An application of the financial instability hypothesis

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A Thesis Submitted to

The Economics Department

in partial fulfillment of the requirements for the Degree of Masters of Arts

by

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Under the Supervision of

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Dedication

To My Beloved Parents

I can never thank you enough
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Contents

Dedication ............................................................................................................... i
Acknowledgement ................................................................................................ ii
Introduction ............................................................................................................ 1

Chapter One: The Theoretical Foundation of the "Financial Instability Hypothesis" Theory

1.1. Introduction .................................................................................................... 5
1.2. The Inherent Instability of Capitalism ......................................................... 6
1.3. Traditional and Modern Approaches to the Study of Economic Fluctuations and Financial Crises ......................................................... 13
  1.3.i. Theories Emphasizing the Inherent Instability in a Capitalist Economy . 13
  1.3.ii. Monetary Explanations ........................................................................ 14
  1.3.iii. Theories Emphasizing the Saving-Investment Process ....................... 15
  1.3.iv. Theories Emphasizing the Role of Investment and Innovations ........ 16
  1.3.v. Accelerator Models ............................................................................. 18
  1.3.vi. Modern Crisis Theory ......................................................................... 19
1.4. Hyman Minsky as a Post-Keynesian .......................................................... 25
1.5. Conclusion .................................................................................................... 31

Chapter Two: The Delineation of the Financial Instability Hypothesis

II.1. Introduction .................................................................................................. 32
II.2. Uncertainty and Confidence Levels ............................................................ 33
II.3. The "Two-Price" Theory ............................................................................ 35
II.4. Profits, "Euphoria", and The Tendency of a Capitalist Economy to Boom . 39
II.5. The Necessity of Institutional Intervention ............................................... 42
II.6. The domain of stability ............................................................................ 46
II.7. Conclusion .................................................................................................... 51


III.1. Introduction ................................................................................................. 53
III.2. Review of the 1998/1999 Financial Crisis in Egypt ................................. 53
  III.2.i. The Egyptian Economy During 1970-1990 ....................................... 54
  III.2.ii. The ERSAP and the 1998 Financial/Economic Crisis .................... 55
III.4. Model Selection ......................................................................................... 62
  III.4.i. The Taylor-O'Connell model (1985) ................................................. 63
III.4.iii. The Filho Model of Growth Constrained by the Balance of Payments (1999) .................................................69
III.4.iv. Duncan Foley’s model (2001) ........................................72
III.5. Conclusion ..................................................................83

Chapter Four: The Application of Foley’s Model and Interpretation of Results

IV.1. Introduction ..................................................................85
IV.2. Data Specification, and Conceived Data Limitations ..........86
IV.3. Interpretation of Results and Crisis Detection ..................92
  IV.3.i. The Consumption Boom and Debt Dilemma During 1970-1990—94
  IV.3.ii. The Asset-Price/Lending Boom and the Detection of
          the 1998/99 Liquidity Crisis...........................................98
IV.4. Testing the Significance of Foley’s model in explaining the 1999 crisis—109
IV.5. Conclusion ..................................................................112

Chapter Five: Conclusions and Policy Implications

V.1. Conclusions .................................................................113
V.2. Policy Implications .......................................................116

References ..........................................................................128

Appendix .............................................................................132
Introduction

Hyman Minsky introduced his revelations on the inherent financial instability of capitalist systems in “Longer Waves in Financial Relations: Financial factors in the more Severe Depressions” (1964). Later, he developed his writings into an articulated theory of aggregate instability driven by debt accumulation in capitalist systems with advanced financial intermediaries, where capital accumulation is determined by the volume of investment-finance available through debts (1982, 1991, and 1992). Minsky argued that the domain of stability dwindles during boom periods due to the deterioration of balance sheets, such that the system becomes sensitive to mild shocks and highly prone to a financial crisis.

The cogency of Minsky’s theory was neglected during the 1960s and 1970s; however, the relevance of the financial instability hypothesis was increasingly recognized during the 1990s and widely applied to the explication of the phenomenal dispersion of financial crises in industrialized economies and emerging-market economies.

In case of Egypt, the enhancement of rapid stabilization and vast financial liberalization during the early and mid 90s resulted in rapid growth during 1994-1997. However, the 1998/1999 liquidity crisis dismantled the impressive macro-economic performance and placed the economy in recession\(^1\). The sudden shift in growth rates leads to the main question of research, whether sudden growth and rapid accumulation during mid 90s combined a self-desstabilizing mechanism that led to the 1998/1999 financial crisis, or not? And whether the crisis was triggered by an internal shock or an external shock? And whether the structural adjustment program ERSAP created a prolific environment for financial instability? Also, how reliable is the financial instability hypothesis for predicting future financial crises?

The main hypothesis herein is that the 1998/1999 financial crisis was mainly a consequent of cumulative financial instability within the private business sector during mid and late 1990s. Also, the financial liberalization that accompanied ERSAP and the constraints placed by the fixed exchange rate policy on the monetary policy had adverse long-term effects on the solvency and liquidity of private enterprises.

This thesis presents an empirical study of the 1998-1999 financial crisis and investigates the explicatory power of the financial instability hypothesis using Duncan Foley’s model (2003). However, data limitations place a binding constraint on the potentials of the model and the strength of the derived results. The balance sheet data on net profits, debt commitments, and net investments is gathered from the annual balance sheets published in the annual financial review of the private enterprise sector and issued by CAPMAS during 1970-2001. The data is limited to the formal private enterprise sector, meaning that the data excludes small scale enterprises, as well as the informal business sector. Hence, there is a limitation placed by the

unavailability of data in explaining the financial development within the whole business sector, and the grand assumption proposed in this thesis that the formal private enterprise sector is a representative of the entire sector private places a constraint on the significance and reliability (biasedness) of results. In addition, the reliability of CAPMAS data is in most cases questionable, placing another constraint on the quality of derived results. Nevertheless, the phenomenon studied here concentrates on explaining the sudden shortage of liquidity within the banking sector in Egypt during the late 1990s, and it is large enterprises that have access to bank credit rather than small enterprises, therefore we may consider the available data as a fair representative of the contribution of the business enterprise sector to the 1998 financial crisis.

Chapter one investigates the theoretical background of the financial instability hypothesis, and the posture of Minsky's theory from economic literature and crisis theory. The first section revives the long-debated issue of the inherent instability of capitalist systems, and the essential need for crisis theory. The following sections review various approaches to crisis analysis and highlight the merits of Minsky's theory and his innovative micro-macro financial approach to crisis analysis.

The second chapter delineates the fundamentals of the instability hypothesis. It starts by discussing the intrinsic role of uncertainty and profits and their impact on capital-asset price levels and the mechanism of instability that translates the anticipation of future profits into rapid accumulation of debts. The following sections discuss the determinants of the domain of stability and the mandatory institutional interventions to limit pace of instability.

The third chapter depicts the indicated financial instability in Egypt during 1998/1999, and outlines the factors validating the application of Minsky's theory to the case of Egypt. The
chapter then reviews five of the mathematical applications of Minsky's theory, and selects an appropriate model for application in the following chapter.

Finally, chapter four presents an empirical application of Foley's model to the case of Egypt and examines the ability of the model to detect the phases of financial instability as introduced by Minsky and modeled by Foley. The results derived from OLS estimation are then evaluated to determine the significance of Minsky's theory in explaining the long growth-wave of the 90s and its implications for future growth.

The necessary data set on annual debts, profits, and investment of the private business sector was gathered from the annual balance sheets published in the financial review of the private enterprise sector and issued by CAPMAS during 1970-2001. Whereas the necessary macro economic data was mainly gathered from the Ministry of Planning's documentary reference on major changes in the national economy during 1959/1960-1999/2000. Finally, financial data was gathered from the quarterly and annual economic reports issued by the Central Bank of Egypt during 1970-2001.
Chapter One

The Theoretical Foundation of the “Financial Instability Hypothesis” Theory

I.1. Introduction

“The epidemic of financial crises in developing and newly industrialized countries that accompanies the liberalization of domestic and international markets in the 1990s has underlined the relevance of Hyman Minsky’s (1975,1982) conception of financial fragility to the contemporary world economy.” (Duncan Foley, 2003)

Financial crises have become characteristic to open market economies during the 1990s and late 1980s. The World Bank counts 113 banking crises in 93 countries during 1975-1999, and only one banking crisis during 1945-1971. The unprecedented frequency of financial crises during the 1980s and 1990s accentuates the essential need for a financial theory of crises (see chart I.1 below). Minsky’s financial instability hypothesis introduces an innovative approach to the inherent instability of capitalist systems; it integrates the dynamics of the financial structure into an investment theory of cyclical growth.

Chart I.1. The Phenomenal Increase in Financial Crises During 1985-1999

![Chart](chart.png)

Source: Chart developed by the Author using the listed dates of financial crises in David Oheim (2001), and Philipe Davis (2003).

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1 David O. Beim: “What Triggers the Banking Crises?”, Colombia University, 2001, p.1.

The chapter exhibits the theoretical foundations of the “financial instability hypothesis”, and its explicative potentials in analyzing financial crises. The first section depicts the inherent instability in capitalism as an economic system. The following section presents various approaches to crisis analysis, and finally, the chapter outlines the position of Hyman Minsky in economic literature with a brief review on the financial instability hypothesis.

I.2. The Inherent Instability of Capitalism

The simple definition of capitalism in economics refers to a system in which the means of production and distribution are privately or corporately owned, and development is proportionate to the accumulation and reinvestment of profits gained in a free market. Hence, by definition, capitalism can exist in various forms:

“capitalism does indeed come in many varieties. At least five stages can be identified — and we might now be on the verge of creating a sixth. The five stages can be labeled as follows: merchant capitalism (1607-1813), industrial capitalism (1813-1890), banker capitalism (1890-1933), managerial capitalism (1933-1982), and money-manager capitalism (1982-present)” (Charles Wahlen, 1996, p.4).

The common feature of the various forms of capitalism is the system’s endogenous instability and the tendency to fall into recessions. The endogenous instability of capitalism is perceived by non-standard economists—Keynesians, Marxists, Post-Keynesians, and other descendendants of the heterodox stream— as a systemic feature built in the mechanics of the system. However, this view is rejected in standard economic theory and replaced by the self-equilibrating mechanism that is assumed to exist in the laissez faire economy.

The “General Theory” by J.M.Keynes was a formal recognition of the failure of capitalism to sustain financed investment at a sufficient level to keep the economy near full-employment. Keynes
introduced the concept of effective demand, and explained how effective demand – through financed investment demand – can bring the economy to full employment. However, the state of equilibrium is unsustainable because investment in a capitalist system is overwhelmed by uncertainty, and hence it is highly influenced by expectations which alter short and long term growth rates.

Profits – the quest of capitalism – are generated through the utilization of investment capacity that follows from the increase in aggregate demand (consumer demand and investment demand). However, the validation of short-term expectations of profits depends upon the size of aggregate investment, which is derived from investment demand. Hence, financed investment demand is the impelling component of aggregate effective demand that forces aggregate growth through the multiplier effect until investment exhausts all available savings. Investment is then stabilized and so is the profit rate and employment at that level where short term expected profits are justified by realized profits. When both investment demand and employment are stabilized, the economy is in “equilibrium”. However, in order to remain in equilibrium, long term expectations must generate financed investment demand at a level that generates adequate profits to justify short-term expectations. This is because the short-term expectations determine the level of employment where long run expectations determine the size of investment, and aggregate economic stability is determined by both. Hence, the Keynesian equilibrium is essential for stability, yet it is not necessarily achievable. Moreover when full employment is achieved, the market is likely to initiate a financial boom and lead to speculative growth in investment, which cannot be sustained.

According to Keynes, the capitalist economy is inherently unstable because long term expectations – the major determinant of investment demand – are continuously adjusted to the
changes in economic and political situations. However, stability requires long term expectations to readjust such that the financed investment demand is compatible with the changes in unemployment, i.e. long term expectations must be adjusted such that short term expectations are validated. Minsky adds in his interpretation of the “General Theory” that even if full-employment is achieved through the validation of short-term profit expectations, the economy is not expected to sustain its stability for long. When profits are validated and debts are fulfilled the perceived risk declines. Consequently, the willingness of businesses and financial intermediaries to acquire debts and give out loans increases, and hence, the economy becomes highly indebted and both investment and profits will eventually have to decline, bringing the growth process to a halt. Therefore, unemployment will have to rise once again.

Minsky agrees with the Keynesian perception that the principal defect of capitalism as an economic system lies in its failure to maintain a close approximation to full employment. However, Minsky asserts that the deeper flaw of capitalism lies in the increasing influence of the financial system on the pricing and demand of capital assets and current output, such that the debt to income ratios rise and conditions become conducive to a financial crisis.

In a capitalist economy with corporate structures, investment is largely financed through equity and debts. The reliance on external finance in the process of capital accumulation allows financial intermediaries to alter the price formation of capital assets. The maximizing behavior and future expectations of intermediaries influence their decisions on providing funds and the price of

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the fund, hence the perceptions of intermediaries influence the market price of capital assets which in case of large corporations diverges largely from the book value. On the other hand, the price of output produced by capital assets is mainly determined by the cost of labor. Hence, both sets of prices may peruse different growth rates and the ratio of asset prices to current prices becomes a non-static ratio. It turns out that investment demand is highly sensitive to the changes in the price ratio; when the asset-to-output price ratio increases, investment demand responds to the expected profits implicit in increasing asset prices. However, financed investment demand requires external finance, which is translated into rising debts on the firms’ balance sheets. The elevation in firms’ leverages is justified by increasing income from profits. If for any reason profits decline or the debt service increases, such that the cash from operations cannot suffice current commitments, the firm will either have to raise more liabilities or sell out positions. This could lead to a sharp fall in assets value, a decline in demand for investment as well as declining income from profits. Hence the capitalist economy tends to create booms, and during booms it tends to accumulate debts. The over-accumulation of debt payments and the decline in net-income cash flows combine to terminate the boom.

"Stable growth is inconsistent with the manner in which investment is determined in an economy in which debt-financed ownership of capital assets exists, and the extend to which such debt-financing can be carried is market determined. It follows that the fundamental instability of a capitalist economy is upward. The tendency to transform doing well into a speculative investment boom is the basic instability in a capitalist economy.” (Minsky, 1982 - p.67)

Joan Robinson enriched economic literature with her perceptions on the inherent instability of capitalism. Her argument rests on the socio-economic imbalances within a profit maximizing economy, as well as the overwhelming uncertainty that governs the investment environment.
Uncertainty determines investment decisions through the influence of expected profits on capital accumulation. Robinson explains that “In dis-equilibrium the expected accumulation rate is either higher or lower than the rate of profit induced by this rate of accumulation. Such states of dis-equilibrium characterize the various phases of the business cycle. In the expansion phase there is a high rate of accumulation, which tends to increase as the induced rate of profits is higher than the expected rate” (Ekstedt H., and Westberg L., 1991). However, during stagnation, the induced rate becomes lower than the expected rate; this may result from a decline in effective demand and aggregate output.

In addition to the inability of capitalism to bring the economy close to full-employment without increasing inflation, the system of allocation between individuals is inclined to de-stabilize the system. Capitalism invites increasing growth rates, nevertheless it tends to redistribute the generated wealth mostly to the possessors of capital assets: profit maximization requires technical progress which shifts the demand for labor towards educated and skilled workers, yet only rich families can afford to pass on such qualities. Hence, capitalism favors individuals who belong to a specific social class, and this class earns income as a reward for its financial power rather than its marginal product. However, the increasing wealth of capitalists is on the expense of the poorer social classes who possess very little capital if any, and are poorly educated: “As growth goes more on the top, more and more families are thrown at the bottom” (Joan Robinson, 1972, p.7). The increasing poverty in a capitalist economy threatens the prospects of aggregate future growth. The

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Ibid. p. 75-77.
income elasticity of demand is higher in low-income societies; increasing poverty feeds into shrinking aggregate demand and limits the span of aggregate growth.7

The failure of consumer demand during over-investment periods generates an aggregate slowdown. Edward Nell (1988) denies the possibility of continuous growth in a capitalist economy without undergoing a structural change, “The capitalist system has two and only two long-run options, enforced by competition—transformational growth or stagnation”. He explains that competition puts continuous pressure on firms to reduce costs and enhance higher levels of efficiency in production. Indeed, this improves productivity yet efficiency requires firms to hold down wages and payouts of dividends and profit incomes. In turn, aggregate consumption — whether worker consumption or capitalist consumption — is held back by the system’s attempt to enhance efficiency and maximize profits. This implies that the productive capacity tends to grow faster than consumer demand. Hence, while investors continue to enhance efficiency — in quest of maximum profit—the gap between output supply and consumer demand widens further, leading to an inevitable state of stagnation, unless there are major transformations within the society to change the behavior of either investors or consumers.8

Proponents of standard economic theory reject the perception of capitalism as a self-destructing system. Their exposition of recurring crises stems from non-systemic factors, in fact

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8 Edward Nell in: Cherry Robert, D’Onofrio Christine, Kurdas Cigdem, Michi Thomas R., Moxeley Fred and Naples Michele I. (Eds.): The Imperiled Economy, The Union for Radical Political Economics, New York, 1988, p.93
depressions are seen as a consequence to exogenous shocks\(^9\). However the economic history of the world shows that capitalism is replete with recessions and depressions\(^10\) arising from endogenous instability\(^11\). Furthermore, the systemic fragility of capitalism is intensified by vast financial liberalization (Ute Pieper & Lance Taylor (October 1996), John Eatwell (August 1996), Roberto Frenkel and Martín González Rozada (February 2000); Amitava K. Dutt and J. Mohan Rao (February 2000), and others).

"The vast and increasing stream of liberalization under the ‘globalization umbrella’ has been triggering a chain of booms and recessions in capitalistic systems in various areas around the world, setting the world system in a state of instability and recurring crises. This flow of instability is not new to the world system, in fact the 1990s are a replica of the 1920s; In the 1920s there were solid liberalization moves resembling those mounted by the IMF today. The liberalized trade and financial systems ceased their hyper growth soon in the 1920s, and the whole world was caught in severe global depression in 1927" (Lance Taylor and Ute Pieper, 1996)\(^12\).

Despite the destabilizing nature of market systems, the length, strength, or even the frequencies of slumps are manageable under certain premises. Hence, crisis analysis is doubtless crucial, and the selection of a suitable analytical approach is a critical issue: “Understanding how a capitalist economy behaves will give us knowledge that will enable us to control and change it so that its most perverse characteristics are either eliminated or attenuated”. (Minsky, 1982, p.96)

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10 The bursting of the British South Sea bubble and the French Mississippi bubble in 1922, the industrial depressions of the 1870s and 1930s, to the Latin American middle income debt crisis, African low income debt-crisis, and East Asian financial crisis.


I.3. Traditional and Modern Approaches to the Study of Economic Fluctuations and Financial Crises

Until the late 1880s, economic literature was suppressed by standard economic theory, with a few exceptions: Malthus, Sismondo, and Lauderdale. Evidently, standard economics is analytically void of the theoretical essentials for crisis analysis, hence, it failed to explain the persistence of fluctuations in aggregate activity and the systemic instability of capitalism. The impelling need to understand the endogenous forces of instability propelled “non-orthodox” scholarly contributions on business cycles and crisis analysis.

I.3.i Theories Emphasizing the Inherent Instability in a Capitalist Economy: According to this class of “crisis theory”, capitalist economies are blasted by the system’s endogenous tendency to create cyclical growth. Mitchell, Pigou, Meltzer, and Keynes, are the most prominent advocates of the inherent financial and economic instability of capitalism. Mitchell argues that depressions result from the accumulation of business strains during prosperous growth periods. The imperative pressure to increase output – in quest for profits- will eventually result in rising overhead costs, increasing costs of operation, an elevation in the price of labor and raw material, as well as a perceptible decline in the efficiency of labor. Furthermore, bank reserves become highly scarce with the escalation in investment demand, resulting in an increase in interest rates on both short and long-term debts. Obviously, boom periods recreate the endogenous economic and financial environment such that profits will eventually have to decline and aggregate growth becomes unsustainable. In a later stage, after depression sets in, the costs of production decline
tremendously, thus the perceptible increase in the profit rate feeds into prospering expectations and a new swing is initiated.\textsuperscript{14}

Pigou and Mitchell stand on common grounds, nevertheless Pigou emphasized on the Keynesian “animal spirits” as an intrinsic de-stabilizer of the capitalist economy. Expected profits develop more rapidly than the accomplished growth rate of the real economy on one hand, and the expected costs of production are underestimated on the other hand. The declaration of errors in estimating future gains and losses bends the overwhelming optimism into market pessimism, and a downswing becomes inescapable.

Meltzer's argument is quite different from the above. Meltzer presented an “inventory theory” of the inherent instability: Fluctuation in aggregate economic activity is the natural outcome of the time-gap between the shifts in aggregate demand and the induced change in aggregate output. The time lag between demand and responsive supply produces unplanned changes in inventory, such that the exhaustion of inventory during boom periods induces market optimism and the pile up during the down turn distributes market pessimism.\textsuperscript{15}

1.3.ii Monetary Explanations: Monetarists assert that the entanglement of a capitalist market into persisting fluctuations is a purely monetary issue. On the aggregate level production is stimulated by aggregate spending. However fluctuations in aggregate spending are chiefly determined by the

\textsuperscript{13} Mitchell emphasized the gradual development of stresses within the economy and stated that the downturn at the end of the boom does not come suddenly in all industries, in fact it begins in specific sectors and spreads gradually to the rest of the economy.


\textsuperscript{15} Ibid, p.351
money supply. Clark Warburton – one of the most prominent monetarists - argues that aggregate economic stability is tied to the changes in the money supply, such that growth in output is sustained only by equivalent growth in the money supply. Friedman and Schwartz introduced fine adjustments to the monetary theory of fluctuations, linking the rise and demise of output to the growth rate of money supply, rather than the absolute level of money in circulation. However, a few monetarists – like Hawtry - diverge from traditional monetarism on the determinants of aggregate spending. Hawtry’s analysis rests on “credit” rather than money supply as the principle determinant of aggregate spending and growth.

Monetary and financial issues are indeed relevant to the growth cycle, and have become a principal determinant of instability with the increasing sophistication in financial markets. Ironically, monetarists did not succeed in devising a theory that reflects the substantial influences of money and finance on macro-stability through the influence of intermediaries on the liabilities of the private and public sector, as well as their influence on asset prices through the determination of interest rates. Monetary theories approach crisis analysis from a rather shallow perspective, they completely overlook the demand side of money and the interaction between the demand and supply that drives financial innovations and layering and its influences on debt structures and capital accumulation.

I.3.iii Theories Emphasizing the Saving-Investment Process: The assertions made by “Over-investment” theories rest on the tendency of capitalist markets to over-invest during boom periods.

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The termination of a "boom" comes with the shortage of capital resulting from the massive increase in implemented investments and the insufficiency of savings.\textsuperscript{18}

Over-investment theories present various conjectures concerning the initiation of booms. Austrian scholars argue that booms are initiated during depressions through the decline in interest rates below the equilibrium rate (Knut Wicksell and Fredrick Hayek). Capital-intensive projects become relatively profitable, consequently the demand for investment expands. Shortly afterwards, investment demand exceeds the savings' supply and credit becomes the only alternative to sustain growth. Also, businessmen are inclined to invest in producing capital goods, rather than consumer goods (at this stage capital goods are more profitable), subsequently the price of consumer goods increases. At this stage capital goods become relatively scarce (investment are diverted to current output) hence the price of capital used in producing capital goods becomes relatively expensive. Moreover, banks constrain their credit supply and raise their interest rate, until it eventually exceeds the equilibrium rate.

