

# Financial Vulnerability

A Post Keynesian Approach to the “Mauritian Miracle”



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## Abstract

*Essentially, the way an economist approaches a study of the financial market depends on the answer to the question: Should an economist strive to explain the real world in which we live, with its inherent complexity? Or is the task of economists to reduce the complexity by the use of axioms and explain an idealized world? This question is methodological in nature and constitute an important line of demarcation in the history of economics, a line which separate the so-called mainstream Neo Classical economists from the unorthodox Post Keynesian economists. The former emphasize the beneficial effects from liberalization and openness of the financial market while the latter warn about the dangers of such policies and recommend state intervention, regulation, and financial controls. This thesis' objective is twofold. Firstly, to discuss the fundamental methodological and theoretical differences between the Neo Classics and the Post Keynesians, regarding the study of the financial market. This thesis conclude that whether or not the future is perceived to be fundamentally uncertain, is the crucial dividing line between the two opposing views. If the "real" world is perceived to be non-ergodic, the fundamental assumptions of Neo Classical theory must be rejected. Secondly, if rejecting Neo Classical theory by rejecting the axiom of ergodicity Post Keynesian theory must be applied to understand financial markets. As an illustrative case, this thesis applies a distinctively Post Keynesian theoretical framework, based on the work of Hyman Minsky, to the African island state of Mauritius and its financial market. Mauritius has, during the last 10 year, developed a financial market along the lines of Neo Classical policy proposals of liberalization and openness. This thesis analyzes whether this process has increased the financial vulnerability of the island, in accordance with Post Keynesian theory. The analysis finds supportive evidence of Mauritius has become more financial vulnerable the last 10 years, especially in the period from 2005 until today. One area where the Mauritian development has been particularly concerning is the rapid increase in short-term maturity debts, denominated in foreign currencies. Mauritius might find itself in deep financial trouble in the near future, as these short-term maturity debts needs renewing, given the increased competition for international credit and the uncertainty which characterize the international financial markets, due to the current financial crisis.*

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## Part I

# Introduction and Theory



# Chapter 1

## Financial Markets: An Introduction

### 1.1 The “Mauritian Miracle”?

The small tropical island state of Mauritius is unique in an African context. Mauritius has, unlike most African countries, managed to integrate into the world markets securing a relatively high level of economic development. Since 1977 Mauritius has achieved a growth rate of 4.2 percent per annum reaching a level of 4700 US-Dollar per capita in 2007. In the same period, the rest of Africa grew by 0.7 percent per annum and the total GDP of Mauritius is now comparable to Zambia which has ten times the population of Mauritius and covers an almost 400 times larger area. The Mauritian growth performance is often interpreted as an economic “miracle” when comparing with the overall performance of the African continent [Frankel; 2008].

One area where the Mauritian performance is particular unorthodox, compared to other African countries, is its success in developing a modern, liberalized and open financial market. The Mauritian process of financial development, characterized by liberalization and openness, is often hailed as a main catalyst for the “Mauritian miracle” [Bundoo; 1999]. However, the “Mauritian miracle” could also be analyzed from a more critical perspective, seeing liberalization and international integration of the financial market as a potential problem, which might jeopardize the future economic development of Mauritius.

### 1.2 Two views - One Truth?

Essentially, the way an economist approaches a study of the financial market depends on the answer to the questions: Should an economist strive to explain the real world in which we live, with its inherent complexity? Or is the task of economists to reduce the complexity by the use of axioms and explain an idealized world? This question is methodological in nature and constitute an important line of demarcation in the history of economics, a line which separate the so-called Mainstream Neo Classical economists<sup>1</sup> from Post Keynesians<sup>2</sup>. The former emphasize the beneficial effects from liberalization and openness of the financial market, while the latter warn about the dangers of such policies and recommend state intervention, regulation, and financial controls.

Post Keynesians are constituted by the notion of a fundamental uncertain future. In an uncertain

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<sup>1</sup>This label is, in lack of a better word, used to characterize the predominant (mainstream) way of modern macroeconomic thinking which originated from the so-called Synthesis Keynesians.

<sup>2</sup>Post Keynesians consist of a rather incoherent group of economists who emphasize the methodological implications of J.M Keynes' *General theory*.

world, financial markets without governmental guidance are inherently unstable [Felix; 2003]. Financial liberalization and openness makes economies more vulnerable and hereby less resilient to domestic or external financial crises. Maintaining control of interest rates, exchange rates, and financial transactions becomes an acceptable political tool for stabilizing the economy.

Late Post Keynesian economist, Hyman Minsky<sup>3</sup>, claimed that "*the normal functioning of our economy leads to financial trauma and crisis*" [Minsky; 2008]. Financial market crises are an outcome of endogenous processes within the capitalist monetary economy. Based on this insight Minsky formulated his so-called *Financial instability hypothesis* which suggests that capitalist (monetary) economies have an inherent tendency to go from financial robustness to financial vulnerability and hereby being exposed to financial crisis<sup>4</sup>. Financial vulnerability can only be dampened through regulation of financial markets, by limiting the access to international credit, and by active fiscal and/or monetary policies. The policies suggested by the Post Keynesians dominated the Bretton Woods system until its collapse in the early 1970's.

The collapse of the Bretton Woods system initiated a re-structuring of the international economic system along the lines of mainstream economic thinking - Neo Classicism. Neo Classicism is constituted by an axiomatic world of individual optimizing behavior and general equilibrium models. This axiomatic world is risky, but not uncertain, as all risks can be calculated probabilistically allowing agents to make rational choices about the future. This is the basis for the so-called Neo Classical *Efficient market hypothesis*. The Neo Classics do not perceive the financial market to be any different from other markets. Just as the case of international trade, the financial market should be left unrestricted to the benefit of all. Allowing free movement of capital and finance across borders facilitates more efficient global allocation of savings and help channel resources into their most productive uses [Fischer; 1997]. The policy implications of the *Efficient market hypothesis* are clear; the government should abstain from interfering in the financial market processes unless the aim is to remove market imperfections or government failures. According to Neo Classical theory, financial crises arises because of market imperfections, exogenous shocks, information asymmetry, or moral hazards. Either way a financial crisis is short lived by nature, as the system soon moves towards its "true" equilibrium reflecting the market "fundamentals" of the economy.

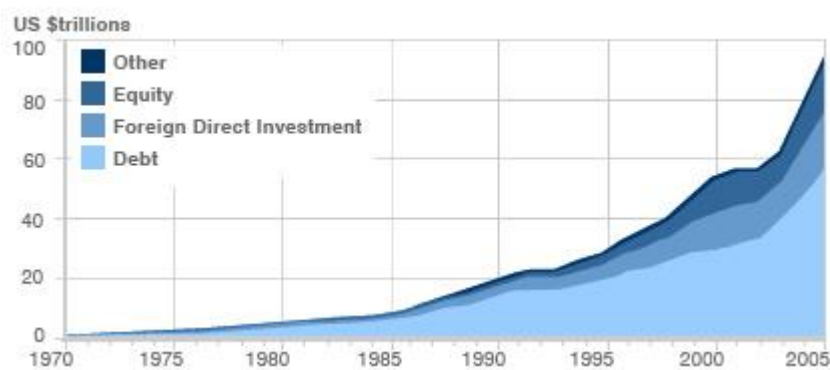


Figure 1.1: Annual global cross-border financial flows [IMF]

<sup>3</sup>American economist (1919 - 1996) and professor at Washington University.

<sup>4</sup>Minsky's original formulation of the hypothesis was only applicable to a closed economy but Arestis and Glickman have extended it to handle open economies with liberalized financial markets.

The re-structuring process after the collapse of Bretton Woods was spearheaded by the Neo Classical "policy trinity" of free trade, free floating exchange rates and free capital movements. Liberalization of all markets became a new hype which since has been successfully implemented as the *comme il faut* of the international economic community (notably in the IMF and World Bank). The political success of Neo Classicism is best illustrated by the expansion of international (cross-border) financial flows the last 40 years. In 1970, total cross border financial flows were below one trillion US-dollar while in 2005 it approached 100 trillion US-dollar as illustrated by figure 1.1.

The discussion between Neo Classicism and Post Keynesianism, which reaches fundamental different conclusions about the financial markets, provides a confusing environment for policy makers. Which approach is correct - the Neo Classical or the Post Keynesian? According to the saying, "*the winner is always right*" the Neo Classics can claim to be victorious as the growth in volume of cross-border financial flows clearly illustrates. However, looking at the economic history, since the advent of the Neo Classical "policy trinity", another less convincing story can be told. In line with the Post Keynesian approach the international financial markets have consistently shown signs of financial vulnerability, and the world economy has experienced more financial induced crises than in the period of the Bretton Woods system. In particular, many developing and emerging economies have become more financial vulnerable and affected by financial crises like the Mexican Peso crisis in 1994 or the Southeast Asian crisis in 1997. Although these crises caused skepticism towards financial liberalization and openness within the Neo Classical approach, they did not induce a fundamental change in policy recommendations from the international community. After the financial crisis, which originated from the Asian "Tiger" economies in 1997, Stanley Fischer, First deputy managing director of the IMF, addressed the problems in Asia by emphasizing financial liberalization and openness as important contribution to the developing process:

*"the benefits of liberalizing the capital account outweigh the potential costs...it is an inevitable step on the path to development, which cannot be avoided and therefore should be adapted to."* [Fischer; 1997].

### 1.3 The Case of Mauritius

According to Stanley Fischer and the IMF developing countries should pursue a policy of liberalization and integration of their financial markets, despite the re-occurrence of crises in the 1990s. One country which has followed the recommendation from IMF and Mr. Fischer is the small African island state of Mauritius. This small tropical island, at the east-coast of the African continent, has been widely credited as one of the few economic success stories of Sub-Saharan Africa. A success which has been named the "Mauritian Miracle" [Frankel; 2008]. Mauritius has liberalized its financial sector and successfully integrated into the international financial markets, attracting foreign direct- and portfolio investments in a relative large scale the last 10 years. This has been achieved by market friendly policies, deregulation of the financial sector, and by a market based exchange rate. This fact and impressive growth rates have made Mauritius a good argument for the validity of the Neo Classical policy recommendations.

Post Keynesians however, tend to take a more cautious position towards the "Mauritian Miracle". The financial liberalization and increased openness, witnessed in Mauritius, might have a serious

potential downside if one rejects the fundamental axioms of Neo Classical theory. Removing the bulwark of financial controls and allowing access to the international financial markets lead to increased financial vulnerability and hereby exposure to financial crisis and its real economic consequences.

## 1.4 Objective of the Thesis

Has Mauritius become more financial vulnerable and hereby more exposed to the current financial crisis during the last 10 years, where financial liberalization and international integration have accelerated? Or is Mauritius better prepared, facing the current crisis, due to its liberalized, open, and well developed financial market? Finding an answer to this question is the main objective of this thesis. However, as the current financial crisis is still unfolding, the question must be answered by studying the period before and just after the break of the crisis. It is hoped that such a study might give indications of whether or not the Mauritian economy has moved towards increasing financial vulnerability as predicted by the Post Keynesians. This will constitute the main analysis of the thesis, but before such an analysis can be done, in a meaningful fashion, it is necessary to perform a theoretical discussion of Post Keynesianism versus the Neo Classicism regarding financial markets.

The theoretical discussion has two objectives. Firstly, to clarify why Post Keynesians differ from Neo Classics in their view of the financial market, and hereby why they perceive financial liberalization and openness to increase financial vulnerability. Secondly, to develop the theoretical framework used in the analysis of the Mauritian economy. This framework will be Minskyan in the sense that it is based on the work of Hyman Minsky and his so-called *Financial instability hypothesis*, but Minsky's work will be extended by including insights from Post Keynesian economists Philip Arestis, Murray Glickman, and Penelope Hawkins.

### 1.4.1 Research Question

Based on the above discussion, the following research question has been formulated.

*"According to Post Keynesian theory how does increased financial liberalization and openness lead to financial vulnerability, and has Mauritius become more financial vulnerable as an effect of the widespread liberalization and increased openness the last 10 years?"*

## 1.5 The Structure of the Thesis

The thesis is structured by two parts. Part one contains the introduction, which have already been presented, followed by a methodological discussion. The aim of the methodological discussion is to clarify the epistemological and ontological consequences of choosing a Post Keynesian approach. The theoretical discussion will also be performed in part one and hence, part one will provide a partial answer to the research question. The theoretical discussion consist of two chapters which are vertical interrelated. Chapter one presents a detailed theoretical historical discussion of the difference between Post Keynesians and Neo Classics in regard to the fundamental assumptions and their implication for economic analysis. This chapter will also provide a detailed discussion of why and how fundamentally different conclusions about the functioning of the economic system, in particular about the financial market, are reached. The second chapter

## The Structure of the Thesis

provides a discussion of the Minskyan framework used in the analysis of the Mauritian economy and financial market. This discussion is based on Minsky's own work, on an open economy version of Minsky's *Financial instability hypothesis* developed by Arestis and Glickman, and on Penelope Hawkins' work on financial vulnerability.

The main aim of part two is to provide an answer to the remaining part of the research question, namely to analyze the Mauritian economy and financial market. Before such an analysis the theoretical Minskyan framework is made operational in regard to the research question and the methodological chapter. This operationalization chapter is followed by a short historical description of Mauritius where focus will be on the process of financial liberalization and openness. After a short introduction to Mauritius the Mauritian economy will be analyzed. The aim is to answer if the Mauritian economy has become more financial vulnerable due to market liberalization and increased financial openness, as predicted by Post Keynesian/Minskyan theory. Part two ends by summing up the main conclusion and by a short discussion of the future perspectives of the Mauritian economy.





## Chapter 2

# Methodology

This thesis started out postulating that an important line of demarcation exist within the economic profession - a line which is methodological in origin. This chapter aims to discuss the epistemological and ontological differences between the Neo Classicals and Post Keynesians, which are the very foundation of their intellectual dispute regarding the financial market and its organization. This discussion is a pre-requisite for discussing the theoretical foundation of the two schools of thought.

### 2.1 Method is the Message?

The discussion of what constitute the science of learning, epistemology, and the learning of the being, ontology, takes place in all fields of science and has led to an intensive battle between different paradigms. The science of economics is no exception, but here the battle has primarily been fought between two schools of thought, which strictly speaking, mutually excludes each other - if one is right, the other must be wrong. It is therefore no surprise that one paradigm has succeeded in obtaining a hegemony status - the paradigm of Neo Classical theory. The Neo Classical paradigm has become mainstream and dominant for economic teaching all over the world (with a very few exceptions), and it strives to make economics a precise science, a science more alike to natural than to social sciences. This has far reaching consequences for the way economic is studied.

#### 2.1.1 Epistemology: Realism Versus Instrumentalism

What is economic science? Neo Classical sees economic science as science of calculable equilibriums and the economist should strive to make precise (mathematically) models which can accurately predict the future. This epistemological view can be named as *instrumentalism*. Instrumentalists judge the soundness of a hypothesis by its ability to make accurate predictions and hereby help calculate an equilibrium position [Lavoie; 2006]. The degree of realism of the hypothesis in question is only of secondary concern. In order for instrumentalists to make accurate predictions, by the use of mathematics, the “real” (complex) world has to be transformed to an axiomatic form - an idealized world. The degree of realism of this idealized world is only of minor importance compared to its ability to provide formal mathematical consistent predictions.

Post Keynesians adhere to another and entirely different epistemology; Realism. A realist weight the power of a hypothesis in relation to its ability to explain the “real” world. A hypothesis must aim at explaining the reality in all its complexity. Naturally, all economic theories are abstractions to some degree, as simplifications are necessary in order to provide any meaningful

interpretations of an otherwise overly complex reality, but unlike instrumentalists, realists cannot make assumptions that directly violates the reality which is observed. Realists strive to explain the real world where outcomes never are predetermined but part of a process of contingency and change.

### 2.1.2 Ontology: Organic Versus Individualism

The foundation of the Neo Classical paradigm's ontological approach is atomized agents. The entire economic system consist of individual (rational) agents which are not influenced by the environment. This approach is called *individualism* and the system is perceived to be exactly equal its parts. An individualistic approach exclude independent influence of institutions as they are just a reflection individual agents and their actions. It follows from an instrumentalist approach that macroeconomic analysis is based on an aggregation of microeconomic behavior.

Aggregation from micro- to macro level is critised by Post Keynesians for being subject to a fallacy of composition. Post Keynesians claim that a system is more than the sum of its parts. This ontological approach can be characterized as *organic*. Economic agents are social being which influence and get influenced by the environment in which they act [Lavoie; 2006]. In such an organic approach institutions have a life of its own and plays a crucial role in stabilizing and destabilizing the economic system. As a consequence the historical context becomes important as well.

## 2.2 Economic Models: Open Versus Closed Systems

The epistemological and ontological differences of Neo Classicals and Post Keynesians lead to different conceptions of the system in which economic models are created. Neo Classical models are developed within a closed system while Post Keynesians emphasize open system thinking.

A closed system is defined as one where the modeller knows the boundaries, relations, variables, and preferences of the model [Hawkins; 2003]. Since the boundaries of a closed system are well known, *a priori*, outside influence is excluded from the analysis. This is known as extrinsic closure [Hawkins; 2003]. In addition, a closed system has no capacity for element of internal surprise. The equilibrium achieved is final as factors determined within the model have no capacity to influence the system further or to have disequilibrium effects. This is known as intrinsic closure. A model characterized by extrinsic and intrinsic closure moves automatically and deterministically towards a permanent equilibrium. It follows that, in a system populated by atomized and rational behaving agents who acts within a predefined set of boundaries, future economic outcomes can be reliable predicted [Hawkins; 2003].

When the conditions for closure are compromised, in terms of either changing boundaries or preferences (or both), the system begins to open [Hawkins; 2003]. An open system approach is constituted by embracing uncertainty where boundaries, preferences, and relations might be known, unknown or unknowable. Hence, an open system is not subject to extrinsic or intrinsic closure. In a system of uncertainty, where all interactions is not fully known, if an equilibrium is reached it is likely to be temporary. An open system is characterized by multiple solutions and the future can not be accurate predicted.

An important distinction between a closed and an open system is the nature of economic constraints. In a closed system constraints influence the economic processes and outcomes in pre-

dictable and deterministic ways [Hawkins; 2003]. In an open system these constraints may influence but never strictly determine the system which might be characterized as constraining tendencies [Hawkins; 2003] as they tend to change according to economic conditions. An economic factor might be a fueling factor under one set of conditions, but under other circumstances a constraining factor. Hence, constraining tendencies might be softened/strengthened through the process of changing conventions, institutions and behavior. In a closed system a constraint is defined initially and considered constant throughout the entire economic process in question.

The methodological position of the Neo Classical and Post Keynesians provides the underlying framework for developing economic theory. In the following chapters it will be shown how different epistemological and ontological positions lead to entirely different assumptions about the basic nature of economics, and how these assumptions create the basis for diametral perceptions of the the organization and real economic influence of financial markets.

## 2.3 Post Keynesian Methodology and This Thesis

In the previous sections the Post Keynesian methodology was explained. This section aims to incorporate this thesis' research question into this methodology. The research question can be divided into two distinct parts - a theoretical and an analytical. The theoretical part discusses the fundamental differences between Neo Classical and Post Keynesians and their approach to financial markets. The theoretical discussion draws heavily on the methodological discussion of this chapter as the differences between Neo Classical and Post Keynesian theory are ascribable to differences in the epistemological and ontological views.

The analytical part of the research question is set up as a case study of Mauritius. The reason why a case study is selected, instead of a more general study, is the desire to use Post Keynesian theory and hereby Post Keynesian methodology. As discussed in this chapter, the institutional and historical context is important when following an organic and realistic approach, which characterize Post Keynesian theory. Analyzing a single country allows more country-specific and historical details which could not be included in a more general study of several countries or a region. The downside following such approach is the inability to make generalization outside the country used as a case.

Mauritius is chosen as case study for three reasons. Firstly, Mauritius provides a good example of a country which has pursued a policy in line with the Neo Classical proposal of free markets. Secondly, the Mauritian financial market has matured to a point where modern financial theories, most notable the theories of Hyman Minsky<sup>1</sup>, can be applied without difficulties. Underdeveloped financial markets, which characterize most African countries, lacks some of the key features of Minsky's theories and can not be used as cases. Thirdly, data availability on the Mauritian economy is superior, compared to other developing countries, especially compared to the rest of Africa. This enables a much more interesting analysis of financial vulnerability.

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<sup>1</sup>This will be discussed extensively in the following chapters of the thesis.



## Chapter 3

# Antagonisms of Economic Theory

As figure 3.1 illustrates; J.M. Keynes might be seen as the last focal point of what has become the orthodoxy (mainstream Neo Classical school) and the heterodoxy of macroeconomic thinking.

