number of dice as we have interviewees and threw the dice, it would take many throws of the dice before the ‘entrepreneur’ dices and the ‘manager’ dices would produce a pattern of differences that look similar to the specific ranges of opinions we have recorded. In other words, even with quite small samples it is possible for a qualitative researcher to have some confidence that the differences s/he identifies *might* be generalizable to a larger population.

The broad difference, considering the interviews is that the way in which entrepreneur’s think and act is more similar to Taleb’s recommended ‘anti-fragile’ strategy while most of the petrochemical managers follow the functional paradigm. It is also clear that although interviewees in both samples experience surprises, *the entrepreneurs have ways of dealing with them that the managers do not have*. Entrepreneurs seems to be happier and more diversified compared to senior petrochemicals managers while petrochemical managers act in more functional ways and envisage a future environment which is more benign than the present one.

This author believes that managers shouldn’t relate all the issues and troubles they experience to international sanctions. While sanctions make surprises more likely, even in

countries that are not sanctioned, enormous, and we suggest, more severe and wide-reaching surprises happen, such as the 2007-8 global financial crisis. Our argument is that there are steps that can be taken towards becoming more anti-fragile in order to have the flexibility to cope with the situation, defend against (localise and contain) the effects of the negative black swans and grab the opportunities that are possible through positive black swans which are equally difficult to forecast. As author emphasises “Without risk there is no profit”. Consequently, Iranian entrepreneurs and managers can find opportunities in chaos and realise considerable profits...but not profits great enough to get them noticed by some authorities which would risk them being taken over’.

In contrast, the ‘profit maximiser’ in the favourable (functional) risk environment modelled by Thompson, would invest too much in positive black swans. As we have observed many times, some profit-maximising entrepreneurs operating in Iran grow very fast for around four years and then crash. Growth is possible because Iranians, we think, enjoy the prestige that comes from conspicuous consumption. The Individualistic-Competitive thought style is evident in Iranians wish to out-do their neighbours. The Individualistic-Competitive thought style is easy to recognise in the country. This means that when a new product or service becomes available it is purchased in high volumes, until the next ‘best thing’ becomes available.

The implications are not common sense. Paradoxically, it may be easier to make profits in unstable countries than in stable ones. Instead of wishing to do business in ‘stable environments’ it is possible to live profitably with risks that cannot in any case ever be eliminated. Managers should be as prepared as entrepreneurs to be vigilant at all times and react promptly and not rely on governments to take action in all circumstances. However, this recommendation applies to government agencies too.

We have been and remain highly critical of the literature on strategic planning partly because it seems highly unrealistic to assume that we can ever know enough to plan for futures that cannot be estimated. Lindblom was right to promote the ‘science of muddling through’ which seems to us to be consistent with Taleb’s concept of antifragility.

As far as the rest of the world is concerned, Iran has a weighty geopolitical position in the Middle East and its oil reserves mean that it has global effects. It would be a mistake to try and exclude Iran from the world system. The importance of the way Iran acts is magnified by its position on one of the world’s main crossroads with a huge potential market in the region. For example, if Iran was to increase its involvement in down-stream refining of diverse high value-added polymers the effects for all polymer manufacturers everywhere could be very large. In other words, the Iranian state could itself embrace the principles of anti-fragility and invest, say twenty percent of its state capital in developing materials which have the qualities of being a) very difficult to make and b) extraordinary properties. It would only require a handful of these to be successful to repay the lost investments sunk into many unsuccessful polymer development projects. In other words, anti-fragility is a scaleable set of principles that apply just as well to large actors as to small entrepreneurs and even to individuals’ private lives. As Iranian entrepreneurs demonstrate, no actor should participate in ventures that are ‘too big to fail’. (The failure of one venture does not wreck the success of another venture.) Governments can also ‘defer decisions’ and ‘make their own luck’ rather than follow ‘utility maximising’ which leaves actors vulnerable to sudden and unforeseen catastrophes which are too large to mitigate.

From the authors point of view no actor can ever be certain of what is going to work and what is going to fail so small successes and small failures are preferable to high gains that come with high risks. If Taleb is correct, then ‘Big Wins’ will come but it is not possible to know what these will be.

Of course, we do not ignore international sanctions which have worsened very much at the time of writing (July 2019) but sanctions should be a reminder that *world trade* is as improbable and surprising as the election of President Trump. Anti-fragility is for all actors at all scales and governmental officers, managers and entrepreneurs should experiment to produce fresh institutional arrangements some of which will thrive in ways that 'defy estimation'. Given the country's global significance, its effective universities, the diversity of the products that can be made from oil and gas and the agility of its surviving entrepreneurs, positive black swans will turn up. As the entrepreneurs demonstrate, in chaos, anti-fragility makes the best sense.

## Chapter 6

### Conclusions, Discussion and Recommendation



## 6.1 Conclusion

The main aim of this research is to suggest defensible strategies given the likelihood of black swan events. This is relevant especially to Iran, given the existence of economic and political sanctions and a modern history that qualifies as ‘turbulent’. Thus Iran provides a demanding and appropriate ‘test bed’ for the principles of anti-fragility, though the same principles explored here apply generally, because no economy or society is free of events which are a) difficult to forecast, and b) have disproportionate impacts, even if the initial change is small. Our long-term aim is that ‘anti-fragile’ measures be put in place in order not only to mitigate the worst effects of black swan events, but also to take advantage of ‘positive black swans’ which are also difficult to forecast but which have disproportionately large positive effects. We think it is consistent with ‘anti-fragility’ *not* to chase positive black swans as far as they might lead, because the biggest successes end with the biggest failures (social platforms such as Friends Reunited, that grew rapidly and have since vanished are good illustrations).

The objective has been to show that surviving Iranian entrepreneurs are more likely to report adopting strategies which resemble ‘anti-fragile’ stances compared with what Iranian senior managers report. Why these thoughts and ways of doing business are thinkable (both the entrepreneurs’ thinking and the senior managers’ thinking) will also be discussed in this concluding chapter. It should not be forgotten that Iran has a well-educated young population and that it is reasonable to suppose that taking advantage of positive black swans in agile ways, should minimize the unemployment rate of the country. It is not possible to guess which young polymer scientists will make very high-value product break-through, but the country is training many of them already.

In one sentence, Taleb’s argument that in a chaotic world in which small changes in antecedent conditions have effects which magnify in ways that cannot be estimated, then ‘anti-fragile’ strategies represent one’s best chances of survival and success (Taleb, 2012). In other

words, it is supposed that the key to survival is to avoid ‘path dependency’ and as Taleb puts it, not to expect the past to supply more information about the future than it can provide.