There are other non-monetary explanations of the over-investment process: Tugan Baranowsky, Arthur Spiethoff, and Gustav Cassel associate the capital accumulation with "innovations". In this context, innovations refer to technological advance, access to new markets, a surge in population growth rates or even a gradual development in market psychology.\textsuperscript{19}

I.3.iv Theories Emphasizing the Role of Investment and Innovations: "innovation" theories developed by Joseph Schumpeter and Alvin Hansen differ from the over-investment theories

\textsuperscript{18} Op cit, Gordon, p. 358.
discussed above. Schumpeter explains that the discovery of innovations issues new investment opportunities that are financed using bank credit. The observed lending boom generates a strong feedback on market expectations, resulting in speculative investments and further "over-investment". The sudden expansion in capital accumulation is eventually terminated by the exhaustion of investment opportunities, giving rise to a major downswing. The failure of consumer demand to expand further, disallows the establishment of new investments and an initial deflation cycle is initiated. Moreover, over-optimism and market speculations that developed earlier during the boom have created speculative excesses, intensifying the over-investment process and resulting in a further decline in output during recession.

Hansen's theory is similar to Schumpeter's but with a stronger flavor of Keynesianism. Investment opportunities are initiated by innovations, however the "booming" behavior is a consequence of induced investment rather than autonomous investment. Hansen argued that the increase in autonomous investment creates a sudden rise in both output and incomes. The rise in income is then reinvested into further capital accumulation, "induced investment". Hansen explains that growth is sustained as long as induced investment maintains growth, however both autonomous and induced investments will eventually have to decline, and the once "booming" economy is suddenly transformed into depression.  

Over-investment theories and innovation theories succeed in highlighting the impact of investment on economic activity being the chief determinant of growth in a capitalist system,

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Ibid, pp 368-369
however, like discussed earlier in monetary theories, they neglect the profound impact of financial intermediaries and debt structures on the mechanics of the growth cycle.

I.3.v. Accelerator Models: J.R. Hicks employed the “acceleration principle” and “multiplier effect” in explaining the frequent fluctuations in aggregate economic activity. The primary cause of crises is dwelled by the feedback between the acceleration principal and induced investment, which interact to produce cycles that can become explosive. The stimulated growth in aggregate output generates savings, which are then used to finance further investment. The sudden spike in aggregate activity results from the increase in induced investment, successively induced investment increases output at the “acceleration rate”. The increase in savings is then reinvested in further accumulation, and growth continues until savings are fully absorbed. Once induced investments suffer a shortage in capital, aggregate output slows down and feeds into declining investment. The downturn cycle continues until induced investment is completely diminished.

Richard Goodwin developed an “accelerator” model similar to the Hicksian model, yet it differs in its specification of induced investment. Goodwin assumes that induced investment is determined by the difference between the desired capital stock and existing capital, rather than savings:

\[ I = a(k - k) \]

\[ \dot{k} = \beta y + \Phi(t) \]

I is investment, \( k \) is the current capital stock, \( \dot{k} \) is the desired capital stock, \( \beta y \) is the product of the accelerator and current output, \( \Phi(t) \) depicts the technological change that could stimulate an increase in the desired stock.\(^{21}\)

\(^{21}\) Op cit, Minsky, 1982, p.232-233
The accelerator models discussed above are intriguing because they illustrate the cyclical behavior of an economy between explosive growth and inescapable depression. They both generate a fluctuating time series but within the defined constraints, hence they overcome the common difficulties associated with linear accelerator models.\textsuperscript{22}

I.3.vi. Modern Crisis Theory: The recrudescence of financial crises in the wake of the 1973 shift in global financial system, invoked modern generations of crisis theory. Contemporary literature divides financial crises theory into three generations. First generation models revolve around currency crises as a consequence of the government’s exceedingly large fiscal deficits and leverage ratios under a fixed or pegged exchange rate regime (Krugman (1979) and Flood & Garber 1984)\textsuperscript{23}. This class of theory is concerned with the impact of weak macro-economic fundamentals on the stock of foreign reserves. Once international reserves approach a specific critical limit, a currency crash breaks out.

First generation models were fit to explain the currency and debt crises of the 1980s in Latin America and South Africa. However, they failed to explain the ERM crisis in the Nordic countries (1992) and the Mexican currency crisis (1994). In case of Mexico (1994) the break of crisis commenced before short-term foreign currency debts (tesobonos) were even mature. The crisis was initiated by a widespread investors’ panic. The growing self-fulfilling expectations that short-term foreign debt service will exceed the stock of reserves by far was translated into massive

\textsuperscript{22} For further details on the difficulties associated with linear accelerator models see Minsky (1982) p.232.

capital outflows and a currency crash later. The case of Mexico and Nordic countries’ crises shifted modern crisis theory onto the second generation.

Second generation models emphasize the impact of a self-fulfilling panic on capital flows. However, as quoted by Roubini, Keller, Rosenberg, and Allen (2002), macro-economic fundamentals are still conceived as leading determinants of currency crises (Obstfeld, 1994; Drazen Masson 1994; Cole and Kehoe (1996))

The first and second generation models focused on the distortions in economic fundamentals placed by the government through the choice and conduct of fiscal and exchange rate policy, in addition to the “self-fulfilling” element. However, the Asian crisis (1997-98), Venezuela’s banking crisis (1994), the Japanese decade recession (1990-2000), Russia’s liquidity crisis (1998), the Brazilian balance of payment crisis (1998-99), and other cases during the 1980s and 1990s show that the private sector -rather than fiscal deficits- is capable of stimulating the instability process. A third generation of crisis theory evolved after the Asian crisis emphasizing the role of the private sector in recent financial crises.

Third generation models recognize the self-fulfilling element as a strong determinant of financial crises (Sachs and Radelet (1998), Rodrik and Velasco (1999)). However the stress is placed on the evolution of balance sheets during boom periods. The balance sheet approach highlights the impact of public and private leverages on aggregate financial stability. Increasing debt ratios under a fixed exchange regime can result in speculative attacks on currency and a reversing capital account

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24 Ibid, p.10.
(Dornbusch 2001), a liquidity crisis, or even worse a twin of currency and banking crises (Kaminsky & Reinhart 1999).\(^ {25} \)

There are three strands of third generation models. The first strand is close to second generation models in emphasizing the self-fulfilling element, however the panic herein is perceived as a direct consequence to the changes in domestic balance sheets (Chang and Velasco (1999)). Liquidity runs are conducted by the interaction of deteriorating bank balance sheets and the depreciation of currency, exposing the banking sector and government to financial crises. Hence, these models contribute to the explanation of twin crises.\(^ {26} \)

The second strand addresses financial crises as a consequence of the impact of moral hazards on corporate balance sheets. The explicit and implicit government guarantees lead to over-borrowing and domestic over-lending, in addition, fixing the exchange rate at an overvalued rate, results in increasing short-term debts from abroad (Krugman (1999), IMF (1998), Corsetti, Pesenti and Roubini (1999a, 1999b)). Exchange rate misalignments are central in this strand of theory, where large depreciation and excessive borrowing from abroad magnify the debt burden and lead to a contraction in investment and output.

The third strand combines the above factors into a single theory. Financial crises are seen as a consequence to the misalignment in the exchange rate, balance sheet imbalances, moral hazards, contagion, external shocks, and the self-fulfilling element that soon develops into a crisis through the interaction of the above factors (Calvo (1999), Schneider and Tornell (2000)).\(^ {27} \)

\(^ {25} \) Ibid

\(^ {26} \) Ibid.

\(^ {27} \) Ibid.
The balance sheet approach shifts crisis analysis from the macroeconomic view towards a more micro inspection of the assets and liabilities of the aggregate economy. Financial crises occur when there is a dive in the demand for the financial assets of one or more sectors of the economy. Once creditors lose their confidence in the ability of the private sector to meet its short-term commitments, the ability of the government to service its public debt, the ability of the banking sector to withstand deposit withdrawals, or the ability of the country to earn enough foreign exchange to service its external debt, once this happens, the demand for the financial assets of one sector or more declines severely. The plunge in the demand for domestic financial assets indicates that investors will demand foreign assets instead, hence, capital flows outwards, the exchange rate is highly depreciated, the current account experiences large surpluses and a state of recession sets in.\(^{28}\)

The preliminary study of crises in recent decades shows that the world economic system is prone to financial imbalances. Such imbalances feed into increasing debts, unsteady capital accumulation, and unstable prices. It turns out that recent crises are mainly the repercussions of financial hazards. Also, Egypt’s 1998/1999 crisis is classified as a liquidity crisis. Hence the analysis of Egypt’s financial crisis requires the application of a crisis theory that can link financial instability to investment and growth.

Recently the balance sheet approach demonstrated ample explanatory potentials when applied to the recent financial and currency crises in various regions. However, the balance sheet approach is not entirely new, in fact it is a reformulation of Minsky’s financial instability hypothesis (1964) i.e. the financial fragility of a capitalist economy illustrated by rapid growth and massive

\(^{28}\) Ibid.
capital accumulations -that are mainly financed through increasing debt to income ratios- will eventually develop into a financial crisis.

Hyman Minsky managed to construct a theory that stands half way between Keynesianism and Monetarism, within the post-Keynesian realm. The “Financial Instability Hypothesis” is a financial theory of investment, and even though it is founded on Keynes, it differs from what is explicit in Keynes and other post-Keynesian theories, mainly in integrating financial institutions and usages into its analysis\(^{29}\). Moreover, through the emphasis on finance and the variations in relative prices of assets and current output, it shows how financial development can alter aggregate investment and aggregate output, thus it becomes a theory of the cyclical behavior of a capitalist economy.

The theory can be dismantled into two propositions: First, the evolution of the financial structure and financial layering over prolonged expansions affects financial usages as well as the nature and pricing of primary assets, that work to produce an over optimistic “euphoric” economy - a booming economy. Second, during the short period of “euphoria”, the economy tends to accumulate increasing debts, such that the portfolio transformations accompanying the increase in debt to income ratios decrease the domain of stability within the financial system. That is to say, the capitalist economy tends to create euphoric growth (booms) and during euphoria the financial structure becomes highly unstable, and capable of generating financial crises.\(^{30}\)

Minsky approaches the economy as a set of firms, where the instability process can be visualized through the distribution of firms along an imaginary line that represents various degrees

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\(^{29}\) Opcit. Minsky, 1982, p.95

\(^{30}\) Ibid. p.145
of stability. Financial robustness is at one end of the line, and on the other end lies financial fragility. History shows that the capitalist economy is capable of creating the sufficient conditions to transform firms from financial “austerity” to financial “fragility”. The economy is hedged as long as the majority of firms are financially hedged, however after a period of prolonged hedged-growth, the perceived risk declines, subsequently interest rates decline, and the economy becomes conducive to capital accumulation using debt finance. The increasing leverages of firms transform them into financially fragile ponzi structures; capable of destabilizing the aggregate economic activity.\textsuperscript{31} According to Minsky then, the simple act of borrowing to finance accumulation is a primary determinant of instability in a capitalist system.

The financial instability hypothesis has an essence of the over-investment theories, the innovation theory, Keynes, monetary theories, and theories emphasizing the inherent instability in capitalism. The transcendency of Minsky’s hypothesis lies in integrating the above into one single theory; explaining the inherent instability of capitalism as a systemic phenomenon determined by the financial aspects of the accumulation process.

Ben Bernanke and Mark Gerler stand on common grounds with Hyman Minsky; they both developed a theoretical framework of financial crises that resembles Minsky’s theory in its elements, however their analysis is not fully-developed into a general theory of financial crises.

They argue for the pre- eminent role of borrowers’ net worth in macroeconomic fluctuations, and that financial fragility arises from the shortage of borrowers’ wealth in relation to the size of their projects: the less the borrower owns in his project the more his interests will diverge from the

interests of lenders. When lenders recognize that borrowers depend largely on external finance, they raise the price of credit supply. Subsequently, the costs of investment rise, implying investment accelerator effects. Ben Bernanke and Mark Gertler identify such a situation as likely to happen in a prolonged recession or subsequent to a debt deflation.\(^{32}\)

Their analytical framework places great emphasis on the costs of credit intermediation. The decline in collateral value decreases the solvency of firms, exposing them to higher risk of default. Consequently, the cost of credit intermediation increases i.e. interest rates increase, which is likely to be a self-defeating process.\(^{33}\) They explained how balance sheet effects can lead to financial fragility, but failed to explain how an initially hedged economy can be transformed into a financially fragile one — they failed to account for the cyclical behavior of capitalism and its inclination to regenerate financial crises. In opposition, the financial instability hypothesis presents a full theory of the mechanics and dynamics of financial crises in a capitalist economy with advanced financial institutions.

\subsection*{1.4. Hyman Minsky as a Post-Keynesian}


\(^{33}\) ibid
Alvin Hansen, and Henry Simons on Minsky's works is unquestionable, however the rationale of the instability hypothesis cannot be traced elsewhere in economic literature. The impressions of Keynes are perceptible in the financial instability hypothesis; Minsky places great emphasis on induced investment demand and profit expectations as the chief source of fluctuations, however, he extended his theory way beyond Keynes. Minsky presents a dynamic analysis of instability: he offers an analysis on how the two price systems can generate optimistic investment demand and rapid accumulation of capital. He then extends his analysis to the financial development of individual economic units and the market structure during the boom. Minsky shows that credit finance, profit expectations, and the interaction between economic agents have strong impacts on the market structure and the fragility of balances sheets, and fluctuations in a capitalist market are seen as the reflection of deteriorating balance sheets on investment demand in a dynamic market structure.

The theory of financial instability explicitly states that the mode of finance is capable of destabilizing the whole system, and that during prosperity, capitalist economies are inclined to finance rapid growth mainly through debts: "a capitalist economy with sophisticated financial institutions is capable of a number of modes of behavior and the mode that actually rules at any time depends upon institutional relations, the structure of financial linkages, and the history of the economy" (Minsky, 1982, p.92).


Minsky divides the economy into two markets, capital assets' market, and current output market. The price ratio of capital assets to current output determines the demand for investment. When the price of capital increases relative to output, expected profits increase and become conducive to rapid capital accumulation.
In a capitalist economy, the process of capital accumulation includes exchanges of present money for future money (expected profits). A significant part of money-flows is in the form of dated commitments with financial intermediaries. Intermediaries lend a fraction of their deposits to firms and corporates. Later in time, firms pay back their debt installments to intermediaries who channel the money back to depositors. The flow of money from intermediaries to firms is determined by the anticipated cash flows from “expected profits”, as well as the past performance of firms, however the flow from firms back to intermediaries is determined by their ability to meet their cash-commitments using the net income from “realized profits”. Hence, profits have a chief influence over the domain of stability: anticipation of profits enlarges the scale of debts in the economy, and realized profits are then used to validate debt commitments. If for any reason the income from profits is insufficient to pay back the debt service, the firm becomes financially fragile. If this occurs on a large scale, the whole economy becomes unstable.

There are various channels through which profits can be destabilizing to the capitalist system, one of which is the feedback between profits—whether anticipated profits or virtual profits—and debts. “Financial fragility arises from the widespread practice of firms using debt contracts to finance production” (Duncan Foley, 2003), hence, the interaction between profits and debts that is explicit in the debt-to-income ratio, determines the stability of the system. Minsky defines three types of debt-income structures: hedge, speculative and ponzi structures. A firm is “hedged” as long as the cash flows from operations will exceed the operating costs; in other words, the net income

37 Minsky adopts Kalecki’s statement of profits; profits are determined by social, economic, political, and psychological factors, rather than technology alone.
from profits exceeds the debt service and covers investment. It becomes speculative when net
profits can cover the debt service and only a fraction of the firm's investment expenses; hence, it
raises further debts to finance the rest of investment payments. Such firms speculate that by the end
of a specific period the expected profits will increase to cover their commitments. If for any reason
the firm is unable to meet its current debt-service commitments, it becomes a highly fragile "ponzi"
structure, and raises further debts to cover part of its debt service. Moreover, if the net present value
of future cash flows from the current operation of the ponzi firm is insufficient to meet the debt
service, the firm will have to liquidate part of its assets or declare bankruptcy.30

Minsky's theory has two major postulates: First, in the absence of financial panics and
depressions, the financial structure changes where financial layering increases and the percentage of
speculative and ponzi structures increases. Second, the changes in the financial and payment
structure and layering increases progressively with time which increases the vulnerability of the
system to debt deflation and may result in deep depression.40

The financial instability hypothesis rests on five elements: investment is mainly induced by
expected profits, the two-price ratio of assets and output is variable, capitalist systems tend to
generate booms, the debt-to-income ratio increases during boom periods to finance rapid
accumulation, and finally, the system is overwhelmed by uncertainty. Minsky's chief hypothesis is
that the growth of a capitalist economy is carried by raising debts that cannot be paid in the future.

Although Minsky did not recognize himself as a post-Keynesian\textsuperscript{41}, his work on financial instability possesses the fundamentals of post-Keynesian scholarly output. First, Minsky presents a dynamic analysis of the inherent instability within capitalism i.e. prolonged growth creates "euphoria", which transforms the economy from hedged to speculative or even a ponzi structure, resulting in a depression that soon develops into steady growth once again. Like the rest of his post-Keynesian peers, he rejects Keynes' static analysis of an evolutionary process that carries its instability from one stage to the other. Second, Minsky treats money supply as an endogenous element. He explains that the money supply is determined by the money multiplier as well as the money base, instead of the other way round. For example, if the regulatory system limits the supply of credit below the level desired by the private sector, then financial intermediation and innovation will develop so as to increase the velocity of money. In addition, governments place implicit guarantees to protect distressed institutions, hence the government will have to guarantee its deposits either by expanding the money base or increasing the money multiplier. The endogeneity of money supply is another post-Keynesian modification to the economics of Keynes. The endogeneity of money supply is essential for Minsky to explain the impact of variations in finance on investment\textsuperscript{42}.

\textsuperscript{41}The founders of post-Keynesian theory were congregated from several dissident traditions within economics, the American Institutionalists, the Continental Marxists, as well Keynes's closest associates. Altogether, they produced an alternative approach to the prevalent orthodoxy, which constrained economic analysis to resource allocation under competitive market conditions. Post-Keynesian theory was highly influenced by Keynes as well as Keynes's younger colleagues like Richard Kahn (Richard Kahn contributed to the multiplier concept), Joan Robinson (known for her work on imperfect competition), Nicholas Kaldor, Pierro Srafa and Michal Kalecki. Together they introduced two discrete lines in classical Keynesianism, one arising from the monetary perspective of Keynes (this line stressed on the uncertainties surrounding investment in a monetarized world), and the other arising from Kalecki's real-side analysis (this line stresses on the ad the distributional effects of investment and savings in a system indulged by complicated monetary uses).

Third, Minsky showed that the pricing of capital assets is determined by the expectations implicit in the net present value of cash flows. The present value is highly determined by expectations that vary over the cycle. On the other hand, pricing of current output is mainly determined by the costs of production. Obviously, the price ratio of capital and current output is variable over time; it tends to increase during booms and decline during slumps. The variability in the 'two-price' ratio is essential for explaining the changes in the induced demand for investment.

Minsky succeeded in explicitly integrating finance into a theory of the inherent instability of capitalism. His work, sometimes referred to as "financial-Keynesianism", is founded on Keynes' monetary perspective. His interest in the relevance of money and finance began long before he developed his financial instability theory. In 1949 Minsky began his studies on the interrelations between market structure, banking, the determinants of aggregate demand and the business cycle. Later he wrote a number of articles on the accelerator principle, central banking, and money market. It was clear from Minsky's writings that he was discontented with the orthodox theory. During his work with the National Bureau of Economic Research (1960) he developed his own critique of the flow of funds analysis, arguing for the essential view of cash flows as contractual commitments to future payments. However, Minsky was not yet recognized as a post-Keynesian before the publishing of his book *John Maynard Keynes* in 1975.

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43 Some of the post-Keynesians like Minsky, G.L.S. Shackle, Sidney Weintraub, and Paul Davidson founded their work on Keynes' monetary perspective. Others built their work on Kalecki's distributional effects, like Alvin Hansen and Lawrence Kliem.

I.5. Conclusion

Capitalism is systematically flawed by the inherent instability of growth in a profit maximizing market-economy. Moreover, the advanced innovations in financial tools, and the increased interference of financial intermediaries intensified the fragility of capitalism, such that financial crises have become characteristic of “money-manager” capitalism (1990-present). Thereupon, the analysis of recent financial crises requires two necessary conditions: First, the employed theory must allow for endogenous instability, and the possible transition between the various phases of stability and instability. Second, it is necessary to augment financial interrelations and financial institutions in the dynamic analysis of aggregate fluctuations in capital accumulation, output, and employment. Financial Keynesianism as founded by Minsky and explicit in the financial instability hypothesis satisfies the two necessary conditions, furthermore, the theory exhibited an astounding ability in explaining and predicting recent financial crises during the 1990s.
Chapter Two

The Delineation of the Financial Instability Hypothesis

II.1. Introduction

In his article entitled “Longer Waves in Financial Relations: Financial factors in the more Severe Depressions”, published in 1964, Minsky introduced his theory on the financial instability of a capitalist system. The article addresses the significance of financial factors in the cyclical behavior of the economy. Minsky posits that the presence of a financial panic during depressions is strictly endogenous; financial panics arise from the acute transformations in the financial structure during prolonged periods of growth. The financial structure becomes highly fragile to endogenous/exogenous displacements such that the triggering event need not be a severe one.

Once the financial panic takes place the system forces a decline in assets’ values, as well as a shift in portfolio preferences towards liquid money, combined with devaluation in anticipated cash flows. The financial instability contributes to a major decline in consumption and investment demand, thus depressing income further. Astonishingly, the deflation spiral accounts for the sufficient requirements of another expansion: reduced debts, increasing liquidity, and low-priced assets.

The chapter investigates the foundations of the financial instability hypothesis. It commences by a discussion on the interaction between uncertainty, anticipated profits, and the price level of capital assets. It then addresses Minsky’s two-price theory, expressing the relative variation in asset

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1Minsky defines the financial structure as a set of financial assets and liabilities and the network of payment commitments among units: financial intermediaries, firms, and the government.
prices as the root of financial instability. The following section explains the impact of euphoric growth on the financial structure. Finally, the chapter discusses the major determinants of the system's domain of stability.

II.2. Uncertainty and Confidence Levels

The concept of “uncertainty” is essential for understanding capitalist decisions over a long period of time. The long-standing interest of Keynes in “uncertainty” that overwhelms decision making in capitalist economies stands as one of Minsky's key conjectures on the behavior of economic units operating under capitalism. Keynes presented an elaborate view of uncertainty in his published book *A Treatise on Probability*; he asserted that the probability assigned to the outcome of economic decisions is numerically imprecise due to the absence of sufficient knowledge. Keynes refers to such values as “subjective probabilities” because they are influenced by the subjective views of decision-makers, hence, they are subject to rapid adjustments with the changes in acquired knowledge and the confidence assigned to the probabilities. The underlying uncertainty in capitalist economies influences system behavior by intervening in the behavior of the production function and the preference function. It turns out that uncertainty induces economic units to perform financial decisions that imply future commitments; the association between financial commitments and uncertainty is the fundamental source of financial instability. However, as Keynes elaborated in *A Treatise on Probability*, uncertainty is an endemic feature of capitalism and assuming otherwise is a defiant abstraction from reality. 46

Generally, we can delineate two stages with respect to the degree of uncertainty and its impact on portfolio preferences of economic agents. The first stage is marked by overwhelming

confidence in the capability of the economy to sustain growth and the rising values of less liquid
assets. Consequently individuals and economic units shift their portfolio preferences to less liquid
assets that bear higher rates of long-term return. However when the rate of return declines and the
confidence is revalued at lower levels, a risk-averse individual/unit is likely to shift portfolio
preferences to a more liquid mix of assets that are protected against declines in nominal values. The
readjustments in the level of uncertainty shifts the liquidity preference function, and this shift can
be quite marked and sudden says Minsky, adding that it may lead to an asset price deflation and a
liquidity crisis. He asserts that “in a capitalist economy, present views about future profits
determine current investment and financing decisions” (Minsky,1982-p.81).

One of the critical issues about uncertainty lies in its influence on financed investment
demand. Although both consumer demand and induced investment are affected by uncertainty,
investment is particularly more sensitive to variations in confidence levels. Consumer demand is
mainly a function of net disposable income, however financed investment demand is highly
determined by the availability of long-term external finance. But then again the supply of external
finance is ruled by the perceptions of financial intermediaries on future returns from investment.
Hence investment demand becomes a function of the confidence of businessmen and financial
intermediaries in the ability of investments to reap sufficiently high rates of return.  