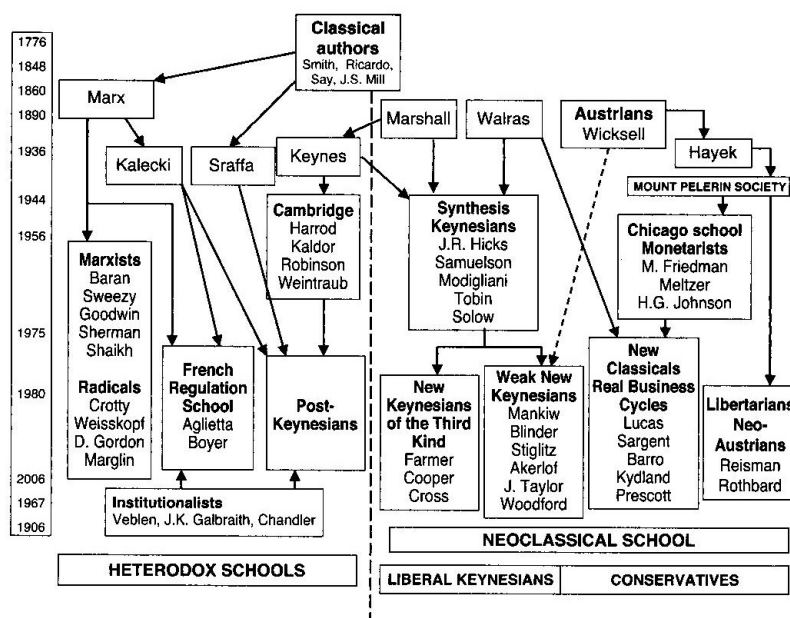


Figure 3.1: Schools of thought in macroeconomics [King; 2003]

Two of the most influential interpretations of Keynes' work are the Post Keynesians and the Synthesis Keynesians. The latter became known as the Neo Classical Synthesis (or just Neo Classicals<sup>1</sup>), because they attempted to reconcile the ideas from the "*General Theory*" with pre-Keynesian thinking. The Neo Classicals linked the Keynesian system with a Walrasian general equilibrium analysis and Marshallian economics. However, most of Keynes' work, not least his methodology, could not be reconciled with the fundamental assumptions of Walrasian,

<sup>1</sup>The term "Neo-Classical" is here taken to cover all post-classical orthodox economic thinking, including monetarists and New Keynesians.

Marshallian and Classical economics and consequently Keynes' work was reduced to imposing rigidity of prices [King; 2003].

Post Keynesians argue that reducing Keynes to sticky prices was not only an offense to the legacy of Keynes, it was misleading for understanding the economic system in general. By ignoring important theoretical aspects of Keynes' work, like the importance of liquidity and uncertainty, the Neo Classical could never hope to understand the "real" economy. According to the Post Keynesians; what was needed was an abandonment of the classical assumptions and abstractions.

The following chapters aims at discussing the theoretical implication of Post Keynesian and Neo Classical thinking regarding financial markets. Where do the the fundamental difference in opinion come from? As will be shown, the disagreement stems from whether or not the future is characterized by fundamental uncertainty.

## 3.1 The Neo Classicals and the Financial Market

### 3.1.1 The Ergodic Axiom

The role of money in production, output, and employment require that the economy is a monetary, not a real exchange economy as assumed by the Neo Classicals [Hawkins; 2003]. In a real exchange or "village market" economy money is added exogenously and its only function is to provide an efficient mean of exchange. Money plays no role in determining real economic outcomes. The necessary condition for assuming a real exchange economy is the working of Say's Law. The working of Say's Law requires a world with no uncertainty - an ergodic world.

Neo Classical theory is constituted by assuming away situations of uncertainty. At any given point in time economic agents are *always* perceived to be able to identify and assign numerical probabilities to *any* future outcome of an economic decision [King; 2003]. This is formally known as the ergodic axiom of Neo Classical theory. In an ergodic world estimates calculated from observed data provides statistical reliable informations about the conditional probability function of future outcomes. The future then becomes a statistical shadow of the past and the long-run equilibrium path is predetermined and embodied in today's fundamentals [Davidson; 2002]. Ergodicity assure that any market will be efficient in the sense that resources (for example financial capital) will be optimally allocated among different uses as long rational optimizing agents<sup>2</sup> are free to make decisions based on informations of the rate of return [Davidson; 1998]. The connection between the ergodic world of Neo Classicism and the instrumental and closed system methodological approach discussed in chapter 2 is very clear.

The ergodicity axiom provides the rationale for the validity of Say's law. The basic idea of Say's law is that there can be no obstacles to economic growth derived from a lack of aggregated demand. Whatever the level of aggregated supply it will give rise to a equal level of aggregated demand [King; 2003]. It follows that any income not consumed must be invested and capital must be fully employed<sup>3</sup>. The Neo Classicals admits the possibility for short-run divergence between saving and investment because savers and investors are not (necessarily) the same people, and

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<sup>2</sup>The ergodic axiom is a necessary and sufficient condition for the theorem of rational expectations.

<sup>3</sup>The Neo-Classical version of Say's Law (as opposed to the Classical version) makes the additional assumption of full employment of labour in the long-run, due to automatic adjustments of the real wage. This way (involuntary) unemployment can only be a transitory problem, given a competitive market.

that saving and the investment decisions are not (necessarily) made simultaneously [King; 2003]. In the long-run the divergence is eliminated through automatic adjustment of the interest rate, which works as the equilibrating factor securing full employment of physical capital, and hence, secures an equilibrium level of aggregated supply and demand. In the Neo Classical world, the interest rate becomes a real phenomenon determined in the market.

In the ergodic world of Neo Classicism saving always equals investments in the long-run because hoarding of money is an irrational behavior. Money provide no or very little interest rate compared to other assets. Say's Law then provide the rationale for assuming a real exchange economy and this provides the rationale for money neutrality. From Say's law it follows that saving determines investment (the prior saving argument) and that flows of liquidity (for example financial flows) are neutral to the real economy.

### 3.1.2 The Efficient Market Hypothesis

Say's Law, money neutrality, full employment of factor inputs, and the rational expectations assumptions, allows the development of the Neo Classical argument for the mutual beneficial effects of an efficient and competitive international financial market, the *Efficient market hypothesis*. The argument is essentially the same as the well know argument for free trade based on comparative advantages. International financial flows will run from capital abundant areas, where return is relatively low, to capital scarce areas with high returns. This process is likely to reduce countries' cost of capital, increase investment, and raise output. In addition it enables capital scarce countries, which are constrained by low savings, to make investment without the necessary prior saving. Notice this is equivalent to the short-run divergence between individual savers and investors described earlier. The interest rate (worldwide interest rates) will secure long-run equilibrium which in this case means long run convergence of capital returns between all countries [King; 2003].

Several other mechanisms through which financial liberalization and openness benefits the individual country, can be stated. Firstly, financial openness provides greater economic efficiency through diversification. For example, if a country is facing an economic downturn, lower wages will attract investments, which stimulates the economy. Secondly, it contributes to the development of a country's financial sector by ensuring funding to those institutions and individual investors most capable of using the funds for productive investment opportunities. Thirdly, financial openness is likely to increase foreign investors' confidence in a country's equity markets, as it provides the option to invest in a variety of domestic equity securities, while domestic investors can gain access to foreign equity securities [Hawkins; 2003].

The policy implication of the Neo Classical *Efficient market hypothesis* is clear - leave it to the market. Removal of financial controls and financial openness allow investors to attain a desired level of portfolio diversification that can, in turn, decrease the likelihood of financial crises. Further, financial openness can result in higher availability of credit, increased financial system efficiency (by eliminating inefficient financial institutions), and decreased incidence of adverse selection and moral hazard. Increased investor confidence allows for a greater degree of financial mobility and a more efficient distribution of funds. Financial liberalization and openness does not only benefit a country through increased access to credit but also through a triggering of reforms that further reduce domestic financial market distortions [Hawkins; 2003].

In this Neo Classical efficient market how can financial crises be explained? One explanation,

associated with the work of Krugman, could be called the *fundamentalist* view [Arestis; 2002]. According to this explanation, financial crises occur due to distortions to the *fundamentals* of the economy, especially through policies affecting the free functioning of the markets, like pegged exchange rates. Another explanation is the so-called *panic* view, associated with Radelet and Sachs [Arestis; 2002]. This view emphasizes self-fulfilling expectations, hedging behavior and information asymmetry in the international market of financial capital. Paradoxically, the *panic* view draws upon irrational behavior as the triggering factor to financial crises which most certainly is inconsistent with the Neo Classical methodology and fundamental assumptions. An explanation to financial crises, which has been used to explain the current crises, is the *bail-out* view [Arestis; 2002]. This view stresses moral-hazard problems of authorities being willing to bail-out failing financial institutions. This possibility of bail-out leads to overly risky financial behavior which might cause financial instability and crises. It follows that this view is closely connected to the *fundamentalist* view, as bail-outs can be seen as interference in the market conditions.

The *Efficient market hypothesis* and its beneficial effects hinges crucially on the premise of the ergodic axiom. If this axiom is rejected all of the above Neo Classical arguments can be proved as fallacies. From this point and forward this thesis will assume the future to be fundamental uncertain, in the Keynesian sense. This will move it into the realm of Post Keynesianism.

## 3.2 Post Keynesians and the Financial Market

### 3.2.1 Fundamental Uncertainty

One of the main messages from J.M. Keynes were the idea of a fundamental uncertain future. This idea constitute, more than anything else, the Post Keynesian way of thought. The future outcomes of economic decisions cannot be reliably (statistical) predicted on the basis of current information. The historical path of real world economics cannot be decomposed into secular trends, a fact simply illustrated by most macroeconomic time series being non-stationary, which is a sufficient condition for non-ergodicity i.e. uncertainty [Davidson; 2002]. Economic agents makes decisions based on conventions and path dependency, not probabilistic calculations. The Post Keynesian rejection of the ergodic axiom implies a rejection of rational optimizing agents, of predetermined long-run equilibriums, and ultimately a rejection of efficient markets. This view is clearly based on the open-system methodology discussed in chapter 2.

Post Keynesian opposes the working of Say's law as it is based on ergodicity. In fact, Post Keynesians claim that it is demand to which supply (within limits) must adapt, not the other way around. The critique of the Neo Classical version of the law hinges on the proposition that the economy, in which we live, is a monetary economy [King; 2003]. In a monetary economy fundamental uncertainty is prevailing and income not spend on consumption can be kept in the form of money (or another liquid store of value) rather than invested in productive or financial capital. Why would economic agents want to hold money as a store of value? In a uncertain Post Keynesian world money is seen as an insurance against uncertainty. The more uncertain the world is perceived to be, the more money is demanded. The demand for money is however, very different from any other form of demand on the market as it has zero elasticity of production [King; 2003].

In an uncertain world, money becomes essential to decisions of aggregated production, output, and employment. The reason why money posses such essential influence on the real economy is liquidity. Money is the most liquid of all assets and in times of uncertainty liquidity is desired by



all economic agents for various reasons. This gives rise to the concept of liquidity preferences or the demand for money. Changing liquidity preferences of different economic agents and economic units enable money to be both a fueling and constraining factor in the real economy. The financial market and its institutional framework, in particular the banking system which supply liquidity in form of credit and lend stability to liquid assets, then becomes crucial for the development of the economy as a whole [Hawkins; 2003].

The key analytical position of the financial market in Post Keynesian economics stem from the fact that the prior saving argument implied by Say's law is rejected. Saving is not the primary constrain on the monetary economy, it is credit, and the financial market is the market where demand for credit is met. The interaction between the production sector and the financial market has potential constraining tendencies which may influence, within a recognizable historical or institutional context, but not strictly determine the processes and interrelations of a economic system [Hawkins; 2003]. Identifying and explaining these financial constraining tendencies becomes key to explain real economic outcomes. The work of Hyman Minsky, most notable his *Financial instability hypothesis*, aims at exactly that.

Late Hyman Minsky provides a distinctively Post Keynesian alternative to the Neo Classical *Efficient market hypothesis* by proposing that, in a world of uncertainty, the financial system has an inherent tendency toward instability and vulnerability, hence, its name *Financial instability hypothesis*. Minsky perceived the financial system, in which we live, to be more like a "Wall Street" market rather than the "village" market assumed by the Neo Classics. In a Wall Street system, finance and financial institutions plays a decisive role in forming the real economy [King; 2003], and the banking sector becomes a key object of study due to its role in providing credit to the firms of the production sector. The interdependence of banks and firms has a tendency to cause instable, vulnerable, and fragile financial markets through an endogenous process. This fragility will be excacerbated by following the policy implied by the Neo Classical *Efficient market hypothesis*, namely financial liberalization of both domestic and international financial markets. Minsky proposed instead that active governmental intervention and regulation is the only "barriers" which can, if not prevent financial vulnerability, then minimize its potential disruptive effects on production, output, and employment.

Before embarking on a discussion of the *Financial instability hypothesis* two important concepts needs to be addressed as these concepts provide the key to understand the mechanisms which fuels the inherent cyclical movement toward financial vulnerability, fragility, and in the end financial crisis. These concepts are liquidity preference (demand for money) and the concept of endogenous money (supply of money).

### 3.2.2 Money - Supply and Demand

The primary significance of money is that it can be held as an alternative to other assets and for this reason money affects portfolio choices and investment decisions [Hawkins; 2003]. It is the liquid characteristics of money that makes it an attractive alternative in an uncertain world where money is used in contractual economic relations. At different points in time, individual agents or economic units like firms and banks have different liquidity preferences and hence, different levels of demand for money. Liquidity preferences then become a central piece of the puzzle in understanding the fueling and constraining tendencies of the financial market.

### 3.2.2.1 Liquidity Preference

The liquidity preference of any agent or economic unit is a function of what Keynes described as four motives for holding money: The transaction-, precautionary-, speculative-, and finance motive. The transaction motive is seen as a stable function of income and as a medium of exchange with no real significance [Hawkins; 2003]. The precautionary motive is likewise a function of income but it is also related to the uncertainty of the future. The precautionary motive is seen as keeping idle balances to any transactions that might arise in the future. The more uncertain the future is perceived to be the more money is demanded due to the precautionary motive. The speculative motive is also related to uncertainty and to divergent expectations of the future. If an agent have different expectations about the development of price movements than the general opinion, then the agent would prefer to remain liquid, depending on the direction of the price movements, in order to avoid capital losses. The fourth motive is the finance motive which Keynes developed later than the other three.

The finance motive represents a temporary anticipations of a gap between inflows and outflows, for example before embarking on an investment project. The finance motive differs from the transaction motive because the latter refers to holding money while the former to borrowing money. The finance motive emphasizes the link between the financial sector (supplier of credit) and the production sector (demander of credit). If the financial sector accommodates the finance needs of the production sector it will be a fueling factor to the economy, but it also has the potential to constrain the economy by refusing extension of credit [Hawkins; 2003]. In an economic boom, an increased demand for credit for additional investments may or may not be met by the financial sector.

### 3.2.2.2 Endogenous Money Theory

Post Keynesians claim a credit theory of money, where money supply is endogenous determined by credit. This is in clear opposition to the Neo Classical view of an exogenous supply of money determined by the central bank. All Post Keynesians agree to disagree with the Neo Classical view of exogenous supply of money, but there exist some disagreement about the degree of money supply endogeneity. On one side the so-called *Horizontalists* or *Kaldorians* claim the money supply to be completely endogenous. Graphically this is illustrated by a completely horizontal money supply curve. The central bank, the lender-of-last resort, controls the base rate and hereby the level of the horizontal money supply curve, but not the supply of money at that level. In this view, demand for money creates its own supply, and the supply of money can never be a constrain on investment and output. Changes in the stock of money are driven by credit demand from the non-bank private sector, which commercial banks are obliged to accommodate [Hawkins; 2003]. If the central bank fulfills its role of lender-of-last resort, liquidity preference then becomes irrelevant.

Another approach to money supply is given by the *Conditionalists*. The *Conditionalists* accept that demand and supply of money is strongly interrelated, but that liquidity preferences of all agents plays an important role. In particular, demand for credit is not necessarily accommodated but conditional on the liquidity preferences of the banking sector. Once again the central bank controls the base rate and hereby the level of the horizontal money supply curve, but not the supply of money at that level. The supply for credit is then horizontal for some level of credit but as credit expands, commercial banks becomes more exposed and financial vulnerable due to increasing debt burdens of the private sector, and becomes more inclined towards a liquid position. Higher liquidity preferences cause the banking sector to provide credit only at a higher risk

premium mark up. It follows that, although credit is endogenous to a large extent, credit supply is not fully demand determined and has an upward sloping part as well. Liquidity preferences then become essential to the economic process. During an economic upswing, banks have falling liquidity preferences as less liquidity is demanded due to the precautionary motive. The private sector's liquidity preferences change as well during an economic boom, as financing motive increase demand for short-term liquidity, pushing the economy towards increasing expansion, but also to increased vulnerability.



## Chapter 4

# The Minskyan Framework - A Theory of Financial Vulnerability

Having discussed the fundamental theoretical differences between Neo Classicism and Post Keynesianism, it is now time to develop the Minskyan theoretical framework which will be used to answer the theoretical part of the research question and later in the analysis of the Mauritian economy. This framework will build upon Minsky's *Financial instability hypothesis*, Arestis and Glickman's open economy version of this hypothesis, and Penelope Hawkins' concepts of financial vulnerability and financial spectrum of provision. The discussion starts out by defining the concept financial vulnerability as it plays a pivotal role in the thesis.

### 4.1 Financial Vulnerability

In her book "The Open Economy and its Financial Constraints", Penelope Hawkins defines financial vulnerability as sensitivity to the withdrawal of credit or to a changes in debt status [Hawkins; 2003]. Financial vulnerability may apply to an individual, a bank, a firm, and to entire countries [Hawkins; 2003]. If an economic agent or unit is perceived financial vulnerable, say a firm, which debt-to-equity ratio is perceived to high by its creditors (commercial banks), it may be cut of from rolling over debt or only obtain credit at a high risk premium. If financial vulnerability becomes the dominant "sentiment" throughout the economy, the economy can be characterized as financial fragile and hereby susceptible to crisis [Hawkins; 2003]. Penelope Hawkins definition and use of the concept financial vulnerability is closely connected to Hyman Minsky's concept of speculative financing, which will be defined and discussed later. As it will be shown, speculative financed units are per definition financial vulnerable units.

According to Hawkins, financial liberalization and openness increases financial vulnerability by lowering the regulatory barriers. These *barriers of conservatism* which secures prudent and cautious banking practice, by increasing the innovative drive toward new forms of financial intermediaries, especially toward short-maturity financial assets [Hawkins; 2003].

### 4.2 The Minsky Wall Street System And Its Participants

Minsky developed his hypothesis within a closed economy. The following sections will provide the closed economy insights before embarking on a discussion of the implications of the hypothesis in an open economy (Arestis and Glickman). In a Minskyan "Wall street" financial system two economic units are central; the firm and the commercial bank. In addition to these fundamental

units, a speculative agent, the central bank, and the policy makers are important participants in the Minskyan closed economy system.

### 4.2.1 The Commercial Bank

In Post Keynesian theory banks are considered both as destabilizing and indispensable to the economy. Banks and their ability to provide and extend loans are key determinant of output and employment through increased investment spending, but on the other hand banks induce and amplify instability through changes in sentiments, most notably through changes in liquidity preferences. The particular level of development of the banking sector is important for its influence on the financial market and on how it can be studied. Seven stages of banking sector development can be identified [Hawkins; 2003].

#### 4.2.1.1 Seven Stages of Banking Sector Development

At the first stage, the banking sector is underdeveloped, small, and characterized by its role to hold saving deposits. The prior saving argument then becomes constraining for the economy. No investment can be financed without corresponding prior savings. The reason for this is that no central bank exist to provide money endogenously. The first stage of financial market or banking sector development is much in line with the Neo Classical view of a real exchange economy with a prior saving constrain. From the second stage, saving is no longer the primary constrain on financing, as bank notes becomes acceptable as payments. New loans lead to new deposits and the bank deposit multiplier begin to function, allowing bank credit to finance investment without prior saving. The central bank authority emerges at this stage and it controls the money reserve. Hence, the activity of the economy is hereby ultimately constrained by the actions of the central banks. On stage three inter-bank lending is introduced and banks are no longer restricted to use government securities as a reserve, but the central bank maintain its control of the reserves. The second and third stage, with exogenously given money supply set by the central bank, is in line with the Neo Classical interpretation of exogenous money. However, as the development continues into later stages this changes and becomes much more in line with the Post Keynesian notion of (conditional) endogenous money supply.

Stage four is characterized by the central bank fulfilling its role as lender-of-last resort. The lender-of-last resort institution allows commercial banks to extend loans beyond the reserve capacity. Money supply is endogenous and determined by credit extensions. The central bank has the power to discourage credit extension through changes in the base rate. Depending on the liquidity preferences of the commercial banks they may react by extending loans only at a higher lending rate. Credit rationing might take place as no mechanisms ensures credit demand equals credit supply. It depends on the interaction between the actions of the central bank and the liquidity preferences of the commercial banks. Stage four is hereby much in line with the conditional endogenous money approach described in section 3.2.2.2.

Stage five, six, and seven hold the essential functions of stage four, but an ever increasing drive for financial innovation is going on. Because bankers operates in the same (uncertain) expectational climate as firms they will actively, driven by profit-seeking behavior, find ways to accommodate their customers [Arestis; 2002]. Increased competition forces bankers to “beat the bushes” in order to flush out new investments [Hawkins; 2003]. This constant search for new financial instruments and new investment projects increase the banks ability to provide credit on demand but, at the same time, it increase the banking sector’s exposure to risks and vulnerability [King; 2003]. According to Minsky, this drive for innovation is the root to the claimed inherent financial

instability as the innovative drive results in a more fragile debt/liability position of both banks and the non-bank private sector [Arestis; 2002]. In addition, the drive for innovation of the financial market is also aimed at avoiding financial regulation and as a consequence the *barriers of conservatism* is being torn down within the banking sector. If the regulatory framework is not constantly updated by the government it will be gradually undermined. On the later stages of banking development the line between commercial banks and non-bank financial institutions becomes more and more blurred.

