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# FRAGILITY OF INTEREST-BASED DEBT FINANCING: IS IT WORTH SUSTAINING A REGIME UNCERTAINTY?\*

*Mughees Shaukat, Abbas Mirakhor, and Nouredine Krichene\*\**

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## *Abstract*

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*Evidence has been mounting that the interest-based debt financing regime is under increasing distress. Evidence also suggests that the financial crises, whatever title they carried - exchange rate crisis or banking crisis – have been debt crises in essence. At present, data suggest that the debt-to-GDP ratio of the richest members of the G-20 is expected to reach 120% mark by 2014. There is also evidence that out of securities worth US\$ 200 trillion in the global economy, no less than three-fourth represents interest-based debt. It is difficult to see how this massive debt volume can be validated by the underlying productive capacity of the global economy. This picture becomes more alarming considering the anemic state of global economic growth. There is great uncertainty with regard to interest rates. Although policy-driven interest rates are near-zero level, there is no assurance that they will not rise as the risk and inflation premia become significant. Hence, a more serious financial crisis may be in the offing and a general collapse of asset prices may occur. This paper argues that the survival of the interest-based debt regime is becoming less tenable, as is the process of financialization that has accompanied the growth of global finance over the last four decades. It further argues that Islamic finance, with its core characteristic of risk sharing, may well be a viable alternative to the present interest-based debt financing regime.*

**Keywords:** Regime Uncertainty, Ambiguity, Complexity, Black Swans, Debt Stress, Islamic finance, Risk-Sharing.

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## I. INTRODUCTION

At a time when the global economy is suffering from a crisis of confidence, structural imbalances, large fiscal deficits, too easy money policies, high inflation and unemployment, and subdued growth prospects, a growing sense of uncertainty prevailing world over is palpable. Evidence has been mounting that the interest based debt financing regime is under ever increasing distress. It has been shown that crises whatever label they carried– exchange rate crisis or banking crisis – have been debt crises (Reinhart and Rogoff, 2009). Empirical research suggests that debt-to-GDP ratio of the richest members of the G-20 will reach 120%

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mark by 2014 while by 2020 the U.S. and other major European centers would amass a ratio of at least 150%, with Japan and U.K. going to 300% and 200% respectively. Even more disconcerting is the projected interest rate paths on their debts which would increase from 5% to 10% in all cases, and as high as 27% in U.K (BIS, 2010). Moreover, there is also evidence that out of securities worth \$200 trillion in the global economy, no less than three-fourth represent interest based debt (Rogoff, 2011). This picture becomes more alarming when it is realized that the growth of the global economy is anemic at best while the interest rate on debt is sure to exceed the rate of growth of global GDP for the foreseeable future. According to the World Bank, global GDP is projected to increase 2.5% in 2012, with growth accelerating to 3% and 3.3% in 2013 and 2014 (World Bank, 2012).

Fiscal austerity measures taken as remedial response are further weakening growth and employment prospects, making fiscal adjustment and the repair of financial sector balance sheets all the more challenging. With still rapidly building debt, excessive fiscal deficits, massive unemployment, and falling real-incomes uncertainty has increased regarding how economies, capital markets, and international trade and finance will evolve. Likely scenarios of hyperinflation or prolonged stagflation cannot be discarded easily. *Policies appear to be locked into the same regimes of near-zero interest rates, negative real interest rates, and rapidly rising public and private debt that led to the economic and financial collapse earlier.* Stock markets and housing markets are going through renewed bubbles fuelled only by credit multiplication and near zero interest rates.<sup>1</sup> Exchange rates are highly unpredictable. In Europe, concerns and uncertainty about the institutional integrity of the eurozone – key to the architecture of modern Europe – continue to mount.

The World Bank in its latest report on Global Economic Prospects, 2012 suggests that Banking-sector deleveraging is cutting into growth and developing country capital flows, faced with rising funding costs, increased counter-party risk assessments, deteriorating bank-asset-quality, and growing concerns over the adequacy of capitalization. Even if the threat of a full-blown crisis is somehow averted, elevated fiscal deficits and debts and the very loose monetary policies being pursued in the high-income world, proposes that for the next several years the external environment for both developed and developing economies is likely to remain characterized by volatile capital flows and unsettled business sentiment. As a result, it is becoming harder to gauge the impact of the constant surge in financial market turmoil on the real sector of the economy, but it is almost certain to be negative. How negative is extremely uncertain. This uncertainty extends to the stability and sustainability of the international economic and financial system.

These developments and the fragility of the global financial setup signal the presence and growing sense of a “*regime uncertainty*”; uncertainty regarding the benefits and costs as well as the sustainability of the regime of interest rate based debt finance Robert Higgs (1997) argued that the depth of uncertainty and ambiguity surrounding the policy regime and its

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<sup>1</sup> The U.S. Federal Reserve has been implementing most unorthodox money policy in the U.S. history of money printing and credit creation at near-zero interest rate under the so-called quantitative easing programs.

economic and financial consequences is the essence of ‘*regime uncertainty*’; a phenomenon that aggravated the ‘Great Depression’ (Higgs, 1997). Moreover, the continuing adverse economic and social consequences, as well as the failure of significant policy actions to elicit the desired response, provide evidence that the global financial system displays the characteristics of a ‘*complex system*’. The financial sector is now being increasingly thought of as a system governed by feedback processes or knock-on effects (Johnson, 2007). It means that the system is influenced by past events, nullifying any ‘random walk’ phenomenon (Mandelbrot and Hudson, 2004 and Peters, 1996). The system corresponds to ‘critical state’ phenomena in which the long-range dependence between the elements can affect massive systemic changes due to small changes in certain parameter; another important feature that assures the complexity of the system (Bookstaber, 2011). The U.S. subprime crisis can be clearly referred to as one of those small marginal changes that have affected the dynamics of the whole system. Given the events in countries such as Greece subsequent to the 2007/2008 US crisis, it appears that the global financial system is at a point where a sovereign default by one country can prove chaotic to global economy. According to Mauldin and Tepper (2011)

*“When things are unstable, it isn’t the last grain of sand that causes the pile to collapse or the slight breeze that causes the ruler on your finger tip to fall. Those are proximate causes. They are the closet reasons at hand for the collapse. The real reason though, is the remote cause, the farthest reason. The farthest reason is the underlying instability of the system itself”.*

United Nations system, in various publications such as the *World Economic Situation and Prospects* and the *Trade and Development Report*, has suggested that the complexities and the vast interconnectedness of excessive risk-taking in financial markets with the problem of the global imbalances, volatile commodity prices, pervasive economic uncertainty and declining trends in productive investment have made economic crisis systemic and synchronized worldwide; hinting that the crisis is fast turning into a humanitarian disaster if necessary measure are not taken to address the systemic flaws in the international financial architecture.

Hence, there is increasing uncertainty regarding the stability and sustainability of the interest rate based debt financing regime; exacerbating the perception that the present financing system is unable to mitigate effectively the risks to the global economy. The search is on for a paradigm shift towards a less volatile and more resilient system<sup>2</sup>. The purpose of this study is to suggest that Islamic finance provides such an alternative to the present crises-ridden conventional finance, in form of a financial system that is based on “*Risk Sharing*”. *Quran and Sunna* strictly forbid interest (Riba) contracts and any form of riba. Moreover, Allah

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<sup>2</sup>For further evidence on the ongoing search for a more stable economic alternative, see *Richard Heinberg, Transition Networks, The Centre for the Advancement of a Steady State Economy, Positive Money, Breakthrough Capitalism, and the New Economics Foundation*, among many other international organizations, all exploring ways to create more understanding and strategies for necessary and urgent change.

discourages hoarding; hence, investment and risk-taking are fully permissible. Many writers during the 19th and 20th centuries have strongly advocated a risk-sharing system very much reminiscent of Islamic finance (Holt Carrol, 1848, Amasa Walker, 1873, The Chicago Plan 1933, Murray Rothbard, Maurice Allais, etc.)