We have confirmed that successful Iranian entrepreneurs practice in ways that are consistent with the chaos paradigm, which it is claimed is also the paradigm that Taleb’s writing inhabits. For example, they do not fall for the sunk costs fallacy and are willing to alter course in any and all of their diverse business activities. Note that we have adopted a particular (fatalistic) definition of success, which is survival. It is not success defined as *profit maximising*. It is not success defined as *predictable, dependable and compliant organisational functioning which shows few or even no deviant behaviour* and it is not success defined as *saving Iran in its collective struggle for survival against the rest of the world* although this last sentiment is consistent with the longer term aim we have set out. These four definitions of success are mentioned for a reason which should become clear.

Because the author is a successful, *surviving* Iranian entrepreneur he has been very well placed to access a circle of other Iranian entrepreneurs and managers and to conduct interviews in their native language. At every supervision meeting, the author was interrogated at length on the uncertainties and opportunities presented to him and other surviving Iranian entrepreneurs known to the author best. Dr. Stephen Smith interrogated our decisions to do things, not do things or stop doing things, making for typically two hours in each session (sometimes longer). These sessions have helped to operationalize Taleb, design our interview schedule and convert our tacit knowledge into explicit knowledge.

It is striking how far ‘survivors’ will go to defer decisions in order to avoid path dependency. For example, our habit is to leave open as many possible pathways for as long as possible before making any irrevocable commitment, some for as long as this author has been conducting this piece of research. There are many examples of another Iranian entrepreneurs

acting similarly. Decisions are kept under review on an hourly basis as each new 'Black Swan Event' is appraised.

From the author's point of view based on Nicholas Nassim Taleb's position, the ambition to take all possible economic and political possibilities that might impact the process into consideration is unrealistic. Yet this is what planners adopting the 'strong' version of strategic planning methodology would need to do in order to make a success of planning.

Taleb advises that black swan events should be taken into consideration on the assumption that "some times what you don't know is more important than what you know". It is consistent with his argument that it is difficult to map uncertainties. Anti-fragility is not a 'strategy' in the ordinary sense but could be quite helpful for survival when systems face frequent unpredictable changes and reversals. The author accepts that long-term strategical thinking and planning is necessary for long term investments and big projects because some estimates need to be made as to what the long-term future will bring. But returns and profits are more likely to be realised over long periods if the black swan theory and anti-fragility be taken to the consideration. For example, a big hydro-electric project will involve scenario-development around climate changes that may affect rainfall. The hard-to-estimate probability of positive and negative black swans over the lifetime of a large project don't make strategic planning dangerous, pointless or unnecessary if it helps strategic planners to care more about unexpected events and to avoid under estimating their systems' risks. Anti-fragility would enable ventures to become more robust in chaotic situations as well as to benefit more from the unexpected. Stretching the 'hydro-electric dam' case as a 'thought-experiment' it might make anti-fragile sense to build many small schemes across many tributary river systems, rather than one giant scheme built on Iran's largest rivers. In a region that was becoming drier, 'chaotic' rainfall (heavy localised rains that cannot be relied on) would mean that at all times, there would be some schemes (somewhere) that would be bringing worthwhile benefits. But

the ‘one big dam’ (i.e. ‘profit maximising’) approach would be vulnerable to a correspondingly large level of disappointment among investors if rainfall reduces. On the other hand, in a region that was becoming wetter, that ‘one big dam’ would not have been built high enough to maximise all the benefits of that increase in rainfall. Consistent with the principles of deferred decisions, after following the ‘many small dams’ strategy, then, if as seems unlikely, rainfalls do increase then a medium-size dam could be built quickly and at less cost at the point in the river system where the ‘large dam’ was once planned. Many small dams are more expensive than one large one of the same total water and power capacity, but our recommendation is to favour resilience instead of high-gains that come with high risks.

We admit that our support for the chaos paradigm and the Black Swan Theory which it leads to, is based on a certain bias, recognised by Grid-Group Cultural Theory as a ‘cultural bias’, in the author’s criterion of success (resilience). The alternatives:

- ‘Hierarchical’ success criteria (minimum deviance, maximum compliance, stability)
- ‘Egalitarian’ success criteria (no change unless it benefits everybody, comprehensive system-wide change if it does)
- ‘Individualist’ success criteria (competitive success and a self-stabilising system of demand, supply and prices) - are culturally available as thoughts and practices...

each succeed in their own terms and in specific, limited circumstances. But these last three conditions do not to prevail in Ira, n.

These ‘cultural biases’ have been set out and explained very usefully by Michael Thompson and we acknowledge the clarity and wide application of his ‘Grid Group Cultural Theory’. He shows that not two, but four ‘risk environments’ may exist (*Uncertain, Moderate, Boom, Bust*) as set out and modelled in his essay *How Banks and Other Financial Institutions Think*.

Placed next to Taleb, we see that Taleb's four key concepts: Silent Evidence, Confirmation Error, Epistemic Arrogance and Future Blindness are especially dangerous in the 'Uncertain Risk Environment' which applies in Iran on the evidence of uncertainties we have seen. Most managers interviewed and observed across the Middle East informally over two decades of our business experience, and those interviewed recently for this study, tend to map the future based on the past experiences, relying more on knowns and ignoring unknowns. Their bias favouring compliance and deviance reduction would have worked well if Iran had demonstrated a 'moderate risk environment' consistently. We observe also that the extraordinary Egalitarian mobilisation which brought about the revolutionary downfall of The Shah and which sustained a terrible war with Iraq would make sense as a success criteria if that collective struggle had continued indefinitely. Egalitarian-Enclave reasoning also makes sense at the present time to the extent of the national emergency caused by the US President placing the Iranian economy and society under extreme 'existential' threat. The reader will understand that the author shares some of feelings of solidarity and wishes for a future Iran that benefits all Iranians and of the region as a whole (hence our recommendations concerning development of advanced polymers).

Back casting and Scenario Development remain useful if they sensitise actors to black swans. The author supports the 'Mitiga' framework in that it promotes sensitivity to 'input information', flexibility and adaptation. However, Mitiga is advantageous only if each cycle does more than deepen existing narrative fallacies. We repeat that the surviving Iranian entrepreneur is in a state of permanent 'cycling' of the evidence and reconsideration of their ignorance (their so-called 'known unknowns'). Secondly this approach (which unlike Grid-Group Cultural Theory probably does not qualify as a 'theory') is consistent with Thompson's thesis especially for 'uncertain' risk seasons.