#### 4.2.1.2 The Financial Spectrum of Provision

Having defined the stages of development of the financial market/banking sector we now turn to the credit supplying decision of the banks. When a banker evaluate information regarding a potential borrower, the banker assesses a number of factors; What is the borrowing history, the debt/equity ratio, collateral and expected cash flows? Whether or not these assessments lead to the provision of credit, and at what price, depends on banking convention and the bankers confidence [King; 2003]. The supply of credit depends hereby on the bankers perceptions of the borrower and future. In economic upswings loans are readily available as optimism dominates the economy, and bankers accept a less liquid position (falling liquidity preferences). In times of economic booms banks may be willing to supply credit to firms and economic agents which otherwise would not be evaluated as creditworthy - the so-called *fringe* of borrowers.

The concept of a *fringe* of borrowers is developed by Penelope Hawkins [Hawkins; 2003]. Hawkins has developed a so-called spectrum of financial provision and it is closely connected to the concept of financial vulnerability. The following discussion of the *fringe* of borrowers is based this work. The spectrum of financial provision relates to both individuals, to firms, and in an open economy to entire countries. The open economy implication will be discussed later. The financial spectrum of provision can be illustrated by figure 4.1.

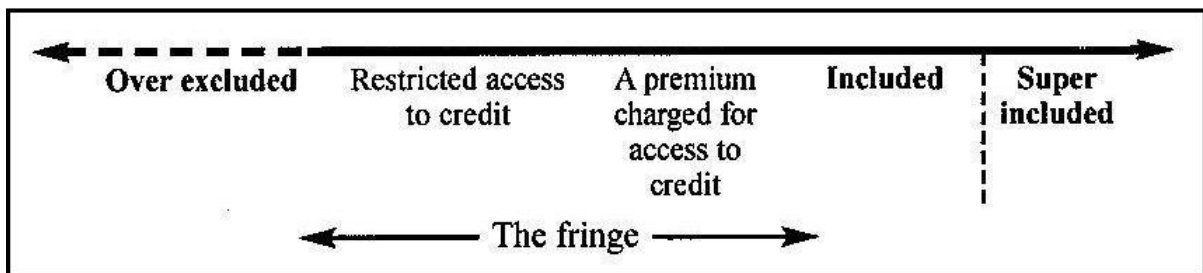


Figure 4.1: Spectrum of financial provision [Hawkins; 2003]

At the extremes of the spectrum are the *super-included* and *super-excluded* respectively. The *super-included* have “first-call” to credit and they get preferential treatment. The *super-included* have, even in economic downturns, a reliable line of credit from the banking sector. The *super-excluded*, on the other hand, have no or very limited access to bank credit even in times of economic upswing, as they are perceived to have extremely low creditworthiness. Under normal conditions the *included* meet the bankers criteria for creditworthiness and have access to credit during most of the business cycle. The *fringe* consist of those demander of credit which is not automatic included. When liquidity preferences are low in the banking sector the *fringe* might

get their demand for credit fulfilled, but this will typically happen at a higher lending rate than the *included* and *super-included*. When the economy is expanding more and more of the *fringe* is included in the credit market, but often at higher lending rates. The *fringe* of borrowers are especially likely to become financially vulnerable. Changes in the banking sector's liquidity preferences affect the *fringe* the most, as they are the first to be excluded in times of economic trouble. It follows that financial vulnerability is often initiated by firms at the *fringe* and then spreading to the rest of the economy making the *included* firm and the commercial banks financially vulnerable as well.

### 4.2.2 The Firm

The firm is the key participant of the production market, where employment and output is decided in accordance with effective demand. The firms invest in real assets or capital goods in hope of gaining future flows of revenue. Expected revenue can, unlike in the Neo Classical case, never be fully anticipated, due to uncertainty about future outcomes. Firms must act in an expectational climate where optimism can be more or less prevailing. In economic upturns, expectations tend to inflate and the memory of previous downturns start to vanish. It is in this climate investment decisions must be performed. An investment decision made by firms is followed by a decision of financing, either by internal (fully or partially) or external financing (debt finance). Internal financing depends on the current position of the firm while external financing depends on availability of bank credit.

Depending on the firm and the expectational climate of the economy, firms can either be subject to a hard or soft budget constraint [Hawkins; 2003]. A firm will face a hard budget constraint when its survival depends on revenue being larger than costs. Such a constraint applies when no external finance is available. Alternatively, a firm can be subject to a soft budget constraint when access to external finance is available. The *super-included* firms will always be subject to a soft budget constraint, even in economic downturns, while *super-excluded* will face a hard budget constraint at all times. In an economic upturn a higher proportion of finance happens externally both because *super-included* and *included* increases the share of external finance and because more and more from the *fringe* gain access to external credit.

### 4.2.3 The Speculator

In the Minskyan system two types of speculators exist. First of all, the pure speculator or *Ponzi financier* who seeks arbitrage opportunities within the financial system by buying low and selling high. This can either be individuals or financial institutions. Their main impact is on the price of financial assets and, in an open economy, on the foreign exchange rate as well. One important characteristic of these *Ponzi financiers* is their tendency to herd behavior.

The other type of speculation, in the Minskyan system, originates from the commercial banks and firms of the system who become speculators through an endogenous process within the financial market. Banks and firms are considered speculators if they rely on overly optimistic expectations about the future. This is essential for the process towards financial vulnerability and instability, which will be discussed in more details later in this chapter.

### 4.2.4 The Policy Makers

Due to the possibility of financial vulnerability, fragility, and crisis domestic policy makers have a stabilizing role to play, unlike in the Neo Classical world. Active policies and regulations



can help the economy reap the potential gains from the financial market while minimizing the risk of the economy becoming financial vulnerable. Two policy institutions are relevant in the Minskyan closed economy system; the central bank and the domestic government. The central bank functions, in the Minskyan system, as lender-of-last resort and as determinant of the base rate. The government determines the fiscal and monetary policy framework under which the central bank and the private sector must act.

### 4.3 The Minskyan Closed Economy

Having defined the main participants within the Minskyan (closed economy) financial system; this section provides a discussion of its implications on the domestic economy. The conceptual trinity of hedge, speculative, and Ponzi financing is the most celebrated part of Minsky's work and it is vital for the understanding of the financial system. This conceptual trinity will be discussed before the movement from financial robustness to vulnerability, fragility and ultimately to crisis, is outlined. The discussion is based on the premise that the financial market is developed beyond the third stages i.e. that the central bank is functioning as lender-of-last resort and money hereby is (conditional) endogenous supplied, with the stock of money determined in interaction between the credit and money market.

#### 4.3.1 Hedge, Speculative and Ponzi Financing

The conceptual trinity of finance was developed by Minsky, most famously in his 1986 "Stabilizing an Unstable Economy", and plays an instrumental role in the cyclical movements from financial robustness to financial vulnerability of the economic system. Hedge financing is defined as financing where realized and expected income cash flows are sufficient to meet all payment commitments on outstanding liabilities [Minsky; 2008]. A hedge financing firm have a very liquid liability structure and a low debt-to-equity ratio, as internal financing is dominant relative to external financing. Many firms are facing a relatively hard budget constrain as the banks only supply credit to the customers which are considered most creditworthy i.e. the included and super-included. Put simply, hedge financing happens when firms and banks "play it safe". However, per definition commercial banks can never be regarded as purely hedge financed as the risk of defaulting is ever present.

Speculative financing is a bit more complex to understand. Minsky defines speculative financing in two interrelated but not necessarily overlapping ways. Firstly, speculative finance happens when debt repayments (cash outflows) becomes larger than expected and realized revenue (cash inflow) [King; 2003]. The only way to accommodate this cash inflow-outflow mismatch is rolling over debt (renew loan upon maturity). If this is the case the firm/bank is involved in speculative financing [Arestis; 2002]. Secondly, a firm or bank becomes involved in speculative financing when their positions becomes vulnerable to changes in the financial market conditions. A firm or bank might be characterized as speculative if one or both of these two criteria are satisfied. Imagine a firm which are issued a variable interest rate loan which they, at the time of issuing, expect to be fully able to meet commitments. In this regard the firm satisfy the hedge financing criteria. However, at the moment the loan is issued the firm becomes involved in speculative financing, according to the second criteria. Due to the variability of the interest rate the firm become vulnerable to changes in the financial market condition [Arestis; 2002]. Minsky's definition of speculative financing is clearly related to Penelope Hawkins' definition of financial vulnerability. Speculative financing is the underlying cause of financial vulnerability, as it increases the sensitivity to credit withdrawal and debt status changes. Notice that if a firm is considered to be

speculative financed and hereby financial vulnerable its creditors (the commercial banks) must be vulnerable as well.

Finally, Ponzi<sup>1</sup> financing is the last part of Minsky's trinity and possible the most famous (infamous). A firm/bank which is involved in Ponzi financing, increases debt to pay debt commitments. Speculative financing firms can be forced into Ponzi financing by income shortfalls or changes in the financial system like increasing lending rates [Arestis; 2002]. The shift from speculative to Ponzi financing is an important part of the endogenous process which leads to financial vulnerability, fragility and ultimately to financial crisis and bankruptcies [Minsky; 2008].

### 4.3.2 From Robustness to Vulnerability in a Closed Economy

The Minskyan endogenous cyclical movement from robustness to financial vulnerability and ultimately to crisis follows three phases, each characterized by one of the three financing forms discussed above. Initially, in the early stage of the cycle, the real and the financial sector, emerging from recession, is in a state of tranquility and precaution. Bankers perceive the future as uncertain and liquidity preferences are accordingly high (precautionary motive). Consequently, credit is only provided with a risk premium and only to the *included* and *super-included* firms. The *fringe* of borrowers are subject to a hard budget constrain with no or very little access to external financing. Coming out of the recession, firms of all kinds tend to undertake safe investment projects, where expected revenue exceeds debt repayments i.e. hedge financing, and where maturity is matched. Because of high liquidity preferences in the banking sector, internal financing is predominant or at least relative larger than external financing depending on firms position on the spectrum of financial provision. The financial regulators have typically tightened the financial regulatory framework setting up *barriers of conservatism* as a consequence of the last financial crisis. Financial regulation and the low demand for credit suppress the banking sector's drive for innovation.

The hedge financing phase cause modest expectations about the future which in generally are fulfilled, and as time passes the economy in general and the financial market in particular is perceived to be more and more robust and healthy. Banks grow more confident and optimistic about the future and starts lowering its liquidity preferences. Credit then becomes more available, often to a lower lending rate for the *super-included* and *included* firms, while the upper-end of the *fringe* might start getting access to bank credit as well. Increased access to credit (and at lower costs) enables previously shelved investment projects to be undertaken, fueling increased production, employment, and household consumption. This initiate an upward pressure on effective demand, which in turn, increases willingness to invest even more. Consequently, the demand for liquid credit is rising within the production sector, due to the finance motive.

Optimism then becomes characteristic for the entire economy, an optimism fuelled by an investment boom. Minsky refers to this phase as *economic euphoria*. Firm profits and their profit-to-debt payment ratios are growing which tend to makes additional financing available from the banking sector. The optimistic expectations make bankers provide credit to finance investment projects which does not, at the time of issuing, satisfy the hedge definition of revenue being larger than cost. This clearly corresponds to the second criteria of speculative financing. In the state of *euphoria* the interest rate structure yield profit opportunities in short-term financial assets [Minsky; 2008] as the booming economy is expected to expand even further. As a result firms start seeking short-term liabilities to finance long-term asset profiles. This correspond to

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<sup>1</sup>Carlo Ponzi (1882 - 1949), an Italian emigrant to the US, who became one of the greatest swindlers in history.

the first criteria of speculative financing. Firms and banks now satisfying both criteria of speculative financing clearly indicates that the economy has moved into a new phase of speculation and hereby becoming increasingly vulnerable.

Simultaneously, speculators (Ponzi financiers) enters the markets seeking arbitrage opportunities because of the widespread euphoria and optimistic expectations. Asset prices are pushed upward and due to the bankers seeking new profit opportunities, speculators can obtain credit to purchase more financial assets, inflating asset prices even further. In addition, the booming economy has a tendency towards increasing factor inputs, but price inflation keeps firms profits intact.

Liquidity preferences are at this point very low in the banking sector and credit demand is largely accommodated. In chase of profit opportunities bankers start “beating the bush” - seeking new investment projects. As the *included* and *super-included* firms are working at capacity, the banks turn to the remaining *fringe* which previously were rated as uncreditworthy. In addition, the drive for financial innovation by the banking sector undermines the regulatory financial framework, and the regulating authorities, which makes decisions in the same euphoric expectational environment as firms and bankers, have few incentives to constrain the booming economy by setting up new regulations.

The banks, firms and speculators are now deeply involved in speculative financing and the private sector becomes more and more indebted and less liquid. The firms debt-to-equity ratio rises and banks becomes increasingly exposed. Firms are now over-sensitive to withdrawal of credit or changes in debt status and more and more firms are therefore perceived to be financial vulnerable, especially at the *fringe* of the spectrum of financial provision. As the nervous sentiment spread from the *fringe*, banks heightens its liquidity preferences due to the precautionary motive and lending rates tend to rise, depending on the the action from the central bank. Some firms, at the *fringe*, start having difficulties rolling over their debts as the increased liquidity preference and hence, the higher lending rates takes effects. These firms now face refinancing of their short-term position at a higher cost, which increases the risk and fear of defaulting. Increasing lending rates might only affect the now financial vulnerable firms at the *fringe* in the beginning, but the entire economy is at risk as more firms struggle to meet debt commitments. Risk of defaulting on debt commitments imply a growing fragility in the banking sector [King; 2003] which tend to have spill-over effects on the remaining firms.

The fragility of the economy, initiated by higher lending rates and the fear of debt defaulting for the *fringe*, starts a wave of uncertainty throughout the economy. Banks start feeling over-exposed to the growing and excessive debt burden of the private sector, and in attempt to avoid further exposure, lending rates are increased for the entire private sector. In addition, speculative financing has inflated not only lending rates and asset prices, but also wages and prices of materials of production, so profit margins becomes eroded. The degree to which the profit margins are eroding depends on the level of price inflation. If the price inflation is high the profit margins are more resilient.

Depending on the extent of eroding profit margins, honoring debt commitments becomes increasingly hard. This moves the economy into the third phase, the Ponzi finance phase. Firms and Ponzi financiers now have to borrows just to be able to meet debt commitments. Economic euphoria and optimism slowly becomes financial panic and all participants rush for a fast exit seeking liquidity. Banks stops extending credits, asset prices collapses, investments comes to a halt, unemployment rise, causing a fall in effective demand, and the economic boom becomes

a burst. At the time when firms need liquidity the most, as they are struggling to refinance their positions, the banking sector does not provide it, setting an ultimate constraint for further expansion. An economic financial crisis is inevitable with a resulting real economic recession.

### 4.3.3 Policy Implications

There are important policy implications of this closed economy version of the Minskyan theoretical framework. The first Minskyan policy proposal is the so-called *thwarting mechanisms* or *barrier of conservatism*, set by the monetary authorities which is intended to curb overly optimistic expectations before they get fully embodied [Felix; 2003]. *Thwarting mechanisms* however, loosen efficiency as financial market agents innovate to avoid these constraints, so they require a persistent revision or replacement throughout the financial cycle [Felix; 2003]. The process of financial liberalization intensifies the drive toward financial innovation and hereby intensifies the breaking down of regulatory barriers. Rules and conventions which govern the market are then increasingly hard to maintain allowing financial units and agents to seek profit opportunities which might cause financial vulnerability.

The second proposal relates to the fiscal authorities and it is highly controversial for Neo Classical economists. Minsky proposes a *big government* as bulwark against financial crisis [Felix; 2003]. By *big government* Minsky means sufficiently large in relation to GDP. A *big government* with a progressive revenue structure can produce automatic stabilizers large enough to dampen the cyclical fluctuation of effective demand caused by the financial market cycle. It is important to notice that Minsky does not perceive policy intervention as capable to produce a stable growth path of the capitalist monetary economy, the inherent instability is in fact, inherent and hereby inevitable. Policies can however, dampen the volatility of the financial markets and lessen the drive toward financial vulnerability and ultimately prevent the most damaging effect of financial crisis.

## 4.4 The Minskyan Open Economy

We are now ready to start developing the open economy version of Minsky's *Financial instability hypothesis* developed by Phillip Arestis and Murray Glickman in 2002<sup>2</sup>. The main message of this interpretation is that openness to international finance tends to exacerbate the tendency towards financial vulnerability and instability of the financial market.

### 4.4.1 Extensions to the Closed Economy

Opening up the Minskyan economy requires some extensions of the closed economy version. From being a domestic financial market it now moves to be an international financial market and this requires the introduction of some additional (foreign) participants. Moreover, the concept of the financial spectrum of inclusion needs some further elaborations, as countries now can be viewed as part of the *included* or of the *fringe* group. Finally, a fourth way of financing in addition to hedge, speculative, and Ponzi financing, has to be defined as a result of introducing foreign currency and its price, exchange rates, into the system.

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<sup>2</sup>In their "Financial crisis in Southeast Asia: dispelling illusion the Minskyan way" (2002).

#### 4.4.1.1 New Players on the Scene

Most domestic participants in the financial markets have foreign counterparts like foreign commercial banks, firms and speculators. For the open economy analysis the foreign commercial bank and the foreign speculator is of most importance. The distinction from their domestic counterpart lay in the introduction of foreign currency and its price, the exchange rate. Credit supplied by foreign banks to domestic firms is followed by a debt commitment paid in foreign currency. The volatility of the foreign exchange rate then becomes an important factor. Likewise, the introduction of foreign currency creates an additional incentive for speculators to enter the domestic market, in hope of currency arbitrage profits. Speculation then becomes exacerbated by opening the economy to financial flows and the entering of foreign Ponzi financiers.

International financial rating agencies becomes highly important. Assessments of individual countries creditworthiness have significant impact on the domestic firms ability to obtain credit on the international financial markets. These financial rating agencies display pro-cyclical behavior about the credit rating of a country, just like it was the case for domestic banks and their assessment of firms. In time of economic boom and positive expectations there is a tendency to upgrade credit ratings, while in downturn credit ratings is lowered [Hawkins; 2003]. The financial rating agencies influence the private foreign banks and their willingness to provide credit to a firm within the country in question, and they are hereby important for the analysis of international financial markets. Financial rating agencies becomes a key decider of whether or not a country, and hereby its banks and firms is part of the *included* on the (international) financial spectrum of provision or part of the *fringe* group.

#### 4.4.1.2 The International Spectrum of Financial Provision

The position of a country on the international spectrum of financial provision is just as important as individual firms position on the domestic spectrum described in section 4.2.1, as it has effect on the foreign credit availability. At one end of the spectrum is the country equivalent to the *super-included* firm. *Super-included* countries are rated to have exceptional high creditworthiness and its domestic banks and firms have almost unlimited access to credit on the international market [Hawkins; 2003]. These *super-included* countries are likely to be high-income countries with a supra-national currency and a center of international finance<sup>3</sup>. The next group on the spectrum is the *included* countries. This group of *included* countries consists of other high-income countries with good investment ratings.

Most important for this thesis is the international *fringe* of financial markets. This group comprises a broad range of middle-income and emerging economies, like Mauritius. The *fringe* group is a matter of degree ranging from very eligible to credit to less eligible [Hawkins; 2003]. Just like in the closed economy the fringe gains more and more access to foreign credit in time of economic upturns, but is also the first to be excluded in times of trouble. The *fringe* countries are attracting relative large proportion of speculative and short-term financial capital compared to the *included* group, and they are particular vulnerable to uncertainty as portfolio investors tend to speculate heavily in these economies when the economy is booming, but as soon uncertainty rises, they move to more secure markets. Finally, the super-excluded group consist of countries on the very bottom of the income scale. They have essentially no access to private international credit regardless of the economic situation, as they are rated severely uncreditworthy by the

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<sup>3</sup>The best real world example is USA and the UK.

international financial rating agencies. These countries must mainly rely on credit supplied on concessional terms from the international community.

#### 4.4.1.3 Super-Speculative Financing

Introducing foreign exchange rate movements into the system complicates the conceptual trinity of hedge, speculative and Ponzi financing. A fourth financing category needs to be developed - Super-speculative financing [Arestis; 2002]. Credit obtained on the international financial market and its resulting debt service payment is normally paid with foreign currency and it follows that movements of the foreign exchange rate becomes important. Consider a firm which hedge-finance its investment in a closed economy by long-term credit. The firm expect that revenue is more than adequate to meet debt commitments. In an open economy this firm might however, be seen as speculative if it obtain its credit on the international market. In this case the firm becomes vulnerable to changes in the financial condition through potential movements of the exchange rate. Recall that this satisfy the second criteria for a speculative unit defined in section 4.3.1. A firm which obtain foreign currency credit on the international financial market can never satisfy the hedge-financing criteria. It can nevertheless, not necessarily be categorized as super-speculative as described next.