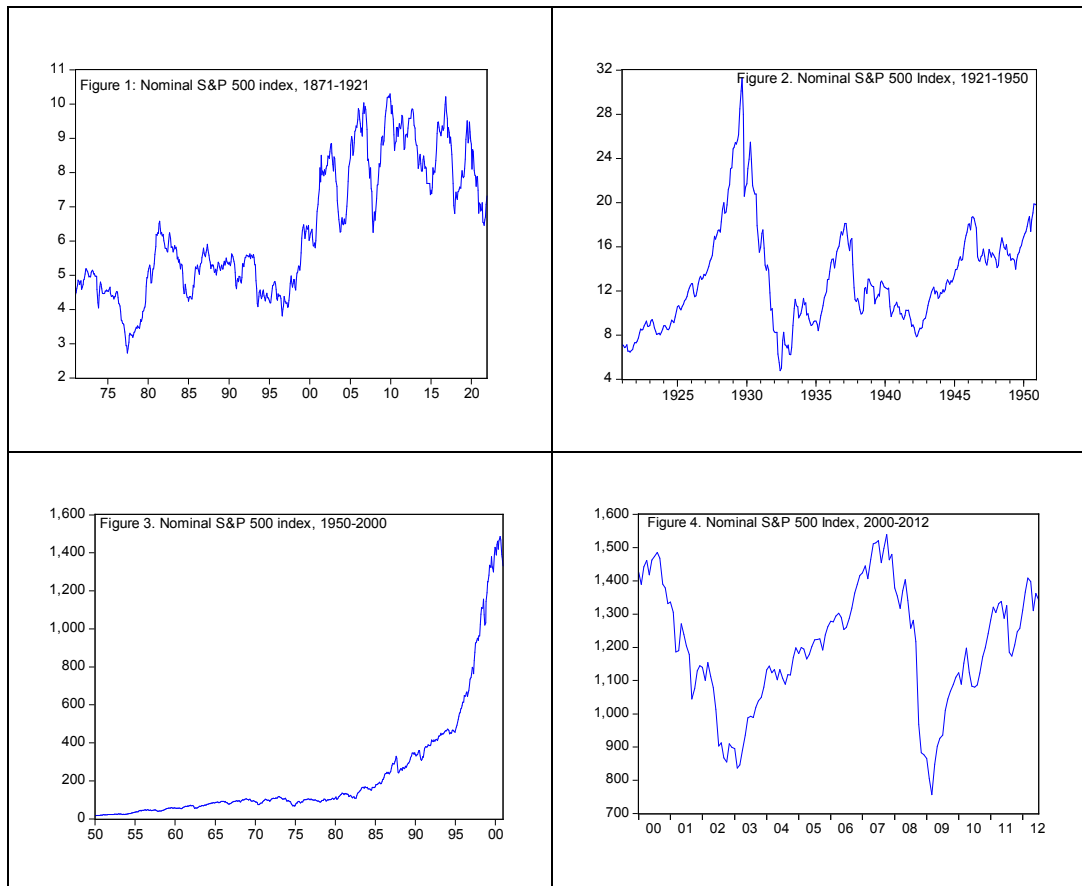
Since it is the contention of this paper that Islamic finance is all about risk sharing, it proceeds to discuss briefly the notions of risk, uncertainty and ambiguity in Section II. It then elaborates on the present debt overhang that has created debilitating fears of contagion and recurrence of another full-fledged global crisis. These fears are exacerbated by the complexity of conventional finance. Section III discusses the concept of complexity and the need for a shift towards a different financing regime. Explanation of the notion of ‘regime uncertainty’ comprises the content of Section IV. Section V contains a discussion of the inherent instability of the interest-based credit system. The Islamic approach to money and finance is discussed in Section VI. Sections VII and VIII of the paper argue that the new regime will need to be based on the idea of risk sharing – the essence of Islamic finance. The discussion of risk sharing focuses on how such a system can create stability and resilience in the individual economies as well as in the global financial system and thus reduce the frequency and severity of crises that have plagued the global economy. Based on the risk sharing principle, Section IX thus argues that innovative approaches are required to promote Islamic capital markets. Finally, Section X concludes the discussion.

## **II. RISK, UNCERTAINTY AND AMBIGUITY**

Decisions are made, at times, based on available probability distribution of expected events. This is decision making under risk. Unlike risk however, uncertainty describes a situation where a known probability distribution is not available but it is still possible to make decisions with some subjective estimates of probability of outcomes of actions or decisions. In the 1960s this view was modified to cover circumstances under which human cognitive ability and information availability are so constrained that even subjective assessment of outcomes was not possible (Ellsberg, 1961). Ambiguity arises under circumstances where the intensity of ‘ignorance’ can create paralysis in decision making (for detail discussions see Erbas and Mirakhor, 2007 and 2010).

Much uncertainty has prevailed in capital markets in the recent decade creating an environment less conducive to long-term investment in the real sector and more attractive to financial speculation. This uncertainty has been caused by distortive and destabilizing policies of the major reserve currencies. Because of their dominance in international trade and finance, these policies have adversely affected other economies. Uncertainty characterizes stock prices, housing and bond prices, commodity prices, interest and exchange rates. Although uncertainty existed in the past, it has become too excessive in recent times. To illustrate, US data provide an example of how policies have exacerbated uncertainty. Figures 1 to 4 exhibit movements in the S&P stock index over the period 1871-2012 and illustrate volatility associated with uncertainty. Table 1 below provides the percentage changes of the S&P Index over the same period.

**Figures 1-4: Volatility of the S&P Stock Index**



Source: <http://www.irrationalexuberance.com/index.htm> and Yahoo finance

**Table 1: Percentage Changes of S&P 500 Index, 1871-2012**

Years	1871-1921	1921-1950	1950-2000	2000-2012
<b>Mean (in percent)</b>	1.62	5.70	9.238	0.56
<b>Standard deviation</b>	11.32	20.96	11.50	14.36
<b>Jarque-Bera</b>	7.25	3566	98.2	113.47
<b>Probability value</b>	0.027	0	0	0
<b>Memorandum items</b>				
<b>US real GDP growth</b>	3.77	3.94	3.63	1.75
<b>Standard deviation</b>	5.29	8.01	2.41	1.96

Source: <http://www.measuringworth.com/>

The period 1871-1921, although characterized by few severe crises in 1873, 1895 and 1907, displayed a moderate rate of shares appreciation at 1.62%. Uncertainty measured by the standard deviation of the stock price changes at 11.32% was relatively high in relation to real gross domestic product (5.29%). The normality assumption for the percentage changes may be accepted with a probability value of 2.7%. It is noteworthy that during the sample period

1871-1921 stock booms were relatively short-lived; stock price crashes were also brief and represented corrections for over-valuation of shares. Crises were of short duration, followed by prompt and spontaneous recoveries. There was no systematic monetary policy designed to forcefully propel stock prices or re-inflate prices in general.

The sample period 1921-1950 exhibited higher uncertainty measured at 20.96%. The rate of appreciation of stock prices was high at 5.7%. The sample period was characterized by one of the longest stock booms (1921-1929), sustained essentially by expansionary monetary policy of the Federal Reserve in the form of very low interest rates and considerable liquidity injection, and by a large amount of credit, called 'call loans' or 'brokers' loans, from domestic and foreign sources. The resulting high liquidity fueled significant speculation in real estate and share prices. Although, the stock boom became too speculative and clearly unsustainable, no policy maker dared to sound the alarm, "take away the punch bowl", and spoil the party. The rate of annual appreciation of stock prices was 18.1% during 1921-1929. Since companies pay only dividends, the rate of appreciation is an excess return paid, not from the profits of the companies, but by players participating in the stock market, a zero-sum game. For the boom to continue there should be buyers who are willing to transfer wealth to speculators indefinitely into the future. However, if more buyers realize that shares have become too overvalued, and the price-earnings ratio has become too high, the boom exhausts its momentum;<sup>3</sup> the stock market was bound to crash in October 1929, and exhibited considerable volatility thereafter.

The sample period 1950-2000 could easily be split into two sub-samples 1950-1987 and 1987-2000 market by one-day crash of 20% in October 1987. The Fed (Federal Reserve System, the central bank of the United States) responded to the 1987 crash by an overly lax monetary policy designed to prop up share prices and extend the stock market boom. The policy of supporting stock prices became known as the Greenspan put. Stock prices appreciated at a very high rate of 9.3% per year during 1950-2000 (Mirakhor and Krichene, 2009). Since companies pay only dividends, the excess returns on stocks over companies' net profits were generated essentially through real transfers of wealth to the gainers from the stock price appreciation. As in the period 1921-1929, the stock boom was too prolonged for the same reason, namely the lax monetary policies that provided abundant liquidity to speculators, including the yen carry trade of the 1990s. The continuation of this policy regime became unsustainable and the crash ensued dramatically.

The sample period 2000-2012 was characterized also by a lax monetary policy of the US Federal Reserve. This period witnessed the worst financial crisis (2007-2008) since the Great Depression and spread financial chaos to the rest of the global economy. Striving to revive the stock boom and prevent deflation of stock prices, interest rates were lowered to one

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<sup>3</sup> The degree of over-valuation is measured by the difference between the market price and the theoretical price of a share. The latter is equal to the expected dividends discounted by a normal rate of return. For instance, if a share is expected to pay a dividend of \$4 per year and if the discount rate is 5%, then its theoretical price is a maximum of  $\$4/0.05=\$80$ . If it trades at \$100, then it is overvalued by \$20. Such a share is preferably to be avoided by long-term investors.

percent during 2002-2004 and massive liquidity was injected into the economy disrupting the housing market as well as the stocks, commodities and exchange markets. The result was an uncertain and distorted environment that rarely encourages long-term investment in the real economy. In spite of near-zero interest rates and massive liquidity injection, stock prices could not be propelled back to their peak.

Uncertainty was not confined to the stock market alone; it also spread to commodities, bonds, and exchange markets. Commodity prices recorded two-digit inflation during the decade 2002-2012. Food prices reached very high levels, causing food riots in some countries. Exacerbated by the wide spread use of commodity indices, crude oil prices rose from average of US\$ 18/barrel in the 1990s to a record of US\$ 147/barrel in 2008. Gold prices rose from US\$ 250/ounce in the 1990s to a record of US\$ 1860/ounce in 2011 (<http://www.ft.com>).

Exchange rates also displayed large volatility with partner nations engaging in currency wars. Currency markets became more propitious to speculation and less favorable for long-term capital movements as foreign exchange risk becomes too high for stocks and bonds. Moreover, easy monetary policy forced interest rates to near-zero level in 2008 and afterwards. In view of the fiscal deficit that currently exceeds 10% of GDP and the high level of the US debt, the interest rates may be kept at near-zero level for a long time in the future as happened during 1930-1950 when the policymakers forced interest rates to very low levels thus creating a liquidity trap and discouraging long-term investment in the real sector of the economy. If interest rates rise, all asset prices crash, which will cause a capital loss to wealth holders.