“Uncertainty, in the sense that there is a need to decide and act on the basis of
conjecture about future economic and political situations which in no way can be
encompassed by probability calculations, enters in an essential way into the
determination of that part of today's effective demand that is derived from
investment behavior.” (Minsky,1982 p.99)

Evidently, uncertainty has substantial impacts on the accumulation of capital and debts in a
capitalist system; nevertheless, financial variables are more sensitive to the changes in market
perceptions. Furthermore, the relevance of uncertainty is compounded during a state of panic. Despite the fact that an increase in uncertainty might develop briskly, the reverse, a decline in uncertainty works at a much slower pace\textsuperscript{48}. Hence, it conduces the system to accumulate rapid debts during prolonged growth, and holds the system back from rapid recovery.\textsuperscript{49}

Recently, second and third generation models recognized the relevance of uncertainty to financial crises, demonstrated by the impact of the "self-fulfilling" element on financial stability. According to Obstfeld (1994), self-fulfilling prophecies can recreate crises and destroy the equilibrium that could otherwise survive. What makes a crisis occur is the belief that it can occur.\textsuperscript{50}

The concept of uncertainty is essential for the understanding of the financial instability hypothesis. Decision making under morbid conditions of uncertainty permits variations in the price ratio of capital assets to current output. In turn, variations in the two-price ratio are translated into variations in investment demand. Hence, uncertainty allows for the transition between the various phases of the cycle through its impact on prices and accumulation.

II.3. The "Two-Price" Theory

One of the most exquisite features of Minsky's exposition on J.M. Keynes is his ability to highlight the price-theoretic aspects of Keynes' work. He developed his impressions into a price theory of the demand for investment. The underlying rationale in the two-price theory builds on the

\textsuperscript{48}Ibid, Minsky,1982, p.99

\textsuperscript{49}Ibid p.128-134

\textsuperscript{50}Ibid, 61-62


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distinction between two price systems, one for current output and another for capital assets. The interrelationship between the two price systems defines the origin of financial instability. “When the price level of capital assets is high relative to the price level of current output, conditions are favorable for investment; when the price level of capital assets is low relative to the price level of current output, then conditions are not favorable for investment, and a recession—or a depression—is indicated” (Minsky, 1986-p.143).31

The impact of “two-price” systems on aggregate economic activity extends back to Knut Wicksell, Irving Fisher, Hawtrey and Keynes. However, Minsky’s two-price theory is distinctive in its ability to integrate liability structures and cash commitments into the determination of capital asset prices, as well as the impact of expectations on the two price systems.

The ratio of current prices to capital asset prices is mainly influenced by the underlying uncertainty in capitalist economies. Overruling expectations of increasing prices in current output lead to the anticipation of increasing levels of profit. Subsequently, prices of capital assets increase to higher levels while current prices are still constant. Hence, the ratio of asset price to current price levels is a variant of market expectations. The price level of current output reflects short-term expectations, whereas the price level of capital assets reflects long-term expectations. The value of the capital asset—once employed in the production process—is the net present value of anticipated profits delivered by that asset. The present value of a capital asset is inversely proportionate to the rate of interest. Minsky showed how the interaction of supply and demand for investment works to settle the price level of capital assets. The demand for investment settles the demand price of capital

assets equally to the present value of anticipated cash flows from the employment of assets, and discounted by the borrowers' risk. However, the supply price of investment is determined by the perceptions of the suppliers of investment finance, and involves a margin for lenders' risk.

The increase in the price ratio of capital assets to current output increases the demand for investment. However, the increase in investment demand requires an increase in the demand for external finance, hence the demand for investment finance becomes less elastic during expansionary periods. If investment supply is infinitely elastic—the supply of finance is usually elastic during normal growth periods—the increases in investment demand will have no consequences on the costs of finance, hence, the accumulation of capital results in increasing profits. But then again, the increase in realized profits shifts the price level of capital assets onto higher levels, subsequently investment demand is subject to further increase. The rapid increase in capital accumulation and profit levels generates a boom.

The subsequent inflation forces monetary authorities to raise interest rates, thus constraining the supply of investment-finance that gradually becomes less elastic to investment demand. The general increases in interest rates discounts the present value of anticipated profits, subsequently, the demand for capital declines. In addition to the dive in anticipated profits, current profits will eventually have to decline; rising interest rates imply a rise in both current and capital costs.

The decline in current profits implies a constraint on the ability of economic units to repay their debts, thus transforming hedged units into speculative or ponzi structures. At this stage the increasing demand for finance becomes more inelastic, and the supply price of investment finance is forced to increase, thus cutting down net profits. This may continue until the supply price of

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52 For further information on the history of two-price models see ibid, pp. 89-96
investment rises above the demand price, leading to a collapse in investment and profits. Subsequently indebted units fail to repay their commitments and the economy becomes financially vulnerable to crises.

Minsky stressed the two-price theory as a pre-requisite for understanding the financial instability hypothesis. In his paper “Longer Waves and Financial Relations” Minsky argued for the tendency of asset-price levels to rise during booms, hence the tendency of the system to expand its capital accumulation and to develop amplified debt commitments. The capitalization rate during unchanging expectations of future returns is given by \(1/r\), \((r<1)\), where \(r\) is the growth rate of the stream of earnings. If expectations change such that the expected rate of return is not fixed anymore, rather is expected to grow at a rate \(g\), in this case the capitalization rate becomes \(1/(r-g)\), where \(g<r\). Evidently, during boom periods –when investment is overruled by over-optimistic expectations- the capitalization rate increases from \(1/r\) to \(1/(r-g)\) of current income. Clearly, the value of assets increases over the boom by the contribution of the difference between the standard rate of capitalization and the growing rate of capitalization to aggregate output \([1/(r-g) - 1/r] \times \) [current income]. The anticipated increase in cash flows increases asset prices above the equilibrium rate \(g\), on the other hand, the increasing price levels of capital assets are justified by realized capital gains. The justification of the previous increases in prices forces expected returns onto higher levels, hence a secondary “speculative” run-up of prices takes place “a purely speculative secondary run up of asset prices can occur as prices begin to reflect capital gains”(Minsky, 1964-p.333).

The impact of such speculative increases depends on whether financial institutions will accept such overvalued assets as collateral or not. Therefore the role of financial institutions is of central
importance and can either advance speculative growth further or bring it to a halt. It turns out that the decision of investment depends on two factors, the ratio of the two price levels of capital assets and current output on one hand, and financial resources on the other hand. Apparently, the feedback between asset prices and investment demand is interpreted into changing liability structures.

II.4. Profits, “Euphoria”, and The Tendency of a Capitalist Economy to Boom

“The fundamental instability of a capitalist economy is a tendency to explode — to enter into a boom or “euphoric” state” (Minsky, 1982, p.118)

In the context of the instability hypothesis, the term “euphoria” defines expansionary capital accumulation that is founded on the anticipation of increasing net-profits by both borrowers and lenders. Naturally, the process of capital development involves rapid accumulation of debt commitments, which draws back to the interchange of symmetric information; Minsky rejects the “asymmetric information” principle and assumes the spread of symmetric information between investors and financial intermediaries. Thus, at the beginning of the boom, euphoric demand for financed investment is accompanied by elastic supply of credit. Later when interest rates rise and investment supply becomes less elastic intermediaries are inclined to increase financial layering, implying that total debt commitments increase on one hand, and the articulation between debt and income increases on the other hand. Apparently it is possible to finance investment through portfolio transformations. Thus in the short-term euphoric capital accumulation can be easily

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54 Kregel, 1992, p.87
55 Ibid, p.87
financed independently of the monetary policy, and at some stage the surge in short-term interest rates contributes to an inflation in debt payments rather than curtailing the demand for credit\textsuperscript{57}. Minsky asserts that an increase in interest rates is the usual culprit in an economy where the demand for credit is interest inelastic. The increase could spark a crisis because credit supply is inelastic and debt payments are excessively large. "The desire to expand and the willingness to finance expansion by portfolio changes can be so great that unless there are serious side effects of feeds backs, an inflationary explosion becomes likely" (Minsky, 1982, p.123)

The grievous aspect of euphoria is that rapid growth involves a commitment between a contractual term "debt service"—that is subject to change only by the decisions of monetary authority—and a real term "realized profits"—that is determined by real market process. Therefore, while profits are declining, the initial debt commitment may continue to increase. Moreover, in a later stage economic units may raise further debts to finance the pending commitments, hence current profits become highly insufficient versus current debt commitments. Ironically, the inherent financial instability in capitalist systems is ascribed to its rapid accumulation of wealth.

However, euphoric growth is but a consequence of the fundamental impacts of profits\textsuperscript{58} on the generation and validation of market expectations. The rapid increase in investment demand is an interpretation of anticipated profits, however investment supply does not respond to investment demand unless there is evidence to support such expectations. When realized profits are equal to or larger than their previously expected values, investors and intermediaries adjust their evaluation of risk such that investments that were previously perceived as risky, are currently assigned a higher


\textsuperscript{58}See appendix for Minsky's statement of profits
level of confidence. Consequently, economic units start emitting more debts –expecting profits to cover for their liabilities- and intermediaries supply more credit –expecting high returns on their financial assets. It turns out that financed capital accumulation is directly related to the justification of debts using realized profits. If for any reason the cash flow from realized net profits is inadequate to repay current commitments, the unit will either demand further increases in debts, or sell out a fraction of its assets, and intermediaries will supply further credit only if they believe that the borrowers will be able to meet their commitments. Once intermediaries lose their confidence in the ability of expected profits to validate debts, financed investment declines and recession becomes a likely outcome.

The changing views on profits during euphoria are considered as the main stimulator of the whole accumulation process. Within the standard business-cycle view of growth, the net present value (V) of anticipated returns (r) on a capital asset is calculated over a period of time (t) is given by:

$$V = \frac{Q_1}{1+r} + \frac{Q_2}{(1+r)^2} + \frac{Q_3}{(1+r)^3}$$

Where Q1 represents the growth phase of the cycle, Q2 is recession, and Q3 is the recovery phase. When current profits increase such that the accumulated debt is justified by realized profits, both investors and financial intermediaries replace their standard business-cycle view by expectations of steady growth. The present value of anticipated returns is revalued such that Q2' replaces Q2, and Q3' replaces Q3, where Q2' and Q3'denote steady growth. Obviously, V' is larger than V, indicating that the anticipated net profit is over-estimated during euphoria#, implying that debts are over-accumulated, and that at some time profits become insufficient for validating debt.

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#Op cit, Minsky, 1982
commitments. "In spite of the greater complexity of financial relations, the key determinant of system behavior remains the level of profits." (Minsky, 1992, p.6)

11.5. The Necessity of Institutional Intervention

Minsky’s propositions on the necessity of institutional intervention as a market stabilizer are derived from his strong impressions on Keynes. The Keynesian theory states that the endogenous instability of capitalism requires an exogenous system stabilizer, and government institutions are seen as the ultimate choice: “The Keynesian theory claims that the state has economic capability to manage the capitalist system, and once this premise is accepted, both the existence of a crisis and the speed of recovery from it are questions of the political ends toward which this capability is applied” (Anwar Shaikh, p.140).

Minsky’s revelations on the financial nature of the inherent instability within capitalism indispensably require what he calls “big government” and a “big bank”. Instability arises from the significant shifts in capital asset prices and their direct impact on anticipated profits, combined with an elastic supply of investment-finance. Thus, there is a compelling need to stabilize the two-price ratio, the anticipation of profits, and to interfere in the risk assessment within financial institutions.

Economic policy and financial institutions have a profound influence on forging the dynamic path of a growing economy. Delli Gatti and Minsky (1994) examined the impact of institutional intervention on the cyclical motion of long-term growth. They managed to develop Schumpeter’s insights on Jugular cycles such that the economy can generate three types of growth paths: wave-like path, non-oscillatory path, or an inconsistent path. The third type indicates that the economy may develop coherent turbulence that requires immediate adjustment. They then introduce fiscal
deficits and bank funds and examine their impact on the incoherence of the system; the model is presented as follows:

Profits are given by

\[ \Pi = I + G \]  
(1)

The demand for investment

\[ I = aV_t + b_tIF_t \]  
(2)

Internal finance is given by

\[ IF = \Pi_{t+1} - m_1D_{t+1} \]  
(3)

Price of capital assets

\[ V_t = V_{t+1} + \xi_t \]  
(4)

Propensity to raise internal funds, i.e. leveragng ratio \( b_t = b_0 + b_1 \text{ arctg}(\Pi_{t+1}) \)  
(5)

Funds from banks

\[ F_t = H \cdot r_t \]  
(6)

Demand for debts

\[ D_t = D_{t+1} + (I - IF_t) \]  
(7)

Equilibrium in banking market when demand equals supply

\[ D_t = F_t \]  
(8)

From 8 and 6 we get that

\[ r_t = D_t / H \]  
(9)

The reduced form of the system of equations as derived by Minsky and Delli Gatti:

\[ \Pi_t = \alpha + b_0\Pi_{t+1} - b_t / H D^2_{t+1} + G \]  
(10)

\[ D_t = D_{t+1} + \alpha + (b_{t+1}) \Pi_{t+1} - (b_{t+1} / H) D^2_{t+1} \]  
(11)

G is government deficit, \( r_{t+1} \) = payments on debts, \( D_t \) = debts, \( b_0 \) = liquidity preference, \( r_t \) = interest rate, \( I - IF_t \) = difference between external and internal finance, \( H \) is under the control of monetary authorities.

The reduced form of the model shows that fiscal deficits and the scale of external finance from bank-funds chiefly determine profits and debt commitments, implying that there is a scope for stabilizing profits and debt structures using institutional interventions\(^6\). The results are relevant to the compelling question “What is it that needs to be stabilized if a threat of a recession/depression is to be contained and if a cumulative decline is to be halted?\(^6\). The answer that follows from


\(^\text{a}\)Opct, Minsky, 1982, p.43
Minsky’s theory suggests that the stabilization of profits preserves the economy against severe slumps. Minsky explains that when financial crises take place and cash-flows fail to justify debt commitments, the compelling issue is not how to pay back depositors, but how to sustain asset values and to prevent a sharp decline that will result in declining investment and an aggregate slowdown. Clearly interventions are essential to prevent the dumping of assets belonging to the unfortunate firms.²

However, the effective employment of fiscal deficits into the process of profit stabilization is conditioned by the size of the budget and the degree of openness. Minsky identified four different statements of aggregate profits; the first states that aggregate profits are spent on investment [profits = investment]. This applies to a small closed economy with a small budget, such that public spending is hardly recognized as a determinant of aggregate profits. Under such conditions variations in aggregate profits are transformed into proportionate fluctuations in capital accumulation and vice versa. In this case the economy is highly sensitive to current investment, and investment is highly sensitive to external finance. The availability of short-term finance and the justification of debts set the economy onto an explosive growth that is eventually reversed into a deflationary process³. In such type of an economy, the fiscal deficits cannot stabilize the accumulation process because the size of the budget does not permit profit stabilization through public spending. In this case the central bank is required to interfere as a lender of the last resort to prevent the cumulative deflationary process from operating.⁴

²Ibid, Minsky, 1991, p.6
³When profits decline asset prices decline, investment declines as well as the ability to repay debts decline, hence profits decline further and the deflationary process continues.
⁴Op cit, Minsky, 1982, p.42
The second statement applies to a closed economy with a sizable budget, where profits are determined by investment as well as the fiscal deficit [after tax profits = investment + fiscal deficit]. In this case investment and deficits are negatively correlated, meaning that the government uses public spending and tax reductions to revive investment demand during downturns. Thus, fiscal deficits can be used to dampen the impact of declining investment on profits (profits are stabilized). Consequently, the debt-accumulation process shrinks back to its standard rates and less units are subject to financial fragility.

The third case describes profits in an open economy with a sizable budget. The flow of aggregate profits is associated with external transactions, and the size of the balance of payments is equivalent to the size of aggregate investment [profits = investment + fiscal deficits – BOP deficit]. Obviously, trade surpluses feed into rapid growth. But at the same time the availability of investment-finance and the validation of debts are tied to current surpluses, hence aggregate growth reverses with balance of payment deficits, unless the government deploys an extensive deficit for validating debts and maintaining aggregate profits.

The last case describes profits in an open economy with a small budget [profits = investment – BOP deficit]. The economy in this case is highly fragile to any decline in trade surpluses. The substantial decline in profits that follows increasing trade deficits result in deteriorating financial structures.

Minsky suggests that governments should sustain a budget that is equivalent to at least 20% of full employment GDP. A sizeable budget implies that the budget is comparable to the size of aggregate profits, hence it permits an effective stabilization through fiscal deficits. However he advocates balanced spending when the economy is close to full-employment otherwise deficits are
transformed into threatening inflation. In addition, the government should work as an employer of
the last resort instead of trying to fix the economy close to the “NAIRU”.65

In addition to sustaining a sufficiently large government-budget, the economy ought to preserve a
“big” central bank. Despite the general recognition of the ineffectiveness of central banks in preventing
inflation and in halting deflation, the central bank remains an essential stabilizer of profits through its
actions as a lender of the last resort. Fiscal deficits may be insufficient to prevent debt-deflation,
especially if it is a major deflation cycle, therefore the price level of capital assets declines, possibly
until the cash flow from liquidations falls short of debt service commitments. Consequently, indebted
units default on their debts and creditors are threatened by moral hazards and the fear of a run on money
deposits. At this stage the central bank must defeat the escalation of moral hazards by lending out money
to distressed units, and through its supervision on balance sheets66. Hence, it limits the scale of losses
during financial crises: “..A combination of rapid central bank action to stabilize financial markets and
rapid fiscal policy action to increase community liquidity will minimize the repercussions of the crisis
upon consumption and investment expenditures” (Minsky, 1982-p.176). The central bank should be able
to extend its authority beyond money markets and depository institutions to cover the financial system as
a whole, including all financial enterprises, the laws and taxes, and all types of regulations applied to
financial enterprises.67

II.6. The domain of stability

The revaluation of the confidence assigned to capital assets and the change in portfolio preferences
are distinctive features of financial crises. However, such changes are far from random, as a matter
of fact a financial crisis is the conclusion of a long process of financial instability. The occurrence

66Opcit, Kregel, 1992

46
of crisis requires a sufficiently narrow domain of stability. "There are conditions for a minor shock like the financial distress of a few domestic units, to trigger financial panic or even a crisis, the domain of stability has to be sufficiently small such that any minor shock would destabilize the macro-economy as a whole" (Minsky, 1982-p.143). Minsky assumes the existence of multiple points of stable equilibrium, and explains that financial crises are fixed by the determinants of the domain of stability around the various points of equilibria.

The domain of stability is generally determined by three factors: First, the weight of protected assets in portfolios (assets that can be sold anytime at their book value in the portfolio of corporates). Second, the close articulation between contractual and customary cash flows from a unit and its cash receipts. Finally, the extend to which expectations have influenced current prices of capital assets. The domain of stability is narrower when the weight of protected assets declines, when the price of assets is highly influenced by expectations, and when payments are closely articulated.68

Minsky asserts that during prolonged growth and "euphoric" periods, the system works as to narrow the domain of its stability: "...When full-employment is being sustained by private demand, the domain of stability of the financial system decreases" (Minsky, 1982-p.144). The argument herein arises from the need to constrain the monetary policy during euphoria and its impact on interest rates and financial layering. The increasing demand on money and finance generates a rapid increase in financial layering hence a close articulation between payments and receipts. In addition,
the increase in financial layering increases the ratio of inside assets to protected assets, meaning that the portfolio preferences are shifted towards assets with prices that are vulnerable to system behavior.

Chart II.1 The Mechanics of The Financial Instability Hypothesis

Flow chart depicting the FIH

Prices of capital assets increase relative to output prices

Uncertainty and expectations of increasing profits

Increasing demand on investment

If profits continue to increase

Increasing demand on sources of finance

If profits decline

Debt deflation cycle

Debts increase and investment declines

Further decline in profits

Maintain asset values through maintaining profit levels

After period of stabilization the system returns to equilibrium

Institutional interventions through fiscal deficits and lender of last resort actions are able to break the cycle of debt deflation.

Firms

Financial Institutions

Foreign Agents

Domestic financial market

Foreign financial market

Source: The chart is developed by the author.

69Protected assets are those assets whose book value are not altered by system behavior.
However, a crisis takes more than a narrow domain of stability. There are necessary systemic conditions for financial crises; generally, the financial structure has to be heavily indebted such that the number of ponzi units or speculative units that can become ponzi is sufficiently large. Thus, financial crises indicate that at least some of the units are financially distressed, and the financial system is adequately unstable, such that the system can rapidly transmit the severe instability in a few units or a specific sector to the whole system. Minsky sites two fundamental elements that can place economic units into distress. First, the solvency and liquidity of the unit: the unit is solvent as long as its net worth is positive, and liquid as long as it can meet its payment commitments. The decline in the net worth of stocks (insolvency) and the inability to pay back cash commitments (illiquidity) lowers the demand for assets on one side, and forces the unit to sell out its assets and positions on the other side. The selling out of assets exposes asset prices to severe decline, and threatens the ability of the unit to repay its debts. However, debt commitments of the initial unit is a source of income for another unit/units, hence the financial distress of the initial unit threatens the ability of other units to acquire cash to repay their commitments. Obviously the domain of stability is critical. The narrower the range within which the system can tolerate financial failures, the more sensitive it is to a minor financial distress.

Second, the nature of payment commitments and its relation to sources of cash highly influences the financial robustness of an economic unit. The increasing need to pay out cash-money could easily place economic units in distress. This takes place when payments increase at a faster rate than the received income. Minsky noticed that during prolonged growth and euphoric periods, financial layering increases at a faster rate than income, indicating that the payments/income ratio is increasing. An economic unit is apt to financial threats if payments and income are closely

\*\*Upc, Minsky, 1991, p.16
articulated, meaning that the repayment of debt commitments is linked to the ability of a unit to earn income within a specific short period of time. Minsky divides payments into three types; balance sheet payments, income payments, and portfolio payments. Empirically, he found that during prolonged expansions the ratio of both portfolio payments and balance sheet commitments increase with respect to income.

The persuasive influence of interest rates over the domain of stability is implicit in the financial instability hypothesis. The elasticity of investment supply—manifest in low interest rates—during the early stages of prolonged growth invites rapid accumulation of capital and debt. During a later stage, the risk margin proceeds with the decline in cash flows from income receipts, forcing a rise in interest rates. However, rising interest rates constrain financed investment, thus profits decline further. It turns out that interest rates facilitate the accumulation of debt payments during the early stages of the boom, and at the same they aggravate the debt deflation cycle during the slow down. Thus, interest rates can be seen as an accelerator element that magnifies the tendency of a growing economy to boom, and its tendency to decay. Furthermore, the spread between domestic and international interest rates guides foreign capital flows. If the exchange rate is fixed the capital inflows are expected to result in currency appreciation. The overvalued exchange rate provides enough evidence for growing expectations of devaluation. The run on reserves that

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71 Balance sheet payments are related to cash flow from balance sheet, i.e. past financial commitments. Income payments are related to the production of output and income, whereas portfolio payments are related to transactions in capital assets.

72 Op cit, Minsky, 1982, p.145

73 Lance Taylor and O’conner (1985) proposed a mathematical model of Minsky’s instability hypothesis, they found a negative relation between the net-worth of firms and the level of interest rates, and a positive relation between net-worth and profit rates.
follows, forces the government to preserve what’s left by raising interest rates, resulting in a decline in the investment-output-employment cycle.74

II.7. Conclusion

The introduction of the financial instability hypothesis (1964) evoked a great deal of skeptic critique during the 1960s. James Duesenberry, John Grley, and Allan Meltzer (1964) agree that Minsky’s theory is rather vague and lacks a definitive articulation of the mechanism of instability. Furthermore, Meltzer claims that the instability hypothesis is rather shallow and incomplete.

It turns out that Minsky’s vision was ahead of his peers’, his perceptions on the dynamics of the financial structure in a capitalist system are recently considered as a comprehensive approach to financial crises, and was progressively applied to explain the increasing instability in industrialized and emerging market economies during the 80s and 90s.