We reject altogether ‘The Space Matrix’ strategy described earlier. This is because it assumes a far higher level of environmental stability than is present and even assumes what Thompson would identify as ‘Moderate’ stability to be the default risk season. The Space Matrix would make sense in a benign world the author has never observed, not even through his UK-based business activities.

The Blue Ocean strategy applies to a small minority of cases in which an actor devises an unprecedented and appealing product or service. For the actor, this product or service is an extraordinarily positive black swan while it can be catastrophic to others. However, the Blue Ocean Strategy only applies once that product or service has been devised. It makes sense only after the event.

Meanwhile, the Author rather disagrees with Strategic Leader Theory, though it might be enhanced by working the lessons of Thompson and Taleb’s recommendations into it. We also feel that Strategic Leader Theory qualifies less as a causal theory than Thompson’s Grid-Group Cultural Theory which has very high descriptive, explanatory and normative power for all ‘risk seasons’. Indeed, much of the literature cited in our literature review is heuristic (rules of thumb) and normative (promoting recommendations) without sociological or anthropological analysis of why any recommendation or rule of thumb should work under any particular set of circumstances. The majority of writers also seem to demonstrate insufficient self-awareness of the paradigms which their writings occupy and how and why risk seasons either change (2007-8 global financial crisis) or persist for decades (high-risk Iran). Thompson is very clear concerning how conflicting rationalities provoke dynamic change and about how different forms of ‘institutions’ (Douglas, 1986) can fix thinking and practices only until they are overwhelmed by blatant surprises which they cannot cope with.

Although the differences between the two interview samples are not absolutely clear cut, we have established that there are differences that can be identified overall (summarised

above). Perhaps the chief finding is that those models of strategy which contain ‘loops’ (feedback stages for checking intended actions against emerging conditions and revising them as necessary) can be said to describe, but not explain the practices of surviving Iranian entrepreneurs adequately. This is true in the sense that they seem to be checking and revising their intentions against changing circumstances hour-by-hour. For example, at the time of writing tensions have arisen between Iran and Britain concerning the detention of an Iranian super-tanker off Gibraltar laden with oil followed by an encounter between three Iranian motor patrol boats, a British oil tanker and a British frigate in the Straits of Hormuz. From the evidence of the interviews we can be confident that Iranian entrepreneurs will be paying attention to these events and allowing them to enter their thoughts and feelings about their existing and intended investments. Questions such as ‘Does Donald Trump want war?’ ‘Could a miscalculation lead to a war that neither side wants?’ or ‘Could the US President act on the hawkish advice of John Bolton or is the posturing only for domestic purposes in Mr Trump’s election campaign?’ ‘How could these events affect my projects?’

In other words, many forms of ‘feedback loops’ exist in the minds of surviving Iranian entrepreneurs which they will be using to assess their steps, today, tomorrow, next week and on a longer time-scale. However, if the number of feedback loops and changes outnumber the original strategic intentions and plans then even the most realistic strategic models which allow for alterations, begin to lose their shape and usefulness. If what is happening in practice is, say 90% checking, re-checking, making alterations, stopping and starting in different directions, then the model is no longer a model of strategic planning at all, but instead a model of ‘muddling through’.

Turning to the senior managers and petrochemical technocrats interviewed, the same questions can be asked. These respondents are significantly more likely to talk about Plans

and long-term strategies. They have described enough about their work as managers to indicate that they

- a) think long-term
- b) that better institutional arrangements will enable their industries to grow eventually
- c) they tend to emphasise the geo-political importance of Iran as if the country's economy and society was fundamentally unsinkable and
- d) it is also clear that their thoughts inhabit a 'functional' world that surviving Iranian entrepreneurs do not emphasise nearly as much

The entrepreneurs are less likely to identify themselves with the functional paradigm than the managers are. In other words, the more classical models of strategy fit the managers better than entrepreneurs.

However, from our position in the chaotic (Talebian) paradigm, the managers' faith in strategy is misplaced and perhaps dangerously misplaced. Our 'entrepreneur' view of what anti-fragile strategy could look like in Iran, which involves investing in a very wide range of extraordinarily valuable but very improbable innovations in high value-added petrochemical products, is quite different to the strategic planning models found in business text-books which seem to be much more single-minded with 'shared' aims and objectives and which see it as necessary that all members are 'aligned' with those 'aims and objectives', also known as 'the vision' of the organisation. In other words, our respondents lie at different points along a continuum between having nothing but feedback loops and nothing but a fixed plan. The entrepreneurs can be placed nearer to the 'loops' end of this continuum and the managers towards the 'fixed' end.

Perhaps it is fair to ask which of these two sets of interviewees benefits the most from the implicit models which they use. Because both the managers and the entrepreneurs are exposed to *the same information* concerning positive and negative black swans occurring in Iran, it is



interesting to hear how differently they respond to them. In a common-sense way Iran is one country, but the two sets of interviewees act in ways that are significantly different because they place that country in two rather different worlds (though there are some who have one foot in one paradigm and one foot in another).

To decide which model of strategy serves its master best we need to return to the success criteria of these two sets of actors. For the entrepreneurs *survival* is what matters above all and changing course, spreading investments, deferring decisions, starting, pausing and stopping a project completely or re-starting all suit their aim and fits Taleb's recommendations. On the other hand, the senior Iranian manager, technocrat or bureaucrat is more likely to expect (and trust) that one month to be like the previous month and we suspect strongly, think in longer time-frames than the entrepreneurs do. In any case because they are employees, they must do what they can to implement national plans which they can influence to only a small degree. A senior administrator is institutionally bound to think differently and have more faith in planning because planning and the implementation of plans is what they are paid to do. Planning is an 'institutionalised' feature of what they do and helps to fix their preference for, say 'control', 'managing by exception' and 'measuring progress against planned objectives'. We have noticed that where national plans are not achieved then new plans are drawn up to try and correct shortfalls. Plans follow plans. As Grid-Group, Cultural Theorists emphasise, the administrator's way of thinking (Thought Style) is 'institutionalised' in the form of 'policies and procedures' and it would take extreme surprises to cause them to think differently. Being owners with their own 'skin in the game' the entrepreneurs have more autonomy to make changes so that paying attention to a wide range of occurrences of different types all of the time is meaningful.