Besides the uncertainties regarding asset prices, there has been considerable uncertainty regarding consumer prices. Excessive fiscal deficits financed by monetization contribute significantly to increase consumer prices. There is also uncertainty regarding economic growth. In the 1930s, unlike the current periods, there was abundance of working capital in the form of large supplies of agricultural products and raw materials as demonstrated by significant fall in the prices of these products during 1929-1937, which, in turn, helped recovery. Combined with an energy policy that diverts food grains into fuel and severe drought conditions, speculation using instruments such as composite commodity indices have built significant upward pressure on food prices. The risk of emergence of food crises across the world and spread of famine and malnutrition cannot be dismissed. In the US alone 47 million live on food stamps (<http://www.usda.gov/>). Food prices have doubled and tripled in the last six years and food price inflation has been on the rise. Crude oil production is limited to a maximum of 87 million barrels and could be a constraint on economic growth which will also be constrained by excessive fiscal deficits as these deficits contribute to reduced real saving necessary for investment in the real sector of the economy where real economic growth originates.

It appears overall that uncertainty in the capital and commodities markets has strengthened in the past decades. The above data can be replicated in other industrial countries that have followed the same policy regime. Considering policy decisions made over time whose consequences are reflected in Table 1 and Figures 1-4 above, it appears that a concept



advanced by the system theorist Ilya Prigogine (1980, 1989 and 1997), namely the “point of bifurcation” has been operating to increase regime uncertainty. Chaos theory argues that a “complex system” approaching a bifurcation point becomes so sensitive that it can amplify small changes into large feedbacks. Decisions made at such points lead the system either toward greater chaos or toward higher order (Mirakhor and Hamid, 2009: 231; Prigogine, 1980). From the historical records reported above, it appears that at every bifurcation point policy makers have made decisions that have rendered the system more unstable.

### **III. COMPLEXITY OF INTEREST-BASED DEBT FINANCE**

The interest-based system was generally assumed superior to the interest free system on the criterion of efficiency and stability (Chapra, 2007). However, both the efficiency as well as the stability argument in favour of the conventional interest-based system of financial intermediation seems to have been substantially weakened by the crises it has experienced over the last few decades. According to one estimate, there have been more than 100 crises over the last four decades (Stiglitz, 2003, p. 54). The crises engulf even those countries that generally appear to follow sound fiscal and monetary policies.

A number of economists have made an effort to determine the causes of the crises. Some consider financial liberalization to be the cause in an environment where financial systems of many countries are not sound as a result of improper regulation and supervision (Bisignano, 1999; Glick, 1998). Others feel that the ultimate cause is the bursting of the speculative bubble in asset prices driven initially by the excesses of financial intermediaries (Krugman, 1998). It has also been argued that the root cause of the crises was the maturity mismatch: short-term international liabilities were far greater than short-term assets (Chang and Velasco, 1998; Radelet and Sachs, 1998). Even though all these factors had some role to play in the crises, no consensus seems to have developed so far in pinpointing the ultimate cause or the cause of all causes (Chapra, 2007, 2008).

However, there is an alternative view which holds that instability and crises are inherent and unavoidable in financial capitalism, because the structure of firms and households is inherently fragile and the emergence and confluence of certain conditions convert fragility into instability and crises (see Mirakhor and Krichene, 2009), to which increased debt, excessive leverage, maturity mismatches, structural imbalances and hence a lack of market discipline (Chapra, 2007, 2008) and fat tailed events are associated (Taleb, 2007/2010). Robert Holland, who has spent 25 years at various positions in the Federal Reserve System, asserts that the ‘instability’ is deeply rooted in the prevailing system, “I do not believe that financial instability is born of bad management or lousy regulation. It is inherent in the kind of financial system we have built and seem to like”.<sup>4</sup> It is under the purview of this view that the focus is further strengthened on scrutinizing the elements which necessarily render the system inherently unstable.

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<sup>4</sup> Robert C. Holland in his speech at the 1985 conference titled “The Problem of Financial Stability”, in ‘The Search for financial Stability: the Past 50 years’ (ed.), Federal Reserve Bank of San Francisco, p. 1

Such insights as well as the increased non-linearity in the system, where small marginal changes are carrying global impacts, seems to have also added impetus to the idea of observing the financial system through the lens of ‘*Complexity Science*’ – including the *Chaos Theory*. Evidence is mounting suggesting that the interest rate debt based financial system has indeed become *Complex*. Consequently, discussions on the complexity of the present system and its connections with the forces which render the system uncertain and unstable seem to have surged (Mirakhor et. al., 2012).

To understand the dynamics that have generated the present uncertainty about the interest-based financing system, it would be helpful to note what is meant by a system and indicate differences between simple, complicated and complex systems. A system is defined as “*set of elements standing in interrelations*” to one another (Von Bertalanffy, 1969: 38). Or, as Meadows (2000: 2) elaborates “*A system is a set of things—people, cells, molecules, or whatever—interconnected in such a way that they produce their own pattern of behavior over time.*” How predictable that “*own pattern of behavior over time*” may be, depends on the nature of the system in terms of the degree of simplicity or complexity of the rules governing the interrelationship among its elements. A simple system is quite predictable because of the simplicity of its operational rules. For example, old cars had simple starting operations: placing keys in the ignition to start the engine. This represents a simple and predictable system. Complicated systems contain subsets of simple systems. Their complicated nature is often related not only to the scale but also to issues of coordination of specialized expertise. Complicated systems are also predictable (Holland, 1995). In contrast to the old cars, newer and more technically advanced automobiles represent complicated systems. Instead of a key in the ignition, push button remotes are used to start an engine. Despite considerably more complicated technologies, modern automobiles still represent predictable systems.

Complex systems contain both complicated and simple subsidiary parts, but are not reducible to either (Goodwin, 1994). By way of summary, it can be stated that Complex systems are dynamical and are characterized by *non-linearity* (Lorenz, 1993). All the heterogeneous elements that make up such a system are interconnected together where each element is doing its own thing. *These systems are governed by feedback loop mechanisms where small, marginal changes in the system have significantly large impact on the overall behavior.* Unavoidably, complex systems innately carry with them large elements of uncertainty and ambiguity (Wheatley, 1992), making it difficult to understand, predict and control such systems (a more detailed discussion on the characteristics of a complex system will be covered in chapter four). Over the last several decades the view that economic reality is somehow fundamentally complex has increasingly taken hold among economists, not only those focused on abstract theory but even policymakers as well (Greenspan, 2004).

In early 1940s, a British mathematician, Alan Turing, was perhaps the first modern scientist to formulate complexity. The hallmark of his contribution was a paper he wrote about the growth of biological system in which he put forward the idea of “*morphogenesis*” (Turing, 1952). He showed that a biological system described by two simple equations with feedback loops among the variables was capable of behaving in totally unpredictable, complex

patterned behavior. A decade later, an American meteorologist, Edward N. Lorenz, tried to predict the weather with computers but instead gave rise to the modern field of chaos theory, developed models with feedback loops to increase the accuracy of weather forecast (Lorenz, 1963). In another paper (Lorenz, 1964) he showed how a small twiddling of parameters in a model could produce vastly different behavior, transforming regular, periodic events into a seemingly random chaotic pattern. In summary, his models showed two things: unpredictability of weather systems and the significantly large impact of small, marginal changes in local individual element's behavior on the global behavior of the system. This last point made famous "*The Butterfly Effect*" also known as "*sensitive dependence on initial conditions*"<sup>5</sup>. However, Benoit Mandelbrot while reaching the same conclusion using a relatively simple equation with feedback interaction claimed further that all the theories in finance were wrong because they relied on Gaussian (normal) probability distributions and the Brownian motion, both of which assume regularities. He pointed out that nearly all economic and financial variables, particularly stock prices and commodity prices, behaved irregularly<sup>6</sup>. Their behavior, Mandelbrot argued, was better described by 'Fractal Geometry and mathematics' than by Gaussian distribution and Brownian motion (Mandelbrot and Hudson, 2004) as they are instead characterized, Mandelbrot suggested, by jumps rather than smooth motion. Since finance theories were wrong so would be their predictions; the recent financial crisis has vindicated his claims.

Peters (1996) argued the need for a new way of looking at markets behavior. He claimed (similar to Mandelbrot) that the assumptions of efficient markets and rational investors in mainstream theories are a fallacy. On the basis of 'chaos theory' he showed that in fact markets are non-linear dynamic systems with feedback effects, criticality levels as well as fractal in nature. He further argued that such a system is always far from equilibrium. Chorafas (1994) echoes both Mandelbrot and Peters and suggests that neither linearity nor the hypotheses of normal distribution can provide the right support in understanding markets. Financial analysts have to turn their attention to non-traditional means of research and analysis in figuring out financial market behavior. These new tools, he argues, come under the heading of 'Complexity Theory' and include tools such as 'non-linearities', 'bifurcations', chaos theory, fractals and other fuzzy engineering techniques.

Schwarz (2009) regarded the complexity of the present system as the greatest financial market challenge of the future. Through *analysis drawn on chaos theory and other*

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<sup>5</sup> The 'butterfly effect' was a phrase discovered in Edward Lorenz's talk for the 139th meeting of the American Association for the Advancement of Science in 1972. Titled, "*Does the flap of a butterfly wing in Brazil set off a tornado in Texas*"

<sup>6</sup> Louis Bachelier (1900), in his thesis, the theory of speculation, developed the notions of stochastic process characterizing financial variables. Two main stochastic processes have become known in finance: the random walk and the martingale processes. A more encompassing approach to uncertainty uses Levy processes that allow for both jumps and smooth motion.