The financial instability hypothesis presents a theory of debt accumulation in a capitalist system that cannot maintain steady income flows. Hence, Minsky succeeded in integrating the credit view of money and finance in the analysis of crises. Moreover, he explained the compelling tendency of the economy to deviate from its various points of equilibria during prolonged growth, and the tendency to approach equilibrium during depressions, thus the theory explains the transitions between the various stages of stability and instability in a capitalist economy. In spite of the resplendent results from applying the instability hypothesis to the analysis of various financial crises, there remains to investigate its validity for the case of Egypt. The next chapter presents an

overview of the indicated crisis and investigates the validity of Minsky's theory for the case of Egypt.
Chapter Three

the Selection of an Appropriate Model for Application

III.1. Introduction

During the 1990s an asset-price/lending boom evolved inside Egypt, resulting in an increase in the rates of capital accumulation as well as an increase in financial fragility. The 1990s became a replication of the “infitah” period with similar distresses explicit in structural imbalances, financial instability, increase in poverty, and the decline in aggregate growth rates. The aim of this chapter is to describe the manifest financial and economic instability during the 1990s, to investigate the viability of the financial instability hypothesis for the case of Egypt (1998), and to select an appropriate model for application.

The first section presents a brief review of the economic and financial development in Egypt during the 1990s. The second section investigates the viability of the financial instability hypothesis in explaining the financial crisis of the 1990s. Finally, the last section presents an appropriate model for application in the following chapter.

III.2. Review of the 1998/1999 Financial Crisis in Egypt:

The underlying hypothesis is that the financial crisis in Egypt (1998) stanches from prolonged financial fragility during the early and mid 1990s. However, the affliction of the Egyptian economy in the wake of the 1998 liquidity crisis was seen as a purely monetary issue (Refaci, 1999), (Khaled Hussien and Ahmed Nos'hby, 2000), implying that the financial instability was fundamentally caused by exhausting total liquidity. In opposition to the monetary view, it appears that the crisis is a
consequent result of financial instability that extends long before the liquidity crash. The concurrent recession is seen as the natural outcome of applying the neo-liberal prescription implicit in the IMF/World Bank stabilization plan. The narrow domain of stability – constricted by increasing debt payments and declining profits– affirmed the sensitivity of the Egyptian economy to minor shocks and its susceptibility to financial crises.

III.2.i. The Egyptian Economy During 1970-1990

The socio-economic and political transformation during 1953-1970 had various implications for economic and financial development at that time. Nasser imposed a nationalist anti-imperialism economic regime that succeeded in transforming the Egyptian economy into an agrarian-industrial economy. The overruling populist ideology assigned governmental and public institutions the primal role in economic activity, and toppled growth prospects in the domestic private sector. In addition, the enforcement of anti-imperialism and import-substitution growth policy implied a closed economy defiant of foreign capital inflows.

Unlike Nasser, president Sadat (1970-1982) was oriented to the western-liberal growth approach to growth. With the adoption of the open door policy – known as 

inflatable

in the mid 1970s, the balance of payment was audaciously liberalized incurring massive inflows of foreign exchange from the capital account, oil revenues, remittances and revenues from Suez canal. Notwithstanding trade and capital liberalization, Sadat failed to bring radical changes to the institutional framework. Government institutions maintained their primal influence on economic activity: public enterprises remained the primary producer; the government sustained its position as the principal employer, and subsidized major commodities and services. Surprisingly, Mubarak (1982-present) extended the
In the initial period, without evident changes in the institutional and economic framework, until the enhancement of the stabilization policy in 1991.

The economy grew at unprecedented rates during 1975-1985. The consumption/investment boom that followed trade and capital liberalization was mainly financed using inflows of foreign exchange; hence, the domestic economy was sensitive to balance of payment shocks. Consequently, the world recession that followed the 1986 oil-price shock was channeled to the domestic economy through the BOP effects.76

By the end of the 80s, the economy was subject to dramatic changes; the total external debt and debt service commitments had binding impacts on domestic growth, the real GDP growth rate declined severely, current prices increased notably, and fiscal/BOP deficits increased. The general deterioration in domestic performance required institutional intervention and macro restructuring77. However, The IMF fragmented restructuring policies in 1986/87 lacked a uniform macro-strategy, and hence were passive when launched in 198778. The aggregate performance continued to deteriorate and the debt burden became an aggravating constraint to growth prospects. In 1991 the IMF and the Bank proposed hard currency and debt rescheduling conditioned by the application of their stabilization policy agenda in 1991. 79

III.2.ii. The ERSAP and the 1998 Financial/Economic Crisis

77Hamza Kheir-El-Din and Sherine El-Shawarby: “Trade and Foreign Exchange Regime in Egypt”, Cairo University, Cairo, 1999.
78Op cit, Kheir el-Dien.

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The IMF/World Bank neo-liberal restructuring prescription\textsuperscript{83} exhibited the characteristic features of structural adjustment programs (SAPs) implemented elsewhere in developing and newly industrialized countries. The policy options proposed by ERSAP were imposed by international financial institutions as a pre-requisite for providing financial assistance to Egypt. Thus, domestic policy makers were left with a diminutive range for discretion.

ERSAP was launched on three stages: The first stage involved financial reforming of the capital market, insurance sector, and banking sector. The second stage tangled price and trade liberalization, and finally the third stage was designed to expand the involvement of the private sector in economic activity.

The liberalization of the financial market was accomplished by imposing a contractionary monetary/fiscal policy during the early stage of liberalization. Domestic ceilings on interest rates were lifted; thus nominal interest rates on short-term domestic deposits increased from 10\textsuperscript{o} in 1992 to 17\textsuperscript{o} in 1993. Later, when the rate declined to 10\textsuperscript{o} in 1996, the government issued treasury bills on weekly auctions to prevent a surge in domestic prices.\textsuperscript{81} Domestic spending declined from 41\% of GDP [1995/1996] to 27\% of GDP [1997/1998], and fiscal deficits were maintained around 1-2\%, and slightly increased by the end of the 1990s to approximately 5\%.

The liberalization of foreign trade required the stabilization of the exchange rate. In 1991 the government unified the exchange rate and announced a flexible peg to the US dollar. In practice, the exchange regime was a fixed rather than a flexible peg. The combination of a stable exchange

\textsuperscript{83}Their proposals are based on the neo-liberal or market friendly brand of policy analysis that has become intellectually predominant over the past dozen of years" (Lance Taylor and Ute Pieper, 1996).

\textsuperscript{81}The data on interest rates is gathered from the quarterly economic review issued by the central bank of Egypt.
rate and a large spread between domestic and international interest rates invited increasing inflows of foreign capital, thus boosting foreign reserves to a record of $20 billions in 1998.

The stabilization of domestic prices during the early 1990s was achieved through fiscal reductions and increasing interest rates. Fiscal deficits were reduced from 15% in 1991 to 1% in 1998, whereas inflation in CPI declined from 21% in 1991 to 4% in 1998.

The general improvement in aggregate growth rates and the stabilization of prices and deficitsameliorated international confidence in Egypt as a promising emerging market economy and encouraged capital accumulation through the anticipation of increasing net returns. However, the vulnerability of the financial structure transformed the formal private-enterprise sector from a speculative structure (1994-1997) into a ponzi structure (1998)\(^82\). The total debt-to-net profit ratio increased progressively during 1993-1998, from less than 20% (1993) to almost 600% (1998)\(^83\). Furthermore, financial fragility extends to the public and external sector: the current account deteriorated from slight surpluses (1991-1993) to persisting deficits (1993-2001). This had a significant impact on the foreign reserve-to-foreign debt ratio (equivalent to debt/income ratios for domestic units) that declined from 64.5% [1997/1998] to 47% [1999/2000]. In addition, domestic public debt increased from less than L.E. 50 billions (1991) to more than L.E. 200 billions (2002). Public debt-to-revenues averaged 270% during the 1990s [with a low of 235% in 1994, and a maximum of 309% during 2000], indicating that shrinking deficits were financed by internal debts.

**External Performance:** Foreign capital inflows responded to the substantial spread between domestic and international interest rates, as well as the stabilization of the appreciated exchange rate.

\(^{82}\)The details of the fragility process are discussed in the following chapter.

\(^{83}\)Calculated by author from the annual financial report on the private enterprise sector, issued by the CAPMAS.
The capital account switched its deficit into long-standing surpluses (1993-1998). The surplus during 1993-1994 and 1998 was accomplished mainly by the shift in foreign inflows from “other investment”, and during 1996-1997 it was achieved by increases in net portfolio investment. Surprisingly, foreign direct investment was almost stagnant during 1990-1994, around $1.14 billions which mildly declined to an average of $0.79 billions during 1995-1999, implying that capital inflows were rather speculative during the mid and late 1990s.

The current account exhibited a deteriorating balance during the late 1990s. In fact during 1995/1996 the current account reversed its surpluses for the first time since 1979/1980. A small surplus was achieved in the following year, however the current account sustained its deficits until 2000. The stabilization program had minor effects on export growth until 1995/1996. Afterwards, net exports continued to decline. In the opposite direction, imports continued to increase until 1998/1999, and the major decline in net imports during 1999/2000 stanches from severe declines in capital-imports (-3.2%) and intermediate-imports (-29.2%), rather than consumer-imports that grew tremendously during 1999/2000, at an approximate rate of 57%. The decline in intermediate and capital imports indicates a general slowdown in economic activity. 84


84"the rapid growth of imports in contrast with the stagnant growth of exports, and the resultant expansion of the trade deficit seemed to many as a signal that the reform in the 1990s might be a replication of the failed 1970s."

Apparently, brief growth in the capital account was maintained on the expense of the current account. This is a likely outcome of maintaining a fixed over-valued exchange rate, and deploying the monetary policy to stabilizing the exchange rate anchor. Currency appreciation that follows capital inflows threatens the international competitiveness of tradables and non-tradables, thus jeopardizing current income flows from abroad. This is equivalent to financing current capital accumulation through increasing debts: in the long term foreign capital inflows forbid the increase in current flows from abroad i.e. the liabilities on domestic economy are increasing whereas income flows are declining.

The decline in foreign reserves and growing speculations on the Egyptian pound contributed to the devaluation of the Egyptian pound (2000). However, the series of insignificant and fragmented devaluations resulted in market speculations of further devaluation, hence, foreign liquidity was in short of demand yet controlled by the inelastic supply of foreign currency that was imposed by the government to control the run on the US dollar. Generally, an evident currency distress was triggered during 2000.

The exchange rate policy is seen as a key determinant of the recent currency distress. The issue is subject to a more detailed discussion in the next chapter.  

1990/1991 and a high of 17% 1996/1997]. The same applies to private implemented investment [a
low of −15.4% in 1992/1993 and a high of 35.8% in 1997/1998]. The wide variance between capital
accumulation and consumer demand growth rates —and only slight increases in export growth—
explains the surge in inventory: the change in inventory increased to 260% in 1998/1999.

Generally, aggregate domestic product grew at adequately increasing growth rates during the
mid 1990s [at an average of 5% during 1994/1995-1997/1998], which then declined to −1.4%
during 1998/1999\textsuperscript{6}. During that period, domestic price inflation of current output declined from
21.1% [1991/1992] to 3.7% [1998/1999], whereas the price level of capital asset vastly increased until
1997/1998. The increase in anticipated cash flows [until 1998] increased the demand on financed
investment, hence, raising the demand for external finance. During that period, credit supply
(investment supply) was elastic to the growing demand on finance: total credit provided by banking
sector grew at 17.8% during 1996, reaching 21% in 1998, and declined back to 12% in 1999. Credit
to the private sector grew at even higher rates; at 30.7% in 1994 and 26.7% during 1998, and
declined to 10.5% during 2000. Obviously the supply of credit became less elastic after 1998.

The increasing debt to profit ratio, and imprudent bank lending during the mid 1990s, had
serious consequences on the financial structure of the private sector. The debt-to-profit ratio
Consequently, non-performing loans for the private sector increased from L.E. 8.8 billions in

\textsuperscript{6}Data on BOP and foreign currency and foreign reserves is gathered from the quarterly economic review, issued by the
Central Bank of Egypt.

\textsuperscript{7}The GDP growth rates are gathered from the Ministry of Planning’s year book on economic achievements.

\textsuperscript{7}Calculated by dividing the sum of bank loans and long-term debts by net profits.
1997Q3 to L.E. 22.4 billions in 1998Q4\(^\text{88}\), and are recently estimated at 33.3 billions\(^\text{89}\). Moreover, the growth rate of total domestic liquidity dropped from 16% in 1992 to 15% in 1996 to 8% in 1997 and did not return back to 15% before 2002.

The dive in domestic liquidity, the increase in debt ratios, the surge in non-performing loans and the decline in the stock of foreign reserves are indicators of a financial crisis that was triggered during 1998. Overall, the 1990s are perceived as a replication of the infitah period (Simon Bromley and Ray Bush\(^\text{90}\), El-Essawi, and Hanna’ Khaier El-Dien). ERSAP generated increasing growth rates during the 1990s, yet failed to resolve the structural impediments that underlie growth in Egypt.\(^\text{91}\)


Egypt's financial crisis satisfies the essential stipulations of the financial instability hypothesis. The 1990s involved the application of an entirely new vision of growth, a liberalized market-economy with further integration in world trade and world financial markets. Naturally, the ERSAP bestowed increasing uncertainty to investment decisions. Simultaneously, increasing prices of capital assets in

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\(^{88}\) The figure for non-performing loans was estimated by Khaled Hussien in his paper: “Finance and Growth in Egypt”, Department of Economics, University of Kent at Canterbury. He states that the estimated figures should be treated with caution.

\(^{90}\) Mervat Al-Husary, Ahram Paper Fri-12th 2003. The article reviewed the issue of non-performing loans and declares that the central bank estimated non-performing loans between 24 and 32 billion Egyptian pounds in 2002.


\(^{92}\) Cassandra(1995) and Sad (2000) explained that the attractive developments in Egypt's macro-profile are due to the massive inflows of foreign currency during the 1990s in addition to debt reduction during the early 1990s rather than changes in the structure and productivity of the Egyptian economy, ibid.
relation to current output yielded anticipations of increasing returns on capital assets, thus increasing the demand for financed investment.

Increasing investment demand was combined with lax monetary measures – declining interest rates and expansionary credit policies. The elasticity of investment supply to investment demand permitted increasing accumulation of capital as well as debts. Later, the cash flow from net profits declined whereas debt commitments increased implying that the private enterprise sector has become speculative. In a later stage, the solvency and liquidity of some units declined, such that non-performing loans for the private sector increased significantly. Moreover, the government accumulated increasing internal debts. The rising debts inside the economy limited the domain of stability and permitted the transformation of a few distresses into a liquidity crisis in 1998.

III.4. Model Selection

Minsky succeeded in presenting a mathematical notation of his groundwork, yet, he was not concerned with the mathematical articulation of the instability hypothesis. Although Minsky extended his work on instability until 1995, yet all attempts to model the instability hypothesis were completely extraneous.

Since the 1960s various models were constructed to depict Minsky's theory. A few models established an interpretation of the instability hypothesis in terms of income distribution (Boddy and Crotty (1975); Weisskopf, (1979); Hahnel and Sherman, (1982); Gordon, Weisskilspf and

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92 Minsky rewrote his insights on the two-price theory, the interaction between uncertainty and euphoria, profits, and the impact of institutional intervention, in mathematical notations.
Pxwles, (1963), Wolfson (1986), as well as Taylor and O'Connell (1985)). Others developed Minsky's emphasis on cumulative debts, (Robert Pollin, and Marc Jarsulic (1989), Goetz Von Peter (November 2003), Suzan Schroader (2002), and Duncan Foley (2003)). Furthermore, a few of models extended Minsky's approach to balance of payment crises in an open economy (Jose Ricardo da Costa e Silva (2002), and Barbosa Filho (2000)).

The aim of this section is to select an appropriate model for applying Minsky's hypothesis to Egypt's financial crisis (1998). The models subject to selection are the most comprehensive and applicable models for the case of Egypt.

III.4.i. The Taylor-O'Connell model (1985)

Lance Taylor and Stephen O'Connell constructed a system of equations to delineate Minsky's hypothesis in their famous article: "A Minsky Crisis" (1985). They used linear dynamic modeling for specifying the conditions of aggregate equilibrium that are derived from stability in commodity markets, financial markets, and government policy.

Stability in the commodity market: They started by deriving the conditions of stability in commodity markets through the examination of investment demand and investment supply. Investment demand is defined as a function of anticipated profits, costs of investment, and the deviation between current profits and their previously expected values:

\[ P_t = g_o + h (r + p - i) P_k \]  

Where \( P_t \) is the demand price for investment, \( g_o \) is autonomous capital stock, \( h \) denotes the firms' response to the deviation between expected profits and current returns, \( r \) is current

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94 Post-Keynesians stress on investment as the key determinant of aggregate stability and growth, therefore Taylor and O'Connell derive conditions of stability in commodity markets through the study of aggregate investment.
profits, \( \beta \) is the difference between anticipated returns and current profits, and \( P_K \) denoted anticipated returns on capital.

They then define investment supply using savings' supply. They used Kalecki's assumptions on profits and investment, where all wages are spent on consumption and a fraction \( s \) of profits is preserved as savings. Savings supply is denoted by:

\[
srP_K = s \tau wbX \quad [2]
\]

Where \( srP_K \) is total savings defined as a fraction of total earnings from capital, \( \tau \) is the constant rate of markup pricing over the wage bill, \( w \) is nominal wage, \( b \) is the wage fraction of income, and \( X \) is aggregate output.

They then arrive at equilibrium by setting \([1] = \text{equal to} \quad [2] \):

\[
g_o + h (r + \beta - i) PK = srPK \quad [3],
\]

where the conditions of stability are derived by setting excess demand equal to zero:

\[
g_o + h (r + \beta - i) - sr = 0 \quad [4]
\]

During euphoria profits and output increase notably such that there is excess demand. In this case the commodity market can sustain stability only if \( s - \tau > 0 \), i.e., if the rate of savings exceeds the response of capital accumulation to changes in aggregate profits, implying that increasing rates of accumulation are hedged by increasing levels of savings.

**Stability in the asset market:** They arrive at the conditions of stability through the study of asset demand and supply. They use a simplified balance sheet to define the firms' net worth, and then use it to define total wealth of rentiers. The change in total wealth is defined by:

\[
W^o = P_e E + P_e E + M^e + B = P_e E + srPK \quad [5]
\]

Where \( W^o \) is the change in total wealth of rentiers, \( P_e \) is the price of equity, \( E \) is the stock of equity, \( M \) is money, \( B \) is short-term bonds, and \( PK \) is the capitalized value of the plant and equipment held by firms.

Total wealth increases through capital gains and financial savings. Market stability requires the allocation of wealth between inside and outside assets, such that the excess demand for money and
equity is equal to zero and excess supply of outside assets is equal to zero (in this case outside assets are assumed to be short-term bonds):

\[ \mu(i, r + \rho) W - M = 0 \quad [6] \]
\[ \frac{\varepsilon(i, r + \rho)}{P_e} W - E = 0 \quad [7] \]
\[ -\beta(i, r + \rho) W + B = 0 \quad [8] \]

Where \( \mu + \varepsilon + \beta = 1 \), and \( i \) is the interest rate on bonds. The demand for money and equity is independent, whereas the supply of short-term bonds is determined by the excess demand for equity and money. Minsky explained that during booms the structure of finance changes such that there is excess demand for inside assets on the expense of outside assets (protected assets). The most critical variables in [6] and [7] are the profit rate \( r \) and the deviation between anticipated and current profits \( \rho \). When \( r \) and \( \rho \) increase the valuation of capital stock rises, thus financial wealth rises. The change in total wealth influences the demand and supply for financial assets. Excess demand can be re-written as:

\[ \mu (i, r + \rho) = \alpha [1 - \varepsilon(i, r + \rho)] \quad [9] \]

where \( \alpha \) is the share of fiscal debt issued as money. Equations [4] and [9] are used to describe equilibrium in the commodity market and money market. The equations are equivalent to the IS-LM construct, where the increase in the price of equity increases the profit rate \( r \), consequently wealth increases and shifts demand towards bonds, hence, interest rates decline. Consequently, Investment demand increases, so does output and profits, implying an inverse relation between the interest rate and the profit rate. Likewise, if there is an initial decline in the profit rate, the demand for money increases and the demand for bonds declines, resulting in increasing interest rates. Consequently growth rates decline and so does the profit rate resulting in a crisis. It is clear that the Taylor-O'Connell cycle is a vicious one, and the internal mechanics of the system do not show how the economy can emerge from crisis nor how it can shift from booms to busts.
**Government policy:** In the presence of a complicated financial market, the monetary and fiscal policies have substantial influence over the growth path of the capital stock. The interaction between the monetary policy and anticipated profits is given by: \( \rho^* = -\beta(i-i) \) where \( \rho^* \) is the change in the difference between current and anticipated profits, and \( (i-i) \) is the difference between the interest rate and its normal long-term value.

Taylor and O'Connell define the money-debt (money to fiscal deficits) ratio by:

\[
\alpha = \frac{M}{F} = \left( \frac{M}{PK} \right) \left( \frac{PK}{P} \right) = \frac{M}{PK} \left( \frac{1}{f} \right)
\]

where \( f \) is the ratio of fiscal debt to the capital stock. The debt ratio changes with time such that capital accumulation must be accompanied by growth in the money supply otherwise fiscal deficits will have to increase and the money-to-debt ratio will have to decline:

\[
\alpha^* = M^* - g
\]

where \( g \) is the autonomous component of the capital stock. Thus, the system of equations is in steady equilibrium when \( g = M^* \) and when \( t = 1^- \).

Undoubtedly, the model captures the basic Minsky hypothesis and shows how the economy can be unstable, however the assumptions laid by the model disallow the transition between the stages of stability and instability. Foley (2001) notices that, according to the assumptions made by Taylor and O'Connell, the model does not permit the transition of hedged structures into other fragile structures. Specifically, the T-O model assumes a closed economy in which the growth rate is defined to be a fraction of the rate of profit, the fraction being the savings rate of rentiers (out of profit). The model needs two modifications in order to illustrate how the economy shifts between
the Minskian stages: First is to allow the rate of investment to exceed the profit rate and second, assume an open economy rather than a closed economy.  


Steve Keen argues that Minsky’s hypothesis could be modeled by introducing the financial sector and two ‘stylized facts’ into Goodwin’s 1967 model of the trade cycle. The basic Goodwin model describes the system using the change in employment and the change in wages’ share of output. The single Goodwin stylized fact is that workers are likely to demand higher wages during periods of high employment than periods of high unemployment. The same rationale applies to capitalists; thus, a similar stylized fact could be introduced for capitalists. Capitalists tend to increase their investments during boom periods more than their investments during depressions.

Keens’ modifications imply that cycles may occur at high frequency. Furthermore, the system’s dynamics is rather explosive. The introduction of the capitalists’ stylized fact increases the frequency of cycles, whereas the introduction of the financial sector allows capitalists to accumulate debts while investing. The introduction of the financial sector changes the nature of the cycle, such that the system either tends to stability or breaks down.