One of the main aims in this thesis was encouraging Iranian entrepreneurs and managers to start thinking and acting differently by adopting anti-fragility. As a theoretical contribution in

support of this aim, we suggest that there are benefits to be had by synthesising Grid-Group Cultural Theory with what Taleb prefers to call his ‘anti-theory’ of Black Swan events. The benefit of the black swan argument is that it enhances awareness of uncertainty and of the importance of surprises. It should be noted that each of the *four* thought styles by Michael Thompson are worthy to be taken to the consideration because each thought style also comes up against surprises, in each case more specific than Talebian black swans:

- Hierarchical, obedient but rigid organisations do not bend in the face of changing circumstances. Stricter and stricter enforcement of rules, greater punishments and writing new rules makes things worse in these circumstances. What this achieves is making deviants out of more and more actors
- Egalitarian movements reach for high ideals but can fall apart due to the practical difficulties of leading ‘crowds’ which are suspicious towards most kinds of leadership and very suspicious of the leadership ‘systems’ which would enable them to continue to operate. They depend on charismatic leaders who are ‘at one’ with the crowd, but very difficult to replace
- Competitive (unregulated) reasoning can fill the oceans with plastic waste as a ‘side-effect’ of profit maximising
- Fatalistic thinking may work for the actor choosing this rationality, but it does not help others, especially if the techniques of survivalist cunning is not shared

It is worth reminding readers (particularly Iranian readers) that G-GCT could enable entrepreneurs and academic professionals to pay more attention to the inherent but conflicting *reasonableness* of each of the ways of thinking so that ‘poly-rational’ or ‘clumsy’ solutions may emerge from the *dialogue*. Thompson makes a convincing case for arguing that Arsenal

FC.'s Emirates Stadium (and other policy challenges) was the outcome of clumsy thinking ([https://www.youtube.com/watch?v=Rmz\\_t\\_V9sJg](https://www.youtube.com/watch?v=Rmz_t_V9sJg)).

Unfortunately, we can see a considerable gap between the universities and the business enterprises in Iran. That is, the author would like to try his best to fill this gap and we are quite confident that both parties could make great contributions to the country's progress if they met, talked to each other, disagreed reasonably and were assisted so that they could identify

- the types of reasoning's that they were using (and their practical limits)

while recognising and respecting the integrity and thoughtfulness of all four available positions

Grid-Group Cultural Theory teaches us the importance and role of different rationalities in any system (bureaucratic, team-based, market based, and even 'bunker mentality').

By encountering each other at problem-sharing symposiums, in 'management learning sets' and 'whole systems conferences' under the guidance of a facilitator who is familiar with GGCT, each actor could become more aware of how

- a) 'positive feedback loops' have fixed (limited) their thinking within their habitual thought style
- b) how other ways of thinking might be better at overcoming their worst difficulties. For example, Individual and Egalitarian reasoning questions the Hierarchical tendency to expand the rule books while Hierarchical thinking teaches Egalitarian and Individualistic thinkers fresh ways of sustaining long term projects
- c) how each specific thought style makes some problems worse rather than better
- d) that each thought style contains some wisdom

It is not so much a question of compromise as it is about creating forums where actors learn to think of solutions which would be unthinkable to just themselves working alone.

## 6.2 Recommendations and Implications

Having said this, because the risk season in Iran is particularly ‘uncertain’ and based on the interviews with petrochemical managers and entrepreneurs, several recommendations can be suggested, which could qualify as helpful in doing business in *any* chaotic environment. Although our reasoning (along with Taleb and Lindblom’s) is mainly Fatalistic, we acknowledge that other forms of reasoning also enter into the following recommendations which are derived from Thompsonian Grid-Group Cultural theory (as indicated). Note that by using G-GCT, Taleb’s more basic Fatalistic recommendations can be augmented in clear and practical ways:

- Reform and simplification of complicated governmental laws and regulations [based on Individual-Competitive reasoning] could contribute to market success within Iran including
- Establishing easy access to the Courts which uphold commercial contracts; and authoritative independent arbitration between contractors who are in dispute. The impoverished entrepreneur should have as much access to commercial courts as the wealthy entrepreneur has. By increasing trust in each other commercial contractors could have more confidence in each other, raising ‘business confidence’ overall. [The reasoning here is a ‘clumsy’ or ‘poly-rational’ hybrid of Hierarchical and Individual-Competitive reasoning]
- Upholding and inspecting standardized weights and measures; defining and upholding quality standards and product certification could have similar benefits [Hierarchical reasoning]
- Entrepreneurs everywhere have reasonable objections to taxation on the grounds that they limit investment and this was the case with more than one of our entrepreneur interviewees. However, from a Hierarchical point-of-view a regularized tax system and

efficient tax collection could reduce the state's dependence on raising income through the existing level of military ownership of so many of the more profitable businesses. If the tax system worked more fairly and if was enforced, then Iranian entrepreneurs could grow without worrying that commercial success might lead to the loss of their businesses [poly rational Hierarchical and Individual-Competitive reasonings with an Egalitarian appeal for a 'whole-system change', beneficial to all]

- Legal enforcement of customs restrictions on sub-standard goods everywhere protects high quality producers from undercutting by counterfeiters. Hierarchical thinking (as well as the three other thought styles to a lesser extent) is 'animated' by legal discrepancies and 'loop-holes' in current laws which make it easy for corrupt (deviant) business owners to import smuggled goods that undermine entrepreneurial incentive, reducing the confidence of investors wishing to start their business in Iran. Consequently, we emphasize that the state may need to impose more stringent border controls and monitoring to reduce the chances of smuggled and counterfeit goods reaching the market. [Here we have hybrid, poly-rational Hierarchical and Individual-Competitive reasoning which supports high quality, competitive but lawful producers]
- Several of the entrepreneurs interviewed highlighted different areas of laws that may require fundamental changes, to improve the probability of businesses thriving and surviving despite the black swans they were encountering in the chaotic business environment. The implication of what many said was that taxation should be levied at rates which recognized the different levels of risk which entrepreneurs were willing to take. Lower taxation of higher risks should enable entrepreneurs to take more risks, particularly in setting up new businesses. It follows in an interesting way that lower risk activities should attract higher taxes. [This is also a poly rational Hierarchical and Individual-Competitive recommendation. It argues reasonably and in a highly

innovative way that tax rates should be marketized so that risks are ‘priced more accurately’.]