*approaches used to analyse complex systems*, the author examines the ways in which complexity can cause markets to fail; arguing further that the complexities of modern financial markets can exacerbate these market failures with nonlinear feedback, enticed by even a minute change in any part of the system. He further suggests that “*solutions should take inspiration from chaos theory, which recognizes that failures are almost inevitable in complex systems and that successful systems are those in which the consequences of a failure are limited*”.

Johnson (2007) while contending the complexity of the financial markets suggests that complex systems have a tendency to move from order to disorder and vice versa. While arguing that such movements cannot be predicted, *for financial markets, crises are actually a move towards an ordered state; sufficing that the ordered state of such a complex system is actually disorder*. George (2012) in the latest book titled: *Nonlinearity, Complexity and Randomness in Economics*, argues: “Those of us who have marvelled at the non-linear feedback loops between asset prices in illiquid markets and the funding illiquidity of financial institutions exposed to these asset prices through mark-to-market accounting, margin requirements, calls for additional collateral, etc. will appreciate what is lost by this castration of the macroeconomic models. Threshold effects, critical mass, tipping points, non-linear accelerators – they are all out of the window. Those of us who worry about endogenous uncertainty arising from the interactions of boundedly rational market participants cannot but scratch our heads at the insistence of the mainline models that all uncertainty is exogenous and additive. The first lesson to draw from the current crisis within Economics is clearly that our models must embrace non-linearity: linearized models with their saddle point dynamics and ‘jump variables’ no longer serve any useful purpose” (See George and Oxley, 1999/2008 for a detailed discussion of this point). Steve Kuchta of the University of Connecticut also suggests the complexity of the financial system, basing his arguments on the growing use of *nonlinear dynamic* system models in economics, their application in financial asset pricing, and most interestingly how ‘*chaos theory* could be the key to putting it all together (Kuchta, 2010).

Schweitzer et al. (2009) argue that the current economic crisis illustrates a critical need for new and fundamental understandings of the structure and dynamics of economic networks. Economic systems are increasingly built on interdependencies of both behavior and information, leading to a global economy where credit and investment, trade and input-output flows, research and innovation all occur at a truly world scale that gives rise to a hugely complex system that is difficult to predict and control. Moreover, some inter-dependencies become obvious only during and after the crisis—*such as tight global credit couplings*—developing as self-fulfilling phenomena, without precursory signatures.

*The complexity of the modern global economy is exacerbated among others, by the speed and scope of credit spread across national and globally networked markets, with variable intensity of ties and of scale. A small shock in the debt repayment- through either*

*endogenous or exogenous means— can lead to mass scale effects; making the attempts to understand or control the emergent and volatile networks very difficult indeed. In particular, the danger of cascading failures or the spread of opportunistic behavior through the economic networks is greater today than ever. Self-feeding effects, reinforcing each other through a co-evolving network, can lead to large-scale and abrupt consequences that may be hard to anticipate and tackle*

Ilya Prigogine (1980, 1989 and 1997) suggested that for a complex system, there is a “point of bifurcation”, a moment of truth, for the system to choose which path it follows. Chaos Theory suggests that a complex system approaching a bifurcation point becomes so sensitive that it can amplify small changes into large feedbacks. Decisions made at such a point lead the system either toward greater chaos or toward higher order (Mirakhor and Hamid, 2009, p. 231). It appears that the “point of bifurcation” has been operating to increase regime uncertainty. At every ‘bifurcation point’ reached, policy makers seem to have made decisions that have rendered the system more unstable.

The relevance of *complex dynamic* has also been particularly stressed by Barkley Rosser (2004, 2005) in several works. The author considered indeed *complex dynamic* a strong foundation for Keynesian models and results. Similar intuitions have also been articulated by scholars such as Gilson, (1984); W. Brian Arthur, John Holland, Blake LeBaron, and Richard Palmer, (1997), Henry Hu, (2008), Gary Gorton, (2008) and Robert Bartlett, (2010). All have conceded to the increasing complexity of the financial system and have suggested it as among the leading contributors in intensifying the *financial instability and hence the presence of regime uncertainty*.

Andrew Sheng (2009) in his book titled “From Asian to Global Financial crisis”, states:

*... Consequently the signal difference between the Asian and the Global crisis is not just tone of the size, but in essence the complexity of the global financial order...The world has moved from the decade of the so called ‘Great Moderation’ to a period of grave uncertainty...Those who look for sensationalism would love for crisis to be a tale of conspiracies... However, the more I studied markets, the more I realised that markets events are of spontaneous order (non-linear). There is no single architect- there may be many conspiracies or plots trying to influence the tide one way or the other, but it is the interaction amongst all parties-some deliberative, some calculated other random- that cause events to unfold like a tsunami. Not even the most brilliant minds in the world, nor the largest economy in the world, could stop the force of the crisis... all are concerned about the possibility of a serious financial instability; creating vulnerabilities which necessitate the occurrence of events which were/are thought as rare. (p, 6-15).*

In line with the above and in consideration of the non-linearities and the large gyrations that are caused by small shocks in the system, Taleb (2007/2010) introduced the notion of '*Black Swans*'; events with very low probability of occurrence but with significantly large impact; quite reminiscent of the 'Butterfly effect'. He termed these events as '*Black Swans*' due to their rare appearance. Recently, the global system has experienced events that would have been thought of as low probability events not long ago. These include, inter alia, the down grading of U.S from its 'AAA' rating, the looming collapse of the much hailed Eurozone, the effort by Switzerland to convince the world that Swiss franc is not a safe haven, the Brazilian suggestion of bailout of advanced economy by emerging markets, China's contemplation of buying Italy's debt, and the Libor rate fixing. The list can go on. Looming in the background of the present uncertainties in the global economy there is a potential event, termed as "*the mother of all black swans*", the effects of which may be chaotic global economy: contagion-riddled events of sovereign default. As suggested earlier, looming in the back ground of the present uncertainties in the global economy, there is a potential event termed as "*the mother of all black swans*" the effects of which may be chaotic to global economy: contagion-riddled events of *sovereign default*.

It can be stated, by way of summary that: (i) in a complex system, elements are independent, adaptive and interactive; there is a feedback process at work; (ii) such systems are characterized by an unpredictable, infinitely complex patterned behavior; (iii) they are all characterized by "bifurcation points" at which a system can either move to more stability and order or to chaos; (iv) in such systems, small, marginal changes have significantly large impact on their behavior; and (v) there is a limitation to the cognitive ability of the human mind to understand, describe, predict and control such systems' behavior.

The global financial crisis of 2007/2008 and its continuing adverse economic and social consequences, as well as the failure of significant policy actions to elicit the desired response, seem to provide evidence that the global financial system displays the characteristics of a complex system. Added to the increased frequency of occurrence of "fat tail" events, increased poverty and worsening distribution of income and wealth in individual and collective economies have intensified regime uncertainty. Such doubts about the sustainability of a system based on the interest rate debt financing had been expressed as early as 1930s by John Maynard Keynes and later by Maurice Allais (1999) among others. Focusing on the interest rate mechanism, Keynes in as early as 1930s argued in his book *The General Theory of Employment, Interest and Money* (1936) argued that market capitalism, if left to it-self, would create two major problems. These are (i) poor income and wealth distribution and (ii) the fact that this system is incapable of creating full employment. A major cause of these problems, he asserted, was the interest rate mechanism which constituted "*the villain of piece*" (see Mirakhor and Krichene, 2009). Keynes solution was the "*euthanasia of rentier*" by socializing financial resources through which financial capital would be provided for investment without the intermediation of the rent seeking class of the money lenders. Keynes's claims of poor income and wealth distribution could be further validated by a recent study which showed how high leverage and crises can arise as a result of changes in the income distribution (Kumhof and Ranciere, 2010). The authors empirically

showed that the periods 1920-1929 and 1983-2008 both exhibited a large increase in the income share of the rich, a large increase in leverage for the remainder, and an eventual financial and real crisis. Much earlier, Karl Marx (1867, 1885 and 1894) had already put forward his understanding of the innate fragility of capitalism. While recognizing that the system may create economic growth, Marx argued that the growth will never be sustainable and the system will collapse on its own; taking back much more than what it gave.

A fact that can be discerned from the historical analyses of nearly all financial crises is the potential destabilizing role of the interest rate mechanism in the debt-growth dynamics of the economies. In general, the condition to be solvent requires that the rate of growth of the economy must be greater than the rate of interest (cost of borrowing). This can be further supported by the findings of Frank Ramsey who in 1920s analyzed the interaction of the growth rates of the economy, population and interest rate. He used the interaction of the rate of population growth, the growth of market determined interest rate and the growth of economy to deduce the following: if the rate of economic growth exceeded the other rates i.e. the market determined rate of interest and the rate of population growth, the economy would grow. A steady state was when all the three rates were in equilibrium; however when the market determined interest rate growth surpassed the growth of the economy and the growth of population, economic activity would begin a downward spiral. He found that whenever the interest rate growth surpassed the other two rates, economic progress was dampened<sup>7</sup> (Ramsey, 1928). In this context it is worth noting that the artificially low interest rates contrived by central banks' easy monetary policy may have disrupted economies, financial markets, and spread financial chaos as recent debt crises have clearly established. There seems to be an adverse debt dynamics at work in the global economy presently where, even at artificially low interest rates, the rates of growth of economies is not sufficient to validate the growing debt. Hayek, (1945) contented that it is the price setting of money i.e. the interest rate and the manipulation of it by the policy makers that is at the root of generating crisis.