A super-speculative financing firm is a firm which borrow short-term on the international financial market to finance long-term investments. The firm needs to rolling over debts constantly to refinance its investments and it becomes exposed to interest rate changes and to changes in the foreign exchange rate. Such a firm is defined as super-speculative. Likewise, a domestic bank which lend short-term on the international market is also super-speculative.

#### 4.4.2 From Robustness to Vulnerability in a Open Economy

The open economy version of the movement from robustness to financial vulnerability is now discussed. The discussion assumes a financial liberalized, developing economy with flexible exchange rates. The main implication of openness is the way it broadens the route toward financial vulnerability and fragility. This intensified fragility, due to financial openness, comes primarily from two distinct channels.

First of all, openness towards international finance exacerbates the drive for financial innovation, which was seen as a main cause of vulnerability in a closed economy. Domestic firms can seek credit opportunities abroad, making them vulnerable to speculative finance, through the foreign exchange rate. Depending on the maturity pattern of this credit it can potentially make the firm super-speculative and highly vulnerable to any change in the financial conditions. Domestic banks can likewise be characterized super-speculative if they provide credit to foreign investors.

Secondly, financial openness is effective in breaking down the domestic *conservative barriers* of finance as the drive for financial innovation is intensified by the introduction of foreign participants. Domestic regulators find it increasingly difficult to maintain and renew financial regulations, as domestic banks and firms seek financial business abroad to avoid regulatory constraints. Financial openness then becomes an endogenous fueling factor of the liberalization process, which adds pressure towards more deregulation in times of economic booms. Hence, the possibility and the magnitude of financial vulnerability increase through the process of financial openness.

Now consider the mechanisms which drive the cyclical movement towards financial vulnerability in an open liberalized economy. Assume that the domestic economy is in the early phase of

an economic upswing shared with the global economy. The domestic economy is in the hedge-financing phase and, depending on its past performances, its history, and level of financial and economic development, it is rated by international financial agencies in accordance with the international spectrum of provision. As this thesis mainly considers developing countries, like Mauritius, it is assumed that the economy, in question, is in the *fringe* of the international spectrum of financial provision. In this hedging-phase firms are mainly demanding domestic credit, as foreign credit is not readily supplied. As time passes the hedge-financed investments meet the modest expectations and profitability increases absolutely and relative to cost of capital. Domestic risk assessments becomes less strict and domestic banks lower the liquidity preferences as confidence grow in both the financial and the real sector. Simultaneously the global economy is expanding, making financial rating agencies re-evaluate their risk perceptions to a more favorable rating for the economy, in question, moving it outside the *fringe*.

The optimistic mood, which surrounds the domestic economy, starts spreading outside its borders. Foreign banks and speculators then turn their attention towards it. This change in market sentiment has several implications. Firstly, consider the impact on the macro prices of the domestic economy. International portfolio investors (Ponzi financiers) invest in domestic financial assets with resulting inflow of liquidity from abroad. This inflow puts pressure on the exchange rate to appreciate, creating foreign currency arbitrage profit opportunities which, in turn, puts additional upwards pressure on the exchange rate. In addition, the price of domestic financial assets tend to rise due to increased foreign demand, while the domestic base rate can be kept relatively stable due to inflows of foreign liquidity.

Another implication of the global system having a more optimistic perception of the domestic economy, is that firms obtain access to the international credit market. The appreciating exchange rates makes foreign short-term credit attractive and domestic firms become engaged in super-speculative financing. These super-speculative firms are hereby extremely vulnerable to change in financial conditions, and per definition financial vulnerable. Simultaneously, the constant inflow of foreign liquidity allow domestic banks to expand its foreign borrowing, making them more speculative or even super-speculative as well.

At a certain point, the expanding domestic economy becomes excessively financial vulnerable and fragile and it becomes susceptible to financial crisis, which can either be domestic or external in origin. A crisis of domestic origin is much like the case of a closed economy in section, but the drive towards vulnerability is intensified because of the now open financial market. Speculators, of both domestic and foreign origins, now have the opportunity to seek more secure markets abroad, shifting to other currencies - a process which is intensified by herding behavior. The domestic currency will then be sold heavily causing a currency depreciation and the inflated domestic financial assets prices will tend to collapse.

Not only do the exchange rate depreciate and the asset price fall, the domestic and the foreign lending rates are also under upward pressure. The domestic lending rate is pushed up by the liquidity outflow to abroad which cause an upward adjustment to the central bank's base rate, and because of increasing liquidity preference of the domestic banks (mark-up to the base rate). This influences the firms which are speculative in terms of domestic financing, making refinancing, on the domestic financial market, difficult. The foreign lending rate is pushed up because increased uncertainty has caused the country in question, to be pushed back into the *fringe* on the international spectrum of financial provision. Foreign credit is now only obtained by a larger risk premium or even completely unobtainable. The Minskyan definition of a crisis, the

inability to refinance positions through normal channels [Minsky; 2008] is hereby fulfilled. The firms and banks involved in super-speculative financing are hit in every possible way. Falling exchange rates cause a debt deflation, interest rates are increasing and short-term debts can not be refinanced. Widespread financial crisis, of domestic origin, is now inevitable and it has the potential to be much deeper than in a closed economy.

Alternatively, the open economy can be viewed from a macro perspective where the state itself can be regarded as a financing unit, just like firms and banks. The state entity can be regarded a financing unit in relation to the external value of its currency. Residents accumulate debt towards the rest of the world through foreign credit, while the central bank accumulates reserves of foreign currency. As long as reserves are substantial in relation to debts, the state entity is engaged in the equivalent to hedge-financing. The reserves are adequate to pay debt commitments and the value of its currency can be maintained. However, as its residents build up foreign liabilities, the debt-to-reserve ratio rises, and the state entity becomes more and more speculative financed or even super-speculative. The outside world then starts to question the ability of the state entity to pay future debt commitments. As a result and despite the domestic economy shows no sign of weakness, international uncertainty regarding the domestic economy might lead foreign creditors to doubt the ability of the economy to repay its debts. As a result foreign lending rates increase or foreign credit is made unavailable. Domestic firms and banks, relying on foreign credit, then have difficulties refinancing their position, the definition of a Minskyan crisis, but this time the crisis is external in origin.

### 4.5 Summary

The theoretical discussion has aimed at answering the first part of this thesis' research question: "How do increased financial liberalization and openness cause financial vulnerability?". The discussion has developed a Minskyan framework based on the work of Hyman Minsky, on Arestis and Glickman, and on Penelope Hawkins, where it has been shown how financial liberalization increases the risk of firms, banks and entire countries becoming financially vulnerable and how openness exacerbates this tendency. This framework will be used in the following analysis of the Mauritian economy, in order to provide an answer to the second part of the research question: "Have Mauritius become more financially vulnerable as an effect of the widespread financial liberalization and increased openness the last 10 years?"



## Part II

# Operationalization and Analysis



## Chapter 5

# Mauritius

In 1961, eight years before the island state of Mauritius gained independence from British rule, the so-called *Meade report*, named after one of its creators Nobel-price winner James Meade, was published. The *Meade report* gave a dire prognostication for the future development of Mauritius, based on Malthusian and etnolinguistic grounds.

*“Heavy population pressure must inevitably reduce real income per head below what might otherwise be. That surely is bad enough in a community that is full of political conflict. But if in addition, in the absence of other remedies, it must lead either to unemployment (exacerbating the scramble for job between Indians and Creoles) or to even greater inequalities...[t]he outlook for peaceful development is poor.”*[Subramanian; 2001]

48 years later, the Mauritian economy has proved Meade wrong. Mauritius has achieved the unexpected and has developed into one of the fastest growing economies in Sub-Saharan Africa (see figure 5.1). In addition, this growth performance has been achieved as one of the most peaceful, democratic countries in Sub-Saharan Africa. From being a poor low-income country Mauritius is today a middle-income diversified economy with growth in tourism, industrial, and financial services.

### 5.1 The Road to Liberalization and Financial Openness

Mauritius, situated in the Southern Indian Ocean east of the African continental coast, is the very definition of a small open economy with its 1.3 million inhabitants and large trade-to-GDP ratio. In the mid-1970s Mauritius was highly dependent on their agricultural mono-crop (sugar) sector to generate income and employment and exposed to changes in global demand for primary products, especially sugar. This led to high volatility in income, adverse terms of trade and resulting balance of payment problems.

Persistent balance of payment problems along with pressure from the IMF, spurred the Mauritian authorities to make structural adjustments of the economy and develop other sectors like tourism and financial services, as a mean of increasing productivity and economic resilience. The process of reforming the economy began in the early 1980s when the government introduced a series of financial and fiscal policy measures to liberalize the economy and prepare the country for global integration. The first step was taken by the Mauritian authorities by adapting to a Stabilization Adjustment Program (SAP) with the IMF. The SAP was Neo Classical *par excellence* aimed

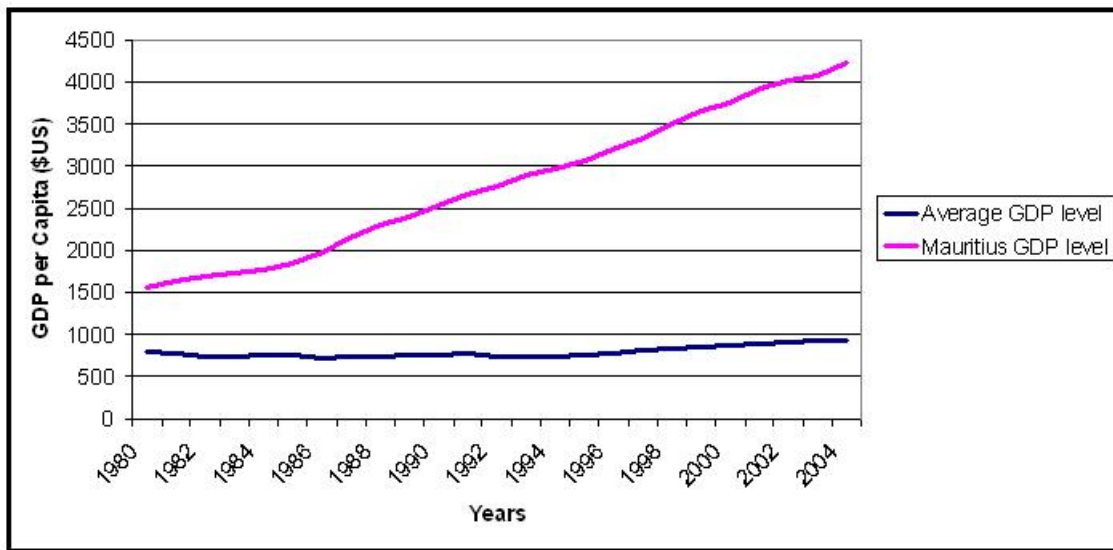


Figure 5.1: Annual GDP per capita in Mauritius and Sub-Saharan Africa [WDI]

at privatization, liberalization and reducing inflation, consumption, budget deficit, and public spending. In addition, the SAP agreement also required the government of Mauritius to pursue economic growth through investments in the productive sectors, including agriculture, with the aim of improving the country's foreign exchange reserves. Initially, the initiatives was directed on the external "real" sector, the drive toward international financial integration was part of the next "wave" of liberalizations, starting in the late 1980s.

The Mauritian government had already, in the late 1970s, established Export Processing Zones (EPZ) in order to generate much needed foreign exchange and to generate employment in the exporting sector. This initiative was reinforced with the passing of the Development Certificate Incentives Act, the Export Service Zone Act, and the Industrial Building Certificate Act all in 1980. In 1984 the Mauritian authorities introduced a series of measures, including the liberalization of imports, removal of non-tariff barriers, promotion of local manufacturing enterprises for the domestic market, and provision of strong incentives for exports of manufactured products. The measures included the implementation of Agricultural Development Certificates, aimed at increasing non-sugar agricultural production for exports.

The success of the external sector in particular of the EPZ's, led the Mauritian government to pursue international financial openness by encouraging foreign investments. A double taxation avoidance agreements were signed with a number of countries namely: Hong Kong, Taiwan, China, Germany, United Kingdom, and France. In addition, Mauritius also introduced the Investment Promotion and Protection Agreement in order to protect and encourage inward investments. The resulting increase in foreign investment acted as catalyst for the later liberalization and modernization of the financial market in Mauritius.

In 1988, The Banking Act 1988 was implemented, setting up a basic institutional and regulatory framework for the banking sector. The following year, the launching of the Mauritian Stock Exchange, was a key step toward a modern financial market and to global financial integration. In line with the development taking place in the financial market, the Mauritius Offshore

Business Activities Authority (MOBAA) was set up with the objective of promoting offshore business activities, which include international financial service, consultancy, shipping and ship management, aircraft financing and leasing, fund management, and banking. The period from 1988 to the late 1990s was dominated by increasing liberalizations, internationalization, and sophistications of the Mauritian financial market:

*“In the late 1980s and early 1990s, the Mauritian financial sector was marked by the process of financial liberalization. Liberalization and market deregulation was important in order to develop and modernize the financial service sector, and at the same time attempting to position Mauritius as a regional financial center.”* [BOM; 1999].

However, at the brink of the new millennium, the Mauritian financial market had yet to experience the rapid liberalization and openness which constituted the following decade. In 1998, just after the Southeast Asian financial crisis, *The Economist* described the Mauritian financial sector as, “well regulated and supervised (perhaps too well). There are no shakey short-term dollar loans to overstretched companies.” [Economist, The; 1998].

From 1999 to 2009 several initiatives were introduced to secure a further liberalization and openness. The deregulation and modernization of the banking sector in the period from 1999 until today have increased the number of commercial banks from 16 to 20 and the number of non-bank financial institutions from 0 to 13. In addition, money changers and foreign exchange dealers have entered the financial market. In 1999 none of these financial agents were present while in 2009 the number was 11 and 5 respectively. The increased banking activity can be even better illustrated by the increase in total commercial bank assets from a level of 103567 million Rupee’s (corresponding to approximately 4046 million US-Dollar) in 1999 to a level of 769831 million Rupee (or 30032 million US-Dollar) in February 2009 [BOM].

One of the most crucial steps, towards a modern and international financial market, was taken in 1999. The Bank of Mauritius, being the country’s central bank, introduced repurchase transactions (Repos) with effect from 15th December 1999. This measure was aimed at promoting efficient liquidity management in the market. Furthermore, on the 15th December 1999, the Bank of Mauritius introduced a standing facility under the Lombard Facility Scheme. This facility provided overnight-collateralized advances to, and was operated on the initiative of, the commercial banks. By implementing these steps, making Bank of Mauritius lender-of-last resort, the Mauritian banking system matured beyond stage three of banking sector development discussed in chapter 4. As well of performing its duties as lender-of-last resort for the banking sector, the Bank of Mauritius is responsible for the exchange rate policy of the Mauritian Rupee. The exchange rate regime is characterized as a managed floating regime with no pre-announced path. The Bank of Mauritius emphasizes that the Rupee should be determined by market forces and intervention should be considered if it is vital for the stability of the Mauritian economy [BOM; 2000].

In December 2004, a new Mauritian banking act was introduced; the Banking Act of 2004. This new banking act was a huge step towards financial openness. Prior to December 2004, on-shore and off-shore banks were required to obtain a separate license and there were restrictions on using the domestic currency, operating in the domestic banking environment, and engaging in foreign currency lending. The removal of distinction between on-shore and off-shore banking and the easing of the regulation aimed at reducing foreign currency lending caused, not surprisingly, a large increase in foreign lending. In 1999, roughly 10 percent of total banking asset where

denominated in foreign currency, while in November 2004, prior to the Banking Act of 2004, this number had dropped to nearly 8 percent. In February 2009 this share had again increased, this time to about 61 percent. This indicates increased openness of the banking sector toward the international market in the period from 2004 to 2009. The non-banking private sector also showed clear signs of increased involvement on the international credit market, by doubling the share of foreign currency credit in total credit from 8 percent in 1999 to nearly 17 percent in 2009.

The above description of the development of the Mauritian financial market, and the indications of expanding credit, increased banking units, and more financial transactions denominated in foreign currency, indicates that Mauritius' financial market, in fact, has become more liberalized and integrated into the world economy. It is now time to analyze whether or not this have made Mauritius increasingly financial vulnerable, as predicted by the Post Keynesians, or more precisely, by Minskyan economists.

## Chapter 6

# Operationalization

As discussed in chapter 2, the open system methodological approach of Post Keynesians simply cannot be contained within a *ceteris paribus* analysis, using econometrics. Underlying factors, which may be known, unknown or even unknowable, influence the economic system in often unpredictable ways. Assuming constant parameters, which are a prerequisite for performing econometrics, is hereby impossible. According to the Minskyan framework developed in the last chapters, the essential feature, which drives the financial system, is exactly the constant evolving of parameters, which at times fuel the economic system but later can evolve to become constraining factors. The Minskyan framework is an example of a Post Keynesian complex and contingent open system. As discussed in chapter 2 the most useful approach of applying the Minskyan framework to “real world” problems is using a case study. The reasons for choosing Mauritius as a case have been outlined, but the actual operationalization needs to be discussed in the following chapter. Two distinct approaches will be used in the analysis

### 6.1 Two analytical approaches

The first approach is to study *tendencies* within the Mauritian economy. *Tendencies* are here defined as the development of some quantitative measures relating to the Minskyan framework, for example the development of volume of credit in Mauritius. This approach can be characterized as a “micro” study of the Mauritian financial market (and to some extent the real market) and its domestic and foreign participants. The aim is to study whether or not these *tendencies* indicate financial vulnerability in the Mauritian financial market, according to the Minskyan framework. The search for *tendencies* will also include a study of the state entity of Mauritius in accordance with the theoretical discussion in section 4.4.2. In order to get a basis of comparison, the observed *tendencies* will be compared to findings of Arestis and Glickman from their study of the Southeast Asian “tiger” economies prior to the financial crisis of 1997-1998 [Arestis; 2002], when possible.

The period of study will be 1999 to 2009, and use data primarily from the Mauritian central bank (Bank of Mauritius). The period is selected for two reasons. Firstly, because the Mauritian financial sector was developed, liberalized and became increasingly integrated with the international financial market in this period. Secondly, because the period from 1999 to 2009 is the best approximation of the economic cycle of the Minskyan framework. In 1999 the world economy suffered from the severe financial crisis which originated from Thailand in 1997 and quickly spread to other Asian “tiger economies” and emerging markets across the globe. The crisis was named the Southeast Asian crisis and contributed to a, by IMF’s definition, global recession which lasted until 2002, with a short upturn around year 2000. In 2008, roughly ten

years after the outbreak of the Southeast Asian crisis, the global economy experienced another financial crisis. This crisis originated from the developed countries, in particular the US, but it has shown contagious effects throughout the global economy. Hence, two financial induced crises set up the historical boundaries for the analysis.

Studying *tendencies* within the Mauritian economy might or might not give indications of increased financial vulnerability, but neither way it is difficult to establish if the observed *tendencies* are “normal” or excessive without a basis of comparison. The comparison with the Southeast Asian economies, using Arestis and Glickman provides some basis of comparison, but an additional approach might provide further insight. Penelope Hawkins provides, in her “*The Open Economy and its Constraints*” from 2003 [Hawkins; 2003], an useful approach. Using her and this thesis’ definition of financial vulnerability, Hawkins created a measure of financial vulnerability which can be used as comparison across countries and across time. Hawkins has created an index of financial vulnerability of individual countries based on four variables; financial account as a percentage of GDP, portfolio investments as a percentage of gross domestic fixed investments, short-term debt as a percentage of total external debt, and exchange rate volatility. She has used the index in a study of 20 countries in the period from 1985 to 1995 including Mauritius [Hawkins; 2003]. This fact provides a basis of comparison which allows an assessment of whether Mauritius has become more financial vulnerable in the ten years (1999 to 2009) of financial liberalization and openness, compared to the predating period from 1985 to 1995.

## 6.2 Data

The data used in the analysis is extracted from Bank of Mauritius’ monthly statistical bulletins and annual reports from January 1999 to Marts 2009. Bank of Mauritius do not provide data in formats which can be used in statistical or graphical software<sup>1</sup>. The author has attempted to transform the used data into such formats and is solely responsible for any error or omissions made in this process. The dataset is available, at request<sup>2</sup>, in Microsoft Excel format for the period January 1999 to Marts 2009, or longest possible period for some variables. To a lesser extent, data from World Bank’s World Development Indicators (online version) and data from IMF’s statistical division are used. In this thesis, data obtained from the database developed by the author, based on information from Bank of Mauritius, is referred to as [BOM], while data from the World Bank and IMF is referred to as [WDI] and [IMF] respectively.

## 6.3 The Structure of the Analysis

The two analytical approaches discussed above aim to provide a qualified answer to the second part of the research question - has Mauritius become more financial vulnerable in its attempt of financial market liberalizations, and increased international integration the last 10 years? The analysis of this question will be structured as follows. Firstly, *tendencies* within the Mauritian economy will be studied by looking at domestic credit volume, foreign currency credit volume, domestic interest rate structure, the price of financial assets, the exchange rate, inflation, factor prices, and foreign lending rates. When possible these measures will be compared with the Southeast Asian economies prior to the crisis of 1997. Then the state entity of Mauritius is examined by studying the debt-to-reserves ratio and the maturity pattern of debts, and again

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<sup>1</sup>Bank of Mauritius provides data in html-format in the period until 2001 and PDF-format in the remaining periods.