- As an alternative to or in addition to differential tax rates for different levels of risk, the Government may consider the introduction of subsidies for entrepreneurs to mitigate the financial impact of black swans, contributing risk reduction in business activities that have clear society-wide benefits. This step appeals to Hierarchical, Egalitarian and Individualistic reasoning. By also promoting survival, it may also appeal to Fatalist reasoning. At a time of severe international sanctions and the sluggishness of the EU in meeting its promise to uphold the ‘Iran Nuclear Deal’, this distinctly ‘poly-rational’ measure should prove popular and effective. It does not satisfy any of the thought styles completely, but it gives each one a little of what they hope for. If Thompson is correct (and he has presented many case studies to back up his claims) the more rationalities which any measure contains, then the better its chances of success in meeting all success criteria at least partially. Because the impact of international sanctions is an example of what Thompson calls a ‘wicked problem’ (because it a) affects many people, b) can be approached in different ways, c) will transform into a new problem once any solution has been applied to it and d) will probably never be solved completely, the ‘institutionalization’ of poly-rational reforms in the entrepreneurial space have the best chance of assisting entrepreneurs but also many other actors.

It is frustrating to Hierarchical thinking that Iran has *complied* with the terms of the Nuclear Deal yet remains under sanction. (Compliance is being punished!) In these annoying circumstances thinking may shift in different directions:

- A Fatalist response is to shrug the shoulders and think ‘What more do you expect?! There is no point in trusting anybody’ with a further variant: resignation, despair and migration to other parts of the world, by whatever desperate means necessary
- A poly rational Fatalistic-Individualist response might be ‘If I can do it without getting caught, then I might try smuggling! Sanctions are a gift to smugglers’
- An Egalitarian response might be to stand shoulder-to-shoulder with all Iranians and strengthen Iran’s military and trading alliances in the face of overwhelming external threat and prepare for war
- An Hierarchical response would be to appeal to all forms of institutions upholding ‘International Law’ and ‘Global Governance’, also protesting Iran’s innocence before the ‘international court of public opinion’

All of these responses (and others which are thinkable) are rational reactions which confound President Trump’s aim of bringing about regime change in Iran. These possible forms of thinking might co-exist with an equally strong desire that Iran should undertake various reforms that are in line with recommendations of the international community with the aim of having the new American sanctions lifted and all other sanctions withdrawn. But having considered all of these possibilities, the Fatalist (surviving) Iranian entrepreneur will probably see no reason for abandoning his or her existing preferences for deferred decision-making and all the associated measures detailed earlier.

We recommend that symposiums in many formats as a way of promoting ‘clumsy’ solutions, arising from disagreements and dialogue between thought styles; but with the particular Talebian recommendation, presented by surviving Iranian entrepreneurs, that every solution should contain a significant element of Fatalistic reasoning and associated practices.

### **6.2.1 Continuous learning by entrepreneurs:**

The entrepreneurs and petrochemical managers are urged strongly to consider adopting and adapting Taleb's 'anti-theories' about black swan so as to be more mindful about the future when acting in the present, particularly in order to increase the robustness and antifragility of themselves and their companies. Due to persistent high-level uncertainty and rapid changes in the Middle East, entrepreneurs will need to exhibit an unusually high level of alertness and agility in coping with the black swan events, need to maximise not profit but survival chances, but also seize novel opportunities presented by unanticipated positive black swans. A hierarchical (managerial) way of thinking does not suit this imperative, at least not unless it is allied to Fatalistic reasoning. It could be noted that what can be learned from today's experiences would be of limited value for the future because, as argued, future circumstances will never quite reproduce current or past events. As Taleb argues, a sceptical orientation, also known as Stoicism, suits this state. It also reinforces the principle that what we do not know is more important than we know.

### **6.3 Further Research**

This study has been about managing for the future in chaotic environments, mainly focussing not on optimising profits but on optimization of risk mitigation among petrochemical manufacturers and entrepreneurs in Iran. We do not think that there is anything particular to 'Iranian culture' which either enhances or suppresses reasoning in Iran. All four thought-styles are available universally and are aroused differentially according to the understanding and presence of risks, ie. prevailing 'risk environments'. Anti-fragile principles also extended to most of the countries in the world because in the author's judgement we are entering a particularly chaotic 'risk season' in which the 'Pragmatist' stands the best immediate chances (Thompson, 2018) The election of President Trump, Brexit, complex civil wars in the region, re-establishment of a cold war between the Russian Federation and The West and their



unpredictable effects on stock market fluctuations, currency exchange rate volatility, oil, gas and gold price volatility can be considered good examples of black swans which also demonstrates chaotic unquantifiable causal interactions *between* each of these over incalculable time periods.

The scope for further research can be stated straightforwardly: any research into ‘strategy’ for any activity which is especially vulnerable to positive and negative black swans is to be encouraged. If our Talebian assumptions are correct, then contrary to orthodox thinking, stability and equilibrium do not provide the only or even the best conditions for profitable activity. It should be possible to find similar strategies to those practiced by surviving Iranian entrepreneurs amid the difficult circumstances across the former USSR, in any contested geographical areas, and even within territories affected by civil wars. But we do not wish to suggest that all actors who adopt Taleb’s principles have any guarantee of surviving. The author recognises that because he has survived for a considerable time, he has built up financial resources (buffers) that would not now be available to new entrepreneurs. For this reason, it makes sense to track and compare new with longer-term entrepreneurs operating in chaotic circumstances, and against these sub-samples, also new and older senior bureaucrats and technocrats.

We would also support further synthesis of Thompson and Taleb as this was a task that was initiated quite late in our research process. This is quite a complex task because

- a) Taleb simplifies his argument as if it was one between just *two* positions (we can call them paradigms)
- b) social science, especially sociology recognises *three* classic paradigms (Functional-Equilibrium seeking, Fiery and Forwards-Moving Conflict and Chaotic-Contingent Chancy worlds of coincidence)

- c) Grid-Group Cultural Theory recognises *four* thought styles which also represent world cosmologies resembling paradigms very much

In other words, should future research be based on the assumption that there are two alternatives to consider, three alternatives or four (plus clumsy hybrids of these four)?

This question is very difficult to answer, because there is no way of deciding absolutely how far models can be simplified and still be worth defending. We will try to make our thesis known to both Taleb and Thompson and seek their answers to this question. However, the author, along with Thompson are equally mistrustful of the neo-classical profit maximising 'efficient market hypothesis'. At best this grasps only twenty-five percent of the available reasoning and practices and at worst, in Taleb's judgement, a catastrophically misleading set of assumptions which leaves 'maximisers' especially vulnerable to bankruptcy as the risk season changes from boom to bust. These risks pose risks to Central Bankers and ultimately to government bail-outs which place risks on future generations.