Hyman Minsky, one of the most perceptive, productive and brilliant followers of Keynes, pushed forward the frontiers of "the classical Keynesian" (as opposed to "bastard Keynesian") thought to produce valuable insights into the working of financial capitalist system (Krichene and Mirakhor, 2008). Minsky the inventor of the 'Financial Instability Hypothesis' spend about forty years in studying and analysing the financial crises. As put forward by Belouafi (2012: 9-10), "his findings led him to conclude that there is a fundamental flaw in the conventional economic system. This flaw is related to the type of financing regime and the contractual arrangements that develop over time, a fundamental property of all capitalist

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<sup>7</sup> In this context it is worth noting that the artificially low interest rates contrived by central banks' easy monetary policy may have disrupted economies, financial markets, and spread financial chaos as recent debt crises have clearly established. There seems to be an adverse debt dynamics at work in the global economy presently where, even at artificially low interest rates, the rates of growth of economies is not sufficient to validate the growing debt (Mirakhor et al., 2012).

economies is the existence of a system of borrowing and lending based upon various margins of safety... a debt instrument or a lease provides for payments to be made on account of both interest and principle. An equity liability has only a contingent commitment to make payments, dividends need to be paid only if earned and declared, and there is no contractual need to repay principle. For any given cash flow, from operations or from the fulfillment of owned contracts, the greater the share of equity financing in a balance sheet the greater the margin of safety that protects the owners of the non-equity liabilities".

Minsky, in his works, had observed the growing fragility of the U.S. financial system since 1966, where a bubble's boom and bust in one asset market was followed by formation and implosion of another bubble in a different asset market as liquidity and credit expansion led to these booms and busts in which major players that had failed were bailed out by the government. These included the emerging market debt crisis, LTCM, dotcom, housing, and commodities bubbles. As financialization would help create one asset market after another, expanding liquidity and credit in search of yield would create one bubble after another (see Mirakhor and Krichene, 2008).

The question that arises is whether there is an alternative to the present dominant global financial system. Perhaps a practical alternative would be to step back from targeting the interest rate mechanism and focus on the incentive structure that has rendered interest-based debt financing such a destabilizing force in the global economy. This can be accomplished by reorienting the system from relying on risk transfer and risk shifting to risk sharing.

#### IV. THE REGIME UNCERTAINTY

The idea of "*regime uncertainty*" (Higgs, 1997) argues that a major cause of the intensity and duration of the Great Depression was the depth of the uncertainty (ambiguity) surrounding the policy regime of the time and its economic and financial consequences. This type of uncertainty can arise from many sources, ranging from simple tax-rate increases to the imposition of new kinds of taxes to outright confiscation of private property. It can also arise from various sorts of regulation, for instance, of securities markets, labor markets and product markets. The security of private property rights rests not so much on the letter of the law as on the character of the government that enforces, or threatens, presumptive rights. Henry Morgenthau, the Treasury Secretary in President Roosevelt administration in the 1930s, encapsulated the wide ranging uncertainty as follows:

*"...Uncertainty rules the tax situation, the labor situation, the monetary situation, and practically every legal condition under which industry must operate. Are taxes to go higher, lower or stay where they are? We don't know. Is labor to be union or non-union? . . . Are we to have inflation or deflation, more government spending or less? . . . Are new restrictions to be placed on capital, new limits on profits? . . . It is impossible to even guess at the answers."* (Higgs, 2006: 16)



There seems to be the debt dynamics at work in the global economy presently. *A serious problem facing the global economy today is the situation of debt overhang which has made the present system to reach a point of criticality and bifurcation; creating debilitating fears of contagion and recurrence of full-fledged global crisis.* Given the prevailing conditions of low growth, validation of the debt of the scale that exists now is in doubt. There is the prospect that countries, including some among the advanced economies, could default on their debt with defaults taking many forms. It could be an outright default as in the 1980s for middle- and low-income countries. It could be in the form of near-zero interest rates by denying creditors any return on their lent capital. It could be in the form of high or hyperinflation that wipes the real value of debt. The fiscal theory of the price level argues that the government will inflate money to reduce the real debt burden. The prospects of high world inflation are likely in view of the large indebtedness in many industrial countries. It will amount to an inflation tax levied on consumers and on holders of money.

Krugman (1988) coined the term ‘debt overhang’ and asserted it as a situation in which “*A country has a debt over-hang problem when the expected present value of potential future resource transfers is less than the debt*”. Over the past few decades, a consensus had emerged that expansion of credit and debt is detrimental to the stability of developed as well as developing economies (Mirakhor and Krichene, 2008). With high debts interest payments also increase, thus increasing both the burden and servicing of debt. The most serious problem facing the global economy today is the situation of debt over hang and, more importantly, the risk of sovereign default.

Rising debt is a drag on macro-economic stability, growth and development. It is also a major source of fiscal and current account deficits, thus aggravating the fiscal crisis which is reflected in such further complications as pressure on the exchange rate (widespread exchange losses in public debt portfolio) and diminishing private sector investment. Higher indebtedness also translates into low credit rating by credit rating agencies which in turn discourages FDI and foreign portfolio investment. Higher debt-to-GDP ratios suppress output, private consumption and government spending on public goods such that welfare costs increase with every incremental increase in debt. Hence, higher debt levels make stabilization more costly and induce shirking by governments.

A number of renowned conventional economists, since the early 19th century have observed a number of common features that precede the occurrence of financial crises (see also Askari et al. 2012). According to Belouafi, (2012: 8-9), “among the features relating to the ‘interest’ issue are the following: An extended period of low interest rates as was the case in the subprime financial crisis of 2007-2008<sup>8</sup>. Such a policy has led to the huge growth of a non-backed expansion of credit. Soros (2008) noted ‘when money is free (or quasi-free), the rational lender will keep on lending until there is no one else to lend to’ (see also Askari et al. 2010: 18). This situation has been attributed to the development of another axiom; it is the

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<sup>8</sup> “Yet these low or even zero-rates are suggested as remedies in the aftermath of FCs. This paradox indicates the puzzling dilemma of the interest rate itself” (Belouafi, 2012).

fact that ‘too much money is chasing too little assets’. Under such a scenario there is no other way that this ‘too much money’ can be absorbed except through the appearance of a bubble(s) that will grow without any economic foundations. The appearance of a bubble(s) will feed the expansion of the unbacked credit, and the vicious circle continues until the bubble (s) burst. If such a situation arose, the huge volumes of the non-backed credit will meltdown, as it was no more than mere promises that were sought to be validated at a certain point in the future. Thereafter, another cycle of the bail-outs programmes, from the tax payers money, and the cheap money through zero-interest rate policy (ZIRP), quantitative easing and other sophisticated measures will come out from the ‘the conventional box’ of policy makers to the rescue of the ‘too-big-to-fail’ institutions and to fix other financial and economic distortions”

Large part of the theoretical and the empirical analysis has focused on the effects of debt accumulation and its impact on overall economic growth. All have pointed to a negative relationship between excessive debt and economic growth trends. Contributions by Buchanan (1958) and Meade (1958) revealed that the national debt is a burden for next generations, which comes in the form of a reduced flow of income from a lower stock of private capital. Apart from a direct crowding-out effect, they also pointed out to the impact on long-term interest rates, possibly in a non-linear form. Adam and Bevan (2005) find interaction effects between deficits and debt stocks, with high debt stocks exacerbating the adverse consequences of high deficits.

Empirical evidence also confirms the debt overhang effects. Pattillo et al. (2002, 2004) show how the stock of debt is the reason for a slow growth, while Chowdhury (2004) finds that both the debt burden and the debt service obligations squeeze investment and the economic performance. Clements et al. (2003) investigates the relationship between external debt investment and growth in 55 low income countries, finding some empirical evidence of the debt overhang. Estimating a simple growth model and using panel data, they find that over a certain threshold, more debt lead to negative growth rates (the thresholds of 30-37% of GDP, or 115-120% of exports). Presbitero (2005) shows using a dynamic panel model that a huge debt burden has a negative and non-linear effect on GDP growth, arguing that the basic relationship is negative. Other studies like Cohen (1993), Elbadawi et al. (1999), Cordella et al. (2005), Imbs et. al., (2005) and Cohen (1993) also suggest a negative dynamic between debt super cycles and economic growth.

The 2007/2008 global financial crisis has been studied and analyzed extensively by now and a variety of causes have been suggested. In 2010, Cristine Checherita and Philipp Rother of ECB, studied the last 40 years period of the debt super cycle in the Eurozone and found a non-linear impact of debt on growth with a turning point—beyond which the government debt-to-GDP ratio has a deleterious impact on long-term growth—at about 90-100% of GDP. Confidence intervals for the debt turning point suggest that the negative growth effect of high debt may start already from levels of around 70-80% of GDP, which calls for even more prudent indebtedness policies. At the same time, there is evidence that the annual change of the public debt ratio and the budget deficit-to-GDP ratio are negatively and linearly

associated with per-capita GDP growth. The channels through which government debt (level or change) is found to have an impact on the economic growth rate are: (i) private saving; (ii) public investment; (iii) total factor productivity (TFP) and (iv) sovereign long-term nominal and real interest rates (Cristine and Rother, 2010).