Keen simulated the impact of interest rates and debts on system stability. In addition, he studied the influence of government policy on the domain of stability. The results show that at a

95 Op cit, Schroeder, p.13
96 Op cit Keen, p.614
97 The basic Goodwin model is determined by the single stylized fact, that workers demand higher wages during periods of high employment that periods of unemployment. The same rationale is applied to capitalists, they tend to increase their investments during boom periods than during depressions.
base interest rate equal to 4.6 or above, the nature of the system becomes explosive, and the system will eventually collapse towards zero employment, wages, and profits. His results support Minsky’s perceptions on modern capitalism, that a market economy can collapse into a debt-induced depression if left to its forces, that interest rates can build down system stability, and that both investment and employment levels must be stable to avoid crises. Hence, it is necessary to use institutional interventions as a circuit breaker, yet, counter-cyclical spending does not eliminate cycles, it merely prevents the economy from a complete breakdown.98

Keen’s final model consists of six differential equations denoting the rate of change in employment, worker’s share of output, government spending, taxation, government debt, and finally the change in capitalists’ debt:

The change in employment is denoted by: $\frac{dL}{dt} = \frac{d}{dt} (Y/a) = \frac{1}{a} \left( \frac{dy}{dt} - \alpha Y \right) \quad [1]$  

Workers’ share of output is given by: $\frac{d\omega}{dt} = \frac{d}{dt} (w/s) = \omega (w(\lambda) - \alpha) \quad [2]$  

The rate of change of government spending: $\frac{dg}{dt} = \frac{d}{dt} (G/Y) = g \left( 1 - \lambda \right) - g \left( \frac{k (\pi n / v)}{v} - \gamma \right) \quad [3]$  

The rate of change of taxes: $\frac{dT}{dt} = \frac{d}{dt} (T/Y) = \left( \pi - t \right) - t \left[ \frac{k (\pi n / v)}{v} - \gamma \right] \quad [4]$  

Capitalists debts: $\frac{dk}{dt} = \frac{d}{dt} (Dk/Y) = r \left( \frac{k (\pi n / v)}{v} - \gamma \right) - (\pi - t + g) \quad [5]$  

Government debt: $\frac{dg}{dt} = \frac{d}{dt} (Dg/Y) = dg \left( r - \frac{k (\pi n / v)}{v} - \gamma \right) + (g - t) \quad [6]$  

Where Y is income, L is employment, k is an accelerator relation equal to Yv, $\lambda$ is the rate of employment, $\omega$ is the workers share of output, r is the interest rate, $\pi$ profit rate, Dk is the capitalist debt, Dg is government debt, T is taxation, I is net investment, and $\gamma$ is the depreciation rate, $\pi n$ profit net of government and interest payments.

Keen concluded that Minsky’s Hypothesis is captured through the interaction of four “stylized facts”: First, real wage rises during booms, falls during slumps, second, capitalists invest...
more during booms than during slumps; third, banks lend money at interest to finance investment; and finally, government net spending is counter-cyclical.

Keen’s model is rather comprehensive. It captures the essential features of Minsky’s hypothesis, and although it is designed to explain crises in a closed economy, yet the model can be modified to account for fluctuations in an open economy. However, the model requires an extensive data set and a long time series to carry out the simulations and to determine the critical values of the interest rate, the debt ratio, and government spending.


This model was established to account for the impact of foreign flows on financial stability in an open economy where domestic growth is determined by net changes in the balance of payments. Filho argues that capital flows dominate current trade flows, and most of balance-of-payment crises during the 1990s were driven by massive flows of foreign capital. The model builds on Minsky’s hypothesis: balance of payment crises are seen as a financial crisis that arises from increasing accumulation of foreign debt with respect to net income flows from abroad (international reserves). Hence, financial fragility can by modeled using the dynamics of the ratio of foreign international reserves to foreign debts.

Filho assumes “a two-country, two-good model”, where only one of the countries can issue international hard currency to finance its deficit. The country which cannot finance its international deficit through the issuance of its currency will try to keep its ratio of foreign reserves to domestic
income above a minimum level. The dynamics of foreign international reserves is illustrated by the following accounting identity:

$$r^o = x - m - (i^* + \phi)d - n + u + f_D + f_I + (\hat{c} - \hat{Y})r$$ \[1\]

Where $r$ is the ratio of foreign reserves to total output, $r^o$ is the change in the ratio of foreign reserves over time, $x$ is export-income ratio, $m$ import-income ratio, $d$ is debt-income ratio, $n$ the dividends-income ratio, $u$ the unilateral transfers-income ratio, $f_D$ the foreign debt-income ratio, $f_I$ the foreign investment-income ratio, $\phi$ the risk premium paid by the domestic country on its net foreign debt, $i^*$ the base interest rate in the foreign country, $\hat{Y}$ is the growth rate of real income, and $\hat{c}$ is the growth rate of the real exchange rate.

Equation [1] shows that the accumulation of international liquidity is determined by the net balance of trade finance ($x-m$), interest and dividend payments ($i^*d + \phi_d - n$), unilateral transfers ($u$), appreciation of domestic currency ($\tau \hat{c}$), foreign debts $f_D$, foreign investments $f_I$, and growth finance ($\tau Q^*$). In addition, the above equation can be solved for foreign investment and foreign debt to show that foreign capital flows can be used for purposes other than financing investment. "Nothing prevents an increase in capital inflows to finance a consumption boom or an increase in interest payments to foreign agents" (Filho Barbosa, 1999-p.5). The liquidity ratio for an open economy is equivalent to net cash flows from current income in a closed economy. The dynamics of the foreign debt to income ratio is given by $d^o = f_D + (\hat{c} - \hat{Y})d$ \[2\]. Equation [2] shows the dual role of foreign debts that work in equation [1] to increase total liquidity, and at the same time work to increase total debts.

Filho argues that financial fragility in an open economy can be illustrated by the ratio of [1] to [2] and a critical ratio below which the economy will suffer massive capital outflows. The critical ratio is supposed to reflect the market psychology and the critical limit for the reserves/debt ratio below which market psychology is expected to reverse (the ratio depends on market expectations.

\[Opecit, Filho, p.3\]
and risk perceptions of investors and organizations as well as other institutional features). The computation of this critical ratio is not an easy task; it requires hefty econometric work, and Filho just assumed it to be 0.25.

When the reserves-to-debt ratio is increasing away from the critical limit, the economy is relatively stable. On the other hand, the economy becomes financially unstable when the ratio approaches the critical limit, because below this critical limit investors believe that the devaluation of the exchange rate is inevitable and hence there is massive potential loss. Such expectations lead to a massive bank-run on foreign exchange and a currency crash.\textsuperscript{100}

In the final stage, the model was modified to integrate public domestic debt in the reserve-to-debt ratio. Filho explains that during speculative periods, the vast increase in the reserve-to-debt ratio is sterilized by high domestic interest rates, however, the increase in costs of finance increases public domestic debt. The vast increase in current debt commitments entices the government to borrow from abroad, and to encourage foreign capital inflows. Moreover, during a bank-run the government finances the bailout of the banking system by increasing its debts. It turns out that public debt is a crucial determinant of financial fragility, thus the modified model is a ratio of foreign reserves to the sum of foreign debts and domestic public debt.

The Filho model proposed a full explanation of the Brazilian financial crises triggered in 1998, however, it is tailored to depict financial instability that arises from the mis-management of foreign flows in an open economy with a sizeable balance of payments. In case of Egypt external imbalances were only part of the story, in addition the size of the BOP to the GDP is not significant enough [the maximum surplus of $3026.7 millions in 1999/2000 was approximately

\textsuperscript{100} Ibid, p.6.
3.8% of GDP], and increasing capital inflows were limited to 4.8% of GDP during 1997/1998 [capital inflows were the highest during 1997/1998].


Duncan Foley modified the Taylor-O'Connell model to account for financial fragility in an open economy. The model stanches from the balance sheet view of the macro-economy, and is mathematically robust in studying the impact of the interaction between profits, capital accumulation, and interest rates on Minsky's financial stages for a small open market economy. The model starts by defining hedged, speculative, and ponzi structures for a single firm. It then studies the dynamic path of the firm's financial structure, and shows that there are definitive criteria for hedged, speculative, and ponzi growth paths. The same approach is then generalized for the national economy, showing that the same criteria apply to the national economy.

Foley clarifies that the assumptions laid by the T-O model are inconsistent with the theory. The T-O model assumes that the economy is closed, and the growth rate $g$ is a function of the fraction $s$ saved out of profits: $g = sr$, where $s<1$. This Kaleckian assumption implies that aggregate profits must exceed capital accumulation, and the profit rate must exceed the growth rate $g$. However, this limits the financial structure to hedged growth, which is inconsistent with Minsky's hypothesis that involves the transition between hedged, speculative and ponzi structures. To the contrary, Foley assumes that the economy is open, hence, the economy is allowed to grow beyond the level of internal savings. In this case $g$ could be sustained at a higher level than $r$.

^101 Op cit, Foley
Foley deployed the balance sheet approach in his modifications of the T-O model. He started with a simplified accounting statement of a firm's sources and uses of fund $R+D=I+V \ [1]$, where $R$ is total revenue, $D$ new borrowings, $I$ investment, and $V$ is the debt service. Foley defines the net-worth of a firm $W$ by the difference between total assets owned by the firm $A$, and the total value of its debt $B$, $W=A-B \ [2]$. It follows that the change in the net worth is the net change in total assets and total debts. Therefore $W'=A'+B'$, where the change in assets $A'$ is investment $I$, and the change in total debts $B'$ is new debts $D$, therefore $W'=I-D$. The firm is solvent as long as the net worth $W$ is more than zero, and it is insolvent if the net worth is less than or equal to zero.

The net worth statement is used to define the firm's financial structure. A firm is hedged as long as it is capable of financing its uses through total revenue, $R>V+I$ and $D \leq 0$. Hedged firms will possibly reduce their total debts with time, however they are still subject to bankruptcy if total revenue suddenly declines or the debt service suddenly increases.

If the total revenue exceeds the debt service, yet is insufficient for financing new investment, the firm is enticed to finance part of its investment using new debts. In this case the firm is defined as a speculative firm where $R \geq V$, $D \geq 0$, and $I > D$. The solvency of a speculative firm is determined by realized profits: if interest rates rise, a speculative firm can avoid bankruptcy if its net revenue is sufficient to pay for the debt service. In this case the firm will respond to the rise in interest rates by cutting down investment. Such firms are not likely to go bankrupt as long as net profits remain adequately high.

The firm becomes ponzi when total revenues are insufficient for paying the debt service $R<V$. In this case the firm is obliged to pay part of the debt service by raising new debts, hence,
new debts must exceed investment. Ponzi firms are susceptible to bankruptcy when creditors lose their confidence in the ability of indebted firms to meet their debt commitments. Foley ascertains that ponzi firms must eventually become insolvent.

After defining the differences between hedged, speculative, and ponzi structures, Foley studied the dynamic path of the firm's financial structure using average growth rates of the capital assets, profits, and inerets payemtns. The growth rate of the firm's assets $g$ is defined as $g = l/A$, and the profit rate $r$ is denoted by $r = R/A$, where the interest rate is defined as the ratio of debt service to the stock of debts $i = V/B$. The cash flow identity is rewritten as follows:

$$B^2 = D = I + V - R = (g - r)A + iB$$  

The equation denotes the change in the total stock of debt that accompanies the process of capital accumulation. Foley then used the statement above to arrive at the growth path of a firm that converges to its long term equilibrium capital asset stock, through stable additions to the capital stock ($g$ is constant). The solution of the equation is then rewritten in terms of the ratio of debts to assets (the ratio of debts to assets determines the solvency of the firm, where the firm is insolvent if $q = D/A > 1$.

The solution in terms of the firm's solvency (debt/asset) ratio is as follows: $\Phi (t) = \varphi + (\varphi - \varphi')e^{(g - r)t}$  

[4]. Foley concludes that there are various paths for the firm through time: a growth path characterized by $r > i$, along this path the firm is defined as solvent and is not likely to experience bankruptcy. This is a typically hedged firm. Foley explains that there are two types of hedged growth, the first is characterized by $r > g > i$, in this case the debt to asset ratio tends to be less than

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$102$ Since $R + D = I + V$, then if $R < V$ then $D$ must exceed $I$ so that both sides remain equal.
zero with time. The second type is characterized by \( r > i > g \), and in this case the debt to asset ratio approaches negative infinity with time. Hence, in both cases the firm is financially hedged.

However, a hedged firm where \( r > i \) has a strong incentive to increase its investment therefore \( g \) increases until it eventually becomes higher than \( r \), thus transforming the firm’s financial structure into a speculative one. In this case -when \( g > r > i \) - the debt to asset ratio \( \varphi \) approaches a positive value with time that is less than one, i.e. the firm’s debt to asset ratio indicates that the firm is borrowing to finance part of its investment, however the debts are still less than assets. In this case if the firm expects interest rates to increase above the profit rate in the future, then the firm is better off if it decreases its investment and raises its financial assets to avoid a ponzi structure.

The classic ponzi growth path -where \( g > i > r \) - implies that the asset-to-debt ratio approaches a value larger one along its growth path, indicating that new debts exceed the firm’s assets and the firm will eventually declare bankruptcy in finite time.

Foley succeeded in defining the difference between hedged, speculative, and ponzi growth paths using the simple average growth rates of assets, profits, and interest payments. He then applied the same approach to the national economy that is perceived as a collection of firms. Foley modified the Taylor-O’Connell model by assuming a small Kaleckian open economy rather than a closed economy. He explains that a closed economy (\( d = 0 \)) implies that \( r \) must exceed \( g \), hence, the economy is by definition restrained to hedged growth.

The capital account surplus is given by the difference between total investment and domestic savings, hence the surplus-to-capital stock ratio \( d \) is defined as the difference between the rate of capital accumulation \( g \) and the savings rate \( s \) out of profits \( r \): \( d = g - s \cdot r \) [5].
The capital account surplus \( d \) is defined as a function of the real interest rate \( i \) - which is controlled by the monetary authority - and the profit rate \( r \), where \( d = d_0 + \eta i = \Psi sr \) [6]. The growth rate of capital accumulation \( g \) is defined as a function of the real interest rate \( i \), the profit rate \( r \), and a confidence factor \( \varrho \); \( g = g_0 + h(r + \varrho i) \) [7], where \( h \) is a positive parameter.

Foley then substituted for \( d \) and \( g \) in [5], using [6] and [7] and the outcome was then solved for \( r \) and \( g \). The solution shows that profits, foreign capital and the capital stock are chiefly determined by the interest rate \( i \) and the confidence factor \( \varrho \). However, the confidence factor \( \varrho \) is monotonically related to the rate of capital accumulation \( g \), thus we can substitute for \( \varrho \) using \( g \). The profit rate and the capital account surplus are then rewritten in terms of \( g \) and \( i \) instead of \( \varrho \) and \( i \), where the profit rate becomes: \( r = (g - d_0 - \eta i)/s(1 - \psi) \) [8], and the surplus-to-capital stock ratio \( d \) becomes: \( d = (g - d_0 - \eta i)/s(1 - \psi) \) [9].

Now the model is rewritten in terms of the profit rate \( r \) and the surplus-to-capital stock ratio \( d \), which are defined in terms of \( g \) and \( i \). In this case we can clearly define various financial structures on the \( g-i \) space. Similar to the case of a single firm, the financial structure is defined by the interaction of the profit rate \( r \), capital accumulation \( g \), and the interest rate \( i \). However, \( r \) is determined by \( g \) and \( i \), therefore hedged, speculative and ponzi structures can be defined on a \( g-i \) axis. Foley defined a 45° line along which \( g = i \), above and below which various growth paths are defined.
The following step was to study the dynamic path of the economy's financial structure. Foley differentiated $g$ and $i$ with respect to time: he defined the time differential of the interest rate $i$ as a function of the difference between the current growth rate $g$ and the equilibrium rate $\dot{g}$, $i' = \gamma(g - \dot{g})$. 

Whereas the time differential of investors' confidence is defined by $g' = \beta(g - \dot{g}) - \delta(i - \dot{i})$, and the time differential of capital accumulation is given by $g' = \{h/(s(1-\psi)-h)\beta(s(1-\psi)-\gamma(s(1-\psi)+\eta))(g - \dot{g}) - \{h/(s-h-\phi)\} \delta(s(1-\psi))(i - \dot{i})\}$. 

$g'$ and $i'$ define the dynamics of the system representing the economy; Foley's findings show that the economy is in equilibrium when capital accumulation and interest rates are equal to their equilibrium levels. However, Foley showed that even if the economy is in a stable speculative equilibrium where $\dot{g} > \dot{i} > i$, high growth rates force the monetary authority to sterilize excess growth by increasing the interest rate. Subsequently, when the interest rate $i$ rises above its equilibrium level the economy is forced onto a ponzi path.
Foley succeeded in articulating definitive criteria of hedged, speculative, and ponzi structures. Furthermore, he proved that the dynamic path of an open capitalist economy is inclined to become ponzi. The final criteria derived from the model implicitly include the impact of external factors on domestic financial fragility by assuming that capital accumulation is a function of domestic savings and foreign capital inflows. Nevertheless, the model completely neglects the public sector; it overlooks the impact of governmental performance on aggregate debts - explicit in public external debt and total domestic debt - and its consequences on the economy's financial fragility.

III.4.v. Susan K. Schroeder's model (2002)\(^{183}\)

Schroeder's model is an extension of the early version of Duncan Foley's model (2000). Schroeder introduced a few modifications to Foley's specifications of the interest rate, the profit rate and the rate of capital accumulation, and applied her model to Thailand's financial crisis (1997). She distinguished between average growth rates and incremental growth rates, explaining that average rates proposed by Foley are best used to depict long-term trends, however, they are insufficient for analyzing short-term displacements. She argues that the transition between the hedged stage to the speculative and ponzi stages can be illustrated best using incremental rates.

Schroeder was highly influenced by Anwar Shaikh's emphasis on incremental profits as a determinant of aggregate investment. Shaikh explains that capital accumulation is guided by incremental profits rather than average profits:

"In a world of uncertainty the incremental return is a better guide than the average rate to what firms can expect to receive on the investment of new funds, given the prevailing market conditions. The incremental profit rate, thus, acts as a signal which directs capital flows. This rate will then influence the pace of capital accumulation. For instance, if the incremental rate of return starts to decline, and remains declining over

\(^{183}\)Op cit, Schroeder.
time, then one can expect the pace of capital accumulation to decline as well, with some time lag” (Schroeder, 2002).

Incremental profits are defined as follows: \( r' = \frac{\Delta R}{\Delta K} = \frac{\Delta R}{K_{t-1}} \), where \( \Delta R = R_t - R_{t-1} \), and \( \Delta K = K_t - K_{t-1} = I_{t-1} \).\(^{104}\) The incremental profit rate tends to be more volatile than average profits as it reflects cyclical short-term changes in aggregate demand.\(^{105}\) Hence, average rates are insufficient for predicting crises that could be triggered by short-term changes such as a surge in private foreign debt, a run on the foreign reserves, a domestic liquidity crisis...etc.

Incremental capital accumulation (\( g' \)) is defined as \( g' = \frac{\Delta I}{\Delta K} = \frac{\Delta I}{K_{t-1}} \), where \( \Delta I = I_t - I_{t-1} \), \( \Delta K = K_t - K_{t-1} = I_{t-1} \), and incremental interest (\( t \)) as \( \Delta V/\Delta B = \Delta V/\Delta t \), where \( \Delta V = V_t - V_{t-1} \), \( \Delta B = B_t - B_{t-1} = D_t - D_{t-1} \). The model applies Foley’s criteria to incremental rates: the economy is hedged as long as \( r' > g' \), and \( r' > i \), it becomes speculative when \( r' \) falls such that \( g' > r' > i \), and becomes ponzi when \( i > r' \).

Suzan sights the stock market and real estate market as the major routes to speculative investment. She explained that when the rate of return on productive investment is lower than the return of stock market and real estate, speculative investment creates short-term gains that attract investors to these particular channels. Sequentially the excessive demand on such channels leads to the inflation in asset prices.

During periods of hedged growth incremental rates of profit increase, capital accumulation surges, interest rates rise, and the current account worsens. By the end of this phase the rate of return on the stock market exceeds that earned on productive investment, and the economy enters a

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\(^{104}\) As mentioned earlier in Foley’s model \( R \) is total profits, \( K \) is the capital stock, and \( I \) is investment.

\(^{105}\) Op cit, Schroader, p. 17
new phase of speculative growth. In this phase the profit rate starts declining leading to a decline in capital accumulation and therefore a decline in interest rates, consequently the current account improves.

Suzan divides the ponzi stage into two sub-stages; pre-crisis stage and crisis stage. During ‘pre-crisis’, both the rate of profit and capital accumulation continue to fall, yet the interest rate and the current account (or new domestic debts if talking domestically) are stable. During this period investors sell their holdings in the stock market to finance the debt service and operating expenses. Suddenly, when the economy is exposed to a shock that shatters investors’ confidence, the economy moves onto the ‘crisis’ stage.

The five models reviewed above vary in many aspects, however, they overlap in studying the core of Minsky’s hypothesis, that is debt accumulation in a capitalist economy, and the influence of financial intermediaries on the instability process. The main features of the five models are summarized in the flow chart below.

As illustrated in chart III.2 some of the models were established for explaining financial crises in an open economy, whereas some explain financial instability in an open market economy. Three of the models build on the balance sheet approach (the T-O model, Foley’s model, and Schroader’s model), Keen’s model builds on Goodwin’s limit cycle model (1967), whereas Filho’s model stanches from the “capital-account” view of the origins of financial instability. However, most of them focus on profits and the destabilizing and explosive impact of high domestic interest rates and increasing debt commitments.

According to Minsky (1964), the essence of the financial instability hypothesis is captured by the rise in debt-to-income ratios, increasing levels of asset prices, and the general decline in ultimate
liquidity. However, the most critical determinant of instability is the debt-to-income ratio. Hence, the representation of Minsky's hypothesis ought to investigate two major points, first; the dynamic study of the determinants of debt-to-income ratios. Second; the tendency of the economy to move between the three financial stages along its growth path.

The review on "Minsky models" shows that Foley's model is superior to the Taylor-O'Connell model and Keen's model due to three factors, first; the model studies instability in a small open economy. Second; it captures the essence of Minsky's perceptions through the examination of the impact of the debt-to-profit ratio on stability along the nation's growth path. Third; unlike the rest of the models, Foley's model allows for the systemic transition between hedged, speculative, and ponzi stages.

Nevertheless, Foley's model and Shroader's extension, both overlook the fundamental impact of public performance on aggregate financial stability. In addition, they confine the impact of BOP displacements on domestic financial structure to the flow of capital surpluses in the aggregate balance sheet, neglecting the significance of public external debt and foreign reserves as a determinant of internal financial instability. Hence, the model selection stems down to the application of Foley's model, with minor reference to the Filho model.
The T-O model focuses on market psychology and expected profits. The model depicts the potential instability through the shifts in points of equilibrium on a quadrant similar to the IS-LM construct.

Market psychology results in a crisis through its impact on current profits and interest rates and the feedback on balance sheets.

Filho's model (2000) focused on capital flows as the chief source of instability in open economies with a sizeable balance of payments. He focused on the dynamics of the foreign liquidity ratio and the total debt ratio (external debt plus public domestic debt) as well as market psychology in determining aggregate financial stability.

Foley's model (2001) studies the dynamics of the solvency ratio for the whole economy. The government variables are the interest rate and the rate of capital accumulation.

Schroeder's model (2002) is merely an extension to Foley's model. It substitutes for the average rate of interest, capital accumulation, and profits, using incremental rates.

Keen's model builds on Godwin's model and focuses on the distribution of returns between wages and intermediaries, and the explosive impact of capitalist debts, and interest charged by intermediaries on the growth cycle.

Source: Chart developed by the author
III.5. Conclusion

The models discussed in the previous chapter succeeded in capturing Minsky's perceptions on financial development in a capitalist system with various approaches to the instability process, furthermore some of the models were specifically developed to explain financial fragility in an emerging market economy (Foley's model, and Schroader's extension to Foley's model). However, the theory was initially developed to explain the financial instability of the US economy, and was developed later for application to other cases, hence the theory fits best for a system with a developed financial market and a large private enterprise sector that has access to credit and can easily fund its growth through debts. Nevertheless, the theory remains applicable to emerging markets—especially during periods of financial liberalization—but the scope of analysis is limited by the dual nature of developing economies.

Developing economies are generally characterized by the dual nature of markets into formal developed segments with access to formal financial intermediaries and informal less developed segments with less capital resources and generally encompasses the poorer social strands of the society. Hence, the rapid debt accumulation process clearly applies to the first segment, but does not directly fit to explain financial development inside the latter. There is an essential need to study the financial structure and payment networks inside the informal less-developed segment which is believed to rely mostly on internal financial resources. However, there is evidence of informal credit inside Egypt, which is isolated from the Central Bank interest rate mechanism, yet during inflationary periods the increasing demand on finance increases the demand on informal credit resulting in increasing interest rates on informal credit and a Minsky cycle is likely to initiate inside
that sector. Moreover, there is mutual feedback between both sectors, the decline in formal activity results in declining wages and a decline in consumer demand in both sectors, and the derived demand on informal output. The assumption put forward in this section is that the large formal enterprise sector in emerging markets initiates the financial instability cycle, and brings financial instability to the whole sector through the decline in liquidity that follows the decline in private output, wages and consumer demand.