Meanwhile at the international scale, we can see that for a mixture of competitive and hierarchical reasons, the world's value-added oil products refiners would rather keep those dominant businesses and geo-political positions for themselves. They would prefer to produce plastics from Iranian oil, outside Iran and gain the added value which can be created through the production of the polymers. There are some competitors in the Middle East who also refine high-value products from oil and gas, which will also resist Iranian progress in petrochemicals, because their market will be highly affected. Nevertheless, Iran should pursue favourable alterations in 'the terms of trade', if necessary as part of a renegotiated 'Nuclear Deal' with the EU, the Russian Federation and China, if not the USA. This is the time to test whether international belief in individualistic 'free market competition' is substantive or cynical rhetoric.

Nevertheless, if our Talebian position is to be maintained, positive surprises should not be ruled out, even if there are reasons for assuming that several countries will support continuing sanctions against Iran in their governments' belief that the ensuing chaos would be in their interests. We point out that chaotic systems are notorious (or famous) for generating unexpected consequences, which could be to strengthen Iran rather than weaken it, particularly by causing the spread of anti-fragile entrepreneurship practices to all branches of activity including innovations in petrochemical refining.

#### **6.4 Summary Recommendations**

Our more specific recommendations for resilience in downstream polymer production are as follows:

- Increase, expand and diversify petrochemical products within Iran, beyond the basic catalytic-cracking stages
- Creating added-value which is typically up to four hundred percent but which may be higher, for example in aromatic compounds such as perfumes and food-flavourings
- Enhanced antifragility accompanying reduced reliance on crude oil export which already face the 'headwind' of international sanctions and the simultaneous reduction of the need to import critical and needlessly expensive petrochemicals necessary for domestic consumption
- Further attainment of anti-fragility among shipping lines, insurance companies and banking systems with mitigation of the high transaction costs which sanctions have imposed
- Antifragility could be enhanced further if the number of destination countries for Iranian polymers was increased to lessen the risk of losing any of these markets without warning, due to, among other possibilities, shifts in geopolitical alliances

These steps are recommended for adoption at the national scale, however the following steps are recommended at the scale of individual Iranian entrepreneurs, again to minimise vulnerability to black swans and therefore increase antifragility:

- Diversify business fields (to put their eggs in different baskets) but grow organically out of existing surpluses where possible
- Train and educate the managers and employees about the black swan concept and the vulnerability of any system to them
- Avoid counting on a particular supplier or bank (increase the number of potential suppliers and financial authorities) even if this increases transaction- and debt-financing costs
- Iran is rare in that it is a country with enormous opportunities with the potential of becoming a closed economy, self-sufficient within its borders. This is due to its high levels of education and unusual richness in its range of natural resources. Consequently, young entrepreneurs should consider positive potentials and opportunities and not just threats. Significant market potential exists in Iraq, Afghanistan and other neighboring countries which matters most during while sanctions persist
- The assumption that what you don't know can be more important than what you know applies equally at individual as it does at company, industry, national and international scales. Some decisions which seems to be a high-risk action from others' point of view may be profitable and low risk for entrepreneurs who make that decision based on *real market knowledge*

## 6.5 Theoretical Contribution

We have found only one brief, passing reference to N.N. Taleb by Michael Thompson and no reference in Taleb to Thompson. Neither Thompson nor Taleb discuss each other.

Considering how little attention they have paid to each other, we think it is interesting and productive to introduce them to each other, here on the page. To close our argument the author has set up an imaginary dialogue between these two respective characters, based on what we think we know. The author characterizes N. N. Taleb as a fatalistic writer who considers *two* principle ways of thinking, the ‘Gaussian’ and the ‘Mandelbrotian’ (Taleb, 2008: 234), while Michael Thompson considers *four* ways of thinking and just as importantly, Thompson introduces two social (not psychological) dimensions which makes these four ‘thought styles’ *possible* (thinkable). We assemble the dialogue by quoting each author. First Taleb speaks to the following propositions:

- Life is affected disproportionately by unexpected events; the past is not a good indication of the future, he argues. Forecasting on the basis of the past experience can even be dangerous, known also as ‘Hume’s problem of indication. We have grounds for expecting Thompson to nod in agreement at this point. He comments that we cannot rely on past experiences as an indication of what will happen next ‘because Risk Seasons will transform sooner or later’ adding ‘All we can say from the evidence of the past for example in financial markets, is that risks seasons change in any one of *three* directions from the prior state, without warning’.
- Taleb might raise an eyebrow at the implication that there are four risk environments
- Even small causes can have big (surprising) effects, Thompson nods again. There *will be* ‘surprises’. Thompson comments that some ways of dealing with them are much more successful than others. ‘In any risk season, there will be one set of responses

which will make matters *a lot worse*. Actors will need to be willing to change their minds.’

- ‘Among all the causes at work, we don’t know which of them is going to have the large and widespread positive or negative effects which is what you mean by ‘surprises’ and what I mean by ‘black swans’, I think,’ says Taleb
- We know much less than we think we know, but, interrupts Thompson, our convictions will be good enough as long as they match the risk season *while it lasts*
- Taleb is not as convinced, stressing that ‘We should be very skeptical and suspicious of the knowledge we feel confident about, and about confident financial consultants especially.’
- He continues by arguing that it is wise to invest at around twenty-percent of what we own in diverse projects which have two qualities a) they should be highly improbable but b) highly beneficial (if they are realized). It should also be the case that we should be in a position to lose all of these investments. ‘As for the other eighty-percent, these should be c) highly probable but b) low in yields.’

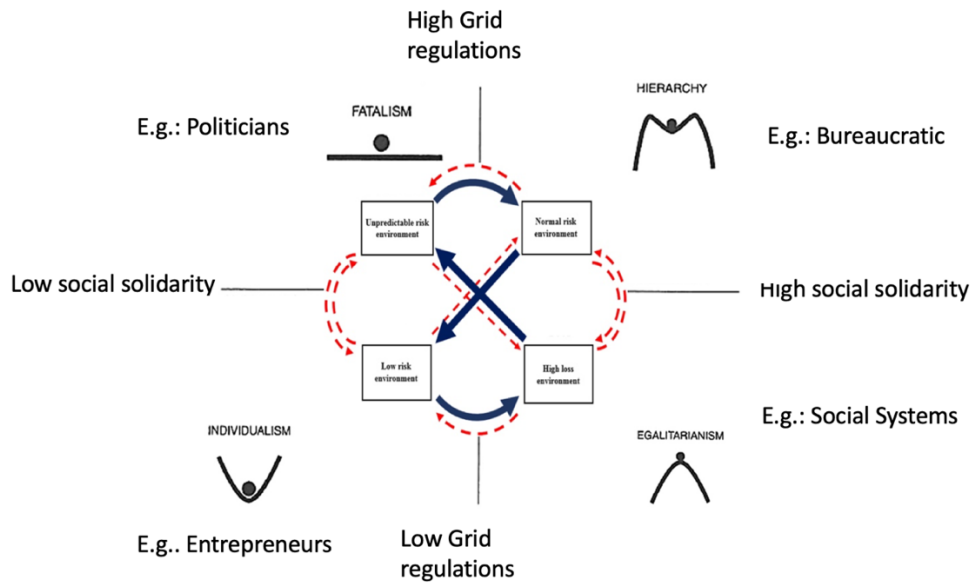
Taleb is a highly successful market trader by training and in practice, something of a philosopher and an accomplished statistician, he has not written from an academic position as a university professor, though he now holds a number of academic positions. He relies less on *social* science (anthropology, sociology) and more on individualistic economic and psychological theories of agency, especially evolutionary psychology (about which the neo-Durkheimian Thompson dismisses as unnecessary). Taleb considers only two principle sets of possibility (which we can identify as the Functionalist and Chaos paradigms), perhaps because a binary model is easier to construct and explain. However the anthropologist Michael