Reinhart and Rogoff, in their recent paper, studied the period of 200 years for 44 countries for which data was available. They showed that the growth of the economy is adversely affected as the ratio of debt-to-GDP goes beyond 30% and nears 100% (reaching a potentially unexpected bifurcation point), eventually creating a situation where the GDP is only able to service the interest payments and the whole system become fragile (Reinhart and Rogoff, 2010a). Reinhart and Reinhart (2010b) examined the behavior of real GDP (levels and growth rates), unemployment, inflation, bank credit and real estate prices in a twenty-one year window surrounding selected adverse global and country-specific shocks or events. The episodes include the 1929 stock market crash, the 1973 oil shock, the 2007 subprime collapse and fifteen severe post-World War II financial crises. They presented evidence that the decade of relative prosperity prior to the falls was importantly fueled by expansion in credit and rising leverage that spans about 10years. It is followed by a lengthy period of retrenchment that most often only begins after the crisis and lasts almost as long as the credit surge.

Arcand et al., (2012) used different empirical approaches to show that there can indeed be “too much” finance. In particular, their results suggested that finance starts having a negative effect on output growth when credit to the private sector reaches 90%-100% of GDP. The IMF reached similar conclusions in its “post-mortem” of the Asian financial crisis in the late 90s and recommended a safe level of government debt-to-GDP of no more than 25%. They further advised avoidance of debt-creating flows; an advice that was not taken by the advanced economies. As stated earlier, present empirical research suggests that the debt-to-GDP ratio of the richest members of the G-20 threatens to touch 120% mark by 2014 while by 2020; the U.S. and the other major European centers would amass a ratio of at least 150%, with Japan and U.K. going to 300% and 200% respectively. Even more disconcerting is the projected interest rate paths on their debts which would increase from now almost 5% to 10% in all cases, and as high as 27% in U.K. (BIS, 2010), all this alongside an extremely anemic global GDP growth at the rate of 2.5%-3.3% (World Bank, 2012).

According to the recent IMF Fiscal Monitor (2011), the average debt per working age person in advanced economies will increase from US\$ 27,600 in 2007 to US\$ 62,000 in 2016 and from US\$ 1,500 to US\$ 2,200 in emerging markets. In 2009, the IMF estimated that gross general government debt in high-income advanced G-20 economies is expected to grow from 78 percent of their GDP in 2007 to 120 percent in 2014, an increase of 40 percent over a 7 year period. In a recent study, Reinhart et. al. (2012) suggests a threshold of 90 percent where debt imposes a serious drag on the growth of an economy. These countries suffer from high unemployment, fiscal instability, low capacity utilization and high debt and leverage. They further note: *“Led by European countries, the surge in external debt since early 2000s is unprecedented.....For Europe as a whole. Public and private external debts are already*

*more than the double the 90 percent threshold and constitute a considerable source of uncertainty.”* (Reinhart et al., 2012: 7). The stress and strain on the international trade and financial system and its associated arrangements did not suddenly become apparent after the 2007/2008 global crisis; in the 1990s Japan, Russia, Argentina, Brazil and Mexico were already sending distress signals (Mirakhor, 2002). Neither the signals nor the lessons of these crises made any noteworthy impact on the way the world economic system and its policies were being steered.

The lessons had been distilled most effectively by the IMF, from the “post-mortem” analyses of the Asian, Brazilian, Argentinian, Russian, Mexican crises of the late 1990s and early 2000s. Reforms and remedies were suggested but were only implemented, most strongly, in the case of emerging and developing countries. The advanced countries perceived their economies immune to the forces of instability. Growing vulnerabilities, however, built up the pressures that proved dramatically the folly of such perceptions. Uncertainties, ambiguities and complexities governing the present architecture and configuration of policies, seem to exacerbate the perception that the present financing regime is unable to mitigate effectively the risks to the global economy. Hence, there is a palpable anxiety and growing concern leading to the search for an alternative to the present interest-based debt financing regime.

Mauldin and Tepper in their latest book titled “*The End Game*” has described the present situation as a debt ‘*super cycle*’; referring essentially to the decades-long growth of debt from small and manageable levels, to a point where bond markets rebel, (translating into an ‘*effective default*’) and the debt has to be restructured or reduced if not formally defaulted”. They refer to the current situation as an *Endgame*, where the end of the global debt super cycle is inevitable as it is no more sustainable. They state very clearly:

*“The debt laden situation is going to cause a lot of pain. It is not a question of pain or no pain; it is just when and how we decide (or are forced) to take it. There are no easy paths, but some bad choices are less bad than others”. ... “We have shifted the crisis from homebuyers to banks and then finally to government. There is no one else to step in. We are at the Endgame, a point of criticality in the system.*

## **V. THE INHERENT INSTABILITY OF THE INTEREST-BASED CREDIT SYSTEM**

Evidence surveyed in many studies showed that every economic and financial crisis was preceded by an expansion of credit (e.g. Fisher, 1933). A number of influential scholars, in the past, proposed reforms that would abolish the credit system and replace it by an equity-based investment system. For instance, Walker (1873) opposed fictitious credit creation by banks and favored the creation of joint stock companies which use savings to buy equities. Among celebrated reforms was the plan formulated in the University of Chicago, ‘Chicago Memorandum’ in 1933 which called for 100% reserve money and for an equity-based investment system. In the modern banking system, a bank can simply create credit ex-nihilo by simply crediting the account of its customer for the amount of credit. Such credit becomes

deposits for the borrower, on which it may issue orders for payments. Since, every bank does the same thing, viz, it credits its client for the amount of a loan, credit expansion can be very fast, and credit far exceeds real savings in the economy. Credit creates deposits. The excess of credit over savings is called fictitious credit by Henry Thornton (1802). It is called counterfeiting by Allais (1999). Excess credit creates price inflation and forces savings upon workers and fixed income households when price of staples increase considerably. Theoretically, credit may expand in relation to created deposits according to the reserve requirements ratio. If a bank creates a credit of US\$ 1,000 and if the reserve requirement ratio is five percent, then total money creation is equal to US\$ 20,000 – a multiple of 20. Credit expansion in the US during the period of run up to the 2008 crisis contributed to inflate housing prices and later caused widespread banking crisis. Analogously, this same scenario can be applied to the case of a number of sovereigns facing default today.

Importantly, credit expansion has contributed to a financialization of the economy, i.e., an increase in the relative size of the financial sector in relation to the rest of the economy. Too much resource has been allocated to financial markets, in the form of thousands of speculative entities such as investment funds, structured finance companies and hedge funds. In turn, the growth of these institutions and instrument innovation for speculation and hedging added substantially to the opacity and complexity of the financial system leading to greater uncertainty. Moreover, traders instead of investors dominate the financial markets. With very low interest rates, speculators, in search of yield, engineer structured products to increase monetary returns and play games against each other. As a result, trading in derivatives has also soared. According to Bogle (2012: 6), *“trading in S&P 500-linked futures totaled more than \$60 trillion in 2011, five times the S&P 500 index total market capitalization of \$12.5 trillion. The credit default swaps alone had a notional value of \$33 trillion. Add to this total a slew of other derivatives, whose notional value as 2012 began totaled a cool \$708 trillion. All this in comparison to \$150 trillion: the aggregate capitalization of the world’s stock and bond markets”*. The loss of J P Morgan of about US\$ 5.8 billion in July 2012 is a gain of hedge funds who bought its structured products. Bogle (2012: 4-5), in his latest book titled *“The Clash of Cultures: Investment v/s Speculation”*, has described this unprecedented surge in financialization and speculation as Capitalism’s ‘mission aborted’.

*“The general mission of the markets was/is capital formation, involving allocation of investment capital to most promising industries and companies, both existing and upcoming. However, out of \$33 trillion stock trading in financial markets, only 0.8% or \$250 billion of the financial activities fulfill the original mission and the rest 99.2% or \$32.73 trillion aborts it.”*

Hans Tietmier, the then President of Bundesbank, warned in international fora that “financial decoupling” was increasing the risks in global finance, (Menkoff and Tolksorf, 2001). These warnings were not attended to and consequences followed (Epstein, 2006).

Cecchetti and Kharroubi (2012) investigated how financial development affects growth at both the country and the industry level. They suggested that “the complex real effects of financial development come to two important conclusions. First, both the size and growth of

a country's financial system can be a drag on productivity growth. That is, there comes a point where further enlargement of the financial system can reduce real growth, and, because the financial sector competes with the rest of the economy for resources, financial booms are not, in general, growth-enhancing. Second, using sectoral data, they examine the distributional nature of this effect and find that "credit booms harm what we normally think of as the engines for growth. This evidence, together with recent experience during the financial crisis, leads us to conclude that there is a pressing need to reassess the relationship of finance and real growth in modern economic systems. More finance is definitely not always better".