<sup>2</sup>Please contact the author by email: [lasse1981@gmail.com](mailto:lasse1981@gmail.com)



## The Structure of the Analysis

this is compared to the Southeast Asian countries. Before turning to the second analytical approach, a short summary and a general discussion of the observed *tendencies* will be performed. The second analytical approach will focus on the four variables suggested by Hawkins as good indicators of financial vulnerability. The values calculated by Hawkins for Mauritius in the period from 1985 to 1995 will be compared to the values calculated, in this thesis, for the period of 1999 to 2007<sup>3</sup>. The analysis ends by summarizing the result from the second analytical approach.

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<sup>3</sup>Due to data limitations the period do not include 2008 and 2009.



## Chapter 7

# Analysis

### 7.1 The Mauritian Financial Market - A Search For Tendencies

The analysis of *tendencies*, within the Mauritian financial market, provides an indication of whether or not Mauritius has become more financial vulnerable during the last 10 years, as proposed in the Minskyan framework developed earlier. The analysis in this chapter will follow the structure outlined in section 6.3 and study the period from 1999 to Marts 2009 using data obtained from the Bank of Mauritius (BOM) and the World Bank Development Indicators (WDI). Bank of Mauritius provides data of the Mauritian economy, which are superior to most other Sub-Saharan African countries, but nevertheless data limitations are still a significant problem. Some *tendencies*, which would have been of great interest to the analysis, can not be studied. Especially two important elements, the domestic spectrum of financial provision and the drive for financial innovation can not be measured in any meaningful way. In addition, although data exist on international financial ratings, which would be a good proxy for the international spectrum of financial provision, the data is not available to the author. This limitation of the analysis is a great weakness, as the spectrum of financial provision and the drive for financial innovation is essential for the movement towards financial vulnerability. However, they have observable manifestations in the financial and real sector, and these manifestation and their development (*tendencies*) can and will be analyzed.

Before embarking on the analysis it must be stressed that as a direct consequence of the Post Keynesian methodology followed in this thesis, this analytical approach is by no means parametric or statistically testable. The Minskyan framework is neither characterized by extrinsic or intrinsic closure and parameters are hereby allowed to evolve and change without boundaries, which make econometrically/statistical analysis inadequate.

The analysis of *tendencies* will focus on three main indicators of financial vulnerability identified in the Minskyan framework. The first of these is the development of credit to the non-bank private sector. In the analysis of credit, focus will be on domestic currency loans and foreign currency loans. The second indicator is “macro prices”, which are the domestic interest rate structure, the price on financial assets, the exchange rate, the inflation rate, the wage rate, and the foreign lending rate. Finally, the third indicator is the state entity of Mauritius in relation to the external value of the Rupee.

### 7.1.1 Credit

The study of *tendencies* will start out by analyzing the provision of credit to the domestic non-banking private sector. For simplicity, focus will be on the private sector and hereby not take governmental credit needs into account. In chapter 4 it was argued that credit expansion is a key element of the drive towards financial vulnerability. Credit expansion can likewise be seen as a manifestation of the inclusion of the *fringe* in the credit market, and as a part of the drive toward financial innovation, as the banking sector seeks new ways to accommodate the credit needs of its customers.

Bank credit to the private sector can be divided into different categories. This analysis considers the two dominant categories used in the Mauritian financial market<sup>1</sup>:

1. Domestic loans
2. Foreign currency loans

Monthly data exists for domestic bank loans for the entire period and for foreign currency loans from May 2005<sup>2</sup>.

Remember from chapter 4, expansion of credit volume early in the cycle should be relatively stable, then increase, first slowly then more rapidly, and then, in the end, come to a stop or even decline. Can this pattern be found in Mauritius in the period from 1999 to 2009?

#### 7.1.1.1 Domestic Currency Bank Loans

Figure 7.1 shows the development of domestic currency bank loans to the non-bank private sector from January 1999 to February 2009. As share of GDP domestic bank loans expanded from 45 percent of GDP in 1999 to 63 percent in 2008 [BOM].

The period from 1999, where a recession hit the Mauritian economy (See figure 5.1 in chapter 5), until *primo* 2005 seems to be in accordance with the Minskyan framework showing a slow expansion of credit volume through domestic currency loans. The expansion in this period amounts to an average monthly growth rate of 0.89 percent or in levels from 459438 million Rupee in 1999 to 898431 million Rupee in May 2005.

From May 2005 to August 2008, the changes in volume of domestic currency bank loans seem to follow a pattern of small periods of expansion followed by short periods of stagnation. The first small expansion happened from May 2005 until December 2005, where domestic bank loans grew at an average monthly rate of 2.25 percent. The second period of expansion came in April 2006 and lasted until January 2007 with an average monthly growth rate of 1.32 percent. This pattern continued after 2007 as well, but the period of expansion lasted for a prolonged period. From June

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<sup>1</sup>Overdrafts and investment in shares and debentures are the other two main forms of credit provided to the non-banking private sector. Data on these exist annual from 2001 to 2008. In this period overdraft in Mauritius have decreased considerably from 34 to 23 percent of total credit and is mainly used as a line of credit for individual and small traders. Investment shares and debentures have decreased from 16.4 to 4.3 percent of total credit and is almost exclusively provided to the financial and business services.

<sup>2</sup>The Banking Act 2004 was implemented in 2005 which removed the distinction between off-shore and domestic banks (Class A). Therefore, even foreign currency loan data exist from 1999 for the Class A banks the introduction of Off-shore banks in 2005 makes comparison of the pre-2005 period with the post-2005 irrelevant in this case.

## Domestic Currency Bank Loans

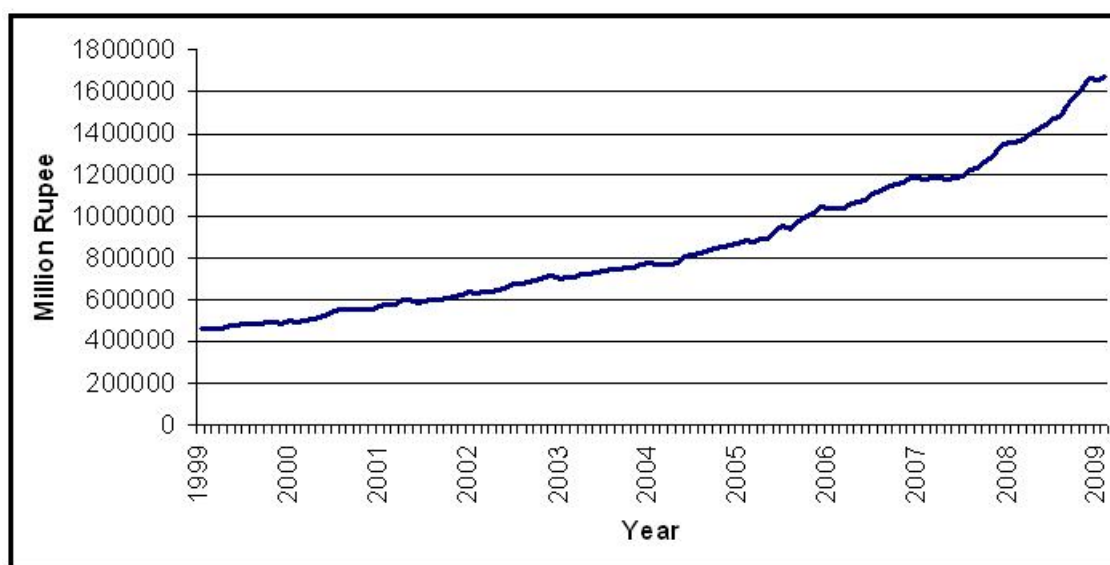


Figure 7.1: Monthly domestic currency bank loans to non-bank private sector in Mauritius [BOM]

2007 until August 2008, the monthly average growth rate of domestic currency bank loans was 1.54 percent. In absolute number the volume of loans increased from a level of 1191529 million Rupee in June 2007 to 1476025 million Rupee in August 2008 - an increase of approximately 24 percent in one year.

One way to interpret this pattern is along the lines of speculative financing. The economic upturn following the recession in 1999 created a downward pressure on the banking sector liquidity preferences and the willingness to provide credit is hereby increased. During the process of changing liquidity preferences, the banking sector constantly re-assesses its positions which may be the reason to the short periods of stagnation. Then, if the banking sector expects further expansion of the economy, it will make downward adjustments to its liquidity preference, allowing a new wave of credit expansion. Depending on the expectations being overly optimistic, the economy can in this process become speculative and hence, financial vulnerable.

It is difficult to conclude if overly optimistic expectations and speculative financing were prevailing based on these findings alone. Supportive evidence that speculative financing was prevailing after 2005 can however, be found by looking at data on debt maturity and sectoral distribution of domestic bank loans. Unfortunately, data on debt maturity, especially short-term debt, is only available as a yearly aggregate for the entire economy and only until 2007 [WDI]. Aggregated data on short-term debt provides supportive evidence that speculative financing had become dominant in the period between 2005 and 2008 as financing long-term investments by short-term maturity loans are the prime definition of speculative financing. From 2004 to 2007 aggregated short-term debts grew from 1353 to 3618 million Rupees, an increase of 167,4 percent. This large increase of short-term debt is clearly indicating that Mauritius had become more speculative, in the Minskyan sense, and hereby had become more financial vulnerable.

Looking at the sectoral distribution of domestic currency loans indicates that the banking sector increased its lending to sectors which, by Minsky, are characterized as speculative in na-

ture [Arestis; 2002]. Bank of Mauritius provides data on sectoral distribution of domestic bank loan credit in the period from 1999 to 2008. Figure 7.2 clearly indicates that the construction sector has been leading the expansion of domestic currency, especially in the period from 2007. Within the construction sector, the property sector has been the dominant recipient of bank loans, receiving roughly 26 percent of all domestic bank loans [BOM]. Firms within the property sector are recognized by Minsky, to be particular prone to speculative financing [Arestis; 2002]. This finding also indicates that speculative financing dominated in the period from 2005 until August 2008.

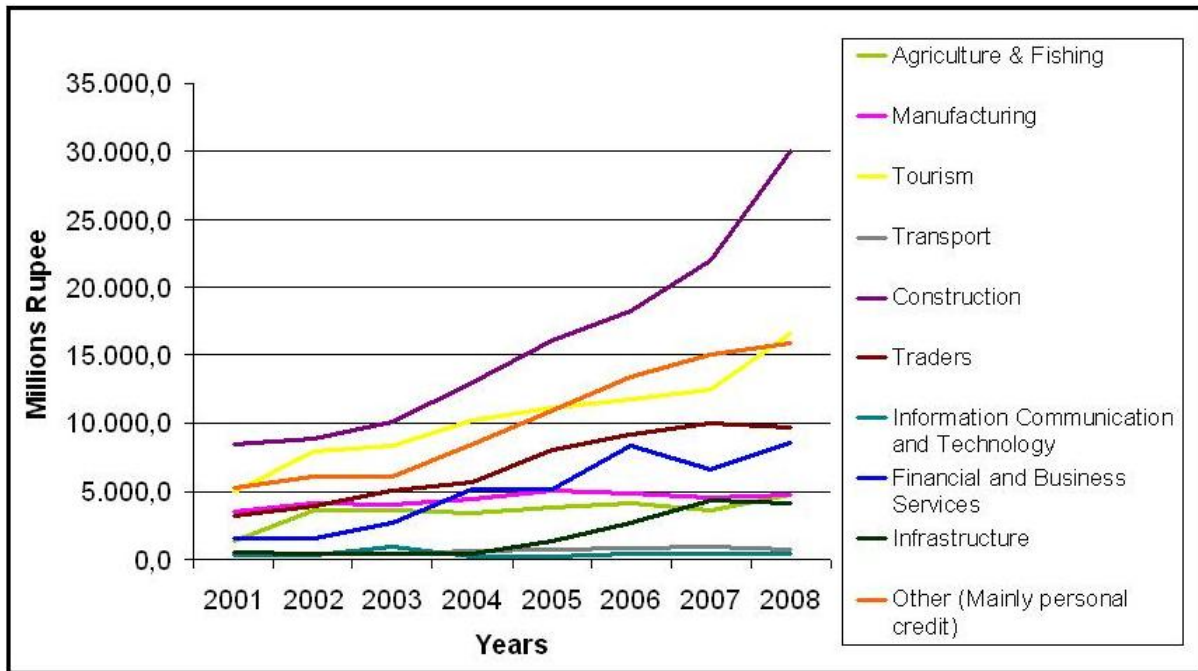


Figure 7.2: Annual sector-wise domestic currency bank loans to non-bank private sector in Mauritius [BOM]

In September 2008, simultaneously with the outbreak of the current financial crisis, a relatively rapid expansion of the volume of domestic bank loans was recorded. In September 2008, domestic bank loans increased by a staggering 4.05 percent<sup>3</sup>, while in October, November and December it increased by 2.05, 2.65 and 2.85 percent respectively. Why this rush for domestic bank credit in an extremely uncertain financial environment? One explanation could be low domestic lending rates, but in fact, as will be shown later, the domestic lending rate was relatively high and increasing from July 2008 to October 2008. Another explanation is flight from foreign into domestic credit because of uncertainty on the international market and hereby high foreign risk premiums. However, foreign lending increased as well from July 2008 until October 2008 before starting to decline slowly.

If the rapid increase in domestic currency bank loans can not be ascribed to decreasing lending rates or lower foreign lending, it could be interpreted along Minskyan lines as Ponzi financing.

<sup>3</sup>The third highest monthly growth rate in the period after April 2001 (5.10 percent) and June 2005 (4.70 percent).

## Domestic Currency Bank Loans

Mauritian firms, which had borrowed heavily, and increasingly short-term, during the ongoing expansion, suddenly faced adverse external and possible internal conditions, as the global economy moved into crisis causing lower international demand. Income shortfalls are then likely to happen to the mainly export-oriented Mauritian firms and increased uncertainty is likely to affect the lending rates and foreign exchange rates<sup>4</sup>. The adverse external and internal conditions could then force speculative financed firms into Ponzi financing. In order to refinance their positions, they increase debts to pay debt commitments.

The hypothetical outcome of such behavior is a quick increase in the banking sectors liquidity preference towards higher preference and a resulting stagnation or decline in domestic credit volume. Such behavior is difficult to determine, given the very short period of time, December 2008 to February 2009, but in this period the credit supplied by banks in form of domestic currency loans has presumable stagnated. This stagnation should be replaced by a rapid decline, if the Minskyan prediction is accurate.

Summing up, the analysis of domestic bank loans provides some support to the Minskyan theoretical approach. If the data is interpreted along Minskyan lines, it follows that the period from 1999 to 2005 can be characterized as a hedge-financing phase. From May 2005 until August 2008 as a speculative financing phase, while the fall of 2008 (September to December) might have Ponzi financing elements. According to this Mauritius have become increasingly financial vulnerable and might be heading toward difficulties as the consequences of the current financial crisis.

In order to give some perspectives of the *tendencies*, found in this section, it would be compared to the *tendencies* found in Southeast Asia before the crisis of 1997-1998. Arestis and Glickman provide some measures of comparison in relation to the above. First of all, bank credit growth less real GDP in the Southeast Asia's "tiger economies"<sup>5</sup> was substantial in the period before the financial crisis. In 1990 the growth of credit less real GDP growth in the region was recorded to 7.36 percent while in 1996 it had increased to 11.10 percent [Arestis; 2002].

<b>Year</b>	<b>Growth Rate</b>
1999	5.39
2000	3.11
2001	3.84
2002	10.01
2003	4.61
2004	6.29
2005	18.48
2006	8.64
2007	7.24
2008	16.97
<b>Average</b>	<b>8.47</b>

Table 7.1: Annual growth in credit less real GDP growth in Mauritius [BOM]

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<sup>4</sup>More on this later.

<sup>5</sup>Thailand, Indonesia, Malaysia, Philippines and South Korea

Table 7.1 shows how the Mauritian domestic bank credit have expanded in relation to real GDP from 1999 to 2008. Credit in Mauritius has expanded in a similar ways as in the Southeast Asian countries, with an average of 8.47 percent. Especially in the period from 2005 to 2008, which has been identified as a speculative phase, credit less GDP has expanded more rapidly by 12.83 percent in average. Arestis and Glickman argues that the Southeast Asian expansion of credit in the early 1990s increased the financial vulnerability of these countries due to increased risk of credit withdrawals [Arestis; 2002], so according to this, the expansion of credit in Mauritius is an indication of Mauritius becoming more financial vulnerable. In addition, the evidence of credit expanding much faster than the overall economy eliminates the possibility that the expansion of credit is simply a result of an expanding economy. Of course, to some extent, it is true that growing economies have higher credit needs, but as credit has expanded by almost 9 percent faster than GDP in the period from 1999 to 2008 and by almost 13 percent from 2005, it is hard to argue that this is the sole explanation.

As mentioned earlier, credit expansion, driven by the property sector, can be seen as speculative (and hereby inducing financial vulnerability). Arestis and Glickman argue that the large share of property sector lending in total lending in the Southeast Asian countries, was a main triggering factor of the financial crisis, especially in Thailand, where the crisis originated from [Arestis; 2002]. In 1997, just before the crisis, the Thailand property sector receipted 30-40 percent of all bank lending<sup>6</sup>. In Mauritius the property sector share of total domestic lending was recorded to 29.1 percent in 2008 [BOM]. This level of property sector credit is comparable to that of Thailand, before the financial crisis of 1997, another indication of Mauritius had become more financial vulnerable in 2008.

#### 7.1.1.2 Foreign Currency Loans

Openness toward foreign financial market will, according to the Minskyan framework, exacerbate the movement towards speculative financing and financial vulnerability. One way to analysis increased financial openness is to study the *tendencies* in foreign currency lending. Allowing firms to obtain and domestic banks to provide credit on the foreign currency market, allows for the possibility of super-speculative financing, which makes the economy exceptional vulnerable to changes in the financial conditions. It follows that an increase in foreign currency loans in absolute terms and relative to total loan credit are good indications of increased vulnerability.

Initially it can be observed from figure 7.3, that the banking sector in Mauritius has increased foreign lending in the period from June 2005 until February 2009. On average foreign currency lending has increased by 2.4 percent per month from June 2005 until February 2009. In absolute terms this amounts to an increase from 828788 to 2263853 millions Rupee or an increase of 173 percent. Foreign loan share of total loans from the Mauritian banking sector has increased from 16.3 percent in 2005 to 23.8 percent in 2008. These findings indicate that the commercial banking sector of Mauritius has become increasingly engaged in foreign currency lending, which in turn indicates that Mauritius has become more financial open and hereby vulnerable to changes in financial conditions.

How do the tendency of foreign currency lending in figure 7.3 relate to the cyclical movement from hedge- to Ponzi financing found in the analysis of domestic bank loans? In the analysis of domestic bank loans the hedge financing phase was estimated to end in 2005, but in the case of foreign currency lending it seems to last until February 2006 (as figure 7.3 shows). In this period

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<sup>6</sup>The other “tiger” economies had share of property sector lending in total lending ranging from 15-40 percent.



## Foreign Currency Loans

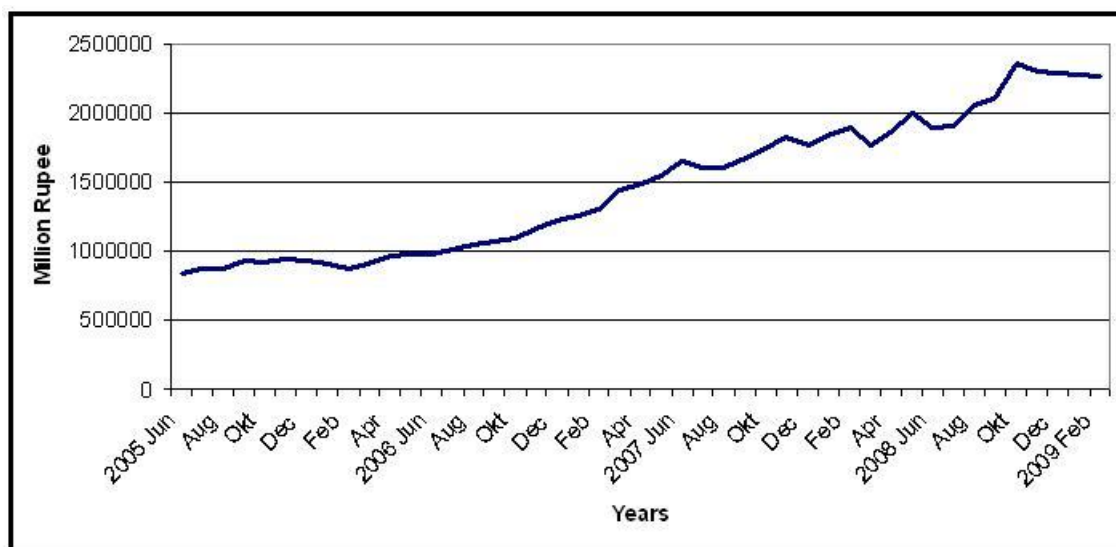


Figure 7.3: Monthly foreign currency bank loans from Mauritius to foreign private sector [BOM]

(June 2005 to February 2006) loans to the foreign private sector increased on average by only 0.7 percent per month. From March 2006 the volume of foreign currency lending from domestic banks started to increase at a much more rapid speed. Once again small stagnation periods are observed throughout the period until July 2008, but nevertheless, the period shows an average monthly growth rate of 2.8 percent. This is supportive for assuming an speculative financing phase and increased vulnerability due to increased openness.