Thompson as a social theorist, (who is certainly interested in practice as well) claims *four* equally universal possibilities.

Our reading of Thompson suggests that he would be sympathetic to Taleb who he would recognize as promoting the ‘Fatalistic Thought Style’, but would also claim that Taleb has ‘about 25% of the thinking that is available’, because for Thompson there are four possibilities, plus what he calls ‘clumsy’ or ‘polyrational’ hybrids formed out of two, three or four of the thought styles. They both agree strongly that the world is non-linear, that is, chaotic and that this is a source of risk and of fresh unanticipated positive possibilities. Indeed, Thompson has travelled the world studying ingenious solutions to risks and his writings have clear relevance to countries like Iran. For example, Thompson has spoken of his admiration for Darius, the Persian King who devised an interesting scheme for financing Persia’s system of irrigation canals. These were constructed voluntarily for no payment(!) on the promise of unlimited future tax reliefs to the direct descendants of canal diggers willing to work on canal projects for free. The improved agricultural prosperity which the canals created benefitted all incidentally, more than offsetting the tax-relief given to the constructors. This was a poly-rational arrangement.

We sense that to expand the reach of black swan theory worldwide we should take the dimensions and possibilities identified by Thompson into consideration and especially, acknowledge the existence of four different ‘risk seasons’ and the more or less successful ways of surviving them (below).

Why four? We present a Thompsonian diagram summarising Grid-Group Cultural Theory, but in a way that matches Taleb’s arguments providing an overview for the readers.



### Four Thought Styles: Grid-Group Cultural Theory and Risk Perceptions

Thompson disagrees with Taleb in that Thompson argues that people (indeed actors at any scale) are *cultural subjects*. Thompson does not rely at all on actors' 'animal' natures, but Taleb does. For Thompson all actors are cultural actors, not psychological types. The four kinds of reasoning that are available to individual 'cultural subjects' are identical with the types of reasoning which organisations (and even whole industries, governments and global bodies) have available to them. His argument is 'fractal' working at any scale.

These four different risks (and ways of thinking about them and responding) are placed in the above table. They are defined and made possible as thoughts and actions by the two defining entirely social/ cultural dimensions: 'Grid', the degree to which we are subject to *Social Regulation* (strong and weak), and 'Group', the degree to which we are bound together in *Social Solidarity* (strong or weak). As both dimensions range between Strong and Weak, this allows for the four cells.

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· Here the terms 'social' and 'cultural' are used inter-changeably



The outright competitive and profit-maximising Entrepreneurs occupy the bottom left ‘Individualism’ sector of the diagram, where the reasonable values are *competitiveness, profit maximizing, success* and where ‘winnings belong to winners’ (Weak Social Regulation/ Weak Social Solidarity). The highest ‘risk appetite’ is a logical feature of this way of thinking.

The Egalitarian way of thinking is defined by Weak Social Regulation/ Strong Social Solidarity (‘Low Grid/ High Group’). Here equality and collective improvement for everybody is the main concern. This is an equally reasonable way of thinking, but the rationality employed is different to the Individualist thought-style because here other people matter, while to the Individual way of thinking it is the weakly regulated self that matters most. This is the reasoning which animates great social movements, such as the one which swept Ayatollah Khomeini to power.

Hierarchical thinking and the systems it creates (bureaucrats and bureaucracies, deference towards experts) are located in the Strong Social Regulation/ Strong Social Solidarity quadrant (‘High Grid/ High Group’ position, top right). Here a lot of trust is placed in Rule Books and punishment of deviance. The, again reasonable argument goes that ‘we can trust each other if everybody sticks to the rules’.

Fatalistic reasoning (such as politicians in precarious positions) occupy the most unfavourable or chancy ‘risk environment’ as defined by High Grid (Strong Regulation) and Low Group (Weak Social Solidarity). This equally reasonable cultural possibility (and its associated survivalist practices) is presented in the top-left cell.

In each case the ‘ball’ is positioned on different kinds of slope representing how each way of thinking judges the level of risk that is present. Consider what happens as the ball begins to move either rightwards or leftwards in each set of circumstances. In this way, cultural theory explains whether and why actors think a) whether stability is attainable, b) the degree of risk present and c) the amount of effort that is called for to keep things stable. In other words, risk

perception varies very much and what some ways of thinking treat as normal and stable, other ways of thinking read as highly dangerous. He emphasises that all four positions are rational but nevertheless they conflict in ways that stimulate debate and new thinking. With Taleb, Thompson sees that there is 'no equilibrium point', but here in culture and it is Thompson who identifies that financial markets are cultural artefacts. He agrees with Taleb that there can be no equilibrium point in practice, but for different reasons.

The G-GCT diagram is useful because it *explains*

- a) why surviving Iranian entrepreneurs perceive risk everywhere
- b) why they seize what opportunities they can where and when they can
- c) why the senior managers, technocrats and bureaucrats interviewed see the world differently and act differently

How? The surviving entrepreneurs combine Fatalistic mistrust and a preoccupation with survival with Individualistic competitive enthusiasm to create what Thompson calls 'clumsy solutions' or 'poly rational solutions', only when opportunity is present.