Similar findings were suggested by Maya (2012) arguing that society is better off when financial intermediation is restricted. Gorton et al. (2012) also evidence the rampant financialization which increasingly got delinked from the real sector and the main supply of financial debt has shifted from commercial banks to the "shadow banking system". Bogle (2012) suggests that the increased financialization has made the real aim of capitalism i.e. *capital formation*, oblivious; arguing that the world of investment has moved from a culture of long term to *shorttermism*. There is hence a further blurring of the difference between investment and speculation (Bogle, 2012). Such situations necessitate bubbles and are a perfect recipe to create financial vulnerabilities with the potential of seeing events we have not seen before. Murizah et al. (2011) argue that it is the interest rate mechanism and the ensuing financialization which is responsible for the expropriation of wealth, financial fragility as well as financial exclusion. Rajan, (2005) also contends that the surge in financialization has made the world more risky; raising system's sensitivity to black swan events (Taleb, 2007/2010).

All in all, the result of these activities has been the growth of complexity in the financial system with increased vulnerability to shocks.

## VI. ISLAMIC APPROACH TO MONEY AND FINANCE

Islamic finance is based on the Qur'an and *Sunnah* (the Prophet's teachings). It prohibits interest rate based debt contracts, although interest-free lending, called *qard hassan*, is permitted. Islamic finance can be envisioned as a two-tier financial system:

- A 100 percent reserve depository and safekeeping banking system for domestic and international payments.
- A risk-sharing investment banking that places real saving directly in private or public projects or indirectly via the stock market. Investors are shareholders.

The first sub-system keeps money deposits in trust and settles payments via clearing, withdrawals and other forms of payments. The second part of the system receives savings, which it invests in productive projects or in more liquid investment such as mutual funds or stocks. Depositors receive transferable or marketable shares that enable them to liquidate their investment if they chose to do so. They share in profits and losses as well as in capital gains and losses. Islamic capital markets intermediate between saving units and investing units

through risk sharing. They would include investment banking, stock markets, mutual funds, exchange-traded funds and other forms of intermediary risk-sharing institutions.

The objective of Islamic finance is to promote sustained growth and full employment thus contributing positively to poverty alleviation and, ultimately, to economic and social justice. Growth cannot be achieved without capital accumulation. Investing in capital is the only way for achieving growth and employment. Islamic finance, being based on sharing the risk of an activity rather than on interest rate driven debt contracts, contributes efficiently to capital accumulation and is immune to financial instability and speculation. It is based on growth solely and allows no wealth redistribution via interest rate based debt contracts; it insulates an economy against banking failure and stock market crashes that have had a constant presence in the conventional system [for the proof of existence of a stable non-inflationary economy operating in a non-interest rate environment, see Mirakhor (1990, 1993)].

It can be argued that Islamic finance precludes capital markets' volatility because in this system the close relationship between the real and financial sectors pre-empt misalignment of rates of return to finance, the rates of real growth of the economy and net rate of profit. It is based on risk taking and risk sharing.

## VII. RISK SHARING<sup>9</sup>: A RULE-BASED SYSTEM

Investors or portfolio managers in general face two kinds of risks. The first is systematic and the other unsystematic or idiosyncratic. The former refers to risks that are macro-economic in nature and are posed by overall economic settings. These risks are un-diversifiable, hence uninsurable. Only effective macro-economic policies and international economic and financial coordination can mitigate such risks. Unsystematic or idiosyncratic risk, on the other hand, relates to risks that are individuals' or firms' specific, emanating from risk of shocks to a firm or an individual's income. Such risks are diversifiable, therefore, insurable. High correlation between consumption and income creates vulnerabilities to income shocks. However these can be mitigated through risk-sharing arrangements that lessen reliance on only one source of income. Therefore, risk sharing reduces the correlation between income and consumption that, in turn, lead to consumption smoothing (Mirakhor, 2011b).

Risk sharing – the essence of Islamic finance – serves as one of the most important desiderata of Islam i.e. the unity of mankind. Islam is a rules-based system in which a network of prescribed rules governs the socio-economic-political life of the society. Compliance with these rules renders the society a union of mutual support by requiring humans to share the risks of life (Mirakhor, 2011c). The epistemological root of risk sharing, as the organizing principle of the Islamic financial system, is discernible from the verse 275 of chapter 2 of the Qur'an. This verse, in part, decrees that all economic and financial transactions are conducted via contracts of exchange (*al-bay'*) and not through interest-based debt contracts (*al-riba*).

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<sup>9</sup> For a more detailed vision of the Islamic alternative financial system, see Askari et. al (2012).

Since in the Verse the contract of exchange appears first and the prohibition of *riba* thereafter, it can be argued that requiring contracts to be based on exchange constitutes a necessary condition and “no-*riba*” the sufficient condition of existence of an Islamic financial system. Together, these conditions constitute the organizing principle of that system. The necessary condition (*al-bay'*) and sufficient condition (no *riba*) must be met for a contract to be considered Islamic (Mirakhor, 2011b).

Classical Arabic Lexicons of the Qur'an define contracts of exchange (*al-bay'*) as contracts involving exchange of property rights claims in which there are expectations of gains and probability of losses (Mirakhor, 2010; 2011b).<sup>10</sup> By entering into contracts of exchange, parties improve their welfare by exchanging the risks of economic undertakings, thus allowing division of labor and specialization. The understanding of *al-bay'*, the exchange of one set of property rights claim for another, as the necessary and “no-*riba*” as the sufficient condition has important implications. Exchange requires the freedom to contract for the parties involved and this implies freedom to produce, which then calls for well-protected property rights to allow and facilitate production. For exchange to take place, there is a need for markets and then for rules that govern behavior of market participants. Rules need enforcement and regulation to keep the flow of information smooth thus reducing transaction costs. These rules of market behavior include: trust, faithfulness to the terms and conditions of contracts, good governance, honesty and transparency in social dealings, rules of property rights and market behavior, contract enforcement, distribution and re-distribution. It can be argued that full compliance with these rules reduces the informational problems and transaction costs thus rendering the system efficient (Askari et. al., 2010).

Risk and uncertainty are undeniable facts of life. As was discussed earlier, uncertainty stems from not only the lack of information but also from ignorance of knowing the response and behavior of others under such conditions. The question arises as to why risk and uncertainty exist. This question becomes more acute for those who believe in the Supreme Creator of all things. Since it is believed that existence of risk and uncertainty is a source of difficulty for humans, a Creator-centric question also arises: why create risk and uncertainty for humans? Bartholoemu (2008: 230) argues that “*a plausible argument for the necessity of risk is that it serves as an important ingredient in the recipe of full human development. It provides the fertility and diversity of experience to develop our skills and personalities.*” The Qur'an, on the other hand, provides a more compelling explanation: humans are subjected to tests throughout their lives to allow them a sense of the degree to which they, individually and collectively, are rule compliant (see for example Qur'an, 2:155; 76:2; 29:2; 9:126; 11:7). Without risk and uncertainty, testing would not be possible (Mirakhor, 2009). To ease the intensity of anxiety in dealing with tests and, therefore, reduce uncertainty and demand on humans' cognitive ability, the Qur'an prescribes rules of behavior. Principal among these rules is that of risk sharing ordained by the Qur'an.

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<sup>10</sup> See also, for example, Al-Tahqiq Fi Kalamat Al-Quran Al-Karim; Lisan Al-Arab; Mufradat Alfaz Al Quran, Arabic Lexicon, among others. These sources define *al-bay'* as “*mubadalati al-maali bi al-maal.*” In English this can be rendered as “*the exchange of one set of property rights claim for another.*”



A financial system based on risk sharing would be more stable than one based on risk transfer and on risk shifting<sup>11</sup>. A main source of stability is the elimination of interest rate based credit system, which has evidently created financial crises, distortions, unemployment, inflation, and unjust wealth redistribution. Other sources of this stability are the operational characteristics that remove major sources of volatility and instability. Among these characteristics are the following:

- Transparency, trust and faithfulness to terms and conditions of contracts; Say's law applies all the time; spending (e.g., investment arises from real purchasing power and not from fictive credit; for instance, consumers spend from earned income and not from consumer loans or government transfers; similarly, enterprises invest genuine saving).
- The real values of assets and liabilities –of financial institution– would be equal at all points in time. In addition the prospect of instantaneous equilibrium between the asset side of the banking system - driven mainly by the real sector of the economy - and the liability side means that there must necessarily be a close and direct relationship between investment and deposit yields. Due to the close relationship between finance and the real sector activities, the rate of return to the latter determines that of the former rather than the reverse.
- Asset/liability risk matching;
- A coordinated asset/liability maturity structure;
- Asset/liability value matching such that the value of both sides of the balance sheet move simultaneously and in the same direction in response to changes in asset prices; and
- Limitations on credit expansion and leverage, naturally arising from the need for credit growth that is tied closely to the expected rate of growth of the real economy.

It has been shown that a system based on these operational characteristics would be stable and capable of producing employment, income and output growth (Askari et. al., 2010). The full range of instruments of such a financial system would be expected to run the gamut of the spectrum of instruments from short-term, liquid and low-risk financing of trade contracts to long-term financing of real sector investment. The lower end of the spectrum would provide financing of sales and purchases of products already produced to allow greater production, thus, greater employment of resources. At the higher end, it would provide financing for planned production in the future; all financing taking place through risk-sharing

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<sup>11</sup> Risk Transfer is when among two parties, one party completely transfers the associated risks to the other and there is consent and acknowledgement. However, in risk shifting, these risks are shifted to a 3<sup>rd</sup> party or parties without their knowledge or consent and they end up bearing all the risks and the associated adverse outcomes. A prime example could be the latest crisis where first the risks were transferred through mortgage securitizations and then once the mortgage bubble busted, those risks were eventually shifted to the general taxpayers (without them knowing). The result is for example higher taxes as the government bailed out the crisis hit financial institutions.

contracts (Mirakhor, 2010). In such a system there would be no opportunity for pure financial transactions, those that have no relation to the real sector of the economy (Mirakhor, 2011a).