In addition to the dual nature of emerging markets, there are other limitations to the analytical scope of theory, first, the asymmetric nature of information inside the market. Second, limited financial development that highly constraints financial layering. Third, the rigidity of prices and interest rates, which breaks down the elasticity of the financial sector to the real economy.

In spite of the mathematical rigorousness of Foley’s model and the successful application of Minsky’s theory to emerging markets (South East Asia, Turkey, Latin America), still the results are not expected to present a full explanation of the 1998 crisis, only a partial explanation of how financial liberalization has placed the formal enterprise sector in great instability and how it contributed to the shortage of total domestic liquidity inside the banking sector and a general decline in total output.

106 This classification is vague because in reality we cannot strictly draw the boundaries between the formal developed sector, and the informal less developed one, however it is drawn to point out the analytical limits of the FIH.
Chapter Four


IV.1. Introduction

The origin of Egypt's 1998/99 crisis was delineated in various studies during 1999-2003. The highlighted fundamentals of the fulminate decline vary from the deep displacements in economic fundamentals, to currency misalignments and the self-fulfilling element. El-Essawi (2000) ascribes the 1999 crisis to coherent structural imbalances and their negative repercussions on poverty and income distribution. Hussien and Nos'hy (1999) argue that the ample instability is mainly attributed to the appreciation in the real exchange rate over the 90s. Both El-Essawi and Husssein and Nos'hy seem overwhelmed by first generation models that limit their view of macro instability to economic fundamentals and the impact of exchange rate misalignments and public debt.

Al-Riffai and Kamaly (1999) and El-Shazly (2003) used a non-parametric approach to predict the 1998/1999 financial crisis. The established indices that blend first and second generation models, succeeded in predicting the crisis, however the non-parametric approach is generally designed to assess the probability of a phenomenon rather than to explain the mechanics of that phenomenon. Far from these results, Arestis (2001) finds no signs of serious financial distress and argues that Egypt has escaped the impacts of financial liberalization.

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This chapter presents the application of a third generation model that analyzes financial crises with reference to the “balance-sheet” approach. The argument proposed herein is that the financial crisis in Egypt (1998) stanches from prolonged financial fragility during the early and mid 1990s. The chapter aims to evaluate the underlined hypothesis using the results from Foly’s model.

Duncan Foley succeeded in deriving the conditions of financial stability in a small open economy, through the dynamic study of firm balance sheets and firm solvency over time. The deterministic factors of financial stability are captured by the real profit rate r, the real interest rate i, and the rate of real capital accumulation g. His criteria differentiates between three types of financial structures, a hedged structure where r > g > i or r > i > g, a speculative structure where g > r > i, and a ponzi structure where i > r. Based on his understanding of Minsky’s hypothesis, Foley argues that a financial crisis may occur any time during the ponzi stage, when i > r. The following sections investigate the ability of Foley’s criteria to explain Egypt’s 1999 crisis, and its ability to reflect Minsky’s instability hypothesis.

IV.2. Data Specification, and Conceived Data Limitations

Schroader’s modifications (2002) of Foley’s model, gives us two choices of application, one that requires annual average rates of r, g, and i, and another that employs quarterly and monthly incremental rates rather than average rates. The application of Foley’s criteria requires the computation of the real annual profit rate, real capital accumulation rate, and real interest rate. Whereas Schroader’s model suggests the utilization of incremental rates of quarterly profits, capital accumulation, and interest, the choice of data specification is constrained by the availability of an adequate time series for analysis.

Average rates versus incremental rates: The average profit rate is defined by the simple ratio of total profits to the capital stock; \( r = \frac{R}{K} \). It follows that the average rate of capital
accumulation is defined by the ratio of aggregate investment to the capital stock; \( g = I/K \), and the interest rate \( i \) is simply the ratio on one-year-or less loans imposed by commercial banks.

Incremental rates refer to first differences, i.e. the ratio of increments rather than levels. Thus, incremental profit rate and incremental capital accumulation are respectively defined by the ratio of the changes in net profits to the change in total assets; \( r' = \Delta R/\Delta A \), and the ratio of the change in total investment to the change in total assets, which is the growth rate of investment; \( g' = \Delta I/\Delta A = \Delta I/I \). Whereas the incremental interest rate is given by \( i' = \Delta V/D_i \), where \( V \) is debt service, and \( D \) is the size of new debts.

The study of financial fluctuations is best illustrated by short-term increments\(^{110}\), however this requires a long times series of quarterly/monthly data on net aggregate profits for the private sector, net investment, net capital stock, and interest rates. Quarterly/monthly financial data is accessible at the Central Bank of Egypt, but quarterly data on profits and investment for private enterprises is not available before 1997\(^{111}\). Moreover, the available statistics are confined to the listed companies in Egypt's Stock Exchange. Hence, the usage of short-term increments is constrained by the lack of quarterly balance sheets for the private enterprise sector before 1997. Furthermore, the commonly used methods of data interpolation and proxy-substitution for \( r \) and \( g \) are expected to yield serious margins of error.

Data interpolation: the common suggestion of extracting quarterly data series through the interpolation of annual data is not suitable for crisis analysis. The idea is to study the changing nature of the financial structure and income streams during the short term, however, data interpolation interferes in short term values by deliberately distributing annual values onto four

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\(^{110}\) Schroeder agrees with Shaikh that "in a world of uncertainty the incremental return is a better guide than the average rate" (Schroeder, 2002:p.17).

\(^{111}\) Quarterly balance sheets were not issued before the 1995 stock market law, and it was not before 1997 when some of the companies delivered quarterly balance sheets. Most of the companies issued their quarterly sheets starting 2000.
quarterly values. Thus, it reflects the assumptions laid on short-term variations, rather than the measurement of real fluctuations.

Using a proxy for profits and private capital: The other suggestion would be the application of quarterly proxies to both profits, and investment. However, the estimated series are expected to yield serious margins of error because, in our case, we will have to employ proxies for two of our three key variables, and due to the lack of quarterly economic data, the choice of proxy-variables is restricted to financial variables.\textsuperscript{112}

It appears that the application of short-term incremental rates is constrained by the lack of quarterly balance-sheet data series. Hence, the choice of variables is confined to Foley's average annual ratios.

Suggested modification to Foley's model: Although most of the 'Minsky' models stress on the profit rate $R/K$ as a measure of returns to increasing accumulation, and as an incentive to capital growth, nevertheless, Minsky did not explicitly refer to the "profit rate" in any of his major works.

Minsky stressed on current and anticipated profits as the major incentive and regulator of capital accumulation, however he did not explicitly mention the "profit rate" as the deterministic factor of growth. Hence, we are not obliged to utilize the profit rate in our interpretation of Minsky, instead we can use the rate of return or incremental rate of return that was mentioned by Minsky (1954), Shaikh (1996), and Schroader (2002) as the chief guide to market entry and capital accumulation in a capitalist economy.

In his doctoral dissertation (1954), Minsky explicitly pointed out the rate of return as the incentive to market entry "When (a firm) possesses some advantages of market position which result in the rate of return ... greater than the rate of return generally available in the economy"
[Minsky, 1954, chap. 7, 5-6]. Furthermore, Minsky relates profits to investment, rather than to the capital stock; he derived his statement of profits from the simple formula: profits = investment (Minsky, 1982-p.36-38). Thus, using the rate of return R/I reflects Minsky's perception on profits, rather than the profit rate R/K. And finally, Minsky was interested in the changes in the capital stock that accompany current profits, hence he was interested in the ratio of current profits to the changes in the capital stock, rather than the ratio of profits to the aggregate capital stock.

The suggestion herein is to substitute the profit rate in Foley's model by the annual rate of return for the private enterprise sector, which is currently seen as the chief guide of capital accumulation in a capitalist system: "the near-term rate of return is what firms use to make decisions about undertaking new investment projects" says Anwar Shaikh (1996).

The required data set for application is as follows:

- The annual rate of return r: r=R/I, where R is real net annual profits for the private enterprise sector, and I is real net private investment during the same period.

- The annual rate of capital accumulation g: g=ΔK/K=I/K, where K is the annual real capital stock, and I is real net investment. Obviously the computation of g requires the estimation of the real annual capital stock. Schroader (2002) estimated the capital stock time series using the following formula: $K_t=\sum_{j=0}^{n} I(t-j) \times (1 - \text{dep})^j$, where $K_t$ is annual net private capital stock, I is private investment, and dep is the rate of depreciation. The annual depreciation dep was calculated using Hultin & Wycoff's PIM procedure. The critical issue is how to

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113 In Egypt, economic variables are issued on annual basis.
115 Op. cit, Schroader, p.17
116 Ibid, p.36.
accurately calculate the initial capital stock $k_{1970}$. The application of the PIM method requires data series on private investment that extends long before 1970, however annual investment and profits for the private enterprise sector are found in annual aggregate balance sheets that were first issued by the CAPMAS in 1970. However, instead of estimating the initial capital stock by the PIM method, we can use the capital output ratio (COR) to derive the initial private capital stock in 1970. “There are several approaches to the measure of initial capital stock, including the COR (incremental capital-output ratio)” (Mohatadi, 2000).

The capital output ratio (COR) for Egypt [1970] was estimated by Summers and Heston (1991), as well as King and Levine (1994). The King and Levine estimates show that the COR was close to 0.44 in 1970, however we cannot accept such estimates with great confidence. It is hard to believe that each unit of capital stock produced output at two folds its value, especially that the estimates for most LDCS varied between 1.4 and 2.5.

On the other hand, Summers and Heston estimated the capital output ratio COR at 1.5 in 1970, which is a rather reasonable percentage. In his article “Human Capital and Economic Performance in Egypt”, Fergany (1999) selected Summers and Heston’s estimates of the capital stock to output ratio as the most accurate among available, when calculating the physical capital output ratio:

“An inventory approach was followed to construct a series of capital stock assuming a Capital Output Ratio (COR) of 1.5 in 1970 and an annual depreciation rate of 6%. These parameters were chosen on the basis of perusal of international comparisons (Summers and Heston, 1991) and a previous work in which a production function was estimated for Egypt on the basis of a standard World Bank approach (World Bank, 1994). However, variability in the capital stock series over time would not be significantly influenced by the choice of these two parameters.” Fergany (1999)

Although the computation of the capital stock using the COR estimates may not be entirely satisfactory it has no serious implications for crisis analysis during the 1990s. When assuming

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various COR ratios (COR=0.4, COR=1, COR=1.5, COR=2) for 1970, the calculated rate of capital accumulation 'g' was almost identical in all four cases during 1983-2001, exhibiting mild variances before 1983 (see chart IV.1). Hence, the assumption of COR=1.5 could be confidently employed in computing the initial capital stock $K_{1970}$. The rest of the series is estimated by successively adding annual net investment to the previous capital stock.

**Chart IV.1**
The Sensitivity of 'g' to $K_{1970}$

The Sensitivity of Calculated Rate of Capital Accumulation to
the Variations in COR(1970)

![Graph showing sensitivity of 'g' to COR variations]

Source: Chart developed by the author

- The annual interest rate $i$: Foley defined $i$ as real annual rate of interest. The nominal rate used is the minimum rate on loans, one-year-or less, at commercial banks, and the real interest is calculated by subtracting annual inflation in CPI index from the nominal rate.

**Data reliability:** Undoubtedly, the time series on annual interest rates published by the Central Bank of Egypt is perfectly reliable. The annual time series on private net investment, net profits, and total debts are gathered from the annual balance sheets for the private enterprise sector issued by CAPMAS. Naturally, the data is not expected to represent the actual size of private

business accumulation, however, it is used as a representative of the changing behavior inside the entire private enterprise sector.

As mentioned above, the estimated capital stock presents no threats for the robustness of our 1998/99 crisis analysis, nor for the preceding period.

IV.3. Interpretation of Results and Crisis Detection

This section addresses the chief question of research; whether the financial instability hypothesis can be used to detect as well as to justify Egypt’s 1998/99 financial crisis or not? The answer follows from the application of Foley’s model (2001) to the dynamics of net income streams and capital accumulation in the private enterprise sector during the 1990s.

The first step is to compare the rate of return $r$ to both the rate of capital accumulation $g$ and the interest rate $i$ during 1970-2001. The next step is to define hedged, speculative, and ponzi periods using Foley’s criteria. The following stage is to investigate the adjacency between the detected ponzi period and the 1998/99 crisis. Finally, the significance of results is tested using OLS estimation.

The results from Foley’s criteria indicate that the economy was financially hedged during 1990/1991-1994/1995, speculative during 1995/1996-1997/1998, and became ponzi during 1998. As argued by Minsky, the crisis was triggered during the ponzi stage by the surge in real interest rates, as well as the continuous decline in the rate of return. Furthermore, the model detects the financial fragility that preceded the 1980s debt crisis (see chart IV.2).

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118 Generally all data on the private business sector are not highly reliable in reflecting the size of the whole private business sector, simply because the share of informal activity is significantly large, yet not accounted for in the data set. In addition, field surveys might have overlooked existing formal units. Nevertheless, if we are interested in the performance of the private sector and the dynamics of liabilities and profits then we may consider the data to be reasonably reliable in representing formal private enterprises.
Chart IV.2.
Detecting Financial Fragility in Egypt During 1970-2000

Identifying Financial Instability Using Foley's Criteria

Financial Instability During (1990/91-2000/01)

Speculative Stage

Ponzi Stage

Source: The chart is developed by the author
IV.3.i. The Consumption Boom and Debt Dilemma During 1970-1990

The early 1970s embraced political and ideological shifts\(^{119}\) that contributed to major transformations in the structure of public balance sheets, yet it had minor influences on financial stability in the private enterprise sector.

The enhancement of the open-door policy that followed the 6' th of October triumph was accompanied by a consumption boom [1976-1985]\(^{19}\). The increasing demand on current output resulted in increasing prices that were soon translated into anticipations of increasing profits and a derived demand for investment. However, credit supply to the private sector was highly constrained, confining investment finance to internal finance, equity finance, and foreign flows from abroad. Consequently, the investment boom was not accompanied by increasing debts (except for 1981-1982) until the 1993 financial liberalization (see chart IV.3).

![Chart IV.3]

Limited Private Debts During 1970-1993

\(^{119}\)The 6'th of October victory, as well as the adoption of the open door policy.
determining the meticulous details of credit policy in both public and private banks.\textsuperscript{121} Moreover, the CBE constrained lending to the private sector by setting credit ceilings for private units, as well as demanding increasingly high collateral: "Under this law – the 1984 law 50: no bank may grant any single client credit facilities exceeding 25\% of its paid-up capital and reserves" (Mohie El-Dien, 1999). Overall, banking regulations were not conducive for debt accumulation. In fact, the inefficiency of the banking sector in mobilizing savings in the interest of private growth has certainly set a limit to private expansion that is equivalent to policy ceilings that determine the maximum rates of investment and de-investment.\textsuperscript{122}\textsuperscript{*}. Nevertheless, it prevented the vicious cycle of debt accumulation that accompanies investment demand during boom periods.

During that period, the increasing return on investment was sustained by withstanding increases in aggregate demand as well as increasing prices of capital assets\textsuperscript{123}. The general increase in price levels that accompanied the boom, enticed the government to contain the manifest inflation by raising nominal interest rates. However, this had no serious drawbacks on financial stability because real interest rates were generally low (real interest was sustained at below zero levels during most of the 1970s and 1980s). The general increase in real profits, and

\textsuperscript{120} See appendix for charts on increasing private demand, and increasing prices.

\textsuperscript{121} Opicit, Hussien, 1999.

\textsuperscript{122} Opicit, Gallegati, Delligatti, and Minsky, p.4.

\textsuperscript{*Delligatti, Gallegati, and Minsky (1994) studied the dynamics of a linear accelerator-multiplier model that is constrained by floors and ceilings. They found that the resulting explosive series can be altered using monetary and fiscal tools as circuit breakers, indicating that the monetary policy can set a ceiling to the level of investment or de-investment.

\textsuperscript{123} To my knowledge capital-asset price indices are not available in Egypt, not even for the real-estate sector. The proxy for capital-asset price levels is taken to be the volume of investments in the housing sector. I will assume that the increase in investment directed to housing is directly related to the increase in the price of houses based on the reciprocal relation between capital asset prices and investment (Schneider and Tornell, 1999). For simplification I will use the changes in the volume of housing investments as a representative of capital asset prices. Starting from the mid 1970s, investments in housing grew from LE732 millions in 1982/83 to LE2,950 millions in 1991/92, representing more than 25 per cent of the total private investment. Building on the assumption made herein we conclude that capital asset prices have increased significantly during the 1970s/1980s. Data from http://www.unu.edu/unupress/unupbooks/uu26ue/uu26ue0e.htm.
decline in real interest fortified the financial structure of the private sector and dwindled the tendency of private enterprises to become ponzi.

However, the financial structure became speculative during the early 1980s. High returns to investment contributed to increasing rates of capital accumulation, even above the rate of return. Nevertheless, the massive increase in capital accumulation was soon restrained by three elements: First, the inelasticity of credit supply, second; the deteriorating performance of the public sector and third, the world recession that followed the 1986 oil-price shock.

The deteriorating performance of the public sector combined with world recession, resulted in declining profits and declining capital accumulation in the private sector. This is explained by the sizeable share of the public sector in total output [The public sector produced 42.2% of total output in 1975, and the percentage increased to 51.5% in 1981, and was sustained at an average of 48% during 1982-1987]. Naturally, fluctuations in public output, public expenditure, and fiscal deficits have profound impacts on private activity in a small economy with large government. Hence, the massive increases in public external debts during the 1980s, the deterioration in fiscal deficits, and the decline in foreign flows that followed the world recession resulted in a general slowdown during the late 1980s. Nevertheless, the decline in private activity was not accompanied by financial fragility in the private sector.

To the contrary, the government sector was financially fragile during that same period, suffering massive accumulation of external debts that generated a debt crisis during the late 1980s. Yet our model does not depict the 1980s debt crisis simply because it was established to depict financial fragility in profit earning units; nevertheless, it remains a “Minsky” case of financial fragility, and can be illustrated using the Filho-Nelson model (see chart IV.4).

\[12^{\text{Data from the Ministry of Planning’s documentary reference on major changes in the national economy during 1959/1960-1999/2000}}
\[12^{\text{Opecit, Minsky, 1982, p.43}}
\[12^{\text{However, the results show that the economy became speculative during the early 1980s and this is supported by the financial crisis detected in Egypt in 1983 (Obeim (2001)).}}

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As mentioned earlier, the Filho-Nelson model depicts financial fragility in an open economy through the detection of the foreign liquidity-to-foreign debt ratio. As the ratio declines the economy becomes financially unstable, indicating that its current commitments exceed its current sources of income. The chart above shows that the liquidity-to-debt ratio was severely low during the 1980s, due to the massive increase in foreign debts and the non-increasing foreign liquidity. Moreover, the ratio declines further with the addition of public internal debt to foreign debts.

In brief, the "infitah" period enhanced trade liberalization and encouraged foreign capital inflows, however the external liberalization was not accompanied by profound financial liberalization, thus the boom was financed by internal resources as well as income from abroad rather than cumulative debts. Hence, while the system forbade financial fragility in the private enterprise sector, it generated financial instability in the government sector.

\[127\] The government had the biggest share of total external debt: in 1987 78% of total external debt accrued to the government
IV.3.ii. The Asset-Price/Lending Boom and the Detection of the 1998 Liquidity Crisis

The foreign-debt dilemma was intensified by stagnant growth and increasing poverty during the late 1980s. The mandatory institutional intervention was essential for structural, institutional, and financial reform. However, the neo-liberal choice of application that is manifest in the ERSAP, restructured the economy such that the system became hedged against government-external debt crises. However, the enhanced financial structure became conducive to other types of financial crises – banking crises, liquidity crises, BOP crises, and currency crises.

The diminution of the domain of stability during the 1990s was a direct consequence to the interaction of three principal policy options: lax credit policy, anchoring a fixed exchange peg, and anti-inflation policy.

**Hedged growth [1990-1995]:** Until 1995 the rate of return \( r \) exceeded the rate of real interest \( i \) and the rate of real capital accumulation \( g \), such that \( r > i > g \). Foley describes the growth paths on which \( r > i \) as hedged growth paths, along which firms are not likely to experience bankruptcy. However, under such conditions firms have a strong incentive to increase their investments by raising \( g \), until \( g > r \), and become speculative. This is particularly what happened during the early 1990s.

The early stages of ERSAP involved price and exchange rate stabilization, which required a conservative monetary policy as well as a conservative government budget. Nominal interest rates increased to 19.5% in 1990/1991, yet the real interest rate was 3.5%. Although real interest rates were still low, yet credit ceilings limited investment finance during 1990-1993. The tightly financed investment growth enhanced efficiency and resulted in increasing profits during 1990-1993: "The combination of a growing economy and conservatively financed investment means that most projects succeed" (Steve Keen, 1995-p.611).
The increases in the rate of return during 1990-1993 were translated into anticipations of increasing profits and increasing demand for investment. However, the inelastic credit supply prevented rapid accumulation and resulted in increasing levels of asset-prices. Simultaneously, the price level of current output declined\textsuperscript{128}, hence, the asset-price to current-price ratio increased and resulted in further increases in investment demand (see chart IV.5).

The limited investment-finance was combined with declining consumer demand and other business constraints\textsuperscript{129} that delayed investment growth during 1990-1993. Subsequently, the rate of return declined in 1993/1994, yet stayed above the rate of capital accumulation\textsuperscript{130}.

The asset-price boom was accompanied by financial liberalization later in 1993. Interest rate floors/ceilings were demolished, and credit ceilings were lifted, creating the sufficient conditions for a lending boom. Credit supply that has become elastic to investment demand resulted in increasing rates of capital accumulation and rapid growth in private investment [investment growth rates increased from 3.5\% in 1993 to 42.7\% in 1994]. Contrary to the 70s and 80s, rapid investment growth was not accompanied by an equivalently growing consumer demand. The striking decline in consumer demand placed a constraint on long-term capital accumulation, yet g continued to increase until it exceeded \( r \) [1995/1996] due to lax credit provisions, and because realized profits seemed sufficiently high.

The perceptible investment boom was combined with a lending boom, which explains the increase in the debt-to-profit ratio in 1994/1995, that continued to increase until 1998. Clearly, the economy was transmitted from hedged to speculative growth during the mid 90s.

\textsuperscript{128} See appendix for the changes in CPI

\textsuperscript{129} Investors and business men still faced major constraints to business expansion in Egypt during the 1990s: tax administration, collateral requirements, the cost of finance, economic policy uncertainty, tariffs and custom procedures, lack of information on domestic market as well as the difficulties of exporting (Sameeha Fawzy, 1998).
Speculative stage [1995/1996-1997/1998]: The elasticity of investment supply during 1993-1998 permitted massive accumulation of capital, such that investment finance was no longer constrained by current net profits. Hence, while the rate of return was declining [1993-1998], capital accumulation was increasing and $g$ exceeded $r$ during 1995/1996-2001 (see chart IV.2). Furthermore, speculative investment in the stock market and real-estate sector grew at increasing rates during 1994-1998. The price bubble of real estate assets induced accumulation in the real estate sector. At the same time market capitalization of the Egyptian Stock Exchange grew at 45.6% during 1994-1998. The share of market capitalization increased from 8.3% of GDP [1994] to 29.9% of GDP [1998], and the turnover ratio increased from 18% to 28% during the same period. Although the rate of capitalization and turnover ratio increased rapidly during 1994-1998, the rate of return on investment in stocks declined during [1996-1998] after the sudden increase during 1995-1996. The decline in the rate of return on stocks is consistent with the decline in the calculated rate of return on investment within the private enterprise sector during the mid 90s (see chart IV.6).

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13Post-Keynesians define profits as a function of capital accumulation, as well as other economic, social, and political factors, yet they stress on the rate of accumulation as the chief determinant of profit growth, hence, insufficient growth rates of capital must lead to a decline in real profits.