It is clear from the diagram that Taleb's black swan theory

- a) occupies the top left Fatalist quadrant
- b) the positions which Taleb attacks so fiercely are the 'Profit Maximizing' competitive Individualist reasoning found in the bottom left hand cell and the 'tyranny of experts' which is defined by the top-right Hierarchical form of reasoning (the proposition that the people at the top know best and should be obeyed)

In other words, it is fairly straightforward to place Taleb in one corner of Thompson's larger picture of what it is culturally possible to feel, think and do. It is also possible to place our thesis, findings and recommendations (and our criticisms of 'Strategic Planning') within this diagram. Notice that each way of thinking offers what it thinks is the best available strategy,

but that for each position there are three positions which will argue for different strategies. According to Thompson's recent arguments (2018) each strategy only works well if the 'risk season' suits it and it fails badly or even catastrophically if it is followed during the wrong season. For example, the Individualistic, profit maximizing strategy works brilliantly in a 'boom' season but fails terribly during 'bust'. Most important here, the Fatalistic survivalist strategy which we have been advocating suits risk seasons of extreme uncertainty. The bureaucratic administrator who trusts in rules and procedures would do well in stable times but sticking to the rules is a mistake when they no longer work as the risk season shifts. When the entire community is face with a threat to its existence, then exceptional courage and solidarity in the face of that threat is the appropriate rational response and thinking will likely move in this direction. But notice that psychological models struggle badly to explain why an individuals' or an institutions' thinking changes. Psychological 'types' are supposed to be lasting, yet cultural thought shifts.

We see now, that as a surviving Iranian entrepreneur, my habits and the actions and the actions of the other surviving entrepreneurs we interviewed (deferred decision-making etc) suit the risk environment which has persisted in Iran for decades. The author's reasonable intuition is that his way of conducting business affairs might be scaled up to apply across Iran's downstream petrochemical and future diversified polymer-producing sectors. In other words the authors feelings, thoughts and actions may be both explained and supported by Thompson, given the prevailing risk environment in Iran. We emphasise that to cultural theorists, but not to Taleb, our perceptions of risk and opportunity can be had by individual actors, groups, professional associations, industry sectors, ministries, governments and international agencies. They will be the same four possibilities and the same disagreement between them whatever the scale.

The author believes that from the dialogue between Taleb and Thompson which he has constructed, that there is ‘culturally available’ reasoning behind his preoccupations and recommendations. In the present circumstances of my country we urge senior managers and administrators to rely and believe less in planning and more in surviving negative black swans, improving the probability of rare but exceptionally positive black swans.

### **6.6 A Limitation**

During a few interviews, we sensed that some petrochemical managers were reluctant to express their feelings, thoughts and plans because they have a reasonable wish to avoid avoidable risks including the possibility that by being too candid, they might lose their positions. As senior figures, they have to be considerate of political constraints and their need to maintain good relations with the elite. They are, after all agents of various national plans and have a defined and formal responsibility for bringing these plans to life. In other words, they face additional risks and constraints which independent owner-managing entrepreneurs are not so limited by.

However, the reader may notice that their reasonable wish to survive and their sensitivity to risk is not so completely different to the surviving Iranian entrepreneurs wish to survive. In other words, though there are significant differences between our two interview samples, they share a reasonable sensitivity to risk which Thompson would identify as Fatalistic and which Taleb would probably approve.

In a risk season of many dangers it makes sense to be cautious. But it also makes sense to act quickly to seize the positive black swans which will come along. Our argument is also that no opportunity should be regarded as ‘golden’ in the way that the Individualistic ‘profit-maximiser’ tends to see it. Pursuing an opportunity as far as it will go will end in tears when the ‘risk season’ changes again.

From Thompson's 2018 article, we see that other risk seasons may come to Iran eventually and his cultural insights into "*How Banks and Other Financial Institutions Think*" is probably the second most important text which the author has come across (after Taleb's essays). What Grid-Group Cultural Theory enables us to see is that Taleb should consider a wider range of possibilities. He may yet concede that actors are not irrational animal psychologies overtaken by new artificial (social) risks but always act rationally given how they see things. They have differing preoccupations and disagreements about what is to be done. Between Taleb and Thompson we now understand how and why actors get things right and wrong and in which circumstances.

In a world, which can never attain equilibrium, this thesis cannot be treated as 'the last word'. But it provides a set of working hypotheses and viable practices which can be recommended to entrepreneurs and some indications of how these can be adapted for use by senior managers who find that their best laid plans are spoiled by events which they were not able to see coming. These recommendations *could* be relaxed or revised only when and if risk seasons change.

It is common to call for 'larger samples' in future research. But what strikes the author as more important is to develop greater understanding of the 'poly-rational' solutions which Thompson has found and to devise forums and symposiums where different forms of reasoning and competing recommendations are brought into contact. The question we end with is this:

'What can facilitators do to enable actors to see the value in each other's reasoning, recognize limitations in their own, and come up with novel solutions that are unthinkable except in a gathering of different minds?' The author proposes to convene these gatherings under conditions which are not just uncertain, but dangerous. To do so may demand of us a risk appetite greater than we are used to.

At the end of this thesis I would like to record my appreciation of my supervisor Dr. Stephen Smith. His kind and friendly support throughout the past five years was beyond expectation. He used his skills to make my tacit skills more visible to myself. His knowledge of approaches to 'managing for the future' as he calls it, which included Nicholas Nassim Taleb and Michael Thompson, have enabled me to understand why actors act the way they do and how they could learn to feel, think and act differently. Dr. Smith enabled me to think abstractly as well as practically and instinctively. It has been refreshing to go beyond the familiar literatures on strategy to see that academic scholars are also 'cultural subjects' with the same various 'thought styles' that also bring non-academics into sincere disagreements over what to do for the best.

Once one sees where thoughts and actions come from, there is no going back to simple 'five step' change management models with their naive and usually hierarchical assumptions that the person at the top always knows best and that the secret of success is to implement those steps one after the other.

This realisation deserves to be shared with Iranian entrepreneurs and senior managers especially. However, the mix of ingenuity and caution that already well-developed in Iran has global implications and we are pleased to bring this to wider attention.

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بر روی بوم زندگی، هر چیزی خواهی بکش  
زیبا و زشتش پای توست، تفسیر را باور نکن  
تصویر اگر زیبا نبود، نقاش خوبی نیستی  
از نو دوباره رسم کن، تصویر را باور نکن  
خالق تو را شاد آفرید، آزاد آزاد آفرید  
پرواز کن تا آرزو، زنجیر را باور نکن

On the canvas of life, draw whatever you want

Whether beautiful or ugly it's your job, do not believe in destiny

If the image was not beautiful, you are not a good painter

Draw it again, don't believe in the picture

You were created happy and free

Fly towards your dreams, don't believe in the chains