### VIII. GLOBAL RISK SHARING

International capital flows may take the form of lending, direct investment, purchase of foreign equity shares and/or bonds. Risk sharing would involve direct investment and equity participation in foreign undertakings. One of the most vital arguments put forward in favor of globalization was that of improved risk sharing that would result from intensified human interaction across the world. On theoretical ground, this would mean expecting much greater degree of risk sharing between and among economies – resulting from greater freedom of movement of resources, and hence, providing a major source of consumption smoothing in the world economy. These developments were expected to lead to progress toward market completion, which means increasing the number of marketable securities to meet a large number of contingencies – a condition of optimal risk sharing posited in Arrow’s (1971) conception. Or, at least, progress could have been expected toward the design and use of Arrow’s idea of having securities with pay-offs contingent on the performance of the underlying asset, for example, equity-based securities with close links to the real sector of the economy (Mirakhor, 2011a). Theoretical research has demonstrated sizeable potential welfare benefits of risk sharing<sup>12</sup>. However, empirical studies have shown only marginal gains in risk sharing from globalization. For example, a study by Kim et. al. (2005) has shown that even in the fast growing East Asia-10 countries risk sharing has not been as significant as would have been expected.

Analyses of the pre-crises data shows a fast growing, debt-creating process in the global financial system with increasingly tenuous links with the growth of the real economy. Increased debt-creating flows, a characteristic of financial globalization in the run up to 2007/2008 crises, does not improve risk sharing, as they either transfer or shift risk. More importantly, risk-shifting or risk-transfer financial transactions led global finance toward decoupling from real sector activities with the growth of the former outpacing that of the latter by double-digit multiples, intensifying the risk of “sudden stops” (Mirakhor, 2011a).

The contribution of the present configuration of the Islamic finance industry to the growth of the real sector has fallen well short of expectations so far. Perhaps the main reason has been the fact that the practitioners and financial engineers of this new asset class – growing within the conventional financial system – had to design instruments that resembled those prevalent in the host system without violating the “no-*riba*” sufficient condition. This meant creating instruments with tenuous relationship to the real sector to weaken the risk of Islamic financial transactions borne by market players. Moreover, the instruments designed by the industry have been by and large benchmarked to the Libor or closely related reference rates to make them more acceptable to large international banks and investors. Hence, the Islamic finance industry focused on portfolio behavior with strategy of asset concentration in short-term

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<sup>12</sup> See, for example, Van Wincoop (1999); Kim et. al. (2005); Lee and Shin (2008).

maturities and real estate in the medium-to-long-term maturities, thus replicating the vulnerabilities of the conventional system.

Aside from these problems, there is a risk of path dependency: the risk that the industry will continue following the same pattern of behavior because it has proven profitable thus far. This growing complacency and doing ‘business as usual’, runs the risk that path dependency will render deviations from the true practice of Islamic finance irreversible. This would mean continued development of debt-like instruments that are low risk but are devoid of risk-sharing elements – a vitally important element of Islamic finance. After all, finance is well aware of the theory of “spanning” – where one basic asset can span into an infinite number of derivative instruments. This theory served as the basis for the rapid development of debt-based derivative markets worldwide which eventually undermined the stability of global finance.

In general, the industry players in their defense argue that “our clients” are not interested in placing their funds at risk, thus discouraging us from risk sharing<sup>13</sup>. Apparently, this argument is unaware that, conceptually, there is a difference between risk taking and risk sharing. The former is prior to the latter. The risk of a given project in the real sector is determined in that sector; and one bears such risks before entering into the financial sector to seek financing. On the other hand, it is at the point of financing where the decision regarding the modality of financing – whether it will in the form of risk sharing, transfer or shifting – is made. The nature and magnitude of risk taken remains the same and immutable as it enters the financial sector at the stage of funds seeking.

Industry players display a further dimension of inertia in resisting risk sharing. This relates to the conceptual “*framing*” of Islamic finance. Framing refers to the fact that people’s response to risky situation depends on how they form their perception of a given situation and that depends on how an event is formulated. People react differently to the same situation when it is framed in alternative formulation.

Framing is closely related to the idea of “*prospect*” which refers to perception of gains or losses attached to decisions. The way prospects are framed can lead to inconsistent behavior; if the same objective outcome is framed differently in terms of gains and losses, people respond differently. Since losses, are given greater weight than corresponding gains, people are in general loss averse. If the outcome is framed either as a gain or loss, people prefer to choose gain. For example, the prospects of 10 percent loss and 90 percent gain can be framed focusing either on the probability of the loss or the expectation of the gain. It can be argued that a major reason for the inertia in the industry for resistance to progress toward risk sharing is due to the inability of the stakeholders and practitioners to first understand and then frame risk sharing propositions correctly and effectively.

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<sup>13</sup> Such arguments are a norm and were also pervasive in the recent International conference on Islamic Business, Islamabad, Pakistan (2012) as well as in a recent conference of security commission Malaysia (2011) held with the theme of Risk Sharing in finance.

While the disappointment with the present performance of the Islamic finance industry is understandable, it should be noted that the industry has a short history in which it nevertheless has demonstrated remarkable growth. Perhaps it is this performance that has triggered evidence of growing interest in non-interest rate based finance. Indications are that emerging markets and developing economies are actively considering adoption of instruments of Islamic finance. Few are leveraging the “first-mover” status of Malaysia in education, manpower training and instrument innovation in Islamic finance to introduce their own brand of risk-sharing method of financing. If these efforts succeed, perhaps even the benefits of emerging multiple growth centers in the global economy will be further enhanced with greater stability and resilience in supporting financial transactions through risk sharing (Mirakhor, 2011c).

Governments, particularly in Malaysia, have been major sources of support for the growth of Islamic finance. The same support can extend risk sharing to government finance. Instead of issuing a debt-based bond to mobilize funding, governments can use equity participation securities for such funding. These instruments can be issued in low denominations and traded in the secondary markets. This would allow ordinary consumers and investors to participate in the process of owning a share of their government’s activities. These instruments, with the incentive for wide participation of the population, could well enhance social solidarity and, perhaps, even provide an incentive structure for strengthened governance. Such alternative methods of financing government expenditures would be viable particularly in the Asian economies with high saving ratios.

Risk sharing could also be an effective alternative to the debt-based instruments adopted by European countries to get out of their sovereign debt crises. For example, a Eurozone country can finance its capital spending through equity participation in the form of public-private partnership. This type of risk sharing instruments has been proposed by analysts for some time now. Shiller (2003), the first to suggest this type of “macromarket” instruments, believes that the benefits of risk sharing are substantial but have yet materialized due to the limited availability of appropriate instruments. The present regime uncertainty has created a valuable opportunity for risk sharing based finance as a viable alternative to the interest-based debt financing.

## **IX. INNOVATIVE APPROACHES TO PROMOTE ISLAMIC FINANCE**

Innovative approaches are required to promote Islamic capital markets. Important areas are investment banking, stock markets, trade and crops financing, and the payments system. The promotion of stock markets can play an important role in Islamic finance. However, the interest-based credit system has considerably reduced the efficiency of these markets as it provides credit for speculation and creates abundant liquidity which distorts the returns on equities and results in price crashes. Returns become more related to speculation and share prices appreciation and only weakly related to the fundamentals of the company. The existing instability and prevalence of lax credit policy would be a powerful deterrent to stock investors, except for speculators.

The Islamic finance industry needs to develop investment banking specialized in long term investment in agriculture, industry, mining, and long term trade. Investment banks would not provide loans but would participate as shareholders. Depositors in these banks would own marketable equity shares that could be traded on the stock market according to market prices. Since depositors are generally risk-averse, they would invest only in shares that provide the risk-return profile they would seek. This will in turn lead banks to select the most profitable projects.

## X. CONCLUSION

Islamic finance can serve as an alternative to the interest-based debt financing. Theoretical research has shown that a non-interest rate based financial system promotes financial stability (Mirakhor, 1990). Islamic finance prohibits interest-based debt contracts and therefore interest-based credit. Investors share in the risk of economic activities; they select most efficient and profitable projects, and share in profits. Return to investment is based on real capital productivity. It would be expected that in this system, the private sector would have significant potential for investment and growth. Because of one-to-one mapping of the real and financial sectors, Islamic finance would be significantly simpler than the interest-based debt financing system. Since growth in finance has to reflect growth in the real sector only, it is not likely that there would be a decoupling of finance from real sector activities in order for the financialization phenomenon to occur. Moreover, because interest-based debt contracts are prohibited, debt cannot build up and thus debt overhang symptomatic of interest-based financing are avoided. Only recently has there been research confirming what has been suspected for some time now. This research demonstrates the large adverse impact of debt overhang on economic growth. A study of 26 episodes of past overhangs revealed that: (i) the duration of an average overhang episode is 23 years; (ii) during the overhang period, growth declines by 1 percent over the period; and (iii) the loss of growth and the long duration of the overhang imply *“that cumulative shortfall in output from debt overhang is potentially massive”* (Reinhart et al., 2012). Given the benefits of the risk sharing approach to financing, it is reasonable to take seriously the potentially substantial improvement in the overall well-being of economies and people that could result from its adoption.

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