As it was the case in domestic bank loans a structural break seems to occur around the outbreak of the current financial crisis. In August to October 2008 foreign currency bank loans increased on average by 7.5 percent per month. Once again this is supportive for the conclusions the previous section and indicates a Ponzi finance phase. From November 2008 and onwards there seems to be a decline in foreign currency lending, which if the hypothesis is correct, might continue further into 2009 and increase in tempo.

Domestic commercial banks have arguably become more speculative financed due to increased exposure to changes in external financial condition and the exchange rate, but what about the domestic firms obtaining credit from abroad? The Bank of Mauritius does only provide annual data on domestic firms obtaining foreign currency denominated credit and only from 2001.

As table 7.2 illustrates, the non-bank private sector has increased its activity on the foreign credit market. In the period from 2001 to 2009 the non-banking private sector have more than doubled its share of foreign currency credit in total credit from 8 to 17.4 percent. Looking at the level of foreign currency credit it has increased from 6261 million rupee in 2001 to 31185 million rupee in 2009, corresponding to a share of GDP of 4.7 percent in 2001 and 11.2 percent in 2009. Data is only provided annual and it is hereby difficult to compare it with the findings previously in the analysis, but a relatively large increase in foreign borrowing in 2005 and again in 2008 is observed, which correspond with the change from hedge to speculative financing in 2005 and from speculative to Ponzi financing in 2008.

<b>Year</b>	<b>Amount (mil. Rupee)</b>	<b>Share of total credit (pct.)</b>
2001	6261	8.0
2002	6781	8.1
2003	8054	9.1
2004	10062	10.2
2005	16307	14.1
2006	16931	12.9
2007	19349	13.3
2008	29788	16.6
2009	31185	17.4

Table 7.2: Annual foreign currency credit to the non-banking private sector in Mauritius [BOM]

### 7.1.2 Key Prices in Mauritius

Besides credit expansion, rising key (macro) prices is another fundamental feature of the the Minskyan framework. According to this framework, an upward tendency should be expected during the cyclical movement from recession to economic upswing. Seven key prices can be identified in the Minskyan framework:

- Domestic lending rate
- Domestic base rate
- Financial asset price
- Exchange rate
- Inflation
- Factor prices
- Foreign lending rate

#### 7.1.2.1 The Domestic Interest Rates

The prime lending rate of commercial banks and its development in relation to the base rate set by the Bank of Mauritius (the spread) is a proxy for the liquidity preference of the banking sector. The spread is only considered a partial measure which fails to capture important aspects of liquidity preferences like information on individual assessments of creditworthiness and cost of credit besides the cost indicated by lending rates. The prime lending rate and its reaction to changes in the base rate is however, the most comprehensive and useful measure, of liquidity preferences for the banking sector, available.

Remember from chapter 4 that liquidity preferences of the banking sector are expected to fall during an upswing, reflecting optimism about the future. Falling liquidity preferences should correspond to an initial decline in lending rates, keeping the base rate constant. As the upswing progresses banks becomes more and more exposed due to and increasingly indebted non-bank

private sector and at a certain point banks perceive themselves over-exposed, *vis-a-vis* the private sector, and starts adjust its liquidity preferences upwards again.

Can this pattern be observed in Mauritius? The domestic interest rate structure of Mauritius is illustrated by figure 7.4. Figure 7.4 shows the development of the Mauritian base rate, set by the Bank of Mauritius, and the average prime lending rate, set by the commercial banks<sup>7</sup>, in the period from January 2000 to February 2009.

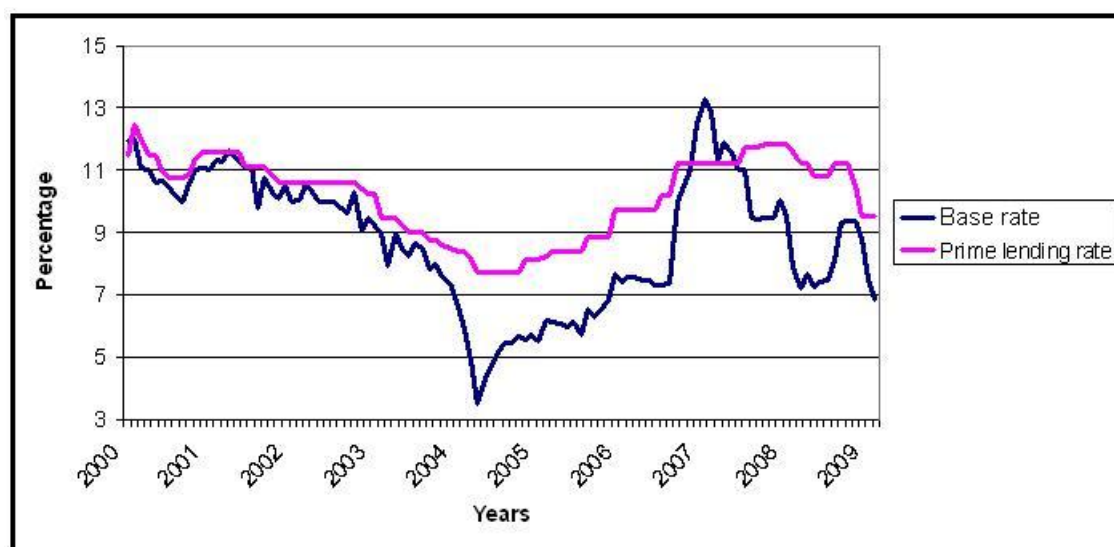


Figure 7.4: Monthly domestic base rate and average prime lending rate in Mauritius [BOM]

According to figure 7.4 the period from January 2000<sup>8</sup> to November 2003, the prime lending rate was very reactive to changes in the base rate. The spread in this period was only 0.56 percentage point on average. From November 2003 the Bank of Mauritius started a process of reduction of its base rate, from 7.58 to an all time low point of 3.51 in April 2004. The commercial banks did not react fully to the significant reduction of the base rate. In November 2003 the average prime lending rate was set to 8.63 (a spread to the base rate of 1.05 percentage point) but in April 2004 the rate had only dropped slightly, corresponding to a spread of 4.24 percentage points. Why did the commercial banks not react more by reducing lending rates? Following a Minskyan interpretation, this lack of reaction can be explained by commercial banks being uncertain about the economic development keeping liquidity preferences relatively high. Previously in the analysis it was argued that the period around 2003-2004 was dominated by hedge-financing and according to theory liquidity preferences should be high.

The period following April 2004 was characterized by increasing base rate, from a relatively low level, and corresponding reactions from the commercial banks, giving a relatively stable but large spread. In September 2006 the Bank of Mauritius reacted by an abrupt change in the base rate from 7.34 to 13.31 in just five month. This attempt to dampen the banks willingness to provide credit is not surprising as this particular period has previously been identified as a speculative

<sup>7</sup>The prime lending rate is calculated as the average between the maximum and minimum lending rate.

<sup>8</sup>The Bank of Mauritius became lender-of-last resort on December 12, 1999, so January 2000 was the first period where a official base rate is reported.

financing phase. This is reinforced by the fact that the commercial banks did not react fully to the rapid increase in the base rate. In fact, after an one percentage point increase from 10.20 to 11.20 in September 2006, the commercial banks kept the prime lending rate relatively stable, causing a negative spread from September 2006 until May 2007. A negative spread is a good indicator of low liquidity preference within the banking sector.

In July 2007, a change of confidence, within the banking sector, seemed to have happened. Despite considerable reductions in the base rate, the commercial banks choose to raise the prime lending rate by 0.55 percentage point and to keep it at a much higher level than the base rate, in the following period. Because of this, the spread from July 2007 to August 2008, amounts to 2.78 percentage points. Once again this development can be explained using the Minskyan framework. After a period of speculative financing and low liquidity preferences, the commercial banks felt increasingly exposed and vulnerable and they started taking a more cautious approach to the future. Despite the Bank of Mauritius reduced the base rate considerably, the commercial banks increased the lending rate and hereby indicating higher liquidity preferences.

The period from September 2008 to February 2009 i.e. during the current financial crisis is a bit more puzzling. The first four month was characterized by a rapid drop in the spread from 3.13 in September to 0.70 percentage points in December 2008, and then a rapid increase to 2.69 percentage points in February 2009. The reasons to particular movement is not easily understood and nothing within the Minskyan framework can readily explain it.

### 7.1.2.2 Financial Asset Price

The price of financial assets is, according to Minsky, an important feature of the monetary capitalist economy. In the beginning of the cycle the price of financial assets should be relatively stable, but as time passes, and economic upturn inflates expectations of the future, the price should rise creating a bubble. When the economy reaches the end of the cycle, and uncertainty becomes dominant, the financial asset bubble should burst. Three mechanism ensures an upward pressure on the price of financial assets: Firstly, the general optimism within the domestic economy. Secondly, willingness of the banking sector to provide credit to speculators (Ponzi financiers) and finally the entering of foreign speculators into the domestic market for financial assets.

Stock exchange prices is the most readily available data on financial asset prices and Figure 7.5 illustrates the development of the main Mauritian stock exchange index, SEM-7<sup>9</sup>. Looking at figure 7.5 seems to confirm the pattern proposed by Minsky. A long, relatively stable and tranquil, period after the recession in 1999 ends in June 2006. This period is characterized by an average monthly increase in the SEM-7 index of 0.62 percent, moving it from index 109.54 in January 1999 to 178.23 in June 2006. From July 2006 the SEM-7 index starts a rapid increase which last until February 2008. In this period the SEM-7 index moves from index 178.23 to 523.21 - an absolute increase of 194 percent, corresponding to a monthly average growth of 5.60 percent. In February 2008 the SEM-7 index collapsed dropping on average by -7.55 percent the following 12 month to a level of 196.31 in February 2009.

The collapse of the the SEM-7 index was significant in comparison with the asset price index's of the Southeast Asian countries during the financial crisis in 1997. In a year, the SEM-7 index

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<sup>9</sup>Data on an additional index called SEM-DEX is also available but its development is parallel to that of SEM-7, so it is not included in this analysis.

## Financial Asset Price

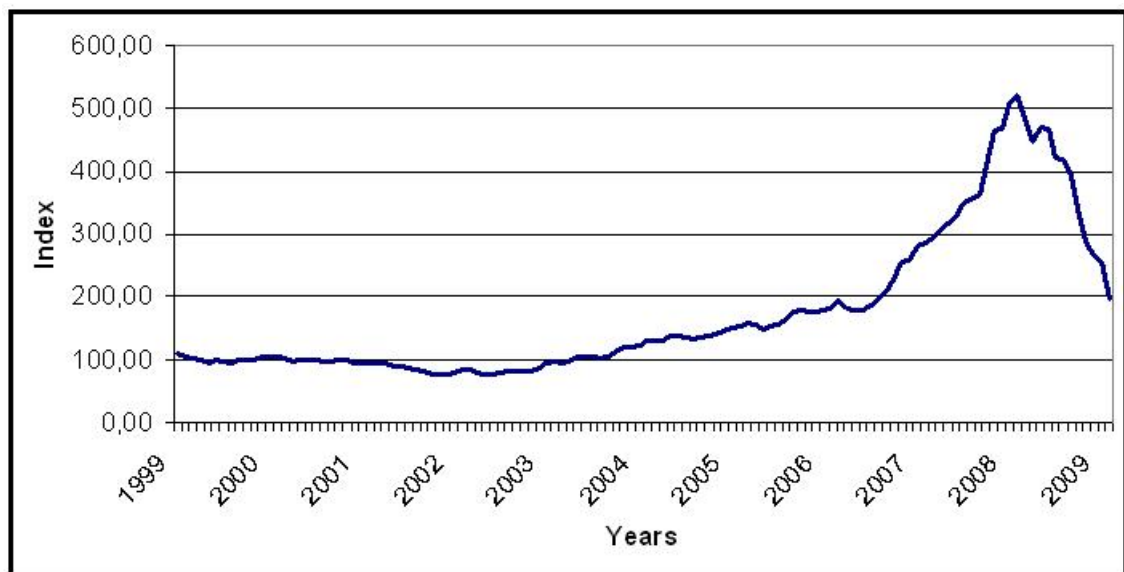


Figure 7.5: Monthly data of the Mauritian SEM-7 Index [BOM]

dropped 167 percent, from February 2008 to February 2009. In 1997, Indonesia, the country which financial assets were most adversely affected of the crisis, experienced a fall in asset prices of 82 percent, while Thailand saw its share prices drop by almost 50 percent [Arestis; 2002]. In this light, the 167 percent decrease in the SEM-7 index is substantial, and indicates that expectations of the Mauritian economy had, in fact, been overly optimistic and severely inflated prior to the collapse in February 2008.

The pattern of the asset prices traded on the Mauritian Stock Exchange seems to be in line with the one predicted by Minsky. Interestingly, the beginning of the boom in asset prices in July 2006 correspond approximately to the beginning of the speculative phase identified in section 7.1.1. However, the collapse of asset prices in February 2008 happens earlier than expected when looking at the credit market and before the collapse of the international financial market in September 2008. This indicates that uncertainty was already a part of the Mauritian financial market before the break of the financial crisis.

The domestic banking sector's willingness to provide credit to speculators (Ponzi financiers) can be proxied by the credit provided to the financial and business service sector, which consist of credit for stockbrokers and investment companies<sup>10</sup>. Monthly data for this proxy would be preferable but only annual data exist and only the period from 2001 to 2009. In 2001 the total credit provided to the financial and business service sector amounted to 6631 million Rupee, in 2008 this number had increased by 214 percent to 20883 million Rupee, making the financial and business service sector the fifth highest recipient of credit in Mauritius.

The introduction of foreign speculators into the domestic financial system would, according to the Minskyan framework, cause increased upward pressure on financial asset prices and cause increased vulnerability as they seek quick exits whenever uncertainty increases. The Bank of Mauritius provides data on foreign investment on the Mauritian stock market but only annually.

<sup>10</sup>In addition this category consist mainly of non-banking deposit taking institutes.

Monthly data would have been preferable to more carefully analyze the role of foreign speculators in the SEM-7 collapse of February 2008.

However, as figure 7.6 indicates foreign investors sold heavily in 2008 and 2009, reacting on increasing uncertainty. In addition, the recessionary period after 1999 seems to have deterred foreign speculators from the Mauritian economy, but as the domestic economy upswing evolved the foreign investors was increasingly attracted towards arbitrage opportunities. This finding is supported by the flows of FDI into Mauritius. Although FDI is not as such speculative it might illustrate the level of foreign confidence in the Mauritian economy. The surge in FDI inflows from 2005 to 2007 is supportive for the other findings of this analysis and the stagnation of flows in 2008 supports the idea of foreign investors losing confidence in the Mauritian economy.

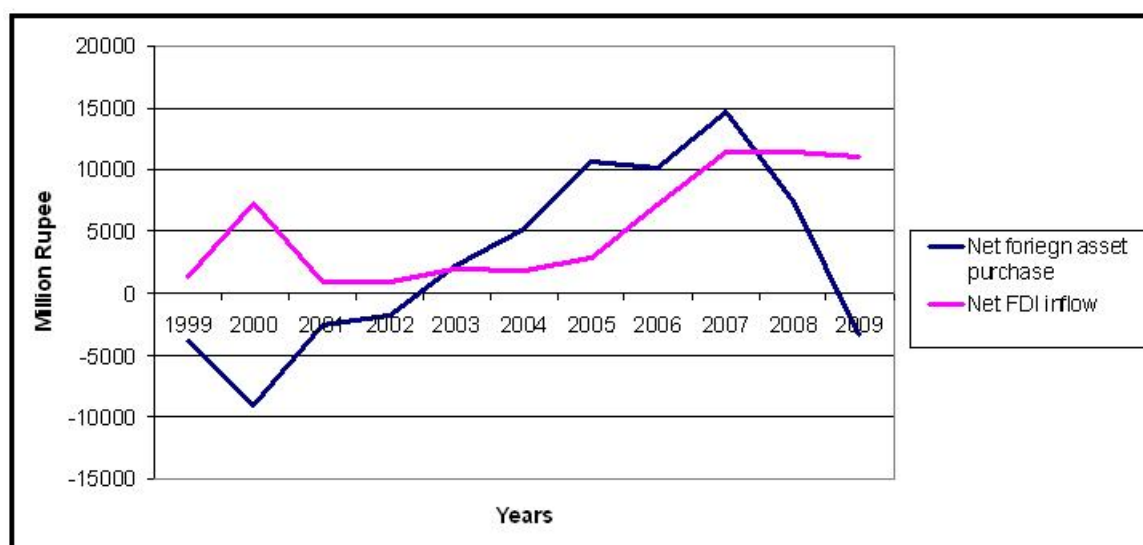


Figure 7.6: Annual net foreign investment in Mauritius [BOM]

### 7.1.2.3 The Foreign Exchange rate

To what extent the Mauritian Rupee follows a pattern consistent with the theoretical Minskyan framework depends on the exchange rate regime pursued by the Bank of Mauritius. Officially, Mauritius is a managed floating regime with no pre-determined path. The Bank emphasizes that the Rupee should reflect market fundamentals and be determined by market forces. Intervention should only be used to avoid short term misalignments [BOM; 2002].

Figure 7.7<sup>11</sup> illustrates the development of the Rupee *vis-a-vis* the US-Dollar<sup>12</sup> and indicates that Mauritius has experienced three periods of appreciations and two periods depreciations from 1999 to Marts 2009. Can this pattern be explained using the Minskyan framework developed earlier? According to this framework, inflows of capital from foreign investors during an economic boom have an significant impact on foreign exchange rate. As an upswing is progressing and foreign investors turns to the domestic economy, the foreign exchange rate should appreciate. An appreciating exchange rate, in a booming economy, creates expectations of more to come and

<sup>11</sup>Notice, Y-scale starts at exchange rate 20.

<sup>12</sup>The price of 100 Rupee in terms of one US-Dollar.

## The Foreign Exchange rate

provides foreign exchange arbitrage opportunity which, in turn, puts additional upward pressure on the exchange rate. If however, uncertainty becomes prevailing, for one reason or another, foreign investors will quickly seek liquidation of their assets and hereby cause a downward pressure on the exchange rate. A process of depreciation makes foreign currency loans more expensive and debt repayments denominated in foreign currency increases without necessarily resulting in income increases. This makes super-speculative financed units increasingly vulnerable and might force them into Ponzi financing.

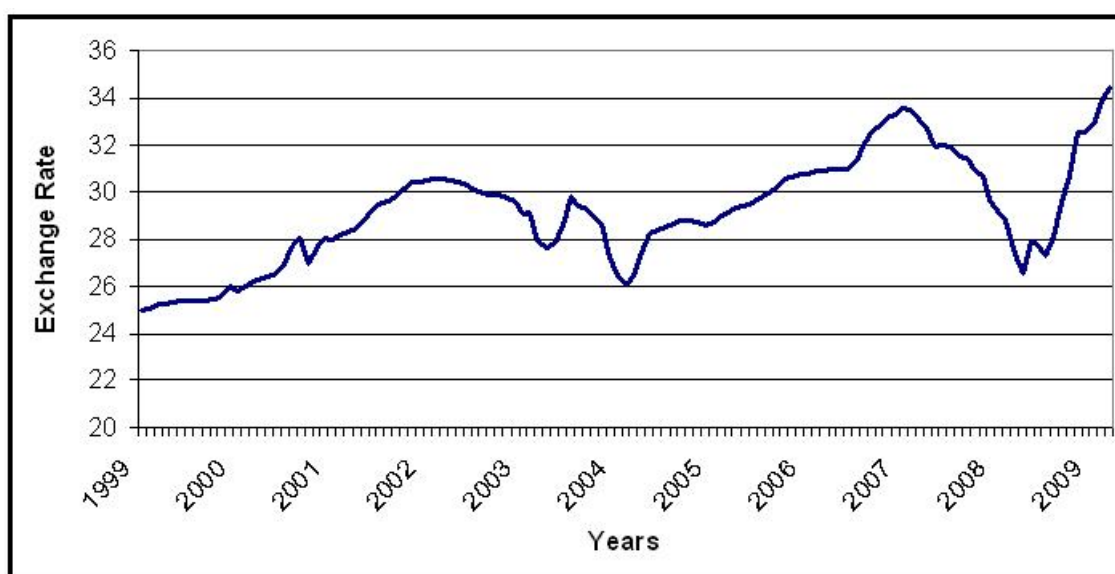


Figure 7.7: Monthly price of 100 Mauritian Rupee in US-Dollar [BOM]

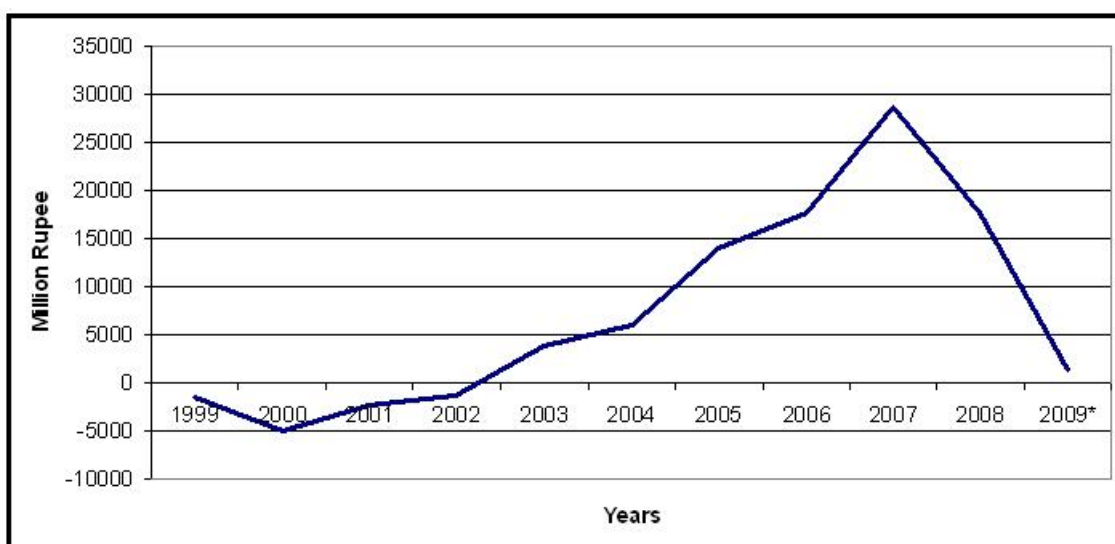


Figure 7.8: Annual net foreign financial flows to Mauritius [BOM]

Before analyzing the exchange rate, a quick view on the financial flows from abroad into Mauritius would be illustrative. Figure 7.8 shows the development of foreign currency financial

inflows from 1999 to 2009 directed towards foreign purchase on the stock exchange, foreign direct investments and portfolio investments less purchases on the stock exchange. Figure 7.8 shows a behavior similar to what was observed when analyzing the price of financial assets and can best be characterized as an economic bubble. From 2002 to 2007 a constant inflow of foreign currency financial capital was recorded, but from 2007 to 2009 the bubbles collapsed, reaching almost zero in 2009.