Speculative growth during 1995/96-1997/98 had gravelling consequences on the liquidity of private enterprises. The ratio of total debts to net profits increased from 146% in 1994 to 392% in 1996 (see chart IV.3), implying that the liquidity of private firms declined by 168% during 1994-1996. In addition, the ratio of debts to owned capital increased notably during the same period (see chart IV.7).

Furthermore, the severe decline in the ratio of net total assets to debts\(^{143}\) indicates the declining solvency of private enterprises during 1994-2001 (see chart IV.8).

\(^{143}\)Nagwa Samuk, and Ommea Helmy; “Foreign Portfolio Equity Investment in Egypt: An Analytical Overview”, The Faculty of Economics and Political Science, Cairo University, April 2000.
The Ponzi stage [1997/1998-2001]: The contractionary impact of the decline in the rate of return [1994-1999] was somehow sterilized by elastic credit supply during 1993-1997, however, in 1998 the asset-price bubble burst\(^{134}\) and profits declined further. The cumulative debt commitments that piled during the speculative stage combined with declining profits, both contributed to the severe decline in the liquidity of private enterprises [the debt to profit ratio converged to 600% in 1998 indicating that the liquidity ratio has severely declined to its absolute minimum during 1971-2001](see chart IV.3).

The decline in the liquidity ratios and the decline in firms’ solvency contributed to a much narrower domain of stability\(^{135}\), subsequently, the system has become highly sensitive to mild shocks i.e. the economy has become financially fragile and prone to crises.

The triggering event: The sudden increase in real interest rates from 6.1% in 1997 to 11.14% in 1998 has certainly triggered the 1998/99 liquidity crisis. The significant shift in real interest rates

\(^{135}\)Total debts refer to the sum of bank loans and long term debts gathered from the financial review of the private enterprise sector and issued by CAPMAS during 1970-2001

\(^{134}\)Op cit, Fraser and Arquachi.

\(^{130}\)Revise the determinants of the domain of stability in chapter II.
is ascribed to the interaction between declining consumer demand, and the maintenance of high
levels of nominal interest.

The fixed exchange peg was achieved by devising domestic interest rates as a stabilizer in
the exchange market, hence, when foreign reserves declined with the 1997 external shocks, the Central Bank had to maintain high interest rates to prevent a run on foreign liquidity. Meanwhile, the decline in consumer demand during the 90s resulted in declining prices of current output, therefore the real interest rate increased during 1995-2000, with a sudden spike in 1998.

The real interest rate increased above the rate of return \( i > r \), indicating that debt-servicing requirements exceeded current flows of income. Foley defines two types of ponzi growth, one where \( g > i > r \), and another where \( i > g > r \). Foley explains that the dynamic path of firms in the first case indicate that firms must become bankrupt. In the second case \( i > g \), firms can stabilize their financial structure by cutting down their investments only if consumer demand is sufficiently high to offset the decline in investment demand, if not the decline in investment is likely to reduce aggregate demand and result in declining output and further declines in profits:

\[
\Phi = (\Phi_0 - \Phi^*) \Rightarrow \Phi \to (\Phi_0 - \Phi^*) \Rightarrow \text{so the firm must aim for } \Phi^* = (r - g) / (i - g) > \Phi_0, \text{ or } g < (r - \Phi_i) / (1 - \Phi_i).
\]
The lower is \( r \), the higher \( i \), and the higher \( \Phi_0 \), the more must the firm lower \( g \) to reach safety. If a large number of firms try to stabilize themselves by cutting back investment expenditures, they may reduce aggregate demand and wind up reducing their profit rates” (Foley, 2003-p.161).

During 1998/1999 the rate of capital accumulation was close to the rate of real interest, however \( g \) soon started to decline in 1999, and it stayed above \( i \), indicating that the economy could be stabilized with the decline in investment if consumer demand was sufficient to offset

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136 The Asian crisis in 1997 resulted in diminishing confidence in emerging markets that was accompanied by foreign capital outflow. The Luxor terrorist attack in 1997 led to sharp decline in income from tourism, and the severe decline in oil prices in 1998 squeezed foreign income from current exports of oil.
the decline in capital accumulation. However, consumer demand reached its lowest growth rates since 1975 during 1998/99 (see chart IV.9), thus the decline in capital accumulation and the previous decline in the rate of return lead to a general slow down in aggregate output in 1999.

Chart IV.9

The Major Decline in Consumer Demand During the 90s

Source: The figure is developed by the author

The sudden increase in real interest rates resulted in declining liquidity in private enterprises. Consequently, non-performing loans for the private sector increased to L.E. 22 billions in 1999. The declining liquidity in private enterprises combined with the decline in asset-prices, have contributed to increasing defaults on one hand, and the decline in bank-asset values on the other hand. Subsequently, the growth rate of aggregate domestic liquidity inside the banking sector declined. The severe decline in liquidity growth rates during 1998/1999, as well as the surge in non-performing loans, and the general decline in output, placed the economy in a financial crisis. The sudden shortage in bank-liquidity is illustrated by the sudden increase in inter-bank rates in 1999 from 9% to 16% \(^{157}\), as well as the sudden decline in credit supply (see chart IV.10, and chart IV.11).
The liquidity crisis (1999) enticed intermediaries to constrain credit supply, and in spite of the collapse in asset-prices and limited investment finance, capital accumulation continued to grow in 1998/1999, however it soon declined during 1999/2000. Tornell and Shnieder (1999) explain that investment could continue to increase even when asset-prices are declining; they studied the dynamic path of asset-prices during asset-price/lending booms, and showed that asset prices must eventually decline in finite time horizon, however investment does not necessarily have to decline with the decline in asset-price.  

138

In brief, the dynamic path of private enterprise sector during the 1990s shows that the massive accumulation of debts transformed the 1990-1994 hedged economy into the speculative stage [1994-1997], which then became ponzi in 1998. The financial fragility decreased the domain of stability such that the economy was highly sensitive to the increase in real interest rates and the decline in asset price during 1997/1998. Thus, the financial instability hypothesis presents ample explanation of the 1999 liquidity crisis. However, until now we have not yet addressed the impact of fragile international accounts on the 1999 liquidity crisis. A brief reference to Filho’s model helps explain the interaction between BOP imbalances and domestic financial crisis.

The impact of financial fragility in international accounts on the 1999 crisis: The balance of payment was subject to a number of shocks during 1997/1998: the loss of confidence in emerging markets that followed the 1997 Asian crisis, the decline in income from tourism following the Luxor terrorist attack, and the severe decline in oil price during 1998. The balance of payment and current account surpluses during 1990-1997, turned into increasing deficits during 1997/98-2000/01, subsequently the stock of foreign reserves started to decline in 1998. The decline in foreign liquidity and the appreciation of the Egyptian pound (1998) generated increasing expectations of devaluation, and market speculations on the pound. Meanwhile government policy was rather passive until 2000, hence, foreign liquidity continued to decline till L.E. 13.4 billions [2000/2001]. Hence, the decline in foreign reserves contributed to the shortage of total liquidity during the 1999 crisis.

According to the Filho model, the Egyptian economy exhibited financial fragility during the late 90s manifest in the decline of foreign liquidity with respect to total foreign debts. In addition to the domestic fragility of the private enterprise sector and the fragility in external accounts, government policy intensified the fragility process and contributed to the 1999 liquidity crisis.
During 1993-1997 external accounts were financially hedged as illustrated by the increase in reserves-to-debt ratios. However the ratio started declining in 1998, indicating that reserves are becoming inadequate, and the accounts are becoming financially fragile.

The impact of the exchange rate policy and public debts on the 1999 crisis: Obviously, the exchange rate policy intensified the impacts of external shocks on domestic liquidity. Fixing the exchange rate at an overvalued level using high domestic interest rates had two implications, first, the exchange rate lost its ability to absorb external shocks, and second, the increase in domestic interest rates aggravated the debt deflation cycle. Furthermore, during the crisis, the government could not combat the decline in liquidity and aggregate slowdown by issuing money, nor by decreasing interest rates, simply because it had to fix the exchange rate at its overvalued level without experiencing a run on reserves. Apparently, the exceedingly high levels of domestic interest rates exacerbated the financial fragility of private enterprises and magnified debt payments of the government “.. if domestic policy is to raise domestic interest rates to

184The appreciation of the pound was magnified by the appreciation of the US dollar during that period. Carmen Reinhart and Vincent Reinhart (2001) argue that the appreciation of the dollar during the 90s led to the appreciation of many currencies tied to the dollar, and worsened their international competitiveness.

protect a weak currency, then cash flow problems are made even worse.” (Suzan Schroader, August 2002)

Furthermore, in addition to aggravating the liquidity crisis in 1999, the exchange policy resulted in currency distress in 2000/2001. The growing speculations on the pound and the decline in foreign reserves resulted in a series of devaluations starting 2000.

Finally, the increase in public debt contributed to the decline in total liquidity. During the 1990s the government carried an expansionary public policy with negligible deficits, on the expense of increasing domestic debt.

“Another internal factor which may have a significant contribution to the liquidity crunch is the large government debt. Over the last few years, the government has launched several mega-projects in the same time such as Toshka, Al-Salam Canal in Sinai, the Gulf of Suez, and East of Port Said. A main part of financing the early stages of the mega-projects has been through bank deposits. Also, the government accumulated a large debt, to both public and private construction firms. Construction companies, in turn, had to increase their loans from banks in order to carry out their commitments.” (Khaled Hussien and Ahmed Nosh’y, 2001, p.10)

Thus, public expenditure combined with government policy, played a central role in squeezing the liquidity available at banks, especially after issuing treasury bonds worth of 4 bill L.E. in 1999.

It turns out that the 1999 financial crisis was a consequent to financial fragility of private enterprises, government sector, and the depicted fragility in external accounts. The increasing instability intensified the system’s sensitivity to minor shocks, hence, the sudden increase in real interest rates during 1998/99 exposed the economy to a liquidity crisis in 1999, and a slowdown in aggregate output.
IV.4. Testing the Significance of Foley’s model in explaining the 1999 crisis

This section presents an evaluation the significance of results from Foley’s model, and the explanatory power of the financial instability hypothesis in case of Egypt. There are three widely used methods for modeling/predicting financial crises: the signals non-parametric approach approach, the parametric logit/probit approach, and regression modeling\textsuperscript{141}. The logit/probit approach assesses the probability of crises using probit/logit estimation, and is often applied to capture the conjectures of a specific theory. The early trials were developed by Blanco and Garber (1986), and later by Klien and Morion (1994)\textsuperscript{142}. Al-Riffai and Kamaly (1999) identify two major advantages of logit/probit models, first, the estimated model produces a precise probability of the crises; second, it identifies the relative significance of variables in generating the crisis.\textsuperscript{143}

The non-parametric signals approach is more recent and is widely used in the construction of early warning systems. The early works of Eichengreen, Rose and Wyplosz, and Moreno, inspired Kaminsky, Lizondo, and Reinhart to construct the \textit{indicator} methodology in assessing the likelihood of crises\textsuperscript{144}. The indication of a crisis is derived from the observed deviations of a set of variables from their normal levels, beyond a critical value. The selection of variables is based on the tendency of those variables to behave differently during periods of instability.\textsuperscript{145}


\textsuperscript{141}"Economic and Social Survey of Asia and the Pacific", Poverty and Development Division (PDD) UN, 2000.
\textsuperscript{142}Op cit, Al-Riffai and Kamaly.
\textsuperscript{143}Ibid, p.8
\textsuperscript{144}Ibid, p.8

109
financial fragility six months before the 1999 crisis. Their results support the achieved results from Foley's model, that the financial structure was becoming fragile starting 1995/1996, and was approaching a financial crisis during 1998.

Although the non-parametric approach is useful in predicting crises, however, it is not suitable for testing the explanatory power of Foley's model, nor in assessing the viability of Minsky's hypothesis. We need to test whether or not Foley's criteria present a good representative of Minsky's hypothesis, and if it is able to detect and explain the 1998/99 crisis.

Testing the results using logit/probit estimation was entirely unsatisfactory. Generally, logit/probit models demand a long series of variables in order to produce coherent results, and unfortunately the available time series was insufficient to generate robust results. Oppositely, the OLS estimation of the relation between financial fragility (derived from Foley's criteria) and the variables highlighted by Minsky's theory (debt-to-profit ratio, growth rate of investment, financial liberalization) produced rigorous results, indicating that Foley's criteria significantly represents Minsky's hypothesis on one hand, and that Egypt's fragility is explained by the accumulation of debt and rapid accumulation of capital under financial liberalization on the other hand.

The dependent variable FRAG is chosen to reflect financial fragility. Based on Foley's criteria, the national economy becomes more fragile as the profit rate declines and as the real interest rate rises, and crises are triggered during the ponzi stage when \( i > r \). Hence, FRAG is defined as the difference between the real rate of return, and real interest rate. Thus the decline in FRAG indicates increasing financial fragility.

The explanatory variables are chosen to reflect Minsky's Hypothesis: the debt-to-profit ratio in private enterprise sector DEBT_PROFIT, the growth rate of real private investment
GR_INV, and FINAN_LIB which is a dummy variable denoting financial liberalization. The increase in GR_INV indicates rapid accumulation of capital that takes place during boom periods, whereas, FINAN_LIB is used to study the impact of financial liberalization on the fragility process, and at the same time is used as a structural variable that denotes the structural changes during 1972-2001. The chief structural difference that has a significant implication for financial fragility is assumed to be the financial liberalization in 1993, hence, the variable is assigned zeros before 1993, and ones in 1993 onwards.\(^{146}\)

The achieved results show that financial fragility is significantly explained by the increasing accumulation of capital and debts during boom periods (see table IV.1), which is usually accompanied by vast financial liberalization. The t-statistics suggest that rapid accumulation of capital is the chief source of instability, and that financial liberalization and the increase in debt-to-profit ratio are equally significant in explaining the 1998/1999 financial crisis (see Appendix 4 for heteroskedasticity test, and unit root tests).

**Table IV.1. OLS Results**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINAN_LIB</td>
<td>-18.82812</td>
<td>6.564208</td>
<td>-2.8685102</td>
<td>0.0089</td>
</tr>
<tr>
<td>DEBT_PROFIT</td>
<td>-0.244997</td>
<td>0.104908</td>
<td>-2.353337</td>
<td>0.029</td>
</tr>
<tr>
<td>GR_INV</td>
<td>-0.121162</td>
<td>0.026478</td>
<td>-4.555901</td>
<td>0.0001</td>
</tr>
<tr>
<td>C</td>
<td>38.42393</td>
<td>3.051267</td>
<td>12.20278</td>
<td>0</td>
</tr>
</tbody>
</table>

R-squared 0.806874 Mean dependent var 20.99615
Adjusted R-squared 0.780538 S.D. dependent var 20.35119
S.E. of regression 9.524503 Akaike info criterion 7.486251
Sum squared resid 1995.756 Schwarz criterion 7.679804
Log likelihood -93.32126 F-statistic 30.63833
Durbin-Watson stat 1.593307 Prob(F-statistic) 0

\(^{146}\)According to Minsky, financial liberalization intensifies the fragility of the national economy because it permits
IV.5. Conclusion

The results from Foley's model indicate that the 1999 financial crisis is another classic case of a "Minsky" crisis. Egypt did move between the three stages defined by the instability hypothesis, and has become highly fragile during the ponzi stage. The underlying financial fragility limited the domain of stability, such that the sudden rise in real interest rates [1998/99] was sufficient to bring on a liquidity crisis during 1998/1999. The liquidity crisis is ascribed to fragile domestic finance within the private enterprise sector and the government, as well as weak external accounts. The instability of the 90s can be confidently attributed to the rapid accumulation of capital and debt beyond the hedged levels of finance permitted by the current rate of return. In addition, the achieved results indicate the significance of Foley's criteria in capturing the instability hypothesis, and in explaining Egypt's financial fragility during the 1990s.
Chapter Five

Conclusions and Policy Implications

V.1. Conclusions

The purpose of the thesis is to present a viable answer to the main question of research, 'whether the balance sheet approach that is enhanced by the financial instability hypothesis can significantly explain the 1998/99 financial crisis in Egypt or not?' The empirical results derived from the application of Foley's model (2001) indicate that the financial instability hypothesis explains the financial fragility that overwhelmed the economy during the mid and late 90s, and strongly predicts the liquidity squeeze during 1998/1999.

In addition to explaining the liquidity crisis, Minsky's theory underlines the changes in the dynamic path of the economy that result in financial fragility. Hence, it presents a dynamic framework for assessing financial satiability and the likeliness of future fragility during the early hedged and speculative stages of growth, through the close detection of cumulative debts relative to sustainable income streams.

The major finding of research is that financial crises can be anticipated from short and long-term changes in balance sheets during speculative and ponzi stages. This extends to firm balance sheets, financial intermediaries' balance sheets, the government's financial structure, in addition to changes in external accounts. In addition, financial fragility is a cumulative process, and the economy becomes fragile during boom periods when growth rates are the highest and accumulation rates are rapid.

The results from OLS estimation support the initial argument that Egypt's financial crisis is mainly an outcome of domestic financial instability, rather than external imbalances, and that the economy became financially fragile in the wake of the financial liberalization that
accompanied the enforcement of ERSAP. In spite of the significance of the derived results, and the ability of Foley's criteria to explain the financial crisis in terms of the changing financial structure of private enterprises during the 1990s, yet—as mentioned earlier in chapter three—the results present a partial explanation of the 1998 crisis due to the limitations imposed by the quality of data and the dual nature of emerging markets.

In addition, there is an evident monetary bias in the financial instability hypothesis that limits the scope of analysis to financial and institutional factors with a great deal of disregard to structural and socio-economic elements. However, this should not be taken against the theory because it is proposed to explain how investment debt-finance can destabilize the system, so it's likely to focus on financial elements alone. In addition, there is no such thing that a single theory can fully explain the dynamics of an aggregate economy.

Indeed, the increasing accumulation of capital financed by debt commitments within the private enterprise sector has brought about aggregate financial instability, however, the dilemma extends to cumulative payment commitments within the government as well as payment commitments related to the external accounts, and other non-monetary factors: the structure of investment, mal income distribution, increasing unemployment, low productivity, institutional corruption, the twin gaps, and many other factors have contributed to the 1998 crisis and the long recession that followed.

Although the application of Minsky's theory to emerging markets has been successful, nevertheless the theory requires little adaptation to the structural differences between industrialized markets – for which the theory was originally designed – and emerging market economies. First; the scope of application must extend beyond the private sector, to include government spending and payment commitments, as well as the financial obligations related to the external account. Second; integrate informal economic businesses into the fragility process.
to study the impact of informal activity on deepening/mitigating the cycle, and the linkages between formal and informal credit cycles, and under what conditions could financial fragility in the formal sector feed into increasing fragility within the informal one. Third: relax the assumptions of symmetric information, elastic prices, and elastic interest rates, which are expected to dampen the acceleration of the over-accumulation process during the early stage and intensify the cumulative debt process during the later stages. Fourth: integrate the distribution of income and consumer demand into the analytical framework. The share of profits determines the pace and size of accumulation on one side, and on the other side the share of wages determines the strength of consumer demand that can assist economic activity during the contractionary phase. It follows from above that a suitable Minskyan model for an emerging market is likely to consist of a system of five equations, one denoting the financial development within the formal private enterprise sector, one for the government's cumulative debt commitments, another for the fragility in external balances, and an equation denoting the network between the fragility in the formal enterprise sector and informal activity. Finally, an equation representing the share of wages out of aggregate income, income distribution, and the absorption capacity of effective consumer demand.

The research raises further questions on how to utilize the applications of Minsky's theory into the construction of aggregate, sectoral, and sub-sectoral early warning systems for the national economy. It also draws attention to the critical role of interest rates in destabilizing the aggregate economy and the essential need for an active monetary policy. Finally, it raises a question on whether the ample results from applying the micro view to macro instability indicate possible gains from applying the micro-macro approach to other fields of macroeconomic study or not:
V.2. Policy Implications

The financial instability hypothesis has various implications for crisis aversion, crisis control, and recuperation during financial/economic slouches. According to Minsky the instability of a capitalist system rests on four edges; the two-price ratio of capital assets to current output; the interaction between anticipated/current profits and capital accumulation, the tendency to over-accumulate debts during boom periods, and the inevitable decline in the profits to debt ratio such that absolute liquidity elapses and firms declare bankruptcy. Thus, a Minskyan policy agenda will naturally blend policy options to disable the dynamic growth of debts beyond certain limits during the debt accumulation phase and the debt deflation phase, and to expand the domain of financial stability.

The instability hypothesis addresses the origins of all various types of financial crises, whether liquidity crises, banking crises, balance-of-payments crises, or even a twin crises. The first implication that runs from Minsky’s theory is the essential need to stabilize the flow of profits to avoid a severe decline in current income flows relative to current commitments. Minsky stressed on profit stabilization as the chief target during periods of distress in order to avoid lengthy and deep depressions: “Managing a financial crisis and a recession involves two distinct steps: ones is refinancing the markets or institutions whose perilous position defines the crisis; and the other is assuring that the aggregate of business profits does not decline” (Minsky, 1982-p.xxi).

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16 Davis (2003) distinguished between three generic types of financial instability. The first encompasses financial crises that are ensued by financial instability within the banking sector, and are either confined to the domestic system like the case of Japan, or related to cross boarder bank lending like the East Asian crisis, or related to cross boarder indebtedness like the debt crises of developing nations in Latin America and Africa during the 1980s. The second type of instability results from extreme market price volatility. This type of financial crises takes place after a shift in market expectations due to sudden asset-price moves, threatening the position of institutions which have pursued highly leveraged positions depending on previously high asset-price levels (Mexico 1994, Stock market crash in 1987 US). Whereas, the third type of financial instability arises from the excess of short-term commitments over available funds, and results in a liquidity crisis.
The stabilization of profits involves a mix of fiscal deficits (within specific limits) combined with the stabilization of capital accumulation. Minsky defines after tax profits by \( \pi^* = 1/1-c (1+DF - BPDF - SW) \)\(^{148} \), where \( c \) is the consumption ratio out of profits, \( DF \) denotes fiscal deficits, \( BPDF \) refers to balance of payment deficits, and \( SW \) is workers savings out of wages. \( BPDF, SW, \) and \( c \) are rather exogenous to government policy, however \( DF \) and \( I \) are rather endogenous. From the statement above the government can interfere to stabilize profits through fiscal deficits and the introduction of market incentives/de-incentives to sustain steady growth of capital accumulation. However, profit stabilization requires a sufficiently large budget, one that is equivalent to the size of aggregate profits\(^{139} \), such that fiscal deficits can sterilize the sudden decline/increase in aggregate profits and bring a halt to the growing anticipations of declining/growing cash flows.

The second policy implication concerns the need to regulate credit supply so as to minimize the expansion of speculative investment and the scale of euphoric growth during boom periods. The central bank must reassess the over-optimistic expectations that intermediaries share with investors through its intervention in risk standards and risk evaluation inside commercial banks. This will place constraints on the over accumulation cycle of debts and will timid rapid growth of speculative types of investment. The South East Asian crisis suggests that exceedingly rapid growth of credit supply far in excess of real GDP growth rates will channel a large amount of credit-finance to the real estate sector and equity markets. The increasing demand on real-estate and equity assets leads to an asset-price boom further increases in demand for speculative types of investment.\(^{130} \)

\(^{148}\) Op cit, Minsky, 1982, p.104
\(^{139}\) Op cit, Tobin.
The third policy implication presses for an active monetary policy and a sizeable central bank that enables it to interfere as a lender of the last resort during the early stages of financial distress, and to prevent sudden increases in interest rates. The deterioration of firm balance sheets and the surge in non-performing loans results in declining profits and lower values of equity within financial institutions. The decapitalization of financial institutions will naturally result in curtailed lending to firms, hence a further decline in investment and a chain-diffusion of financial distresses from non-viable firms to the viable ones.\(^{151}\) Thus, the central bank is required to limit the initial decline in investment by interfering in the recapitalization of the distressed yet viable financial intermediaries.