We now turn to the development of the Rupee exchange rate *vis-a-vis* the US-Dollar. The first period of appreciating exchange rate, from 1999 to 2002, can not be explained by inflows of financial capital from abroad. As figure 7.8 shows, this period was characterized by a net outflow of financial capital. In this period the Bank of Mauritius intervened by net selling US-Dollar to a total value of 6042 Million Rupee in order to strengthen the domestic currency, which might have caused the observed appreciation. This is supported by the fact that the appreciation came to a halt just after the Bank of Mauritius stopped its intervention in October 2001. The particular reasons for the Bank of Mauritius to intervene are outside the scope of this thesis, as this could relate to many and complex factors such as external trade performance.

From 2002 foreign financial capital started flowing into Mauritius, but the exchange rate depreciated nevertheless until July 2003, where a short appreciation occurred, before the depreciation continued until April 2004. Once again this downward movement is unexpected due to the increasing inflow of financial capital, but this tendency could also be ascribed to intervention from Bank of Mauritius. From February 2002 to February 2004, where the Rupee depreciated from a level of 30.51 to 26.79, the Bank of Mauritius intervened by net purchase of US-Dollars in 18 of the 24 month, corresponding to a net sale of 7246 Million Rupee.

The period from Marts 2004 until January 2007 was characterized by an heavily appreciating Rupee. The appreciation happened parallel to a heavy net inflow of foreign financial capital, which went from a level of approximately 5000 million Rupee to nearly 30000 million Rupee. However, in this period as well, the Bank of Mauritius intervened, on the foreign exchange market, by selling US-Dollar worth 12256 million Rupee, creating an additional upward pressure on the Rupee exchange rate. Because of this, it is difficult to establish the precise effect of the net inflow of financial capital from abroad on the exchange rate.

In February 2007, the Bank of Mauritius seemed to had perceived the Rupee exchange rate to be too high. In February, Marts, and April, the Bank of Mauritius purchased US-Dollar (sold Rupee) worth 6573 million Rupee, the highest amount during a single quarter over the period of study. This intervention initiated a rapid depreciation of the Rupee, which might be an important reason why foreign investors withdrew from the Mauritius financial market from 2007, as illustrated in figure 7.8. The withdrawal of foreign financial flows looks to have exacerbated the depreciating Rupee, which kept falling rapidly after the Bank of Mauritius stopped its intervention, reaching the lowest level in four years in April 2008.

From May to November 2008, the Bank of Mauritius made a successful attempt to strengthen the Rupee by selling US-Dollar worth 5642 million Rupee. This initiated a process of appreciation which, despite the outbreak of the current financial crisis and the massive outflow of foreign financial capital, was maintained to Marts 2009 (the last entry of data) where the Rupee reached the highest level ever recorded *vis-a-vis* the US-Dollar.

The observed tendency of the foreign exchange rate from 1999 to Marts 2009 is difficult to



interpret along the lines of the Minskyan framework. The main reason for this is the extensive intervention of the Bank of Mauritius, which has happened during the period of study. However, there seems to be some correspondence between the reversal of foreign currency financial flows in 2007 and the rapid depreciation of the Rupee in the following period, indicating that the Rupee is, at least to some degree, vulnerable to financial openness.

#### 7.1.2.4 Factor Prices

According to the Minskyan framework factor prices should be expected to increase during the cyclical movement of the financial system. As more and more investments is undertaken, the demand for labour and other factor inputs increase, pushing factor prices upwards and, depending on the price inflation<sup>13</sup>, erodes firm profit. Eroding profits increase the financial vulnerability of firms, and hereby the financial system, as it is profits which are used to pay debt commitments. In this analysis, the price of labour is chosen, in lack of other measures, to reflect changes in factor prices in general. More precisely growth of unit labour cost in excess of labour productivity growth is used to analyze whether or not the Mauritian economy has faced increased costs of factor inputs in the period of study. Unfortunately, data on unit labour costs and labour productivity is only available until 2006.

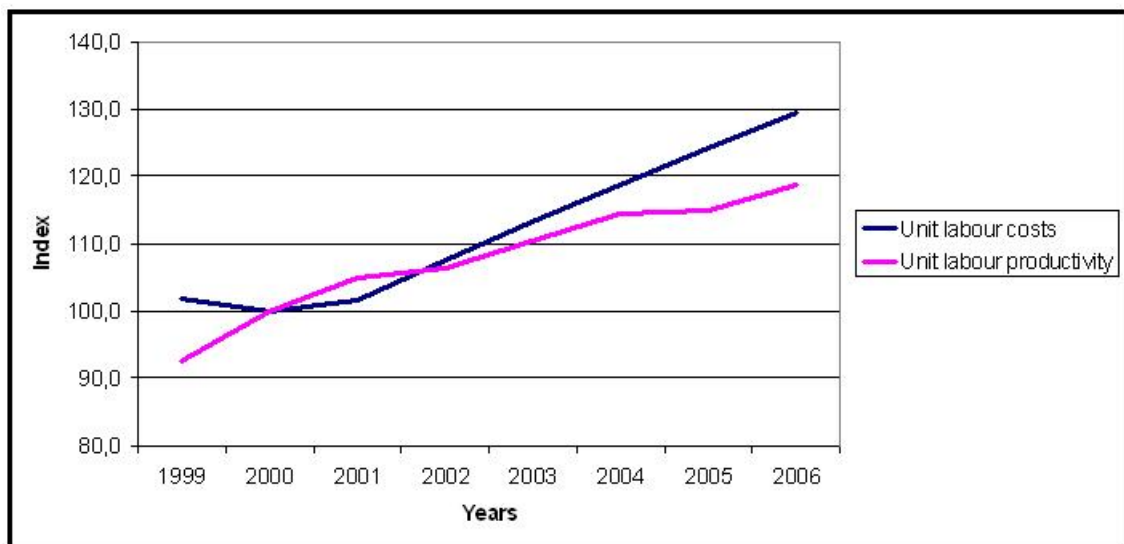


Figure 7.9: Annual unit labour productivity and unit labour costs index for Mauritius [BOM]

Figure 7.9<sup>14</sup> illustrates the development of unit labour costs and unit labour productivity in the Mauritian economy from 1999 to 2006. After three years of stagnating unit cost in 1999 and 2000 and 2001 where productivity increased, unit labour costs have been in excess of productivity until 2006. Unit labour cost seems to grow at a constant rate which are larger than productivity growth indicating increasing wage costs for firms. Regrettably nothing can be stated about the post-2006 period which is more interesting in relation to the Minskyan framework, but this pre-2006 period indicates that factor input have been rising within the Mauritian economy and this is expected to continue according to a Minskyan interpretation.

<sup>13</sup>See next section.

<sup>14</sup>Notice, the Y-scale starts at index 80.

### 7.1.2.5 Inflation

Table 7.3 shows the development of the price inflation rate of the Mauritian economy from 1999 to 2008. Inflation plays an important part in the Minskyan system as price inflation keeps firm profits high enabling them to meet debt commitments despite increasing lending rates and factor prices. However, price inflation can also have a negative impact on firm profits as it reduces price competitiveness in the exporting sector, which is of great importance for Mauritius.

Year	Inflation Rate
1999	7.9
2000	5.3
2001	4.4
2002	6.3
2003	5.1
2004	3.9
2005	5.6
2006	5.1
2007	10.7
2008	8.8

Table 7.3: Annual price inflation rate in Mauritius [BOM]

As table 7.3 shows the price inflation rate has been relatively high throughout the period of study (average of 6.31 percent) despite the Bank of Mauritius effort to keep it down. Inflation has been especially high during the period identified as a speculative financing phase (2005-2008), a fact that may be one of the explanations to the observed credit expansion in the Mauritian economy. It would have been illustrative if the inflation rate of the first half of 2009 could be included, but inflation data from 2009 is yet to be published by the Bank of Mauritius. Knowing the inflation rate of 2009 could indicate if the Mauritian economy has faced deflation in the light of the financial crisis, as predicted by Minsky. If this is the case, the firms with high debt commitments will find it increasingly difficult to meet these, as profits are eroded. However, as export plays such a crucial role in the Mauritian production sector, a deflationary process might increase price competitiveness and hereby increase sale and profits. As the global demand for goods is falling, due to recession, in most parts of the world, this effect is likely to be very limited.

### 7.1.2.6 Foreign Lending Rates

Foreign lending rates are decided on the international financial market. Their key determinants are the overall global economic performance and the economic performance of the borrowing economy. In addition, the international financial rating agencies play a decisive role as the international commercial banks rely on rating from these agencies when assessing individual countries' creditworthiness and hereby the cost of lending. The international ratings, made by large corporations like *Moody's* and *Standard Poor*, are assigned to sovereigns but the availability of foreign credit to the domestic private sector is connected to the ratings of the sovereign [Hawkins; 2003].

Regrettably, no available data exists which can be used analyzing the development of the foreign lending rates, faced by Mauritian firms, in the period of study. In addition, data on the international financial ratings of Mauritius are not freely accessible. If data on foreign lending rates and international financial rating could be retrieved they could be used to study if the Mauritian

private sector faced relatively higher foreign lending rates in the beginning of the period, but as the global and Mauritian economy strengthened, these lending rates should decrease.

### 7.1.3 The Mauritian state entity

Arestis and Glickman argue that, once an economy opens to the global financial market, the state entity can be regarded as a financing unit in relations to the external value of its currency [Arestis; 2002] as discussed in chapter 4. As it has already been shown in section 7.1.1 the domestic Mauritian residents (firms, commercial banks and individual agents) have been accumulating debt denominated in foreign currencies in an increasing magnitude. In section 7.1.2.3 it was also shown how the Bank of Mauritius has been actively intervening in the foreign exchange market. In order for the Bank of Mauritius to intervene<sup>15</sup> it needs to accumulate foreign currency reserves. It is the relation between these reserves and the accumulated debt, that makes the state entity a financing unit. As long as reserves are substantial in relation to total external debt, the state entity can be regarded as a hedge-financing unit, but if this ratio rises the state entity becomes more and more speculative, especially if the rise is caused by increased accumulation of short-term debt. A speculative state-entity is per definition financial vulnerable as it is sensitive to credit withdrawals or debt status changes.

Figure 7.10 shows the development of the debt-to-reserve ratio from June 2005 to February 2009<sup>16</sup>.

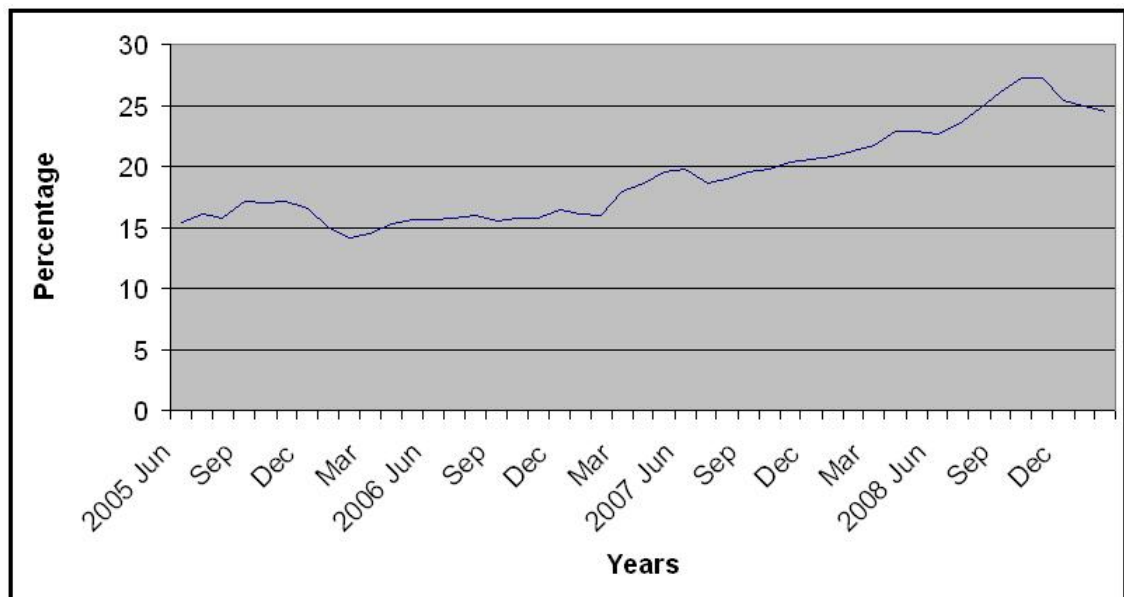


Figure 7.10: Monthly external debt-to-reserve ratio in Mauritius [BOM]

Figure 7.10 shows that the debt-to-reserve ratio has, in general, been rising until November 2008, i.e during the current financial crisis. The period from June 2005 until February 2006 is characterized by a relatively stable development in the ratio. In this period, both net reserves and

<sup>15</sup>Selling foreign currency only.

<sup>16</sup>A longer period would have been preferable, but, as mentioned earlier, the removal of the distinction between domestic and off-shore banks in May 2005 makes this impossible.

foreign debts increased in modest rates (2.14 and 2.35 percent per month respectively) resulting in an average rise in the ratio of 0.27. From Marts 2006 until June 2008, the ratio increased from a level of 15.97 to 22.58 or by 2.25 percent on average per month. This rise is attributed to growing debts while reserves were relatively stable. From July 2008 to October 2008, the ratio increased rapidly from a level of 22.25 to 27.14 or by 4.70 percent per month before stagnating and ultimately declining.

The pattern of debt maturity is important to take into consideration when analyzing whether or not the state entity of Mauritius has been increasingly engaged in speculative financing and hereby become financial vulnerable. Figure 7.11 provides an illustration of how short-term debts have evolved in relation to total external debt, in the period from 1999 to 2007<sup>17</sup>. As illustrated in figure 7.11, short-term debts have increased considerably to a level of 85 percent of total external debt in 2007. If the development in 2008 follows a patten consistent with Minsky, this would have increase even further.

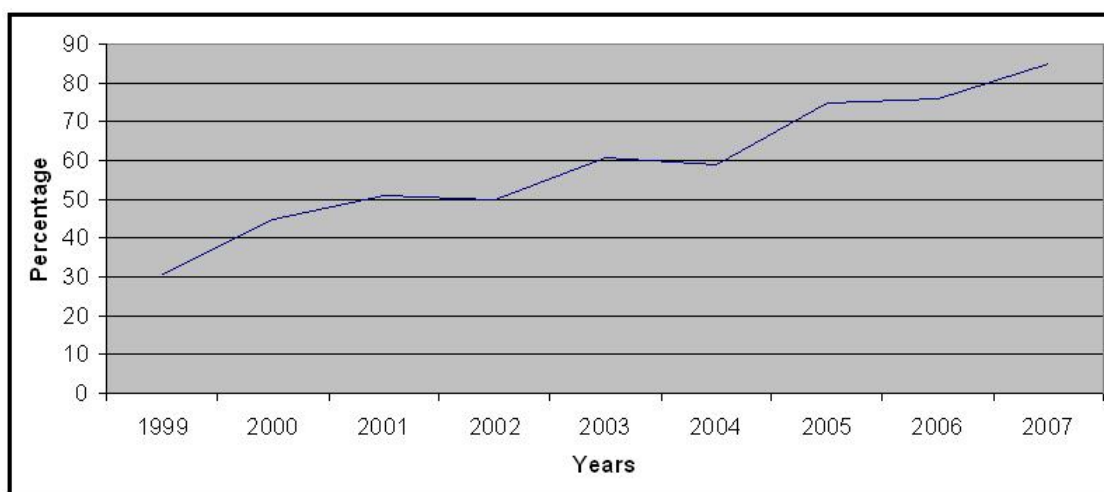


Figure 7.11: Annual short-term debt as percentage of total external debt in Mauritius [WDI]

Country	Short-term debt (\$bn.)	Net reserves (\$bn.)	Short-term debt-to-reserves (%)
South Korea	70,2	31,3	224
Mauritius	56,6	28,6	198
Indonesia	34,7	18,9	184
Thailand	45,6	37,7	121
Philippines	8,3	9,4	88
Malaysia	16,3	26,6	61

Table 7.4: Short-term debt status for Mauritius and the five Asian “Tigers” [WDI]

According to figure 7.10 and figure 7.11, the state entity of Mauritius has indeed become more speculative financed and hereby financial vulnerable. Debt have increased in relation to net reserves during the period, at least until the break of the current financial crisis, and the share

<sup>17</sup>Data on short-term debt for 2008 and 2009 is not available

## Summary

of short-term maturity debts to total external debts have increased as well. Especially the last observation is important, as financing investment with short-term maturity debts is the very core of speculative financing. It would be illustrative to compare the observations of the state entity of Mauritius with the Southeast Asian economies, just before the break of the Asian financial crisis in 1997. Doing so would allow us to compare the financial position of Mauritius with countries which has proved themselves financial vulnerable, using Arestis and Glickman's definition. Table 7.4 compares Mauritius with the five Southeast Asian countries, which were affected the most by the financial crisis in 1997.

Table 7.4 indicates that Mauritius has reached a critical level of short-term indebtedness in 2007, in comparison with the Asian "tigers" and according to this Mauritius, as a state entity, has indeed become financial vulnerable. On behalf of their analysis of the Southeast Asian "tigers", Arestis and Glickman concludes the following which, as a consequence of the observations in table 7.4, must also apply for Mauritius:

*"as speculative financing activity by firms, households and banks drives up the ratio of private sector debt to national foreign currency reserves, the state, on our extended Minskyan analysis, is turned into a speculative- and ultimately a Ponzi financing unit in relation to the exchange rate."* [Arestis; 2002]

### 7.1.4 Summary

The analysis of *tendencies* within the Mauritian economy have provided indications which can be used to answer the analytical part of the research question. In general, this analysis provides supportive evidence that Mauritius in fact, has become more financial vulnerable the last 10 years, through a process of increased speculative financing. There is both stronger and weaker supportive evidence, but no observation has been in direct contradiction to the Minskyan framework. In section 7.1.1, it was shown that the domestic credit market had expanded over the period of study, and in a pattern corresponding to the Minskyan framework's predictions. It is worth noticing that this expansion of domestic credit was in excess of real GDP growth by an average of 8.47 percent, and that domestic currency credit, as a share of GDP, grew from 45 to 63 percent in the period. The expansion can hereby not only be ascribed to a growing economy. The fact that a large proportion (nearly 30 percent) of domestic credit was directed towards property sector development illustrates that the expansion of credit, at least to some extent, was driven by speculation.

In section 7.1.1, it was also observed that the commercial banking sector of Mauritius has been increasingly engaged in foreign currency lending. Foreign currency lending to the foreign private sector increased by 173 percent in the period or from 16 to 24 percent of total lending. The increase followed a pattern corresponding to the Minskyan framework's predictions. The non-banking private sector of Mauritius went through the same development of increasing foreign borrowing. Foreign borrowing of this sector amounts to 11 percent of GDP in 2008 compared to a little under 5 percent in 2001. Regardless the reason for the increase of foreign currency lending and borrowing<sup>18</sup> it makes economic units engaged in speculative financing, as they become sensitive to volatility of exchange rates.

Section 7.1.2 gave indications on how the key prices of the Minskyan system had developed in

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<sup>18</sup>Growing global economy, more efficient international transactions, liberalized and open economy etc.

the period of study. The analysis of the domestic interest structure gave indications of changing liquidity preferences within the banking sector, which were, to some degree, in accordance with the Minskyan predictions. However, this measure can only be regarded as a partial measure and a proxy of liquidity preferences, caution must therefore be taken when making conclusions. The development in financial assets prices provide some of the most compelling evidence of Mauritius financial sector has been moving towards financial vulnerability. The bubble and burst behavior of the SEM-7 index supports the Minskyan framework and indicates that the Mauritian economy was dominated by overly optimistic expectations in the period from 2005 to 2008. This behavior can clearly not be contained within the Neo Classical *Efficient market hypothesis*.

The tendency of the foreign exchange rate to follow a pattern in accordance with the Minskyan framework is blurred by the interventionist policy followed by the Bank of Mauritius. The main conclusion from analyzing the exchange rate is that there seems to be some connection between international financial flows and the Rupee. In particular, there seems to be some correspondence between the sudden withdrawal of international financial flows in 2007 and the Rupee depreciating. The inflationary process of Mauritius in the period of study indicates that factor prices has increased in excess of productivity. This is in accordance with the Minskyan framework. Price inflation has likewise been relatively high which provides an alternative, but only partial, explanation of the expansion of credit observed in section 7.1.1.

Mauritius as a state entity, was found, in section 7.1.3 to have become speculative during the period of study. One observation of special interest and source of concern is the relative high levels of short-term debts. The level of short-term maturity debts was even high in comparison with most of the Southeast Asian countries in the 1990s. This is a very strong indication of Mauritius has become more financially vulnerable during the period of study.

## 7.2 Financial Vulnerability

Having assessed the financial vulnerability of the Mauritian economy in the last chapter it is now time to compare the Mauritian economy across time to provide more information to whether or not the Mauritian economy has become more financially vulnerable during the years of financial liberalization and openness. A measure of financial vulnerability, which can be used as basis of comparison across time is provided by Penelope Hawkins in her “*The Open Economy and its Financial Constraints*”. On the basis of four variables<sup>19</sup> Hawkins constructs a financial vulnerability index for 20 countries, including Mauritius, in the period 1985 to 1995. In Hawkins’ study, she finds Mauritius to be the third most financially invulnerable economy with only Switzerland and India being considered more invulnerable. Mauritius performs even better than countries like United States, Canada, and New Zealand which all were considered more financially vulnerable. The most vulnerable countries in the period were found to be Thailand, Brazil, South Africa and Mexico, which were all hit by financial crises during or just after the period of study<sup>20</sup>, which seems to indicate some validity of the index.

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<sup>19</sup>The four variables were selected among ten different variables following criteria of plausibility, simplicity, non-overlapping and ease of comprehension [Hawkins; 2003].

<sup>20</sup>The Mexican Peso crisis in 1994 and the East Asian crisis in 1997 originated in Thailand which spread to Brazil and South Africa among others.

### 7.2.1 The Four Variables and the Mauritian Result

This chapter aims to update Hawkins' index for the period 1999 to 2007<sup>21</sup> for Mauritius. The four variables will each be discussed, analyzed and compared to the results of the earlier period presented by Hawkins [Hawkins; 2003] before the results are summarized. Data is obtained from Bank of Mauritius (BOM) and from the World Banks development indicators (WDI).

#### 7.2.1.1 Financial Account as a Percentage of GDP

The financial account (former known as the capital account) is a measure of the value of the capital/financial transactions on the balance of payment. The financial account is the net sum of direct investments, portfolio investments and other investments. According to Hawkins, the larger the (positive) share of the financial account in GDP and the larger volatility measured as the standard deviation the more financial vulnerable is an economy [Hawkins; 2003]. The argument is that countries with a large share of financial account to GDP is more exposed to financial flow reversals, as was the case in Thailand in 1997. In Hawkins' study, Mauritius had an average share of the financial account to GDP of 1.97 percentage in the period from 1987 to 1996<sup>22</sup> with an standard deviation of 0.56. In comparison Thailand, the most financially vulnerable country, had an average of 8.06 percentage while Switzerland's financial account amounted to -5.73 percent of GDP (outflow of capital), making Switzerland the most invulnerable economy according to this particular variable.

Year	Financial Account to GDP
1999	-3.02
2000	5.96
2001	-4.35
2002	-5.39
2003	-2.36
2004	0.53
2005	4.91
2006	5.06
2007	0.93
<b>Average</b>	<b>0.25</b>

Table 7.5: Annual financial account as a percentage of GDP [BOM]

Table 7.5 shows the result from this thesis' study of the financial account as a share of GDP. This study finds that Mauritius had an average financial account amounting to 0.25 percent of GDP in the period from 1999 to 2007. This is considerable lower than the previous period but looking at a sub-period from 2005 to 2007 which was identified as a speculative financing period, in the previous chapter, and hereby expected to be increasing the financial vulnerability of the Mauritian economy, the result shows a positive value of 3.63 percentage of GDP. The standard deviation amounts to 4.31 for the entire period, substantial higher than in the preceding period, indicating increasing volatility of financial flows.

<sup>21</sup>Preferably to 2009, but data limitations excludes this possibility.

<sup>22</sup>This period is shorter than the period of study due to lack of data availability.

### 7.2.1.2 Net Portfolio Investment as a Percentage of GDFI

The amount of portfolio investment as a share of total gross domestic fixed investments is the second measure used by Hawkins. Portfolio investment is used as a measure of the composition of investment flows into an economy. High value of portfolio investment indicates an exposure to short-term volatility, as these flows are particular sensitive to changes in market sentiment due to shorter time-horizon for portfolio investors compared to for example foreign direct investments [Hawkins; 2003]. Hawkins finds that Mauritius experienced an average inflow of portfolio investment of 1.97 percentage of gross domestic fixed investments from 1986 to 1996 with a standard deviation of 5.51. This is a low value compared to the rest of the sample.

The result for the period from 1999 to 2007 is presented in table 7.6. The pattern in table 7.6 is not unlike the one found in table 7.5. Over the entire period an average of -0.98 percent is observed, but this is mostly due to large outflows of portfolio investments in year 2000. Looking, once again, at the sub-period from 2005 to 2007, a positive average of 2.10 percentage is found indicating a net inflow of portfolio investments. This indicates an increasing vulnerability, but the values are still very low compared to sample in Hawkins' study.

Year	Net portfolio investments to GDFI
1999	4.21
2000	-11.35
2001	-1.95
2002	-1.71
2003	-1.50
2004	-2.83
2005	1.24
2006	0.39
2007	4.67
<b>Average</b>	-0.98

Table 7.6: Annual net inflows of portfolio investments as a percentage of GDFI [BOM]

### 7.2.1.3 Short-Term Debt as a Percentage of Total External Debt

The increased financial vulnerability in relation to increasing short-term maturity debt have already been discussed extensively in this thesis so further elaborations are unnecessary. In Hawkins' study, Mauritius has an average share of short-term debt to total debt of 10.33 percent, which are relatively low in comparison with the sample. In the period from 1999 to 2007 this share has increased dramatically, as illustrated by table 7.7, to an yearly average of 59.22 percent (78.66 percent for the sub-period 2005-2007). This average value is almost twice the size of the largest share found by Hawkins in her sample for the period 1985 to 1995<sup>23</sup>.

### 7.2.1.4 Exchange Rate Volatility

The final variable Hawkins has used to construct the financial vulnerability index is episodes of exchange rate volatility. The consequences of exchange rate volatility in relation to financial vulnerability has been discussed previously. Depending on the extent economic units are engaged

<sup>23</sup>Thailand which had an average share of short-term debt to total external debt of 32.08 percent.



## Summary

<b>Year</b>	<b>Share of short-term debt</b>
1999	31
2000	45
2001	51
2002	50
2003	61
2004	59
2005	75
2006	76
2007	85
<b>Average</b>	<b>59.22</b>

Table 7.7: Annual short-term debt as a percentage of total external debt [BOM]

in foreign currency lending/borrowing, volatile exchange rates can makes speculative financing units, super-speculative financed and hedge-financed, speculative financed. Hawkins defines an episode of exchange rate volatility as a 10 percent variation in the currency value from one quarter to the next. In the period studied by Hawkins (1986-1996) Mauritius was found to have had two episodes but in the period following period, studied in this thesis, no episodes of exchange rate volatility were recorded.

### 7.2.2 Summary

Was Mauritius more financial vulnerable in the period from 1999 to 2007 than in the period from 1985 to 1995? According to the financial vulnerability index developed by Penelope Hawkins this is not entirely clear. One out of the four studied variables is clearly indicating a more vulnerable Mauritian economy (share of short-term debt to total external debt), two is showing a tendency towards increased vulnerability late in the period (Financial account to GDP and Portfolio investments in total GDFI), and finally, one have improved in the later period (Exchange rate volatility). Based on these findings it is hard to make a clear-cut conclusion that the Mauritian economy have become more financial vulnerable. However, the rapid growth in short-term debt as a share of total debt, which per definition has made Mauritius severely engaged in speculative and even super-speculative financing, is a serious concern and a very strong indication of financial vulnerability of the Mauritian economy.



## Chapter 8

# Conclusions

12 years ago, in 1997, the so-called Southeast Asian financial crisis hit the world economy, and it was claimed by prominent economists (Krugman, Stiglitz, Arestis among others) to be the worst financial crisis since the Great Depression of the 1930s. 10 years later, in 2007, the world economy had long forgotten the recession of the late 1990s and the decade's financial crises. The world economy was booming, growth rates were high, asset prices sky-rocked, and confidence and optimism dominated the economic system. The financial markets had played an integrated part in the boom. Financial deregulations and liberalization had secured new possibilities for investors and creditors, and the removal of financial controls had allowed cross-border financial flows to reach levels of almost unimaginable heights. Only a year later, in 2008, the system collapsed, asset prices dropped, growth rates reach negative values, and a sentiment of financial and economic panic spread.

It can seem like a mystery, why the financial troubles of Southeast Asia seemed to have been forgotten just 10 years later, and why policymakers did not take a more careful approach to the financial markets in the light of the lessons from previous financial crises. However, the mystery might be explained by looking at the dominant mainstream of economic thinking, the Neo Classicals, which advocate liberalization and openness of the financial markets. The fundamental reason, why Neo Classicals claim that a liberalized and open financial market is efficient, is the axiom of ergodicity. As this thesis has shown, rejecting this axiomatic approach, and instead invoking an assumption of a fundamental uncertain future, makes the conclusion regarding the organization of the financial market fundamentally different. In a non-ergodic world, where uncertainty is a premise for all economic agents, financial markets can never be efficient, but will have an inherent tendency toward vulnerability and instability. Financial liberalization and openness will only exacerbate the process towards vulnerability and hereby make economies more exposed to financial crises. What is needed, to reduce the risk of financial vulnerability, is a strong government, regulatory financial authorities, and controls of cross-border financial flows. This approach is advocated by the Post Keynesians, or more precisely by the Post Keynesians who might be called Minskyans.

The research question of this thesis had two objectives. Firstly, why Post Keynesians perceive financial liberalizations and openness to increase financial vulnerability. In part I it was discussed that financial liberalization intensifies the drive for financial innovation, which breaks down the regulatory framework. This reduces the *barriers of conservatism* within the banking sector, and causes a downgrading of risk assessments of potential borrowers. These mechanisms have a tendency to move economic units and agents towards speculative financing. Financial openness exacerbates this tendency, and allows the possibility that economic units, agents or state entities

become engaged in, what is called super-speculative financing. Speculative or super-speculative financing makes the economy sensitive to changes in market conditions and hereby to financial vulnerability.

Following the conclusions of the first (theoretical) part of the research question, the Neo Classical policy recommendations needs to be revised. A international discussion needs to be undertaken on how to organize the financial markets in the future. The free-market thinking, based on Neo Classical theory and assumptions, might need adjustments if financial vulnerability is to be reduced. No matter what, in the light of the current financial crisis and its real economic consequences, the burden of proof must be on the Neo Classicals, not the Post Keynesians.

The second objective of the research question was, whether or not Mauritius has become more financial vulnerable following its attempt to liberalize and open its financial markets? This question was analyzed by studying *tendencies* within the Mauritian economy. No observations were found to be in clear contradiction to the Minskyan predictions, while several supportive evidence were indeed found. The three most compelling evidence, supporting the Minskyan view, were: 1) The expansion of both domestic and foreign currency credit, which grew much more rapid than the general economy. 2) The “bubble” behavior of the price of financial assets, which collapsed in 2008. And finally, 3) the increasing share of short-term maturity debts in relation to reserves and total debts. On the ground of these three and several other observations, this thesis concludes, that Mauritius has become financial vulnerable during the period of study. This conclusion is supported when comparing the Mauritian performance with the Southeast Asian countries in the 1990s. The study of the updated financial vulnerability measure, created by Penelope Hawkins, provides both supportive and less supportive evidence to the Minskyan framework. The two main conclusions from the analysis of this measure is: 1) That short-term debts in relation to total debts have increased in Mauritius in the period from 1999 to 2007. This increase is substantial in comparison to other economies and Mauritius itself in the predating period of 1985 to 1995. 2) Exchange rate volatility seems to have declined in the later period, which can either be an indications of a stronger economy or of increased interventionist policy followed by the Bank of Mauritius.

The conclusions of this thesis indicate that the Minskyan (Post Keynesian) framework is superior in explaining the development of Mauritius financial market in the period from 1999 to 2009, compared to rival Neo Classical explanations. The three Neo Classical views on why the financial market becomes instable, outlined in section 3.1, all struggle to explain the observed tendencies. The *fundamentalist* view emphasized market distortions, but as shown in this thesis. the Mauritian development has been characterized by liberalizations which aimed at reducing market distortions. Although the *bail-out* view to some extent can explain the expansion of credit and the short-term maturity pattern of debts, it fails to explain the bubble behavior of the financial asset price. In addition, Bank of Mauritius has shown clear indications of willingness to let poor performing banks and financial institutions fail, most notably the bankruptcy of the Delphi Bank in 2002 [BOM; 2002]. It is paradoxically that the Neo Classical explanation, which performs best in explaining the peculiar development of Mauritius the last 10 years, is the so-called *panic* view. The *panic* view essentially renounces several of the Neo Classical fundamental assumptions, most importantly the assumptions of rational behaving agents.

## 8.1 The Future Perspectives of Mauritius

At present, the global economy faces economic difficulties due to the financial crisis, which originated from the US economy in September 2008. Across the globe dire predictions of the economy is revealed, with low or even negative growth rates and increasing unemployment. If the conclusions of this thesis are valid, the Mauritian economy is no exception. In fact, due to the liberalization process and increased openness towards international financial markets, the small African island may face severe financial and real economic difficulties in the near future. Difficulties which could jeopardize the otherwise impressive developing performance of the Mauritian economy. Until now, the Mauritian economy has not been as severely hit by the turmoil of the global economy as other economies like Iceland and the Baltic states. Predictions for Mauritius in 2009 are still pointing in the directions of positive real growth rates at around 2 percent (an downward adjustment from the 4-5 percent real growth expected before September 2008). However, as this thesis has shown, one of the most concerning observations of the Mauritian economy is the high levels of short-term maturity debts. The level of short-term debts in Mauritius is by no means trivial. Figure 8.1 illustrates this fact by comparing the short-term debt-to-reserve ratio with different regions and incomes groups.

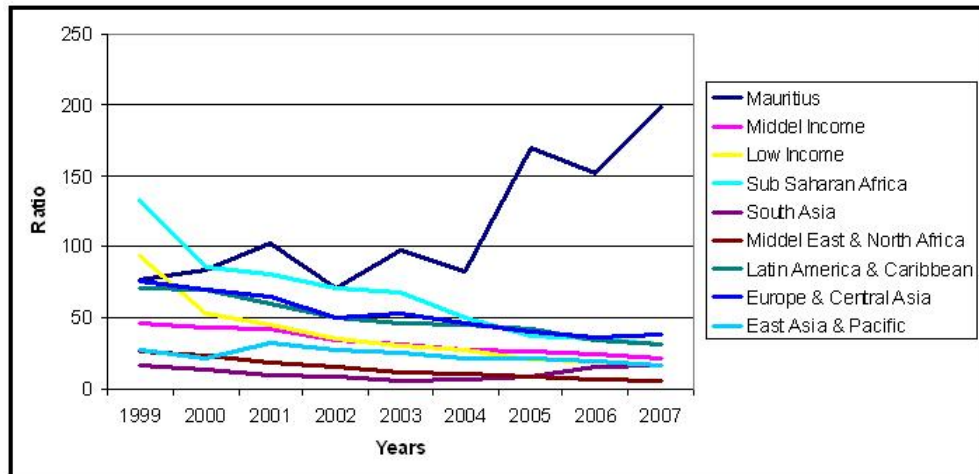


Figure 8.1: Annual short-term debt-to-reserve ratio in Mauritius and regions across the globe [WDI]

Figure 8.1 illustrates Mauritius' high levels of short-term debts, relative to the rest of the world. Combining this fact with the fact, that the financial crisis has increased the risk perceptions among international lenders, and the competition for international credit has intensified; Mauritius might find itself at the back of the line regarding obtaining international credit. In this light, how can Mauritius, as a state entity, refinance its short-term positions? The answer to this question might be the deciding factor to whether or not the Mauritian economy comes to face economic hardship and declining growth rates in the near future. The coming month and years will indicate if the price for expanding the economy the last 10 years has been too high? According to the Minskyan framework developed in this thesis, it might unfortunately be the case.



# Appendices





# Appendix A

## Dansk Resumé

Hvordan bør økonomer opfatte den verden, som de stræber efter at forklare? Bør de stræbe efter at forklare de komplekse og evigt forandrende interaktioner og relationer, som karakteriserer den "virkelige" verden eller efter at simplificere virkeligheden, ved hjælp af aksiomer, så en idealiseret verden således kan analyseres? Dette normative spørgsmål konstituerer en vigtig demarkationslinje i den økonomiske teoris historie. Denne linje adskiller "mainstream" økonomisk tænkning, bedst kendt som Neo Klassicismen, og den såkaldte Post Keynesianske tilgang.

Et område, inden for det økonomiske studium, som i særlig grad er afhængig af svaret på det overstående spørgsmål, er studiet af de finansielle markeder. Neo Klassikeres metodologi stræber efter at forklare økonomiske fænomener ud fra en forsimpning af virkeligheden, således kan denne studeres ved brug af matematik og statistisk analyse. De fremhæver fordelene ved liberaliserede og åbne finansielle markeder. Post Keynesianerne derimod advarer mod liberalisering af finansielle markeder og åbenhed over for strømninger af internationale finansielle goder, som kan føre til finansiell sårbarhed, ustabilitet og finansielle kriser.

På baggrund af denne metodologiske og teoretiske uoverensstemmelse mellem Neo Klassicismen og Post Keynesianerne ønskes det i dette speciale at diskutere, hvorfor så vidt forskellige opfattelser af de finansielle markeder kan opstå inden for samme videnskabelige disciplin. Grundlæggende er den teoretiske uoverensstemmelse opstået på baggrund af forskellige opfattelser af fremtiden. Neo Klassikerne antager, at alle fremtidige udfald af økonomiske beslutninger kan udregnes ved brug af sandsynligheder. Det følger heraf, at det er muligt at prediktere fremtiden ved brug af statistisk metode. Dette kan kort betegnes som det ergodiske aksiom, hvilket danner fundamentet for al Neo Klassisk teori. Som følge af det ergodiske aksiom, givet kompetitive markeder, vil økonomiske agenter have rationelle forventninger og sikre effektiv fordeling af goder. Den Neo Klassiske anbefaling af liberalisering og åbenhed af de finansielle markeder skal ses i dette lys.

Post Keynesianerne er om noget konstitueret ved forkastelsen af det ergodiske aksiom. De følger i stedet John Maynard Keynes' metodologiske observation: At fremtiden er fundamental usikker og hermed ikke kan statistisk predikteres. Finansielle markeder kan hermed aldrig antages at være efficiente og sikre optimal udnyttelse af finansielle goder. Tværtimod ser Post Keynesianerne liberaliserede og åbne finansielle markeder som en potentiel destabiliserende faktor, der kræver konstant regulering og kontrol. Den mest udtalte kritik af liberaliserede finansielle markeder er fremsat af Hyman Minsky, og dette speciale har anvendt hans teorier i analysen af den afrikanske østat Mauritius. Denne analyse er et illustrativt eksempel på, hvorledes Post Keynesiansk analyse står i stærk kontrast til Neo Klassikerne.

## Appendix A. Dansk Resumé

Mauritius har gennem de sidste 10 år gennemgået en finansiel liberaliseringsproces. Samtidig har de åbnet op for strømninger af international finansiel kapital. Denne politik er tydeligvis præget af de Neo Klassiske anbefalinger, men ligeså tydeligt er det, at ud fra Post Keynesiansk teori vil en sådan politik føre til øget finansiel sårbarhed og ustabilitet. Gennem analysen af Mauritius har dette speciale fundet adskillige indikationer på, at Mauritius faktisk er blevet langt mere finansiel sårbar end for 10 år siden. De tre mest iøjnefaldende observationer er: 1) En stigning i både hjemlig og udenlandsk kredit til den mauritianske private sektor, som steg markant mere end resten af økonomien i perioden fra 1999 til 2009. 2) Prisen på finansielle goder, der gennem perioden udviste tegn på "bubble-behavior", og som kollapsede i starten af 2008. 3) Og endelig er der sket en voldsom stigning i kortsigtet lån til den private sektor på Mauritius. Disse tre hovedindikationer, samt en række andre observationer, får dette speciale til at konkludere, at den mauritianske økonomi er blevet langt mere finansiel sårbar de sidste 10 år som forudsagt af den Post Keynesianske teori.

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