However, the ill management of liquidity support could exacerbate the initial distress into serious financial crash. Open-end liquidity support of viable firms will help in stabilizing investment and profits, however financial support to insolvent firms will lead to further expansion in speculative activity and further losses. Hence, there is an essential need for a set of criteria to differentiate between viable and non-viable units during the early stages of crises. Although some argue for a strictly tight monetary policy that provides corrective stimulus to growth, however recent experiences show that expansionary policies during the early stages of financial distress are likely to yield speedy recovery.\(^{152}\)

However, the liberty to pursue an active fiscal/monetary policy is constrained by the choice of exchange rate regime. Under a fixed exchange rate regime the monetary policy becomes inactive and merely deployed to enhance stability in the foreign exchange market, and fiscal spending is constrained by the need to stabilize domestic price levels. The currently recognized trilemma is the impossibility to co-maintain a fixed exchange rate regime, foreign


\(^{152}\)The easing of monetary and fiscal policy has quickened the pace of recovery in both Thailand and Malaysia, whereas the delay in significant expansionary efforts in Japan led to a prolonged stagnation.
capital mobility, and an independent monetary policy. Hence, the fourth policy implication is to adopt an exchange rate policy that does not contradict with an active monetary policy.

Edwards and Sevastano (1999) divide the post-Bretton Woods exchange regimes into nine categories, with variable degrees of flexibility\textsuperscript{153}. Their assessment of the cons and pros of each individual regime show that a fixed peg should be applied or sustained only in the short-term, especially in countries with inflationary forces. A fixed exchange regime must eventually result in acute currency appreciation (Sachs, Tournell, Valesco, Bruno (1995) and Dornbusch (1997)), furthermore inflexible regimes disables the central bank to pursue an expansionary monetary policy during down turns. The optimal time for transition between a fixed and a flexible regime is when the costs and benefits of sustaining a fixed peg are equal.\textsuperscript{154}

Currently, a flexible exchange regime is seen as the optimal choice for an emerging market economy (Valesco, Chang, and Luis, (2000), and Edwards and Sevastano (1999)), nevertheless, the application of a flexible exchange regime must be accompanied by capital controls, otherwise sudden capital outflows could easily result in a currency/BOP crisis\textsuperscript{155}. In brief, capital mobility that accompanies a free float could easily trigger a currency/BOP, and in some cases capital controls may be insufficient to prevent instability, yet a free float guarantees an active monetary policy. Oppositely, a fixed regime limits the exposure to external shocks and stabilizes domestic prices of current goods, yet it could result in chronic instability if fiscal deficits and foreign debts exceed specific limits, and resulted in numerous currency crises during the 80s and 90s. Moreover the monetary policy becomes inactive under a fixed exchange...

\textsuperscript{153}Edwards and Sevastano divided exchange rate regimes into nine categories, a free float, a dirty float, float within a band, sliding band, crawling band, crawling peg, fixed but adjustable rate, currency board, and full dollarization (for details see Edwards p.7-8).


\textsuperscript{155}Although capital controls may result in short-term costs of foreign capital flight, however in the long term the gains compensate for short-term losses.
regime. Hence, the application of a flexible regime that is supported by capital controls seems indispensable to avoid currency mismatches and to gain full control over the monetary policy.

The fifth policy implication advocates the construction of an early warning system that implements the balance sheet approach in monitoring sectoral and sub-sectoral short-term changes in firm and bank balance sheets, the short-term changes in external accounts, and changes in the government's financial structure. The constructed index ought to combine various measures of liquidity and solvency within the major sectors and sub sectors of the national economy. Each indicator is assigned an estimated weight and an estimated critical limit, beyond which any further changes in that indicator are taken as an early warning for a crisis. The summation of the weighted indicators yields a composite index of aggregate stability. Furthermore, for each indicator a different weight is assigned for each economic sector. The sectoral weights are derived from the forward and backward linkages of that sector within the economy, and the strategic nature of its output.

The sixth policy implication concerns the speedy restructuring of corporates and financial institutions during the early stages of distress. Successful endeavors are essentially supported by efficient incentive structures for corporates and financial institutions to submit financial restructuring. The incentive structure for corporates implies the melioration of bankruptcy and liquidity reform, enhancing efficiency in the competitive framework and the judicial system, undertaking corporate governance reform, and other structural reforms. The restructuring of the corporate sector is necessary in order to reduce the vulnerability of the corporate sector and thus prevent the mild distresses from triggering a financial crisis. However, in the short run, a quick recovery can not be engineered unless there is resurgence of domestic

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*debt-to-equity ratio, profit-to-debt service ratio, the structure of capital accumulation, the structure of total debt, the ratio of short-term to long term debt, and the foreign liquidity-to-foreign debt ratio*
demand. Thus, an expansionary fiscal/monetary policy is essential during the early stages of reform.

In addition to boosting domestic demand, corporate restructuring must be accompanied by the restructuring of financial institutions. This includes the liquidation of undercapitalized institutions and the recapitalization of viable institutions: financial institutions need to have the loss absorption capacity to engage in sustainable corporate restructuring.

The policy implications briefly discussed above involve the elimination of rapid accumulation of contractual debt commitments during the euphoric stage, and substantial stabilization during the early stages of distress. However, the successful application of macro economic restructuring and stability measures hangs by the ability to perform sound institutional reform\textsuperscript{157}. In case of Egypt institutional reform is indispensably critical due to the severity of institutional constraints and the binding repercussions of institutional corruption and bureaucracy on private investment and growth: Egypt was ranked 54 in the corruption perception index, with a score equal to 3.6 (Alaa El-Shazly, 2004)\textsuperscript{158}, also the institutional country risk guide\textsuperscript{159} that estimates transaction costs dwelling from institutional constraints scored 2.6 for Egypt [1997], compared to other emerging markets Egypt possesses high and binding institutional constraints\textsuperscript{160}. Institutional reform is a wide and complicated field of research for the case of Egypt and what follows in the following paragraphs is but an attempt to touch on the types of reforms needed.

\textsuperscript{158}A score equal to 10 indicates the absence of corruption, and a score of zero indicates ultimate institutional corruption.
\textsuperscript{159}The index is a weighted average of the severity of five elements: contract repudiation, expropriation risk, corruption, rule of law, and bureaucratic quality, (Sameeha Fawzy, 1998-p.16).
\textsuperscript{160}Sameeha Fawzy: "The Business Environment in Egypt, Constraints to Private Sector Development", Public-Private Partnerships in the MENA Region Workshop, Marrakech, Morocco, September 5 - 6, 1998, p.16
There are generally six main domains that require primal and substantial institutional reform in Egypt: institutional corruption, dispute settlements and legal reform, tax administration, banking regulations, and wage policies. However, combating institutional corruption\textsuperscript{161} comes on top of the policy recommendations and is highly critical in determining the success of institutional reform as well as a pre-requisite for economic reform\textsuperscript{162}. Various studies argue that the intensity and diffusion of institutional corruption in Egypt has severe adverse effects on the costs of exchange, private investment and aggregate growth (Sameeha Fawzy (1998), Michael Johnston (1997), Lee Benham (1997)) \textsuperscript{163}, and must be addressed coherently and rapidly.

In addition to institutional corruption, Egypt suffers an indolent juridical system. The juridical system is excessively complicated combining conflicting laws, and in some cases a conflict between contemporary laws and the Egyptian constitution. In addition, the enforcement of law and dispute settlements involve excessive procedures and long periods of courting and in some cases law enforcement is obliterated.\textsuperscript{164} The underlying impairment of the juridical system threatens any prospects of sustainable growth: "A market economy rests on secure property and contract rights. Yet legal rights are, in the end, no better than their enforcement. Good enforcement, in turn, depends on the confluence of a number of supporting institutions" (Kleen, 2004, p.12). Fawzy (1998) shows that dispute settlements is one of the most binding institutional constraints overwhelming private investment growth in Egypt during the 1990s, and in addition to the costs inferred by long periods of time consuming

\textsuperscript{161}The definition of corruption is highly debatable and consuming, thus the definition employed here is a general one proposed by Michael Johnston (1997) as the abuse of public roles or resources for private benefit\textsuperscript{162}, Michael Johnston: "Fighting Systemic Corruption: Social Foundations for Institutional Reform", Colgate University, Hamilton, New York, Fall 1997, p.8

\textsuperscript{164}Stagnation and slow growth is in some cases strongly related to institutional corruption that in some cases would result in increasing costs of investment such that projects become non-viable. Also, privatization under corruption yields unsatisfactory results. Moreover, it is highly repelling to foreign investors, and chronic corruption is likely to destabilize the political system, is in some cases strongly for theories on institutional corruption and patterns of...see. centralized and decentralized corruption
courting and expensive litigation (the average period for dispute settlement is 4.5 years), the majority of current legislations were developed before the enhancement of the market oriented regime, thus they are devoid of the essential legislations for settling disputes in a market economy.

Another institutional constraint that demands speedy reforming inside Egypt is tax administration, in fact tax administration is ranked by entrepreneurs as the most binding element for private investments during the 1990s. Tax inspectors are left with a great deal of discretion, the profits are estimated using observable metrics, that are in many cases irrelevant to the size of profits\textsuperscript{165}. In addition to the arbitrary estimation of profits, entrepreneurs argue that tax administrators tend to over-estimate tax payments due to the incentive schemes based on the size of tax collections. Moreover, the dispute settlement system is inefficient and the outcome is unpredictable\textsuperscript{166} resulting in increased tax evasion, and a decline in aggregate tax collections, placing high constraints on the size of the state's budget and limits the size of fiscal spending.

As mentioned above, the banking sector is one of the tainted fields that require fundamental institutional reform. There are wide applications of financial reform\textsuperscript{167}, however they all converge to the elimination of government's intervention in the determination of interest rates, and in credit allocation. They also include the enhancement of increasing competition, facilitating foreign entrance, bank restructuring, and the establishment of banking

\textsuperscript{165}Ibrahim Shehata: “The Institutional Framework of Economic Reform in Egypt”, Egyptian Center for Economic Research, Distinguished Lecturer Series no.5 , October 1996.


\textsuperscript{167}Opcit. Sameeha Fawzy, p.23

According to Caprio and Claessens(1997) Financial reform is in many cases followed by a financial crisis. Speedy reforms that are void of the essential institutional pre-requisites (accounting and reporting standards, legal system, the incentive system, and human capital in the banking sector), in addition the reform is combated by vested interest groups that controlled the banking business before the enhancement of reform. Also, the timing of reform highly determines its outcome, undergoing financial reform during periods of instability threatens its likelihood to succeed.
infrastructure (auditing, accounting, enforcement of contracts, legal system). It is essential to establish an incentive scheme for banks to perform efficiently, to diversify their assets, and at the same time limit their risk margins. Successful reform also requires good governance of banks, in case of Egypt 70% of performing banks are publicly owned intermediating anemic savings ratios – much lower than the average rates in growing emerging markets- under very little market supervision and inefficient auditing and accounting schemes and without any rating companies. Moreover, bank managers have limited incentives to pursue safe banking due implicit government guarantees. The chief policy implication herein is to enforce full independency of the Central Bank of Egypt and to upgrade the technical skills within the central bank and the banking sector in general, also, enlarging the size of the central bank within the financial sector and relative to the size of the GDP to support its actions as a lender of the last resort and in stabilizing the financial sector. In addition, it is essential to limit the size of publicly owned banks and gradually and efficiently privatize at least some of them, however as mentioned earlier the timing element is a crucial determinant of successful bank privatization and bank reform.

Finally, the severe decline in labor productivity and real wages inside the formal private sector and the vast increase in informal labor during the 1990s and relative to the 70s, combined with increasing unemployment and the increasing biases against rural areas and female labor strike for fundamental reform in the labor market. Manal Metwalli and Nglia Al-Ehwany (2000) call for rapid policies of reform that integrate labor market reform into macro-economic policies that target aggregate growth, accompanied by educational reform and poverty elimination policies. The areas of reform are expected to cover various incentives for the formal private enterprise sector to develop labor-intensive projects and continuous training and

166 Ibid.
development of human resources, as well as developing the wage grade-system inside the public sector. In addition, support informal businesses to upgrade their working conditions, increase their access to credit, and to overcome their most adverse technological and marketing constraints.

Policy implications for case of Egypt: The financial instability hypothesis has various implications for the case of Egypt. The policy options are briefly discussed in the table below, and are mainly concerned with the measures that should have been taken to limit the pace of instability in 1999. The policy options address the enhancement of an active monetary policy, increasing domestic demand, restructuring the exchange rate regime, and the early detection of increasing debt ratios (See table V.1. below).
<table>
<thead>
<tr>
<th>Policy option</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Policy Constraints** | - The essential need to hedge stock of foreign reserves and the overvalued exchange rate using high domestic interest rates
- The scare of increasing dollarization with the decline in nominal interest rates.
- The stock of reserves is barely sufficient
- The scare of domestic inflation |
| **Positive Impacts** | - Restore domestic liquidity
- Minimizing the debt service burden and the fear of debt deflation cycle
- Restoring market optimism and growing capital accumulation
- Redirecting capital from speculative investments to more productive types of investment |
| **Negative Impacts** | - Capital outflow that follows the decline in the spread between domestic and international interest rates.
- The expected inflation could set real interest below the international rates and result in domestic capital flight |
| **Policy Implementation** | - The cut down in interest rate must be accompanied by a delayed transition from a dollar peg to a basket of currencies, this should minimize speculations on the pound and prevent a run on reserves.
- The nominal interest rate on the pound has to stay above the foreign account rates to prevent dollarization.
- The real domestic interest rate ought to stay within international levels to prevent capital flight.
- In the short-term a little bit of inflation would have been beneficial in 1998, the scare of long-term chronic inflation could have been managed through central bank interventions and issuance of bonds later when the crisis is avoided.
- The credit policy should be revised, imposing high risk margins on speculative types of investment and credit incentives to risk adverse productive investments |

| **Policy Constraints** | - Availability of adequate reserves of the selected currencies.
- Cut down the speculations on devaluing the pound against the dollar.
- Maintain the current stock of reserves and international liquidity.
- Allow the active use of the exchange rate as an external shock absorber.
- The ability to freely manage domestic interest rates. |
| **Positive Impacts** | - Exports are expected to become relatively more competitive with the free float. |
| **Negative Impacts** | - Higher exposure to external shocks.
- Increasing capital mobility and potential capital account crises.
- Higher domestic sensitivity to international markets, specifically those to which the Egyptian pound is tied. |
| **Policy Implementation** | The new exchange regime must be combined with constrained capital mobility measures, and serious endeavors to put a monetary system to support the exchange system against external shocks. |
**Raise domestic demand**

- Focus on increasing real income distributed to the lowest income tiers of the society, the demand elasticity to changes in real income is much higher for low income levels, whereas savings elasticity is higher for the highest income tiers.
- Give tax and credit incentives for labor intensive projects as well as small and micro businesses (consider China's case during the 90s in effectively enhancing growth of small and micro enterprises).
- Enhance effective micro-credit finance for the poor, with minimum or even zero interest rates, resembling the Grampanchayat Bank experience that succeeded in significantly raising the standards of living of hundreds of thousands inside Bangladesh.
- Revise the institutional impediments that squeeze private efforts for increasing real investment.
- Increase fiscal spending during the decline in capital accumulation to restore aggregate demand back to its normal levels. Fiscal deficits are required during the early stages of distress to prevent a deep lengthy depression.
- The government could intervene in limiting unemployment and work as an employer of the last resort during the early stages of distress by offering employment opportunities in short-term and medium-term projects.
- Encourage informal economic activity during the crisis stage because it works as a safety net for the impoverished layers of the society.

**Minimize and monitor the increase in debt to income ratios beyond a critical limit**

- Rapid development of banking governance with efficient auditing, accounting, and rating schemes.
- The necessity of aggregate and sectoral, as well as sub-sectoral monitoring of balance sheets, for private enterprises, the government, and the banking sector. The short-term changes in debt to income ratios are critical in determining the possibility of a financial crisis.
- The continuous revision of capital requirement ratios, the risk premium and risk assessment schemes applied to credit supply within the banking sector, imposing higher risk margins on speculative projects.
- Avoid implicit and explicit guarantees to the financial sector, to ensure efficiency in loan provision schemes and to avoid moral hazards.
- Early restructuring of viable firms and financial institutions during the pre-crisis period, and the speedy liquidation of bankrupt units.

**Alleviate pessimistic market psychology**

- Announce fundamental changes in the cabinet, the new figure sought to possess public acceptance in addition to the technical prerequisites.
- Propose a set of clear cut medium and long-term targets, and announce the growth strategy for the next five to ten years.
- Immediate restructuring of the legislative and institutional framework including policy options for combating institutional corruption, the deficiency in tax administration system, reforming commercial law and improving law enforcement, reforming the labor market, and avoiding hostile measures against the informal sector.
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Appendix

App.1. Minsky’s statement of profits: Minsky adopts the Kaleckian equation of profits, in which the structure of aggregate demand determines profits which are then spent on investment. In a more complicated version profits are equal to the sum of investment and public deficit. Also, in the Kaleckian equation current profits depend on investment and future profits depend on future investment.

\[ \pi = I \text{ (profits equal investment)} \]

This is the classic Kaleckian statement of profits. The causation runs from investment to profits and that investment is a function of the price of capital assets \( P_k \) and the supply price of investment \( PI \), expected profits, and external finance. Therefore, we can rewrite the profit statement as follows:

\[ \pi^* = I + \text{DF} - \text{BPDF} \]

Where \( \pi^* \) is after-tax profits, BPDF is the deficit in the balance of payment, and DF is the government deficit. If we allow profit earners to spend a fraction of their profit income on consumption, and workers to save a fraction of their wage income, then after-tax profits are given by:

\[ \pi^* = I + \text{DF} - \text{BPDF} - SW + C\pi^* \]

Where SW is the fraction saved by workers and C\( \pi^* \) is the fraction consumed of profits. If we gather net profits on one side of the equation we get the following:

\[ \pi^* = \frac{1}{1-\epsilon} \left[ I + \text{DF} - \text{BPDF} - SW \right] \]

This statement of profits is typically a post-Keynesian one as it draws variations in profit levels to economic, political, social, and psychological factors I, DF, PBDF, W, SW, and C\( \pi^* \).

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1 Herman Minsky: “Can It Happen Again?”, p.103-104
App.2: Major Changes in the Macro Economy During the 1990s

The Deterioration in the Egyptian Economy During the Late 1990s

- Inventory
- Real GDP Annual Growth Rate (Data From the Ministry of Planning)
- Growth Rate of Private Consumption
- Growth Rate of Real Implemented Private Investment
- Construction
- Agriculture, Industry and Electricity
- inflation in CPI
- Growth rate of domestic credit
Source: All charts developed by the author.
APP.3: Tests for Heteroskedasticity and Units Roots

White's Heteroskedasticity Test Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>61.61795</td>
<td>45.01003</td>
<td>1.368983</td>
<td>0.1822</td>
</tr>
<tr>
<td>FINAN_LIB</td>
<td>-92.14332</td>
<td>66.65321</td>
<td>-1.362499</td>
<td>0.1821</td>
</tr>
<tr>
<td>DEBT_PROFIT</td>
<td>2.842117</td>
<td>2.707741</td>
<td>1.049626</td>
<td>0.3064</td>
</tr>
<tr>
<td>DEBT_PROFIT*2</td>
<td>-0.020958</td>
<td>0.02601</td>
<td>-0.801924</td>
<td>0.4328</td>
</tr>
<tr>
<td>GR_INV</td>
<td>-0.723988</td>
<td>0.662521</td>
<td>-1.092778</td>
<td>0.2875</td>
</tr>
<tr>
<td>GR_INV*2</td>
<td>0.001135</td>
<td>0.002092</td>
<td>0.542529</td>
<td>0.5934</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.2328</td>
<td></td>
<td></td>
<td>0.6013</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.041</td>
<td>S.D. dependent var</td>
<td>0.1821</td>
<td>0.961367</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>94.17042</td>
<td>45.01003</td>
<td>1.368983</td>
<td>0.1822</td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>177361.4</td>
<td>1000000000</td>
<td>1.049626</td>
<td>0.3064</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-151.6544</td>
<td>2.2116</td>
<td>-0.977582</td>
<td>0.3394</td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>2.316377</td>
<td>0.767498</td>
<td>0.4513</td>
<td></td>
</tr>
</tbody>
</table>

Unit Root Test for DEBT2PROFIT

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEBT2PROFIT(-1)</td>
<td>-0.13622</td>
<td>0.139344</td>
<td>-0.977582</td>
<td>0.3394</td>
</tr>
<tr>
<td>D(DEBT2PROFIT(-1))</td>
<td>-0.080248</td>
<td>0.2216</td>
<td>-0.36213</td>
<td>0.7209</td>
</tr>
<tr>
<td>C</td>
<td>19.37875</td>
<td>25.24925</td>
<td>0.767498</td>
<td>0.4513</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.071639</td>
<td></td>
<td></td>
<td>0.241047</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>-0.016776</td>
<td>0.2216</td>
<td>-0.767498</td>
<td>0.4513</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>90.19506</td>
<td>25.24925</td>
<td>0.767498</td>
<td>0.4513</td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>170838.1</td>
<td>25.24925</td>
<td>0.767498</td>
<td>0.4513</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-140.4995</td>
<td>2.2116</td>
<td>-0.977582</td>
<td>0.3394</td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>1.872051</td>
<td>0.767498</td>
<td>0.4513</td>
<td></td>
</tr>
</tbody>
</table>

*MacKinnon critical values for rejection of hypothesis of a unit root.
## Unit Root Test for FIANA_LIB

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINAN_LIB(1)</td>
<td>-0.047619</td>
<td>0.093351</td>
<td>-0.527046</td>
<td>0.6028</td>
</tr>
<tr>
<td>D(FIANAN_LIB(-1))</td>
<td>-1.10E-17</td>
<td>0.210819</td>
<td>-5.24E-17</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>0.047619</td>
<td>0.042592</td>
<td>1.118034</td>
<td>0.2742</td>
</tr>
</tbody>
</table>

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FIANAN_LIB)
Method: Least Squares
Date: 05/15/04 Time: 02:12
Sample(adjusted): 1973 2000
Included observations: 28 after adjusting endpoints

## Unit Root Test for GR_INV

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GR_INV(1)</td>
<td>-1.54E+00</td>
<td>0.554022</td>
<td>-2.78E+00</td>
<td>0.0116</td>
</tr>
<tr>
<td>D(GR_INV(-1))</td>
<td>0.329165</td>
<td>0.542467</td>
<td>0.606793</td>
<td>0.5508</td>
</tr>
<tr>
<td>C</td>
<td>28.69057</td>
<td>18.77982</td>
<td>1.576191</td>
<td>0.1307</td>
</tr>
</tbody>
</table>

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GR_INV)
Method: Least Squares
Date: 05/15/04 Time: 02:13
Sample(adjusted): 1974 2000
Included observations: 23
Excluded observations: 4 after adjusting endpoints

136
Unit Root Test for FRAG

<table>
<thead>
<tr>
<th>ADF Test Statistic</th>
<th>1% Critical Value*</th>
<th>5% Critical Value</th>
<th>10% Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2.218998</td>
<td>-3.9852</td>
<td>-2.9705</td>
<td>-2.6242</td>
</tr>
</tbody>
</table>

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FRAG)
Method: Least Squares
Date: 05/15/04   Time: 02:15
Sample(adjusted): 1973 2000
Included observations: 28 after adjusting endpoints

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAG(-1)</td>
<td>-0.398932</td>
<td>0.17978</td>
<td>-2.218998</td>
<td>0.0358</td>
</tr>
<tr>
<td>D(FRAG(-1))</td>
<td>1.41E-01</td>
<td>0.207189</td>
<td>6.80E-01</td>
<td>0.5026</td>
</tr>
<tr>
<td>C</td>
<td>8.464199</td>
<td>5.072633</td>
<td>1.668535</td>
<td>0.1077</td>
</tr>
</tbody>
</table>

R-squared     | 0.16961     | Mean dependent var | -0.607143   |
Adjusted R-squared | 0.103179 | S.D. dependent var | 16.59608    |
S.E. of regression  | 15.7166    | Akaike info criterion | 8.44827     |
Sum squared resid  | 6175.292   | Schwarz criterion  | 8.591006    |
Log likelihood    | -115.2758  | F-statistic        | 2.553173    |
Durbin-Watson stat| 1.839319   | Prob(F-statistic)  | 0.097955    |